KERNFORSCHUNGSZENTRUM

KARLSRUHE

Oktober 1965

KFK 370

Literaturabteilung

Laboratorien für Arbeiten mit radioaktiven Stoffen

Bibliographie über Planung, Bau, Einrichtung und Ausrüstung

Teil III

G. Brossmann

GESELLSCHAFT FÜR KERNFORSCHUNG M.B.H.

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Gesellschaft für Kernforschung m.b.H.
Karlsruhe

Vorwort

Teil I und II der Literaturzusammenstellung über Bau, Planung, Einrichtung und Ausrüstung von Laboratorien für Arbeiten mit radioaktiven Stoffen, die als KFK 69 und KFK 176 veröffentlicht worden sind, enthalten 1220 seit 1955 erschienene Veröffentlichungen sowie ca. 150 umfassendere Abhandlungen aus den Jahren 1947 bis 1955. Im vorliegenden Teil III dieser Literaturzusammenstellung wurden weitere 425 Literaturstellen zu diesem Thema erfaßt. Die Literatur wurde in die nachstehend aufgeführten großen Gruppen eingeordnet. Die Art des vorliegenden Stoffes erschwert eine feinere sachliche Unterteilung. Viele Publikationen behandeln das Thema auf breiter Basis, so daß sie trotz der relativ großen Sachgruppen unter mehreren Gebieten angeführt werden mußten. In den einzelnen Gruppen findet man daher nebeneinander Publikationen, die speziell das Teilgebiet behandeln, und solche, in denen unter anderem darüber berichtet wird. Eine strengere Einordnung war nicht möglich, zumal die Probleme oft eng miteinander verknüpft sind.

Für die Bearbeitung wurde stets die Originalliteratur herangezogen. Teils wurden an Hand der Originale neue Referate zusammengestellt, teils wurden passende vorhandene Referate ergänzt und übernommen (Autoren-Referate und Referate der Nuclear Science Abstracts).

Bei der Fertigstellung der Druckvorlagen leistete Herr Baum wertvolle Hilfe.

Für Hinweise zur Ergänzung der Zusammenstellung sowie Anregungen und Kritik sind wir dankbar.

Kernforschungszentrum Karlsruhe,
im Oktober 1965 Literaturabteilung

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Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1.Rev., Suppl. 5) 24 Bl.)

Cape-218: Ball Socket Manipulator -4" Ball. The four in. ball socket manipulator is used for simple manipulations behind a lead shield or in a dry box in low level gamma activity. It consists of a stainless steel rod 55 3/16 in. long with a handle on one end and a tong on the other. Cape-414: Remote Shielded Metallograph. In adapting a standard Bausch and Lomb research metallograph for use in a hot cell, it was necessary to design shielding, remote control equipment, and transfer mechanisms. Lead-glass windows permit viewing. The mechanical transfer system shuttles the irradiated specimens between the cave and the metallograph which is located adjacent to the cave.

TID-4100 (1.Rev., Suppl. 5) CAPE-218 CAPE-414 1/4

(8) NSA-1960-4409 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1394
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl. 6)(1960) 21 Bl.)

Cape-430: Shielded Pipette Control. The shielded pipette control protects the hand from ß and low level γ radiation. A 5/8 inch CD Lucite tube is attached as a handle and a housing for a 2-ml syringe. A 1/8 in. ID Tygon tube through the shield connects the syringe and micropipetts. The thumb actuates the syringe. Cape-436: Remotely Controlled Balance. The modified Ainsworth "Right-A-Way" balance is mounted on top of the junior cave to facilitate weighing materials inside the cave. Cape-442: Shielded Autoclave Equipment. The Autoclave is loaded and unloaded in a hot cell but operated outside in a thin wall contamination enclosure. The shield is a 20 in. diameter cask

TID-4100 (1st.Rev., Suppl. 6) Cape-430 Cape-436 Cape-442 Cape-447 Cape-459 Cape-497 1/4

(12) NSA-1960-8519 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1394 1. Forts
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl. 6)(1960) 21 Bl.)

with the center board out and extra shielding at the bottom. Cape-447: Hand Changer Fixture for BNL Rectilinear Manipulators. The fixture facilitates the interchange of different types of hands used on BNL Rectilinear Manipulators. It consists of a flat plate on legs with 2 slots that fit around the manipulator jaws. Cape-459: Remotely Controlled Analytical Balance. The balance is used to accurately weigh metallurgical and other radioactive materials from 0.1 mg to 200 g in a hot cell. The balance was made by modifying a standard balance so weights could be shifted, zero adjustments made and the beam locked by motors and potentiometers.

TID-4100 (1st Rev., Suppl. 6) Cape-430 Cape-436 Cape-442 Cape-447 Cape-459 Cape-497 1/4

(12) NSA-1960-8519 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1394 2. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl. 6)(1960) 21 Bl.)

Cape-497: Potentiometric Acid Apparatus. This remotely controlled apparatus is used for typical potentiometric, amperometric, and conductometric titrations of highly radioactive samples.

TID-4100 (1st Rev., Suppl. 6) Cape-430 Cape-436 Cape-442 Cape-447 Cape-459 Cape-497 1/4

(12) NSA-1960-8519 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.)

Cape-456: Bag Sealer. To keep contamination at a low level, plastic bags are used in hot cells and gloved boxes. This bag sealer is an apparatus for sealing the plastic bags. Included in the package is an outlet ring for a gloved box used to remove the sealed plastic bag from the box. Cape-482: Metal Glove Box. The box has two glove ports, each 6 1/6 in. in diameter, and a safety-glass window in a metal frame 18 in. by 36 7/8 in. with fluorescent lighting at the top. Cape-534: Cenham Hoods. The Chemical Engineering Division hoods are built in modules. This module is 42 in. high, 42 in. long, and 42 in. deep. The fronts and backs have 4 glove ports each.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1/3 4 5

(15 NSA-1961-4087 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395 1. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.

Cape-556: Syntron Polisher. The polisher is used in a hot cell with a vibrator to polish metal samples for metallographic examination. Cape-568: Glove Type Hoods. The hood is used to safely handle highly toxic or reactive materials. The hood contains an inert or treated atmosphere under regulated pressures. Equipment is operated manually through gauntlet gloves secured and sealed to the hood sides. Cape-603: Automatic Alpha Hand Counter, Model HC-2. The automatic, personnel-operated α particle hand meter is a qualitative instrument indicating that hands are hot or cold.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1/3 4 5

(15) NSA-1961-4087 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395 2. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.)

Cape-628: Dry Box Equipment. Dry box equipment includes a pneumatic airlock door, an edge filter, and a centrifuge housing. The pneumatic door is a guillotine type, air-cylinder-actuated door that is used where space does not permit the use of a hinged door.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1/3 4 5

(15) NSA-1961-4087 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1396
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

Cape-30: Extraman Manipulator. These manipulators, designed to perform remote handling odd jobs, are capable of operating through a 1-in. pipe which penetrates 3-inch thick cell walls. Cape-37: Ball Swivel Manipulator Tongs. Ball-swivel manipulator tongs for a general-purpose, handling-device may be either hand-held or supported by a ball-swivel joint that is mounted in a protective shield. Cape-315: Health ChemistryManipulator. The manipulator is used with a 4 in. lead shield and is known as a Castle manipulator. A tong-holder system replaces the previously used ball-socket accomodation for tongs.

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TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 3 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1396** 1. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

Cape-676: Jumbo Mixer-Settler Units. The 24 stage mixer-settler unit consist of 4 six stage Jumbo units. Each state is 16 in. wide, 30 in. high and 131 in. long containing an interface weir section, an aqueous inlet section, a solvent inlet section, a mixing section, and a settling section. Cape-677: Slab Extractor, 10 Stage. The 10 stage extractor is a "pump mix" mixer-settler used in liquid-liquid extraction processes. Cape-685: Defilming Tongs. The tong handles very small specimens with a minimum contact between specimen & tong. Cape-686: Utility Tongs. The tool is used to handle small articles within a shielded enclosure, by use through

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TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1396** 2. Forts
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

a ball socket manipulator. Cape-687: Wire Cutting Tongs. The tongs are used to cut wires remotely by pinching them between a stationary knife blade and a moving anvil. Cape-688: Modified Wiggle Tong. The tong is used through a ball joint or rotating cylinder. Cape-689: Handling Tongs for HRE. The tong is used for general handling. Cape-692: Retriever Tool for Remote Maintenance. This cable-actuated, retriever tool is used for handling flange bolts or other objects in a hot cell. Cape-694: Disassembly Tools. The tools have offset handles to be used through a hole in the lead shield without

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TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1396** 3. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

exposure to the radiation beam. The tools consist of a tube and wire cutter, a remote wrench and a special soldering gun. Cape-698: Slave Robot. This electronically controlled slave-robot performs the numerous unforseen operations, such as maintenance, repair, and transfer of equipment and materials, where the other handling equipment is not usable.

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TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1397**
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-298: Sleeved Tong, Model 2. This experimental-type, stainless steel, sleeved tong is used with a manipulator as slip on fingers. Cape-712: Ball Socket Manipulator. The manipulator operates through a 10 in. square opening in an 8 in. thick shielding wall. Cape-716: Intermediate Level Triple-Cell Cave. The cave is used for metallographic process operations. A small conveyor transfers the specimens. Cape-718: Glass Shielding Windows. Shielding windows provide an unrestricted view for operations involving radioactive materials. The windows consist of a tank filled with one inch glass plates immersed in mineral oil.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740

1/3 4

(15) NSA-1961-24922 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1397** 1. Forts
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-719: Portable Shielding for Chemistry Hood. The portable shield is used in handling fractional curie quantities of radioactive materials. The shield is used with standard hood shielded on the sides, back, and bottom with steel plates. Cape-729: X-Ray Diffractometer Facility. The x-ray diffractometer facility is located in the physical and metallurgical hot laboratory and is a 2.3 density concrete cave with a capacity of 100 curies. Cape-739: Hot Laboratory Creep Test Facility. The facility tests irradiated samples with the same accuracy as is obtained with non-irradiated samples.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740

1/3 4

(15) NSA-1961-24922 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1397** 2. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-740: Power Reactor Fuel Processing Plant. The cells used are an adaptation of segmenting cells with the main processing operations carried out in Cell A and stored in the storage cell. Maintenance is performed from the top of the cell.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740

1/3 4

(15) NSA-1961-24922 RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1398**
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl. 13)(1961) 24 Bl.)

Cape-631: Remote Analytical Facility. The building is of reinforced concrete and is 88 ft by 83 ft. It is divided into three parallel areas; analytical lab., decontamination area, and a multicurie cell. Cape-735: Heating and Ventilating Equipment for Purex. The laboratory is 144 ft long by 56 ft wide. It contains: 3 hot labs, one cold lab, a decontamination room, sample storage room, instrument shop, glass shop, counting room, x-ray room, fluorometer room, 3 offices, hot and cold change facilities for men and women, and a lunch room.

TID-4100 (1st Rev., Suppl. 13) CAPE-631 CAPE-735

1 3 4

(9) NSA-1961-26130 RL

Smith, R.J. (Ed.) **1534**
Civil Engineering Bibliography on the Design and Construction of Nuclear Facilities
(NP-11896 (1962) IV, 66 S.)

A total of 459 references to unclassified reports and published literature is presented on civil engineering and architectural aspects of the nuclear field. The period from 1945 to early 1959 is thoroughly covered; later information is represented by several selected citations to bibliographies and publications of wide scope. An author index is provided.

NP-11896

1/2 3 4

(7) RL

Duthie, R.E.C., Sachs, F.L. **1546**
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1.Rev., Suppl.15)(1962) 27 Bl.)

Cape-877: Manipulator Cell. The manipulator cell is shielded with 3 foot thick walls of high density concrete. Two rolling doors in the rear of the cell are 12 ft high, 6 ft 3 3/4 in. wide and 3 ft thick. These also are of high density concrete. There is a small lead door 1 ft 5 1/4 in. wide, 1 ft 2 3/4 in. high and 6 in. thick. The inside of the cell measures 5 ft 6 in. deep, 4 ft 9 in. wide and 7 ft high, but there is a tray across the cell 3 ft 6 in. from the floor. Forts.

TID-4100 (1.Rev., Suppl.15)
Cape-877
1/4

(7) NSA-16-14846 RL

Duthie, R.E.C., Sachs, F.L. **1546**
Supplemental Insert Sheets for Engineering Materials List Forts.
(TID-4100 (1.Rev., Suppl.15)(1962) 27 Bl.)

The stepped viewing window consists of a piece of plate glass 21 5/8 in. x 32 3/8 in. by 1 in; lead glass 19 in. x 30 in. by 8 1/2 in.; 3 non-browning lead glass panes, 22 in. x 32 in. x 9 in., 26 in. x 34 in. x 9 in., and 30 in. x 36 in. x 7 in.; and a sheet of non-browning lime glass 34 1/8 in. x 39 3/8 in. x 1 in. The cell is lined with a 3/16 in. stainless steel liner, stainless-steel-lined manipulator sleeves, a bridge trolley, and hoist are included. The set consists of 37 items including plot plans, structural, electrical and piping drawings.

TID-4100 (1.Rev., Suppl.15)
Cape-877
1/4

(7) NSA-16-14846 RL

Duthie, R.E.C., Sachs, F.L. (Ed.) **1547**
Engineering Materials List. Cumulative Index Through Supplement 12
(TID-4100 (1st Rev.) Index 2 (1962) 149 S.)

This cumulative index to the Engineering Materials List (EML) covers the CAPE-numbered packages of engineering materials that have been announced in TID-4100 (1st Rev.) and Supplements 1 through 12. It completely supersedes all indexes issued previously. The Engineering Materials List is published by the U.S. Atomic Energy Commission to announce engineering materials which are available and were developed in conjunction with nuclear science projects undertaken by the AEC.

TID-4100 (1st rev.) Index 2
1/3
4

(7) NSA-16-30515 RL

Connolly, T.F. **1548**
Bibliography on Nuclear Reactor Fuel Reprocessing and Waste Disposal. Vol.5: Plants and Equipment
(CRNL-2971 (Vol.5)(um 1962) 203 S.)

This volume includes Section 5.0 of eight sections of a bibliography on nuclear reactor fuel reprocessing and waste disposal. The collection will be a unit, and cross references are made between volumes. The complete collection includes about 7000 abstracts, nearly all from Nuclear Science Abstracts, representing books, bibliographies, symposia, journals, and contractors' topical reports. Most of the material dates from the 1955 Geneva Conference to the present.

CRNL-2971 (Vol.5)
1/4

(5) NSA-16-30496 RL

Lanier, S.F. (Comp.) **1736**
Fire and Explosion Protection of Glove-Box Facilities. A Literature Search
(TID-3578 (1964) III, 52 S.)

A total of 379 references are cited on the safety design of facilities handling radioactive materials. Included are references on glove boxes, fire hazards and control, explosion hazards and control, laboratory design, ventilation systems, and filter systems.

TID-3578
1/3
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(7) NSA-18(1964)-39414 RL

2 Baupläne und Beschreibungen von Gebäuden und Laboratorien

Hanthorn, H.E. 1381
Calculated Costs of Fabrication of Plutonium-Enriched Fuel Elements
(HW-74304 (1962) VI, 125 S., 12 Fig., 35 Tab.)

In part 3b and c plant layouts and conceptual machine design descriptions are discussed. In part 4 are presented construction cost study estimates for the fuel element fabrication plants described in parts 2 and 3.

HW-74304
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Fig.:
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(6) RL

Vanden Bemden, E. 1383
Description of the Belgonucléaire - C.E.N. Plutonium Project
(HW-75007: Proceedings Plutonium as a Power Reactor Fuel, Dec. 1962 (1962) S. 22.1-22.36, 29 Fig., 1 Tab.)

The general lay-out of the plutonium facilities located in the hot wing of the C.E.N. chemistry building is shown. The four laboratories on the left side of the wing are completely installed and in operation. The laboratory was first operated in early 1960. The last two laboratories on the right side of the wing are still under construction. The location of the various glove boxes in the laboratories are shown.

HW-75007
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Fig.:
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(5) RL

Gorns, H., Clelland, D.W., Hughes, T.G., Lisle Nichols, J.W. de 1385
The New Separation Plant Windscale: Design of Plant and Plant Control Methods
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, August 1964. A/Conf.28/P/161 (1964) 15 S., 2 Fig.)

This building extends beyond one side of the concrete structure to form a four-storey annex 252 ft. long x 35 ft. wide. The annex contains the main process control room, ventilation equipment, compressors and plant for mixing and metering process reagents. An isometric sketch and a diagrammatic layout of this plant are given.

A/Conf.28/P/161
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Fig.:
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(7) NSA-18(1964)-37255 RL

Sethna, H.N., Srinivasan, N. 1386
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

A Purex type process has been chosen for its flexibility as well as the advantages it offers in the matter of concentration of the fission product raffinates. The Plant has a co-decontamination cycle, a partition cycle and two separate parallel cycles for the purification of uranium and plutonium. For the extraction cycles, 30 % TBP is used as solvent. Initially 1.0 M, 2.0 M, and 0.01 M have been chosen as the concentration of nitric acid in the feed, scrub and strip respectively, with sodium nitrite in the feed solution to stabilise the valencies of uranium and plutonium. Ferrous sulphamate is used as a reducing agent for the partitioning of plutonium from uranium. (8) NSA-18(1964)-37283 Forts. RL

A/Conf.28/P/786
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Fig.:
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Sethna, H.N., Srinivasan, N. 1386 1. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

The plutonium separated from the bulk of the uranium is purified by an anion exchange process, for which Dowex-1 with 4 % cross linkage is used with loading and washing in 7.2 nitric acid medium and elution with 0.35 M nitric acid. The radioactive part of the Plant in the Main Process Buildings is housed in eight cells with a total volume of about 3600 cubic metres. The walls and the roof of the cells and the stagings are lined with stainless steel in three out of the eight cells, the rest are protected by acid resistant paint. The floors of all cells are lined with stainless steel with 30 cm of skirting.

A/Conf.28/P/786
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Fig.:
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(8) NSA-18(1964)-37283 Forts. RL

Sethna, H.N., Srinivasan, N. 1386 2. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

On one side of the cells are the access corridor, the service corridor, the operating gallery and the transmitter and tank space. The entrance doors to all the cells are situated at the access corridor (ground floor) level. The control laboratory has a lead shielded cell for work with highly active samples and other associated fumehoods and glove boxes for medium level and low level analytical work and for plutonium handling.

A/Conf.28/P/786
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Fig.:
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(8) NSA-18(1964)-37283 Forts. RL

Sethna, H.N., Srinivasan, N. 1386 3. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 2o S., 10 Fig., 1 Tab.)

For the active laboratories and the plutonium laboratory the conditioned air is rendered dust-free with absolute filters and is exhausted through fumehoods to maintain the minimum velocity of the air required across the face of the fumehoods. While final cost figures are likely to be available after some time, approximate indications are given.

A/Conf.28/P/786
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Fig.:
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(8) NSA-18(1964)-37283 RL

Imre, L., Nagy, J. 1388
(Ungarisch.) Isotope Laboratory of the Institute for Physical Chemistry, Lajos Kossuth University. II. Technical Equipments of the Laboratory
(Magyar Kemikusok Lapja, 19 (1964) S. 185-8)

The technical design of the laboratory is based on the requirement of being able to technically educate a certain number of students. In compliance with this lab working places of customary type have been provided. The layout of the rooms has been performed as to hinder any radioactive contamination from the hot booth to get to the measuring apartments or to the tracing lab either by personal communication or by water or air flow. The working mechanism of the air cleaning equipment made on the basis of Hungarian projects is an object of dosimetry research over the recording of automatic activity measuring instruments. (6) NSA-18(1964)-35439 RL

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Bussy, P. 1412
The Plutonium-Based Fuel Production Programmes in France
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel. Am.Nucl.Soc.Top. Meeting, Richland, Washington-Sept.13 and 14, 1962 (1962) S.3.1-3.24, 22 Fig.)

The building is described roughly into three sections. One contains 12 active plants of about 120 M^2 each powerfully ventilated, in which are placed most of the glove boxes for manipulations on pure plutonium, alloys or refractory compounds containing plutonium. The second part contains the general utilities of the building: mechanical plant, reception centre, stores, radiation protection centre etc. In the third part is a hall and a number of less strongly ventilated rooms which are used for canning operations (welding, machining, polishing, cleaning of the finished elements and for metallurgical transformation operations on alloys already canned (rolling, drawing, hammering etc.).
(5) RL

HW-75007
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Fig.:
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Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab.,41 Fig.)
(AD-142157 (1957)VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A two-chambered hot cell has been designed, built, and used. The hot cell is suitable for radioactive material testing, hot chemistry or handling of radioactive sources. The access door to each chamber has a zinc bromide window and a pair of ANL Model 8 manipulators mounted on it. A 2-ton traveling bridge crane serves both sides of the cell. A Jordan Remote Area Monitoring System Model I was installed in the cell when it was built.
NSA-12(1958)-5748
Forts.
(12) RL

WADC-TR-57-498
AD-142157
PB-131619
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Tab.: 2 3 4 5
Fig.: 2 3 4 5

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460 Forts.
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A filtered exhaust system was provided to prevent contamination of areas outside the cell. A CO_2 fire extinguisher system is installed with two nozzles in each chamber of the cell.
(12) NSA-12 (1958)-5748 RL

WADC-TR-57-498
AD-142157
PB-131619
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Tab.: 2 3 4 5
Fig.: 2 3 4 5

Corbin, L.T., Winsbro, W.R., Lamb, C.E., Kelley, M.T. 1462
Design and Construction of ORNL High-Radiation-Level Analytical Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.3-10, 5 Fig.)

The High-Radiation-Level Analytical Laboratory is designed and built for use in the chemical analysis of highly radioactive materials. The in-line hot-cell bank has separate cells for unloading, storing, performing analyses (six cells), and nondestructive testing. Supporting areas include laboratories and rooms for assemblying equipment, decontaminating equipment, and changing clothes. The salient features are an intercell conveyor, transfer drawer, maintenance cart, cask-transfer cart and interchangeable work pans. All areas in which radioactive operations are performed and which are adjacent to these operating areas are equipped for the safe handling and confinement of radioactive materials.
(9) RL

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Fig.:
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Moore, P.F., Allen, J.D. 1463
Los Alamos Radiochemistry Hot Cells
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.11-16, 2 Fig.)

A major expansion of the hot cell facilities at the Los Alamos Radiochemistry Building in 1962-63 included adding a new wing on the building; increasing the number of cells from three to sixteen. Rapid transfer of materials was provided for by the use of overhead monorail hoists and by a small railroad train passing through all cells. Building size and cost were held down by designing for light-duty manipulators and by simplification or elimination of some of the usual secondary systems. Over-all cost of the project was about one million dollars. The windows were to provide shielding for 100 curies in the chemistry cells and 1000 curies in the dispensary cell.
(7) RL

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Fig.:
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Brebant, C., Dick, H., Junca, A., Portal, A., Wallet, P. 1464
LECA - Irradiated Fuel Study Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.17-32, 13 Fig.)

The building containing the laboratory is a two story building with a basement. Total cost, including installed cell equipment (windows, manipulators, conveyor, transfer devices) was $3,200,000. The laboratory and its particular features are described. The entire building is ventilated and air conditioned.
(11) RL

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Fig.:
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Kelsch, R.D. 1466
Hot Metallurgy Facility at Savannah River Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.45-74, 19 Fig., 6 Tab.)

This paper describes the evolution of hot metallography at SRL since 1958, the factors that have determined its present state, and the equipment and operating techniques that have been developed. The 1958 Facility was located in Cells 4 and 5 of the High Level Caves. The 1960 Facility was located in Cells 6,7, and 8 and Cell 5 was added in 1962. These cells are 6 x 6 feet in floor area. Each cell is equipped with a pair of Model 8 masterslave manipulators and an electromechanical heavy duty manipulator is available.
(4) RL

2
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Fig.:
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Tab.:
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Coogler, A.L., Craft, R.C., Tetzlaff, R.N. 1467
A Facility for the Production of Pu-238
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.75-87, 6 Fig.)

A pilot-scale chemical processing facility for recovering Pu-238 and unconverted Np-237 from irradiated Np-237 was assembled and was successfully and routinely operated for an extended period in shielded cells at the Savannah River Laboratory. The process equipment was enclosed in three containment enclosures of stainless steel, which were in turn installed in two general-purpose shielded cells of a ten-cell complex.
(6) RL

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Fig.:
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Richards, P. 1495
Hot Cell Operations at BNL
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.455-56)

Brookhaven National Laboratory has three major hot cell facilities: a three-cell chemical processing complex, a high-level metallurgy facility, and a high-level gamma irradiation facility. The chemical processing cells have three feet of regular concrete shielding except the operating face, which is shielded by hydraulically operated steel doors. The metallurgy facility consists of a three-section cell shielded with three feet of high-density concrete, suitable for handling kilocurie amounts of acitivity. Each section is equipped with Model 8 manipulators, hoists, oil-filled lead glass windows and periscopes. The High Intensity Radiation Development Laboratory (HIRDL) consists of two high-level cells and a connecting canal, designed to handle megacurie quantities of Co 60 and Cs 137. (4) 2/4 RL

Schulte, J.W. 1497
Power Reactor and Rove· Hot Cell Facility
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.458-59)

The facility consists of sixteen cells arranged in two banks of eight each; in each bank the cells are located back to back with a common corridor between them. The cells may be isolated from each other and from the corridor by hydraulically operated cast iron doors. The cell walls are constructed of ferro-phosphorous concrete having a density of 300 lbs./ft.^{3} and a thickness of 32". Viewing is provided by oil-filled lead glass windows. Two periscopes, which can be placed in any cell, are also provided. Building support services include: a decontamination room, hot storage facility, low level laboratories, mock-up area and a hot machine shop. 2/4
(4) RL

Westphal, R.C. 1498
Atomics International Components Development Hot Cell Facility
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.459-60)

The facility comprises four rather large shielded cells of megacurie capacity. The cells have the following floor dimensions: one 10 x 32 ft., one 10 x 20 ft., and two 10 x 16 ft. Each cell is provided with a number of lead glass, oil filled viewing windows and serviced by master slaves, electric manipulators, and two-ton crane. Probably the most unique feature of the facility is the ability to provide a nitrogen atmosphere in the cells to insure safety in handling Na and NaK, as well as offering protection in the course of examination of pyrophoric and atmosphere affected fuel materials. 2/4
(4) RL

Stearns, R.F. 1500
GE-Radioactive Materials Laboratory Vallecitos Atomic Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.461-62, 1 Fig.)

The RML facility consists of four high-level general purpose cells and a low-level metallography cell. Each of the high-level cells contain three work sections, three pairs of master-slave manipulators, and a radiation lock. A general purpose General Mills manipulator and three-ton bridge crane services the whole cell and radiation lock. All cell doors open to a large extending to a loading dock on the outside of the building. Adjacent to this corridor are located a Radiochemistry laboratory, Decontamination Room, manipulator repair area, Isotope Processing area, and a 16'x8'x16' deep pool for underwater operations. The ventilation system is designed so that all air flows toward higher contamination areas. (4) 2/4 Fig.: 4 RL

Blosser, T.V., Freestone, R.M. 1504
The ORNL Mobile Radiation Measurement Laboratory
(Nucleonics, 21, No.2 (1963) S.56, 2 Fig.)

The truck is an essentially unmodified Ford Vanette. Shock-mounted electronic equipment occupies most of the interior with a work-table area forward of the driver's seat. Beneath one of the racks is a lead-shielded scintillation counter. An air-conditioning system ensures that all racks are cooled. Neutron and gamma detectors are interchangeably connected to the counting equipment by 250-ft coaxial cables. The detection and counting equipment is conventional. 2/4 Fig.: 2 4

(5) NSA-17(1963)-10877 RL

Betzler, K.-E. 1505
Der Aufbau eines heißen Labors
(Kerntechnik, 5 (1963) S.254-6, 10 Fig.)

Der Gesamtaufbau des heißen Labors des Forschungsreaktors München wurde in verschiedene Abschnitte geteilt, die bei der Erstellung des Rohbaues durch horizontale Ebenen gekennzeichnet waren. Es wird über die einzelnen Bauabschnitte und die Anbringung der Ausrüstung der Zelle und des Tresors berichtet. 2/4 Fig.: 4

(4) NSA-17(1963)-32211 RL

First Report on the Activities of the Eurochemic Company 1959-1961 1507
Paris: Organisation for Economic Co-Operation and Development, European Nuclear Energy Agency (1962) 380 S., 121 Fig., 32 Tab.
(NP-12804)

The main process building will consist of 31 process cells with adjacent access areas and two rows of service corridors on six different floor levels. Additional installations will include an analytical laboratory (adjoining the main process building), a fission product storage building, final product storage, an effluent station for the concentration of medium and low active liquid waste streams, and inactive storage unit. A research laboratory, consisting of a "cold" wing, "hot" laboratories, "hot" cells and an engineering hall has NP-12804 2/3 4 6 Fig.: 2 3 4

(7) NSA-17-25357 Forts. RL

First Report on the Activities of the Eurochemic Company 1959-1961 1507 Forts.
Paris: Organisation for Economic Co-Operation and Development, European Nuclear Energy Agency (1962) 380 S., 121 Fig., 32 Tab.
(NP-12804)

been designed by a team of architects from Switzerland, Denmark and Spain. It will be located in the vicinity of the Eurochemic re-processing building. The total investment has been estimated to be $ 24 million, including site development. NP-12804 2/3 4 6 Fig.: 2 3 4

(7) NSA-17-25357 RL

Wervers, H.J., Vrijburg, O.B. 1513
Remote Handling at Petten. The Laboratory for Highly Radioactive Objects (LSC)
(Atoomenergie en Haar Toepassingen, 4 (1962) S.272-7, 6 Fig.)

The LSC building covers an area of 51 x 35 metres. The "active maintenance area" is a hall, measuring 12 x 43 metres, with a height of 12 metres, which forms the central part of the building. The high-activity cell line, which terminates at both ends in so-called "loading-bays", is situated along the southern side of the active maintenance area. The cell line operations are controlled from the southern part of the corridor, which is called "operations hall". Five high-density glass windows, affording a shielding equivalent to 1.20 m barytes concrete, permit wide angle observation of the interior. Forts.

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Fig.:
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(6) NSA-17(1963)-14548 RL

Wervers, H.J., Vrijburg, C.B. 1513 Forts.
Remote Handling at Petten. The Laboratory for Highly Radioactive Cbjects (LSC)
(Atoomenergie en Haar Toepassingen, 4 (1962) S.272-7, 6 Fig.)

Each window station is equipped with a pair of 'master-slave' manipulators. Maintenance men can enter the cells through a 1.80 metre high opening provided for that purpose in the rear wall of each cell, which is normally closed by means of a concrete-filled plug.

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Fig.:
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(6) NSA-17(1963)-14548 RL

Project GNOME, Carlsbad, New Mexico, Dec. 10, 1961 1517
Final Report. Cn-Site Radiological Safety Report
(PNE-133F (1962) 28 S., 2 Fig., 6 Tab.)

Facilities were established adjacent to the work areas and manned to provide anti-contamination clothing and equipment, dosimetric devices, and radioactive and toxic material detection instruments. In addition, on-site facilities and equipment included a mobile radiochemistry laboratory, and instrument maintenance and repair facility, facilities for personnel, vehicle and equipment decontamination, anti-contamination clothing laundry facilities, and a variety of equipment for environmental sampling to assay air-borne radiation and industrial hygiene hazards.

PNE-133 -F
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(4) NSA-16-20873 RL

Grinberg, B., Le Gallic, Y. 1522
Caractéristiques fondamentales d'un laboratoire de mesures d'activités à bas niveau
(Bulletin d'informations scientifiques et techniques, 1962, No.65, S.9-19, 3 Fig., 12 Tab.)

Un laboratoire de mesure de très faibles activités, dans lequel on se propose également de doser les impuretés radioactives par spectrométrie, doit remplir un certain nombre de conditions, si l'on désire réaliser une protection optimale. Ces conditions découlent de l'analyse et des expériences rapportées plus haut. 1. Local souterrain: plus il sera profondément enterré, moins onéreuses seront les protections nécessaires. 2. Alimentation continue en air filtré. 3. Protection des détecteurs en plomb sélectionné (vieux plomb ou plomb spécialement affiné). 4. Détecteurs réalisés en matériaux (verres, métaux, scintillateurs) sélectionnés.

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(4) RL

Ferguson, D.E. (Comp.) 1533
Transuranium Quarterly Progress Report for Period Ending February 28, 1962
(CRNL-3290 (1962) IV, 88 S., 52 Fig., 6 Tab.)

The scope of the Transuranium Processing Facility was changed from a $ 14,000,000 project to $ 8,700,000 in late September. In early November it was found necessary to modify the cell configuration at the west end of the cell bank to allow entry to the analytical cells directly through the rear of the cell. Both cells were decreased to 7 by 7.5 ft and a 4 by 7 ft shield access door was added in the rear wall. The pit area behind these cells is covered with 4-ft-thick shielding plugs. The current building layout is shown in Fig. 5.15. Forts.

CRNL-3290
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Fig.:
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(5) NSA-16-23528 RL

Ferguson, D.E. (Comp.) 1533 Forts.
Transuranium Quarterly Progress Report for Period Ending February 28, 1962
(CRNL-3290 (1962) IV, 88 S., 52 Fig., 6 Tab.)

The equipment will be installed so that it may be removed by heavy duty manipulators, an impact wrench, and a crane mounted in the large equipment-removal cubicle located on the top of the cell bank. The equipment will be in a modular arrangement to allow relocation or replacement of all cell tanks in a standard support frame.

CRNL-3290
2
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Fig.:
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(5) NSA-16-23528 RL

Smith, R.J. (Ed.) 1534
Civil Engineering Bibliography on the Design and Construction of Nuclear Facilities
(NP-11896 (1962) IV, 66 S.)

A total of 459 references to unclassified reports and published literature is presented on civil engineering and architectural aspects of the nuclear field. The period from 1945 to early 1959 is thoroughly covered; later information is represented by several selected citations to bibliographies and publications of wide scope. An author index is provided.

NP-11896
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(7) RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

The hot cell contains and shields the high activity level chemical process equipment. The space for active process equipment is 35 ft long, 11 1/2 ft wide, and about 14 ft high. The hot-cell equipment is mounted on eleven racks; two spare racks have been included to permit future modification and expansion of the process system. The decontamination cell is 12 1/2 ft long, about 14 ft wide, and slightly less than 17 ft high; it is equipped with wash-down facilities. The decontamination cell has one shielding window, one pair of heavy-duty manipulators,

TID-7650 (Book I)
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Fig.:
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(9) NSA-17-28461 2 Forts. RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540 1. Forts
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

and special wall plugs duplicating the north-wall plug system in the hot cell. There are two doors in the decontamination cell; one to the decontamination area and one to the hot cell. The warm cell is equipped with glass shielding windows, a pair of manipulators for each of nine windows, and a single manipulator for the tenth window. The equipment also includes a General Mills No. 100 mechanical arm and a 3-ton hoist of the General Mills type, which are used primarily to assist in servicing the machines and transferring material. A plan of the ground floor of the

TID-7650 (Book I)
2 3 4 Fig.: 2 4

(9) NSA-17-28461 Forts. RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540 2. Forts.
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

process building is shown. The plant is ventilated by three separate systems: one services the areas where hot phases of the process are carried out, one the potentially contaminated (warm) areas of the processing building, and the third the cold area or office wing.

TID-7650 (Book I)
2 3 4 Fig.: 2 4

(9) NSA-17-28461 RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

To accomplish the objectives, four operating cells and two service cells will be required. The first floor plan of the building is shown. The four operating cells are arranged in a line with one of the service cells, which is to be used for decontamination and as a radiation lock, teeing off from the line at the point where the two large central cells join. Another service cell, to be used for storage of contaminated equipment, is located at the basement level and joins the Decontamination Cell via a hatch in the Decontamination Cell floor.

TID-7650 (Book I)
2 3 4 6 Fig.: 2 3 4

(8) NSA-17-28462 2. Forts. RL

Irvine, A.R., Lotts, A.L. 1541 1. Forts.
The Thorium Fuel Cycle Development Facility Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

All operating cells will have a common roof line; however, the floor level will vary to provide different inside cell heights. The lifeline of the cell complex is the transportation system. This consists of a pair of overhead bridge cranes which can travel over essentially all the area in the Glove Maintenance Room, Decontamination, Contaminated Fabrication, Mechanical Processing, and Chemical Cells. The window will consist of two major assemblies: a seal glass removable from inside the cell, and a shielding window removable from the non-radioactive side.

TID-7650 (Book I)
2 3 4 6 Fig.: 2 3 4

(8) NSA-17-28462 Forts. RL

Irvine, A.R., Lotts, A.L. 1541 2. Forts.
The Thorium Fuel Cycle Development Facility Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

The window will be a composite unit consisting of approximately 6 in. of glass and 60 in. of zinc bromide solution. The cost of this facility is estimated to be \$ 6×10^6 exclusive of process equipment but inclusive of manipulators, remote cranes, viewing windows, design, and inspection.

TID-7650 (Book I)
2 3 4 6 Fig.: 2 3 4

(8) NSA-17-28462

Meyer-Jungnick, W. 1552
Heiße Zellen und ihre Einrichtung. Bericht über die "Eighth Conference on Hot Laboratories and Equipment", San Francisco - 13. bis 15.12.1960.
(Atomwirtschaft, 6 (1961) S.239-240)

Es wird ein kurzer Überblick über die Vorträge der Konferenz gegeben.

2 4

(4) RL

Koschany, G. 1553
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S.565-580, 71 Fig., 16 Tab.)

Der vorliegende Beitrag befaßt sich primär mit den speziellen Problemen beim Bau von Laboratorien und Instituten, in denen mit Kernenergie gearbeitet wird und erwähnt die sonstige technische Einrichtung nur, soweit sie von grundsätzlicher Bedeutung und in diesem Zusammenhang interessant ist. Es sei hier auf die entsprechende Standardliteratur hingewiesen. Die Raumgruppierung unter dem Aspekt der Radioaktivität erfordert zunächst deren Einordnung in ein System der Strahlungsstärken, etwa mit folgenden Einheiten:

2 3 4 5 Fig.: 2 3 4 5

(6) Forts. RL

Koschany, G. 1553 Forts.
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S.565-580, 71 Fig., 16 Tab.)

Bereich bis zu 10 μC, Bereich bis zu 100 mC, Bereich mehr als 100 mC ("heiße Zonen"). Der inaktive Teil des Labors sollte durch Schleusen und angegliederte Reinigungs- und Umkleideräume von der aktiven Zone getrennt sein. Über die Auswahl der Materialien für Fußböden, Wände, Decken sowie über Fenster, Türen, Lüftung und Feuerlöschvorrichtungen wird berichtet.

2 3 4 5 Fig.: 2 3 4 5

(6) RL

Stewart, D.C. 1554
A Large-Scale Facility for Chemical Research With Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9: Analytical Chemistry, 3, P.7 (1962) S.238-65, 6 Fig., 4 Tab.)

The facility to be described in this chapter, the 2
Chemistry Division's new hot laboratory at Argonne 3
National Laboratory, is unique in several features. 4
The new hot laboratory is attached to the rear of the 6
Argonne Chemistry Building along an existing access Fig.:
driveway. A complicated ventilation system is proba- 2
bly the primary (and usually the most expensive) 4
engineering feature distinguishing radiochemical from 6
ordinary laboratory design. The main air supply is
brought in at the service floor level where it is pre-
filtered, tempered, and conditioned. This supply is
used for the offices, corridors, laboratories, shops,
and cave areas. The remaining regions of the building
(6) Forts. RL

Stewart, D.C. 1554 Forts.
A Large-Scale Facility for Chemical Research With Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9:Analytical Chemistry, 3, P.7 (1962) S.238-65, 6 Fig., 4 Tab.)

are ventilated separately. Essentially all of the glove 2
boxes and radiochemistry hoods as well as the associ- 3
ated duct-work are fabricated of glass-reinforced poly- 4
ester resin. Dimensions and details of the cave cells 6
are included. The three megacurie and the two large Fig.:
kilocurie cells are all similar in design. The primary 2
face of each has two working positions, with a third 4
window on the side wall away from the shielding door 6
and a fourth window in the back wall. All of the view-
ing windows are simple tanks cast directly in the wall.
These tanks are filled with concentrated zinc bromide
solution. Costs for the building, hoods, glove boxes and
shielding windows are shown.
(6) RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Les caractéristiques essentielles de ce bâtiment sont 2
les suivantes: Il comporte 4 tranches à peu près sembla- 3
bles d'environ 40 m x 50 m (alors que le projet initial 4
en prévoyait 6), 2 tranches étant disposées côte à côte, 5
les 2 autres étant symétriques des précédentes par rap- 6
port au grand côté des halls. L'ensemble mesure ainsi Fig.:
80 m x 100 m. Dans chaque tranche, 4 laboratoires 2
parallèles (14 m x 7,8 m) sont compris entre le couloir 4
"personnel" et le couloir "matériel", un couloir trans-
versal permet en plus une communication directe entre
ces deux couloirs sans obliger à traverser les labora-
toires. L'air arrive par un diffuseur au centre du pla- Forts.
fond et par des bouches au-dessus de la porte d'entrée.
(7) NSA-17-23390 RL

Trouvé, S. 1555 Forts.
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Chaque hall est divisé en 2 parties: l'une (7 m x 39 m) 2
de hauteur voisine de celle des laboratoires (4 m); 3
l'autre (11 m x 39 m) de grande hauteur (8,50 m) 4
avec un pont roulant de 5 t. Le coût total de ce 5
bâtiment, sans les aménagements intérieurs spé- 6
cialisés se monte environ à 20 millions. Fig.:
2
(7) NSA-17-23390 4

RL

Guillet, H. 1560
L'atelier pilote de traitement des combustibles irradié. Description et caractéristiques générales
)Bulletin d'informations scientifiques et techniques, 1963, No.68, S.43-51, 6 Fig., 1 Tab.)

Le bâtiment principal, l'Atelier-Pilote est orienté 2
approximativement Nord-Sud et se présente sous la 4
forme d'un hall de 90 m x 20 m environ et d'une hau- Fig.:
teur de 15 m sous faîte. C'est dans ce hall que sont 2
situées les cellules abritant les récipients et tuyaute- 4
ries nécessités par le traitement industriel des com- Tab.:
bustibles irradiés et autour desquelles se trouve l'ap- 2
pareillage de contrôle et de commande. Entourent ce
hall sur ces faces Est, Nord et Ouest: 1. Au rez-de- RL
chaussée: -cinq laboratoires dont un laboratoire équipé
d'une chaîne de onze cellules destinées aux analyses sur
produits radioactifs α, ß, γ et qu'un autre article de Forts.
cette même revue décrit plus en détails; -
(4) NSA-17-23442

Guillet, H. 1560 Forts.
L'atelier pilote de traitement des combustibles irradiés. Description et caractéristiques générales
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.43-51, 6 Fig., 1 Tab.)

des locaux destinés à la décontamination et au travail 2
d'atelier sur pièces décontaminées; - un couloir, dit 4
"couloir actif", qui, par trois sas étanches α, dessert Fig.:
les cellules situées dans le hall. 2
(4) NSA-17-23442 4
Tab.:
2

RL

Runnalls, C.J.C. 1566
Plutonium Fuel Program in Canada
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel (1962) S.8.1-8.26, 20 Fig.)

A new plutonium laboratory at Chalk River has been HW-75007
completed recently. A schematic layout of the labora-
tory which measures some 2500 ft^2 in area is shown. 2
Equipment has been installed to permit alloy prepara- 4
tion and metal-working, ceramic sintering and grind- Fig.:
ing, corrosion testing, metallography and mechanical 2
testing. In figure 2, two sintering furnaces in the ceramic 4
fabrication line may be seen. All of the glove boxes are
constructed of stainless steel with plastic viewing panels.
Their atmosphere is filtered air at a pressure of 1 inch
H_2O below that in the laboratory.
(5) RL

Puechl, K.H. 1567
Plutonium Fuel Development Programs at Nuclear Materials and Equipment Corporation
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel (1962) S.9.1-9.19, 15 Fig.)

Figure 1 is a plan view of the facility as it will look HW-75007
in December 1962 after completion of construction
of a 14,000 square foot addition. With this addition, 2
the building will contain 38,000 square feet of floor 4
space. The building is divided into a front "clean" Fig.:
area and a rear working area with these areas 2
separated by change rooms. The hot cell facility 4
contains a relatively large hot cell with walls com-
posed of high density concrete. This cell is capable
of handling up to 200,000 curies of cobalt-60 equiv-
alent and is equipped with removable alpha enclosures
to permit operation with alpha-active materials without
contamination of the cell proper. Forts.
(5) RL

Puechl, K.H. 1567
Plutonium Fuel Development Programs at Nuclear Materials and Equipment Corporation Forts.
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel (1962) S.9.1- 9.19, 15 Fig.)

Also included in this facility are two steel cells. These also contain alpha enclosures and are used for postirradiation examination of small specimens including metallography and fission gas release and burnout determinations.

HW-75007 2/4 Fig.: 2 4

(5) RL

Foote, F.G. 1568
Plutonium Metallurgy at the Argonne National Laboratory
(Coffinberry, A.S., Miner, W.N.(ed.): The Metal Plutonium. - Chicago: University of Chicago Pr. 1961. Chapter 6, S.63-69, 2 Fig., 2 Tab.)

A brief description of existing and planned plutonium-handling facilities in the Metallurgy Division at ANL follows: Building 200 is a small and very crowded physical metallurgy laboratory installed some years ago in three modules in the F-Wing of the Chemistry Building. It consists of a series of interconnected stainless-steel glove boxes, most of which operate with a highly purified recirculated helium atmosphere. A general view of the laboratory is shown.

2/4 Fig.: 2 4

(4) NSA-17-16555 Forts. RL

Foote, F.G. 1568
Plutonium Metallurgy at the Argonne National Laboratory Forts.
(Coffinberry, A.S., Miner, W.N.(ed.): The Metal Plutonium. - Chicago: University of Chicago Pr. 1961. Chapter 6, S.63-69, 2 Fig., 2 Tab.)

Building 350 is a versatile plutonium-fabrication facility still under construction. The facility consists of a series of glove boxes interconnected by means of a central conveyor system. Figure 2 shows the general plan of the working area. The equipment is housed in one large room, 70 x 160 feet, and again is a tight glove-box system with helium atmosphere in those boxes where fire is a hazard.

2/4 Fig.: 2 4

(4) NSA-17-16555 RL

Active Metallurgy 1569
(The Nuclear Energy Research Centre Studsvik. Stockholm: Lidhströms Tryckeri 1960. Bl.6-7, 2 Fig.)

The laboratory for active metallurgy is primarily intended for studies of fuel elements and structural materials irradiated in the R2 materials testing reactor. The radiation shield inside the laboratory consists of about 1 m thick concrete walls. A special ventilation system prevents circulation of air-borne activity. The radioactive material is handled inside seven hot cells. Five of these have a floor of 2 x 2 m and the other two 2.5 x 4 m. Each cell has an inside height of 4 m. Through specially constructed shielding windows it is possible to view the active samples without danger from the radiation. The active material is handled by using remotely operated manipulators. The floor space in the laboratory is 1440 m^2 of which the cells only occupy 100 m^2. (4)

2/4 Fig.: 2 4

RL

Siewert, G. 1571
Laborbau und Laboreinrichtung - technischer Strahlenschutz in Arbeitsräumen
(Kernenergie, 6 (1963) S.428-436, 10 Fig.)

Es wird eine Übersicht über Entwicklung und Stand des Laborbaus in der DDR bei der Einrichtung von Laboratorien für Arbeiten mit radioaktiven Stoffen gegeben. Die abgebildeten Abzüge zeigen als Besonderheit - an den Ständen sichtbar - zusätzliche Lüftungsklappen, die sich in Abhängigkeit von der Stellung des Abzugsfensters mehr oder weniger öffnen oder schließen. Sie halten so die über die Entlüftung des Abzuges abgesaugte Luftmenge konstant, ohne die Strömungsgeschwindigkeit der Luft in den Arbeitsöffnungen unzulässig zu erhöhen. Der Innenraum der Abzüge, die Fensterrahmen und das Armaturenbrett sind aus feingeschliffenem, nichtrostendem Stahlblech in Schweißkonstruktion hergestellt. Forts.

2/3 4 Fig.: 2 4

(5) NSA-17(1963)-39229 RL

Siewert, G. 1571
Laborbau und Laboreinrichtung - technischer Strahlenschutz in Arbeitsräumen Forts.
(Kernenergie, 6 (1963) S.428-436, 10 Fig.)

Die Fenster wurden teils aus organischem Glas (Piacryl), teils aus Sicherheitsglas hergestellt. Bei heißen Zellen ist die Arbeitszone eine hermetische Kammer aus nichtrostendem Stahl. Auf der Operatorseite trägt sie ein Fenster, dem in der Strahlenschutzwand ein Strahlenschutzfenster aus Bleiglas gegenübersteht. Eine Schleusenanlage für 7 männliche und 7 weibliche Beschäftigte wird beschrieben. Der Grundriß ist abgebildet.

2/3 4 Fig.: 2 4

(5) NSA-17(1963)-39229 RL

Tomlinson, R.E. 1576
Safety Review of Manufacturing Facilities Chemical Processing Department
(HW-69586(Rev.)(1961) 17 S.)

The plant is contained in a three-story structural steel frame building with a partial basement. The structural steel frame has an outer sheathing of insulated aluminum panels. The floors are of concrete or steel. The roof is insulated metal decking covered with asphalt and gravel. The process area within the building is contained within a reinforced concrete shell. As an aid to contamination control, the building is divided into four zones. The working areas of the plant are well ventilated, with air pressures so regulated that the flow of air is toward the areas of increasing contamination.

HW-69586 2/3

(5) NSA-16(1962)-29025 Forts. RL

Tomlinson, R.E. 1576
Safety Review of Manufacturing Facilities Chemical Processing Department Forts.
(HW-69586(Rev.)(1961) 17 S.)

The ventilation air is exhausted to the atmosphere through a 200-foot stack after being filtered through "AEC absolute" packaged filters composed of cellulose-asbestos or fiber-glass asbestos paper. The building and process areas are equipped with fire detectors and manually-operated fire fighting systems.

HW-69586 2/3

(5) NSA-16(1962)-29025 RL

Lloyd, R.C., Clayton, E.D., Reardon, W.A. 1577
Operating Experience in the Hanford Plutonium Critical Mass Facility
(HW-SA-2622 (1962) 5 S., 10 Bl., 10 Fig.)

The Laboratory is located in the 200 East Area of the Hanford plant. Figure 2 shows a room schematic which includes a heavily shielded critical assembly room, a mixing, change, equipment, and control room, as well as office space for the operating personnel. The critical assembly room is shielded by three and five foot thick concrete walls. Figure 4 shows one of the two large hoods which are enclosures for the experimental equipment. These hoods are held at a negative pressure as compared to the critical assembly room for control of possible contamination.

HW-SA-2622
2
Fig.:
2
3

(6) NSA-16(1962)-27897 RL

Baxter, J.P. 1585
Lucas Heights Research Establishment
(Nuclear Energy, 1963, Jan., S.22-3, 4 Fig.)

The site of 160 acres now accommodates 45 modern buildings, a large research reactor and a great deal of specialized equipment. The buildings are specialized and were carefully designed to meet requirements. There are "active" areas, with laboratories and workshops equipped to handle radioactive materials. Contamination is guarded against by special finishes applied to floors and walls, and elaborate ventilation and air filter systems. The scale of operations ranges from small and delicate bench work to quite large and heavy manipulations and some of the special equipment is unique in Australia.

2
Fig.:
4

(3) NSA-17(1963)-10254 RL

Graf, P., Metzger, K., Stöhr, R. 1603
Der Bau des Hot- und Isotopenlaboratoriums
(Neue Technik, 5, No. 9 (1963) S.490-497, 6 Fig.)

Der Gebäudekomplex des Hot- und Isotopenlaboratoriums (Erdgeschoßfläche 2120 m^2, umbauter Raum 22170 m^3) wurde entsprechend den in den verschiedenen Räumen gehandhabten Aktivitäten und den daraus zu folgernden Gefahrenmomenten in verschiedene Zonen unterteilt (Inaktiver Gebäudetrakt, Radiochemietrakt, Heißzellentrakt). Die Anlage und Installationen der in sich geschlossenen Gebäudetrakte werden beschrieben.

2
3
4
Fig.:
2
4

(7) NSA-17(1963)-5448 RL

Ruddy, J.M. 1631
Hot Cell Layout Criteria
(BNL-5820 (1961) 8 S., 2 Fig.)

The space relationships requiring consideration for "hot" cell complexes are those between "cold", "semihot", and "hot" areas which are the operating, the charging and service areas, and the "hot" cell itself. The basic layout criteria for planning is different between beta-gamma and alpha-gamma cell complexes because of contamination in the latter from radioactive materials. The criteria affecting all size and access, ancillary space type and size, general cell complex access and traffic, and personnel and radiation control are defined for both complexes plus contamination control for alpha-gamma cell complexes. The difference between production type and experimental cells is described for all types of cells.

BNL-5820
2
4
Fig.:
4

(5) NSA-17(1963)-6203 RL

Dean, C.C., Brooksbank, R.E., Lotts, A.L. 1637
A New Process for the Remote Preparation and Fabrication of Fuel Elements Containing Uranium-233 Oxide-Thorium Oxide
(ORNL-TM-588 (1963) 40 S., 19 Fig., 3 Tab.)

The purpose of this paper is to present the objectives, design, development, and operational performance of the Kilorod Facility. The plant, though integrated will be discussed as three processing sections.

ORNL-TM-588
2
4
Fig.:
2
4

(7) NSA-17(1963)-25746

RL

Berry, G.B., Bottenfield, B.F., Breeding, E.J, Hannon, F.L., Morgan, W.L. 1648
Design of the TRU Process Plant
(ORNL-3408: Ferguson, D.E. (Comp.): Transuranium Quarterly Progress Report for Period Ending Nov. 30, 1962 (1962) S.81-86, 1 Fig., 2 Tab.)

All drawings and specifications were received from the architect-engineer for initial ORNL Title II review, and about 95 % were reviewed and returned. ORNL will also obtain the detailed design and fabrication of the ten cell-viewing windows (lead-glass and oil), complete with the alpha-seal feature and equipment for replacement of the bulk shielding windows and the alpha-seal components from the cell wall.

ORNL-3408
2
3

(9) NSA-1963-25058 RL

Griner, W., Studer, H. 1650
Die Speisung des Hot- und Isotopenlaboratoriums mit elektrischer Energie
(Neue Technik, 5, No. 9 (1963) S. 536-37, 1 Fig., 1 Tab.)

Die Sicherheitsanforderungen an eine gesicherte Stromversorgung des Hot- und Isotopenlaboratoriums sind sehr hoch. Als Hauptgrund ist die ständige Anwesenheit von offenen hochradioaktiven Materialien in den Versuchseinrichtungen des Hotlabors zu nennen. Ein ganz besonders anspruchsvoller Verbraucher ist die umfangreiche Ventilations- und Klimaanlage, die ununterbruchslos im Gebäude und in den Versuchszellen ein bestimmtes Druckdifferenzsystem zu gewährleisten hat, um das Entweichen und Verbreiten aktiver Gase und aktiver Aerosole in die Arbeitsräume oder die Umgebung zu verhindern. Die Konzeption der elektrischen Verteilanlagen im Hotlabor gestattet, die einzelnen Netze ohne Störung des Betriebes zu warten.

2
4

(5) NSA-18(1964)-5451 RL

Lindell, B., Reizenstein, P. 1651
A Swedish Building Material for Low-Radioactivity Laboratories
(Arkiv för Fysik, 26, Heft 1 (1964) S.65-74, 4 Fig., 7 Tab.)

The increasing use of measurements of low levels of radioactivity both in the medical field and in the field of radiation protection has made it desirable to find more convenient building materials to provide both shielding from the environmental radiation and low contents of radioactivity in the material itself.

2
5
Tab.:
2

(5) RL

Meyer, F. 1658

Lüftungsanlage und Raumheizung im Hot- und Isotopenlaboratorium des Eidgenössischen Institutes für Reaktorforschung in Würenlingen

(Technische Rundschau Sulzer, 46, No.2 (1964) S.57-65, 13 Fig.)

Im Gegensatz zu Laboratorien konventioneller Bauart, in denen die Experimente offen durchgeführt werden, vollziehen sich in einem Heißen Laboratorium alle Arbeiten mit radioaktiven Stoffen in geschlossenen Unterdruckgehäusen mit der erforderlichen Strahlabschirmung unter Verwendung von Fernbetätigungseinrichtungen. Besonders hohe Anforderungen stellen solche Forschungsstätten namentlich an die Lüftungsanlagen. Wie Gebrüder Sulzer im einzelnen die zahlreichen mit der Belüftung wie auch mit der Heizung des Hot- und Isotopenlaboratoriums Würenlingen zusammenhängenden Probleme gelöst haben, beschreibt unser Beitrag. (4)

2
3
Fig.:
2
3
4
5

RL

Somerville, A. 1659

General Motors Builds Radioisotope Laboratory

(Nucleonics, 13, No.10 (1955) S.68, 2 Fig.)

A radioisotope laboratory, where industrial and research applications of radioisotopes will be explored, was completed in July at the GM Technical Center in suburban Detroit. Laboratory building, steel framework and concrete construction, has ground floor and basement. Of ground floor's 19,000 ft^2, 5000 ft^2 are equipped for handling radioisotopes, remaining area is devoted to offices, dark rooms, counting areas; concrete-slab floor supports 300 lb/ft^2; laboratory rooms are separated by 8-in.-thick concrete-block walls.

2
4
Fig.:
2

(4) RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L. 1662

Transuranium Processing Facility Design

(Nuclear Science and Engineering, 17 (1963) S.479-85, 6 Fig.)

The facility will consist of nine heavily shielded process cells and eight laboratories. The toxicity of the heavier transuranium elements justifies a refined building containment and ventilation system. The building is scheduled for full-scale operation by December, 1965, at an estimated cost of $8.7 million. The nine shielded process cells are arranged in line. Removable top plugs provide access to the cells. The entire building will operate at a normal pressure of 0.3 in. water gauge below atmospheric pressure at all times to ensure against escape of any airborne contaminants. Normally occupied personnel areas are supplied with a once-through air flow system. A preliminary cost estimate of the TRU Facility, including process equipment, is given.

2
3
4
6
Fig.:
2
4

(8) RL

Merker, L.G., Thomas, I.D. 1664

Hanford Plutonium Fuel Development Laboratory

(HW-SA-2904 (1963) 5 S., 7 Fig., 1 Tab.)

The Plutonium Fabrication Pilot Plant (PFPP) consist of a two story process area having a gross floor area of 20,000 ft^2 each floor, and an attached, one story service and office wing of 2,000 ft^2. Of the 40,000 ft^2 of building space, approximately 8,000 are required for ventilation equipment and maintenance shops. This leaves a total of approximately 32,ooo ft^2 for laboratory use. Contamination spread is minimized by the directional ventilation system which maintains a negative building pressure and provides 15 air changes per hour. Washed, filtered air is supplied through ceiling diffusers and exhausted through high-efficiency filters located at floor level.

HW-SA-2904

2

(5) NSA-17(1963)-32537 RL

Hesson, J.C., Feldman, M.J., Burris, L. 1666

Description and Proposed Operation of the Fuel Cycle Facility for the Second Experimental Breeder Reactor (EBR-II)

(ANL-6605 (1963) 193 S., 54 Fig., 17 Tab.)

The Fuel Cycle Facility consists primarily of an argon-atmosphere cell where fuel processing is done, an adjacent air-atmosphere cell where reactor subassemblies are assembled and disassembled, and an operating area (for personnel) which surrounds the two cells. Because of the high levels of activity excepted, the fuel-handling-and-processing equipment is designed for remote operation. Remote processing is accomplished with the aid of bridge cranes, electromagnetic bridge manipulators, and master-slave manipulators.

ANL-6605

2
3
4
Fig.:
2
3
4

(8) Forts. RL

Hesson, J.C., Feldman, M.J., Burris, L. 1666

Description and Proposed Operation of the Fuel Cycle Facility for the Second Experimental Breeder Reactor (EBR-II) Forts.

(ANL-6605 (1963) 193 S., 54 Fig., 17 Tab.)

Transfer ports and air locks are used in the transfer of materials and equipment into the air-atmosphere cell and between the two cells. The walls between the argon-atmosphere and air-atmosphere cells and the operating area are heavily shielded, and viewing is done through thick shielding windows.

ANL-6605

2
3
4
Fig.:
2
3
4

(8) RL

Lüscher, E. 1670

Lay-Out Principles of Main Plant Building

(ETR-46 (1959) 2 S., 1 Faltbl. Zeichnungen) ETR-46

(NP-7867 (1959) 3 S., 7 Fig.) NP-7867

Besides the processing cells, which are except the tail end, arranged in line, the building will contain: a crane gallery on top of the cells, a control and operating room with an appertaining cable- and piperoom, the analytical laboratories, a sampling corridor, access and utility corridors, a large ventilation hall, a make up area, decontamination facilities, health physics facilities, an assembly hall, a product storage room, some offices. All processing cells, except the one of the U-tail end, the decontamination facilities and the assembly hall near the head end of the plant are desserved by the main travelling crane located at the top of the building.

2
Fig.:
2

(5) NSA-13(1959)-19991 RL

Sease, J.D., Lotts, A.L., Davis, F.C. 1674

Thorium-Uranium-233 Oxide (Kilorod) Facility - Rod Fabrication Process and Equipment

(ORNL-3539 (1964) iv, 99 S., zahlr. Fig.)

The facility consists of a number of permanent alpha-tight cubicles which are shielded with 4 1/4-in. steel. The fabrication process is carried out remotely in these cubicles with the exception of several gloved-hand operations which occur where the dexterity required for manipulation exceeds that of the remote castle-type tongs. The facility ventilation system was designed so that the operating cubicles will be maintained at a pressure below atmospheric through the use of existing ventilation systems in the vicinity of the cell. A special multipurpose port is employed in the facility that may be fitted either a glove or a castle-type manipulator, and these units may be interchanged while maintaining an alpha-tight seal. (8)

CRNL-3539

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3
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Fig.:
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NSA-18(1964)-16455 RL

Olsen, A.R., Nichols, J.P., Peterson, S. 1679
Safety Analysis of the Operation of the High-Radiation-Level Examination Laboratory
(ORNL-3479 (1963) III, 87 S., zahlr. Fig. u. Tab.)

The High-Radiation-Level Examination Laboratory ORNL-3479
is basically a two-story brick building with a partial 2
basement for housing some of the essential ventila- 3
tion equipment. The structure provides a gross floor 4
area of approximately 26,500 ft^2, exclusive of the Fig.:
floor area occupied by the shielded cell complex, 2
which has a working area of 950 ft^2 shielded for high-level gamma activity. The operating and service areas occupy approximately 223,000 ft^3. The shielded cell complex, which is the very heart of the facility, is centrally located and occupies the full building height. The shielding windows are the oil-filled, lead-glass variety and of proper thickness and density to match Forts.
the 3 ft of high-density concrete shielding provided by the cell walls. (8) NSA-18(1964)-4025 RL

Olsen, A.R., Nichols, J.P., Peterson, S. 1679
Safety Analysis of the Operation of the High-Radiation-Level Examination Laboratory Forts.
(ORNL-3479 (1963) III, 87 S., zahlr. Fig. u. Tab.)

The inside surfaces of the cell banks are lined ORNL-3479
with stainless steel sheet to provide containment 2
of particulate matter. Within each cell bank, heavy 3
objects are moved by the General Mills Model 303 4
electromechanical manipulation and a companion Fig.:
3-ton bridge crane. The cell banks are ventilated 2
by a system of individual recirculation units and a single exhaust system, as described.

(8) NSA-18(1964)-4025 RL

Thorium Utilization Program 1680
(ORNL-3470: Metals and Ceramics Division Annual Progress Report for Period Ending May 31, 1963 (1963) S.196-212, 10 Fig., 5 Tab.)

The heart of the Thorium-Uranium Fuel Cycle ORNL-3470
Development Facility is the hot-cell complex.
It is composed of a chemical cell, a mechanical 2
processing cell, a contaminated fabrication cell, Fig.:
and a clean fabrication cell. Also provided by the 2
facility are two service cells: a decontamination cell (which is to be used for decontamination and as a radiation lock) and a storage cell (which is located at the basement level and is to be used for storage of contaminated equipment).

(4) NSA-18(1964)-4175 Forts. RL

Thorium Utilization Program 1680
(ORNL-3470: Metals and Ceramics Division Annual Forts.
Progress Report for Period Ending May 31, 1963 (1963) S.196-212, 10 Fig., 5 Tab.)

A glove maintenance room with an attached air ORNL-3470
lock is located adjacent to the decontamination cell and is to be used for maintenance of manipulative 2
and process equipment as well as for entry to the cell Fig.:
complex. Five of the six cells either will be, or can be, 2
maintained entirely by remote devices.

(4) NSA-18(1964)-4175 RL

Samsahl, K., Schüller, W. 1682
Main Process Analytical Laboratory Requirements
(ETR-36 (1959) 7 S., 2 Fig., 4 Tab.)
(NP-7868 (1959) 11 S., 2 Fig., 4 Tab.)

The plan view included in the appendix shows a ETR-36
proposal for the layout of the main process analyti- NP-7868
cal section. Hot laboratories have been arranged
in line on one side, cold labs and general services 2
on the other side of a central service corridor. 4
Personnel access is provided by a cold and a hot Fig.:
corridor on opposite sides of this assembly. The 2
hot personnel and service corridors are accessible from the cold section via change rooms. A separate change room with an air-lock is provided for the plutonium laboratory. Total gross floor area required for the analytical labs is 1354 m^2. As approximately 30 people are required for the analytical section, the average net laboratory floor space is 18 m^2/person. (7) RL

Hot Laboratory and Special Handling Equipment 1684
(Atomics, 17 (1964) No. 3, S.19-30, 21 Fig.)

The design of one of the most modern hot labora- 2
tories to be placed in service - that of the new hot 3
laboratory for the Chemistry Division at Argonne 4
National Laboratory - following which some special Fig.:
features of other installations will be reviewed. The 2
bulk of the laboratories are located to the east (right 3
hand) end of the main floor, while the shielded cave 4
complex occupies both floors at the west end of the building. The cave complex or shielded cell facility consists of two floors of shielded cells with exhaust fans and filters, and a contaminated storage area on the roof. All walls on the lower floor are four feet thick and the ceiling 40 inches thick.

(5) NSA-18(1964)-25641 Forts. RL

Hot Laboratory and Special Handling Equipment 1684
(Atomics, 17 (1964) No. 3, S.19-30, 21 Fig.) Forts.

The window openings at the cell interior range in 2
general from 3 ft wide by 2.5 ft high to 5 ft wide by 3
3 ft high, and they range up to 7 ft in thickness. The 4
thick windows are actually tanks consisting of an inner Fig.:
and outer glass plate with the space between filled 2
with a zinc bromide solution or in some cases with 3
oil. 4

(5) NSA-18(1964)-25641 RL

Peterson, S., Wymer, R.G. 1688
Radiochemical Processing Plants
(Peterson, S., Wymer, R.G.: Chemistry in Nuclear Technology. Reading, Mass.: Addison-Wesley 1963, S.260-79, 3 Fig., 2 Tab.)

The major part of the radiochemical plant is the 2
processing area. In a typical plant the processing 6
area consists of one or two long shielded canyons Fig.:
or one or two rows of shielded cells. Between the 2
two cell banks or canyons (or along one side if there Tab.:
is only one processing area) are the operating gal- 6
lery, pipe tunnels with connections between the different parts of the processing area, cold processing areas for preparation of nonradioactive chemicals which enter the process, and process sampling facilities. An analytical laboratory must be located near the processing area, and some

(5) Forts. RL

Peterson, S., Wymer, R.G. 1688
Radiochemical Processing Plants Forts.
(Peterson, S., Wymer, R.G.: Chemistry in Nuclear Technology. Reading, Mass.: Addison-Wesley 1963, S.260-79, 3 Fig., 2 Tab.)

arrangement must be provided for the shielded trans- 2
fer of samples from the processing area to this 6
laboratory. A radiochemical plant of typical design Fig.:
is the Idaho Chemical Processing Plant, of which the 2
plan view is shown. The laboratory must be equipped Tab.:
to handle samples remotely, preferably in hot cells 6
with master-slave manipulators. Radiochemical plants are maintained principally by two procedures, direct maintenance and remote maintenance. A proposed third method, underwater maintenance, calls for flooding the processing area and performing repairs with long-handled tools through a mobile, transparent shield of water. The distribution of costs in the Idaho Chemical Processing Plant is given. (5) RL

Jefferson, R.M. 1694
50-Kilocurie Gamma Irradiation Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 25-29, 2 Fig.)

The facility consists essentially of two hot cells above 2
a pool. Through the use of self-contained handling 3
equipment, sources may be readily introduced and 4
removed from these cells. Provisions are included for 6
visual, physical, and electrical access as well as con- Fig.:
trol to provide the necessary safety. Several problems 2
encountered in the operation of this facility are also discussed. Overall cost of the building, excluding land and site improvements but including utilities, was $431,420. The cell ventilation system is described.
(6) RL

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S.45-53, 5 Fig.)

The five in-line hot cells are equipped for metallo- 2
graphic preparation and examination, physical and 3
mechanical testing, and machine-shop operations. The 4
supporting areas include a radiochemistry laboratory, 5
facilities for decontamination, isotope storage, liquid Fig.:
radioactive waste disposal, and miscellaneous support- 2
ing laboratories and shops. The special features of the 4
laboratory include transfer ports, electrical patch panels, access openings, intercell transfer gates, isolation cubicles, a decontamination room, and an isotope storage area.
(7) Forts. RL

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S.45-53, 5 Fig.)

The ventilation system of the entire laboratory is 2
equipped to provide fresh air continuously without 3
recirculation of the air inside the building. Gamma- 4
detection area monitors are strategically positioned 5
throughout the laboratory. In addition, gamma-de- Fig.:
tection alarms are situated at critical points on the 2
second floor, above and beside the hot cells. A fire 4
detection, alarm, and extinguishing system is being planned for the hot cells.
(7) RL

Dascenzo, R.W., Hammill, K.H., Merker, L.G. 1697
The Fuels Recycle Pilot Plant
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 55-64, 3 Fig., 3 Tab.)

The building is divided into four primary functional 2
areas: (1) radiochemical engineering cells, (2) shielded 3
metallurgical cells, (3) low level canyon, and (4) cold 4
canyon. The basic requirement of the ventilation 6
system is to maintain an established negative pressure Fig.:
in the cells and building structure. This is accom- 2
plished by pulling air through the building by the Tab.:
exhaust fans. The cost of constructing the FRPP 2
is $5,560,000. 4
(8) RL

Mas, R., Tarbé de Saint-Hardouin, A., Lecouvreur, P. 1702
ADAC-Design of Alpha-Beta-Gamma Cells with Alpha Back Cells and Transfer Facilities
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 149-57, 8 Fig.)

The hot cells of the Shop for Cutting Fuel Assemblies 2
are designed as a sealed unit with the shielded cells 3
in front and adjacent to the back cells in which a man 4
wearing a frogman suit can work. Following a de- Fig.:
scription of the layout of the cells and back cells, the 2
remote handling equipment and the sealed lead out 4
connections will be described. Television cameras are provided in both the cells, back cells and underground floors to monitor the position of the active components and operational equipment from the operating area.
(7) RL

Goertz, R.C., Ferguson, K.R., Lindberg, J.F., Mingesz, D.P., Blesch, R.A., Potts, C.W., Grimson, J.H., Forster, G.A., Brown, F.L., Armstrong, J.L. 1710
The ANL Alpha-Gamma Metallurgy Hot Cell - its Design Philosophy and Components
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964, (1964) S.285-306, 13 Fig., 1 Tab.)

The hot cell complex has a main working area (11 x 2
32 ft.) capable of containing a high-purity nitrogen 3
atmosphere, and several integral, shielded service 4
areas (with only an air atmosphere) to provide for Fig.:
storage of contaminated equipment, remote repair, 2
glove repair, transfers, and so forth. The facility is 3
designed so that when fully equipped, it can be operated 4
for extended periods of time without personnel entry into the area which become contaminated (14) Forts. RL

Goertz, R.C., Ferguson K.R., Lindberg, J.F., Mingesz, D.P., Blesch, R.A., Potts, C.W., Grimson, J.H., Forster, G.A., Brown, F.L., Armstrong, J.L. 1710 Forts.
The ANL Alpha-Gamma Metallurgy Hot Cell - its Design Philosophy and Components
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S.285-306, 13 Fig., 1 Tab.)

under normal operation. However, to achieve the in- 2
tended degree of remote operation, the unilateral 3
electric manipulators now installed must be replaced 4
with electric master-slave manipulators mounted on Fig.:
vehicles and overhead support systems. The air 2
ventilation system has been designed according to the 3
generally accepted practice of providing flow from 4
areas of least contamination risk to areas of greater contamination risk. (14) RL

Brown, F.L., Koprowski, B.J. 1711
Startup of the ANL Alpha-Gamma Metallurgy Hot Cell
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 307-13, 1 Fig.)

The cell main working area is filled with dry nitrogen gas. Adjoining air-atmosphere cells, as shown in the figure, provide service areas for repair, maintenance, and storage of contaminated equipment, and waste disposal. These service areas are enclosed by alpha-gamma shield walls and are ventilated by a 56.6 m^3/min (2000 ft^3/min) air exhaust system. Pressure is maintained at minus 1.9 cm (0.75 in) of water column. Personnel dressed in air-line plastic suits regularly enter the contaminated service areas for routine service operations. Three types of manipulators provide for the general handling and maneuvering of test equipment. samples and supplies.

2 4 Fig.: 2

(5) RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande, (1964) No. 5, 6 S., 1 Fig., 2 Tab. (Sonderdruck))

Le laboratoire se divise en quatre zones qui permettent de mieux échelonner les mesures de radioprotection: I. Secrétariat, consigne et vestiaire extérieur. II. Locaux destinés à l'exploitation normale (distribution normale). III. Locaux prévus pour l'exploitation spéciale (synthèses radiochimiques). IV. Locaux pour la manipulation de très hautes radioactivités (où la manipulation d'activités excédant celles de la classe B pourraient être exceptionnellement autorisées). Dans chacune des zones, la ventilation s'opère des locaux les moins contaminés (vestiaires, laboratoires de mesure, de préparation ou de décontamination)

2 3 4 5 Fig.: 2

(9) Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723 1. Forts.
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

aux salles de manipulation, et plus particulièrement aux cellules de manipulation elles-mêmes (hottes ou boîtes à gants). Les installations de radioprotection fixes sont disposées comme des hottes de laboratoire. Les manipulateurs à rotule ont été commandés à la Société française F.C.R.; la rotule est enchâssée dans une brique occupant la place d'une brique normale. La longueur des tiges de manipulateurs varie: 40 cm, 60 cm, 80 cm, 1,20 m suivant les fonctions. Les sols existants sont protégés par un revêtement plastique synthétique sans joints à base de chlorure

2 3 4 5 Fig.: 2

Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723 2. Forts.
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

de polyvinyle. Toutes les portes sont munies d'un ferme-porte automatique; les poignées sont prolongées et orientées de telle sorte qu'elles puissent être manoeuvrées à l'aide des coudes. Les boîtes à gants qui occupent le laboratoire 8 servent à manipuler les substances radioactives pulvérulentes ou volatiles. Elles sont construites en résine synthétique dure et résistante, par la firme Saint-Gobain Nucléaire à Courbevoie, en France.

2 3 4 5 Fig.: 2

(9) RL

Lerch, P. 1724
Le rôle d'un service de radiophysique dans un hôpital universitaire
(Schweiz. Ges. Radiol., 50. Jahresvers., Bern (1963) Sonderdr.)
(Radiologia Clinica, 32 (1963) S. 516-24, 3 Fig.)

Les tâches principales qui peuvent être confiées au service de radiophysique d'un hôpital universitaire sont énumérées tout d'abord. Leur réalisation à l'Institut de radiophysique appliquée de l'Hôpital cantonal universitaire de Lausanne est ensuite discuté: les activités du laboratoire des radioéléments, du centre de radioprotection, du groupe de dosimétrie clinique, du laboratoire de mesure de la radioactivité et enfin de l'atelier d'électronique nucléaire sont successivement examinées. Le laboratoire chaud est actuellement en pleine extension.

2 Fig.: 4

(3) RL

Progress in Construction 1726
(Eurochemic News Bulletin, 1964, No 12, S. 7-8, 2 Fig.)

The Process Building was provisionnally handed over to Eurochemic by the contractor on December 6th last. The Reception and Storage Hall is now virtually complete. Doors and structural steelwork have been installed, and the building has been painted. The ventilation ducts are in position, and work is proceeding on the entire ventilation system- scheduled for completion in August. A provisional heating system was installed in the hall and water purification area for use during the winter. The electrical installation has been completed, and connections have been made to the installed mechanical equipment, including the 80 t crane. The instrument piping and most of the equipment has also been installed.

2 Fig.: 2

(3) RL

Hunzinger, W. 1727
Hazard Assessment and Safety Control at Eurochemic
(Eurochemic News Bulletin, 1964, No 12, S. 21-28)

This paper discusses the potential major nuclear hazards concomitant with the Company's reprocessing plant, examines the safeguards and methods of control applied to overcome them. Complex installations known as containments protect the workers and the neighbouring population from internal exposure. There are at least two containments surrounding the unsealed radioactive material throughout the plant. Each containment is as airtight as practicable and is ventilated in such a way as to provide a decreasing air pressure from an outer to an inner containment. When repair or maintenance work has to be carried out in the intervention areas the men themselves can be equipped with an additional "containment", such as pressurized plastic suits.

2 5

(4) RL

Dukes, E.K., Dorsett, R.S. 1730
Process Control in the Production of Pu 238 and Np 237
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 333-6, 1 Fig., 1 Tab.)

One standard analytical laboratory (12 x 24 feet) was equipped to perform all the analyses required to control the Pu 238-Np 237 process. In addition to the usual services, the laboratory contained a small shielded cell and transfer station, four gloved boxes, two radiobenches, and one hood. All areas except the vented containment boxes were maintained free from contamination. The floor was covered with a polyvinyl sheet to protect the tile and to facilitate removal of accidental contamination. Access was restricted to one entrance. Another portal was reserved for emergency exit.

2 4

Forts.

(5) RL

Dukes, E.K., Dorsett, R.S. 1730
Process Control in the Production of Pu 238 and Np 237 Forts.
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S.333-6, 1 Fig., 1 Tab.)

Shoe covers were worn and removed at a step-off pad located at the entrance to prevent spread of contamination to other parts of the building. Radiation monitoring instruments and other safety equipment were also located at this entrance.
2/4

(5) RL

Hottenstein, E.R. 1752
Design Aspects of the Saxton Radioactive Waste Disposal Facility
(American Society of Mechanical Engineers, Paper No 61-WA-224 (1961) 8 S., 2 Fig.)

The waste-treatment plant is a building that has been divided into six compartments or rooms. Essentially the high-activity regions are separated from the low-activity. In general, the waste-treatment plant is constructed from ordinary reinforced concrete. The control and storage rooms are constructed with concrete-block walls. The three ventilating systems and the common exhaust fan discharging to the stack are shown. The negative pressure insures that leakage will be into the duct and no radioactively contaminated air will leak into the surrounding environment.
2/3

(4) NSA-17(1963)-2644 RL

Nowak, W., Hausdorf, S. 1732
Das Isotopenlaboratorium.
Leipzig: VEB Deutscher Verl.f.Grundstoffindustrie 1961. 108 S., 32 Fig., 7 Tab.

Die vorliegende Broschüre unterrichtet über einige wichtige, mit dem Bau, der Einrichtung und der Tätigkeit im Isotopenlaboratorium zusammenhängende Fragen. Es werden folgende Laboratorien unterschieden: Forschungslaboratorien, Industrielaboratorien, Unterrichtslaboratorien und fahrbare Laboratorien. Verschiedene Kapitel befassen sich mit den Merkmalen solcher Laboratorien, ihrer Einrichtung, Be- und Entlüftung, ihrer Grundrißgestalung und dem Raumprogramm. Der Strahlenschutz im Isotopenlaboratorium behandelt bauliche Strahlenschutzmaßnahmen sowie apparative Maßnahmen zur Kontaminationsüberwachung.
2/3 4 5 Fig.: 2 3 4 5

(7) RL

Winsbro, W.R., Burch, W.D., Ryon, A.D. 1765
Safety Requirements for the Design of Radiochemical Processing Facilities
(CF-58-10-112 (1958) 14 S.)

Design safety requirements applicable to the selection of a radiochemical processing building site and applicable to the layout and general arrangement of operating, control, administrative, and access areas which surround the process containment areas within the process building are presented. Emergency exits shall be provided but shall be designed to prevent the entrance or exit of personnel except during emergencies.
CF-58-10-112
2/3 5

(8) RL

Hamada, M., Oae, S. 1741
Design of Tracer Laboratory
(Annual Report of the Radiation Center of Osaka Prefecture, 2 (1961) S.91-4, 4 Fig.)

In this paper the outline of design and several characteristics of arrangements are shown. In each room near entrance where low level radioactivity is used, one or two built-in unopenable windows are arranged, whereas no window is accommodated in the room where semi-high activity is handled. Built-in or movable type experimental tables, side tables and fume hoods are equipped in each room. On the side table, both sinks for inactive and active waste water are provided, the former is made by lead and the latter, stainless steel. In this laboratory, clean air, temperature and humidity of which are controlled is blown into each room through
2/3 4 Fig.: 2 4

(6) NSA-16(1962)-20568 Forts. RL

Smith, C.W. 1769
Engineering Studies Fission Product Plants at Hanford
(HW-SA-3377 (1964) 40 S., 16 Fig.)

The process area of the plant is a cylindrical, concrete structure, 103-feet in diameter extending about 75-feet above grade and 20-feet below grade. This portion of the building is surrounded by an 18-feet wide operating gallery. The process area includes eight wet chemistry cells, eleven manipulator cells, a cell access area, a service gallery, and an operating gallery. Entries to all of the cells are provided through removable cover blocks and through shielded personnel access doors for all cells except the product storage cell.
HW-SA-3377
2/3 4 Fig.: 4

(6) NSA-18(1964)-13914 Forts. RL

Hamada, M., Oae, S. 1741
Design of Tracer Laboratory Forts.
(Annual Report of the Radiation Center of Osaka Prefecture, 2 (1961) S.91-4, 4 Fig.)

the grill of ceiling, while contaminated air is drawn out from each room through fume hoods or exhaust grill, and ultimately put through the filtrating system. The filtering system is consisted of wet filters and dry absolute filters. When the electricity stopped accidentally, ventilation fans are immediately operated and lights along the wall are turned on by means of emergency electric generator in order to avoid the contamination by radioactivity.
2/3 4 Fig.: 2 4

(6) NSA-16(1962)-20568 RL

Smith, C.W. 1769
Engineering Studies Fission Product Plants at Hanford Forts.
(HW-SA-3377 (1964) 40 S., 16 Fig.)

The process ventilation system is designed in accordance with the established Hanford practice for radioactive process area. The ventilation system is a once through system, in which filtered, washed, and heated (in winter) air is supplied to the process area. The exhaust air is cleaned of radioactive particles by passage through high efficiency filters and is discharged through a 200-feet high stack.
HW-SA-3377
2/3 4 Fig.: 4

(6) NSA-18(1964)-13914 RL

Lakey, L.T., Bower, J.R. (Ed.) 1773
ICPP Waste Calcining Facility Safety Analysis Report
(IDO-14620 (1963) getr. Zählg., zahlr. Fig. u. Tab.)

The process building is a single unit 110 feet long and 70 feet wide. Radiation shielding is provided by the thick reinforced-concrete walls of the "hot" process cells. The building has six levels or floors which provide access to all rooms and cells. Heating and ventilation air is supplied through a branch duct from the main heating and ventilation duct system. Ventilation systems, laboratories and cells are described. The fire alarm system is a manual system. The alarm can be actuated at any of four pull-lever fire boxes located throughout the facility. There are several portable fire extinguishers which are strategically located throughout the building.

IDO-14620
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4
5
Fig.:
2

(8) RL

Johnson, A.A., Crawley, J.E., Hoffmann, J.M., Huntoon, R.T., Orth, D.A. 1776
Commercial Fabrication of Plutonium Fuel
(DP-838 (1963) getr. Zählg., zahlr. Fig. u. Tab.)

The building was assumed to be constructed of concrete block, with steel columns and beams. The processing area and office are on the main flow. Heating and ventilating equipment is housed in a small second flow area above the processing area. The exterior concrete block walls are plastered on the inside to present a smooth surface. Floors are covered with vinyl plastic floor covering in the process area, and with asphalt tile in the office wing. The first aid room is included in the regulated area so that it will be readily accessible to people working in the process rooms.

DP-838
2/3

(9) NSA-18(1964)-7160 Forts. RL

Johnson, A.A., Crawley, J.E., Hoffmann, J.M. Huntoon, R.T., Orth, D.A. 1776 Forts.
Commercial Fabrication of Plutonium Fuel
(DP-838 (1963) getr. Zählg., zahlreiche Fig. u. Tab.)

Air is supplied to the building on a "once through" basis, with the air flowing from "clean areas" to progressively "dirtier" areas. All air discharged from the building will be filtered with absolute filters.

DP-838
2/3

(9) NSA-18(1964)-7160 RL

Tadmor, J., Galron, H. 1780
Guide for the Hazards Evaluation of a Chemo-Nuclear Installation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf. 28/P/508 (1964) 19 S.)

We present in this paper an outline and discussion of the particular points which we consider should be taken into account in planning the safety precaution of a chemo-nuclear establishment and which should be considered in a report evaluating the hazards in such an installation. Description of design of the building, thickness and materials of construction of the walls, roof and floor. Position and dimensions of doors and windows (indicate double doors with airlocks) and the degree to which they are leakproof, direction of opening, and mate-

A/Conf. 28/P/508
2/3
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(7) Forts. RL

Tadmor, J., Galron, H. 1780 Forts.
Guide for the Hazards Evaluation of a Chemo-Nuclear Installation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964, A/Conf. 28/P/508 (1964) 19 S.)

rials of construction. Interlock and bypass provisions for airlocks. Emergency escape doors. Detailed description of each of the rooms of the building; size, thickness of the walls, materials of construction, paintwork, degree of resistance to fire and to radioactive contamination. Indication of method of introduction and removal of materials into and from the various facilities (including description of change of gloves in the glove boxes). General description of the ventilation system, including joints and welds in the ventilation ducts and their tightness to leaks. Number of air changes per unit time in the different facilities.

A/Conf. 28/P/508
2/3
5

(7) RL

Lister, B.A.J. 1782
Plutonium Properties, Hazards and General Methods of Control
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan March 1964 (1964) S. 1.1-1.7, 8 Fig., 9 Tab.)

The type of laboratory required for plutonium work will depend on the amount of plutonium which it is intended to handle. We can for convenience think of three grades of laboratory: Class 1 Laboratory, Class 2 Laboratory, Class 3 Laboratory. It may be suggested that for normal chemical or metallurgical operations a Class 3 laboratory is suitable for handling up to 10 μc of plutonium and a Class 2 laboratory up to 1 mc. If greater than millicurie amounts are handled regularly the facilities should be designed to the highest standards. Exposed surfaces within the

AERE-L-151
2/5
Fig.:
2
4
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(5) Forts. RL

Lister, B.A.J. 1782 Forts.
Plutonium Properties, Hazards and General Methods of Control
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan March 1964 (1964) S. 1.1-1.7, 8 Fig., 9 Tab.)

laboratory should be of smooth nonpermeable finish and projections and ledges where dust might collect should be avoided. Similarly, sharp edges which might cause wounds should also be avoided. There should be suitable facilities for monitoring of personnel and for storing the necessary protective clothing for routine and emergency use. Monitoring of air and surfaces should be carried out regularly. The decision on whether respirators should be worn is highly dependant on circumstances and should be made by the local health physicist. In extreme cases completely sealed clothing may be necessary. (5)

AERE-L-151
2/5
Fig.:
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RL

Fassbender, H. (Hrsg.) 1799
Einführung in die Meßtechnik der Kernstrahlung und die Anwendung der Radioisotope. 2. Aufl.
Stuttgart: Thieme 1962. XVIII, 420 S., 240 Fig., 26 Tab.

In Kapitel E wird über die Einrichtung und über *Hilfsmittel für Isotopenlaboratorien* (Bauweise von Isotopenlaboratorien, Raumeinteilung- und Anordnung, Ausstattung der Räume, Wände und Fußböden, Be- und Entlüftung, Abzüge, Handschuhkästen) berichtet.

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Fig.:
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(5) RL

3 Eingebaute Vorrichtungen

(Abzüge, Filter, Ventilatoren, Klimaanlagen, Abwasserleitungssysteme, Fenster, Sichtvorrichtungen sowie deren Materialien)

Manipulatoren und Krane siehe 4

Graf, P. 1377
Die Einrichtungen zur Bearbeitung und Untersuchung von Bestrahlungsexperimenten im Hot- und Isotopenlaboratorium in Würenlingen
(Neue Technik, 5, No.3 (1963) S.128-39, 6 Fig., 3 Tab.)

Die Abschirmzellen des Heißen und des Isotopenlaboratoriums im Reaktorzentrum Wurenlingen und ihre Fernbedienungseinrichtungen zur mechanischen Bearbeitung, metallurgischen und chemischen Untersuchung hochaktiver Materialien werden beschrieben. Der Beobachtung des Zellenraums dient ein gestuftes Abschirmfenster: außen (kalte Seite): 76 x 46 cm hoch, innen (aktive Seite): 96 x 76 cm hoch, aus strahlenstabilisiertem Bleiglas (d 3,3 und 6,2 g/cm^3), mit einem den Zellenfrontwanden entsprechenden Abschirmvermogen und einem seitlichen Blickwinkelverlust von 5°. Ein Paar mechanische Manipulatoren (ANL Mod-9) mit simultaner Parallelubertragung der Bewegungen des Bedienungsarmes außen auf den Arbeitsarm innen bilden das allgemeine Fernbedienungs-Handwerkzeug. (4) RL

3/4
Fig.: 2 4
Tab.: 4

Sethna, H.N., Srinivasan, N. 1386
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug.1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

A Purex type process has been chosen for its flexibility as well as the advantages it offers in the matter of concentration of the fission product raffinates. The Plant has a co-decontamination cycle, a partition cycle and two separate parallel cycles for the purification of uranium and plutonium. For the extraction cycles, 30 % TBP is used as solvent. Initially 1.0 M, 2.0 M. and 0.01 M have been chosen as the concentration of nitric acid in the feed, scrub and strip respectively, with sodium nitrite in the feed solution to stabilise the valencies of uranium and plutonium. Ferrous sulphamate is used as a reducing agent for the partitioning of plutonium from uranium. (8) NSA-18(1964)-37283 Forts. RL

A/Conf.28/P/786
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Fig.: 2 4

Sethna, H.N., Srinivasan, N. 1386 1. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug.1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

The plutonium separated from the bulk of the uranium is purified by an anion exchange process, for which Dowex-1 with 4 % cross linkage is used with loading and washing in 7.2 nitric acid medium and elution with 0.35 M nitric acid. The radioactive part of the Plant in the Main Process Buildings is housed in eight cells with a total volume of about 3600 cubic metres. The walls and the roof of the cells and the stagings are lined with stainless steel in three out of the eight cells, the rest are protected by acid resistant paint. The floors of all cells are lined with stainless steel with 30 cm of skirting.

(8) NSA-18(1964)-37283 Forts. RL

A/Conf.28/P/786
2
3/4
6
Fig.: 2 4

Sethna, H.N., Srinivasan, N. 1386 2. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug.1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

On one side of the cells are the access corridor, the service corridor, the operating gallery and the transmitter and tank space. The entrance doors to all the cells are situated at the access corridor (ground floor) level. The control laboratory has a lead shielded cell for work with highly active samples and other associated fumehoods and glove boxes for medium level and low level analytical work and for plutonium handling.

(8) NSA-18(1964)-37283 Forts. RL

A/Conf.28/P/786
2
3/4
6
Fig.: 2 4

Sethna, H.N., Srinivasan, N. 1386 3. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug.1964. A/Conf.28/P/786 (1964) 2o S., 10 Fig., 1 Tab.)

For the active laboratories and the plutonium laboratory the conditioned air is rendered dust-free with absolute filters and is exhausted through fumehoods to maintain the minimum velocity of the air required across the face of the fumehoods. While final cost figures are likely to be available after some time, approximate indications are given.

(8) NSA-18(1964)-37283

A/Conf.28/P/786
2
3/4
6
Fig.: 2 4

RL

Imre, L., Nagy, J. 1388
(Ungarisch.) Isotope Laboratory of the Institute for Physical Chemistry, Lajos Kossuth University. II. Technical Equipments of the Laboratory
(Magyar Kemikusok Lapja, 19 (1964) S.185-8)

The technical design of the laboratory is based on the requirement of being able to technically educate a certain number of students. In compliance with this lab working places of customary type have been provided. The layout of the rooms has been performed as to hinder any radioactive contamination from the hot booth to get to the measuring apartments or to the tracing lab either by personal communication or by water or air flow. The working mechanism of the air cleaning equipment made on the basis of Hungarian projects is an object of dosimetry research over the recording of automatic activity measuring instruments. (6) NSA-18(1964)-35439 RL

2
3/4

Dykes, F.W. 1390
Remote Analysis Apparatus
(IDO-14636: Annual Report of Division Analytical Branch for 1963 (1964) S.10-11)

An extended pan balance was installed in the recess adjacent to the last box in the B line. A chamber of lead bricks serves as shielding for the pan. Transfer between the box and the recess is by a crank-operated conveyor. A distillation apparatus was installed in another box for the determination of total nitrogen, computed as nitrate. A separate box was equipped with a can sealer for disposal of hot waste. In a fourth box, samples are prepared for X-ray diffraction analysis to measure alpha alumina content. To prevent particulate matter from passing into the plant exhaust system, an absolute filter was installed in the exhaust duct of each of the four boxes. A vane-axial fan was placed downstream of each filter to maintain the necessary air flow. (5) RL

IDO-14636
3/4

Duthie, R.E.C., Sachs, F.L. (eds.) 1395
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl.9)(1960) 56 Bl.)

Cape-456: Bag Sealer. To keep contamination at a low level, plastic bags are used in hot cells and gloved boxes. This bag sealer is an apparatus for sealing the plastic bags. Included in the package is an outlet ring for a gloved box used to remove the sealed plastic bag from the box. Cape-482: Metal Glove Box. The box has two glove ports, each 6 1/6 in. in diameter, and a safety-glass window in a metal frame 18 in. by 36 7/8 in. with fluorescent lighting at the top. Cape-534: Cenham Hoods. The Chemical Engineering Division hoods are built in modules. This module is 42 in. high, 42 in. long, and 42 in. deep. The fronts and backs have 4 glove ports each.

(15 NSA-1961-4087 2 Forts. RL

TID-4100 (1st Rev., Suppl. 9)
Cape-456
Cape-482
Cape-534
Cape-556
Cape-568
Cape-603
Cape-628
1
3/4
5

Duthie, R.E.C., Sachs, F.L. (eds.) 1395 1. Forts.

Supplemental Insert Sheets for Engineering Materials List

(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.

Cape-556: Syntron Polisher. The polisher is used in a hot cell with a vibrator to polish metal samples for metallographic examination. Cape-568: Glove Type Hoods. The hood is used to safely handle highly toxic or reactive materials. The hood contains an inert or treated atmosphere under regulated pressures. Equipment is operated manually through gauntlet gloves secured and sealed to the hood sides. Cape-603: Automatic Alpha Hand Counter, Model HC-2. The automatic, personnel-operated α particle hand meter is a qualitative instrument indicating that hands are hot or cold.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1 3/4 5

(15) NSA-1961-4087 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395 2. Forts.

Supplemental Insert Sheets for Engineering Materials List

(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.)

Cape-628: Dry Box Equipment. Dry box equipment includes a pneumatic airlock door, an edge filter, and a centrifuge housing. The pneumatic door is a guillotine type, air-cylinder-actuated door that is used where space does not permit the use of a hinged door.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1 3/4 5 RL

(15) NSA-1961-4087

Duthie, R.E.C., Sachs, F.L. (eds.) 1397

Supplemental Insert Sheets for Engineering Materials List

(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-298: Sleeved Tong, Model 2. This experimental-type, stainless steel, sleeved tong is used with a manipulator as slip on fingers. Cape-712: Ball Socket Manipulator. The manipulator operates through a 10 in. square opening in an 8 in. thick shielding wall. Cape-716: Intermediate Level Triple-Cell Cave. The cave is used for metallographic process operations. A small conveyor transfers the specimens. Cape-718: Glass Shielding Windows. Shielding windows provide an unrestricted view for operations involving radioactive materials. The windows consist of a tank filled with one inch glass plates immersed in mineral oil.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740 1 3/4

(15) NSA-1961-24922 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1397 1. Forts

Supplemental Insert Sheets for Engineering Materials List

(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-719: Portable Shielding for Chemistry Hood. The portable shield is used in handling fractional curie quantities of radioactive materials. The shield is used with standard hood shielded on the sides, back, and bottom with steel plates. Cape-729: X-Ray Diffractometer Facility. The x-ray diffractometer facility is located in the physical and metallurgical hot laboratory and is a 2.3 density concrete cave with a capacity of 100 curies. Cape-739: Hot Laboratory Creep Test Facility. The facility tests irradiated samples with the same accuracy as is obtained with non-irradiated samples.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740 1 3/4

(15) NSA-1961-24922 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1397 2. Forts.

Supplemental Insert Sheets for Engineering Materials List

(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-740: Power Reactor Fuel Processing Plant. The cells used are an adaptation of segmenting cells with the main processing operations carried out in Cell A and stored in the storage cell. Maintenance is performed from the top of the cell.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740 1 3/4

(15) NSA-1961-24922 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1398

Supplemental Insert Sheets for Engineering Materials List

(TID-4100(1st Rev., Suppl. 13)(1961) 24 Bl.)

Cape-631: Remote Analytical Facility. The building is of reinforced concrete and is 88 ft by 83 ft. It is divided into three parallel areas; analytical lab., decontamination area, and a multicurie cell. Cape-735: Heating and Ventilating Equipment for Purex. The laboratory is 144 ft long by 56 ft wide. It contains: 3 hot labs, one cold lab, a decontamination room, sample storage room, instrument shop, glass shop, counting room, x-ray room, fluorometer room, 3 offices, hot and cold change facilities for men and women, and a lunch room.

TID-4100 (1st Rev., Suppl. 13) CAPE-631 CAPE-735 1 3/4

(9) NSA-1961-26130 RL

Mayfield, R.M., Tope, W.G., Shuck, A.B. 1400

The Facility 350 Helium-Atmosphere System

(ANL-6489 (1962) 45 S., 25 Fig.)

The helium atmosphere system in Argonne's Facility 350 is described in detail. The system is straightforward, employing drying and carbon towers for the removal of moisture, oxygen, and other impurities. The bulk of the 15,000 ft^3 of helium atmosphere is continuously recirculated at nearly atmospheric pressure. The operation is continuous, requiring a minimum of maintenance and operational manpower. The helium atmosphere is supplied to the gloveboxes with impurity levels below 3,000 ppm (0.3 %) nitrogen, 1,000 ppm (0.1 %) oxygen, and 50 ppm moisture. Such purity levels prevent oxidation and combustion of the plutonium materials being processed.

ANL-6489 3/4 Fig.: 4

(7) NSA-17-16171 RL

Paprocki, S.J., Keller, D.L., Alexander, C.A., Pardue, W.M. 1403

Equipment Design and Construction, Powder-Metallurgy Glove Box

(BMI-X-170(Del.): Properties of PuC_2 and PuC_2-ThC_2 Ceramics (1961) S. 5-7)

All powder metallurgical operations were performed in a glove box with the shape of a horizontally positioned cylinder and constructed of 1/4-in. stainless steel in two 8-ft-long sections 38 in. internal diameter. Six 1-in.-thick safety-glass windows each having a viewing area measuring 7 by 13 in., are provided, as well as twelve 8-in.-internal-diameter-glove ports with attached shoulder-length lead-impregnated neoprene gloves. Dissolution and preparatory steps in the analysis of the condensate from the transpiration

BMI-X-170 (Del.) 3/4

(?) Forts RL

Paprocki, S.J., Keller, D.L., Alexander, C.A., Pardue, W.M. 1403 Forts.
Equipment Design and Construction, Powder-Metallurgy Glove Box
(BMI-X-170(Del.): Properties of PuC_2 and PuC_2-ThC_2 Ceramics (1961) S. 5-7)

condenser were carried out in open-front flowing-air chemistry hoods. The air velocity can be varied in these hoods with a minimum value of 125 ft^3 per min.

BMI-X-170 (Del.)
3/4
(8) RL

Kesel, G.P., Baker, R.C. 1432
CAC-880 Pu Reclamation Facility - Z Plant Glove Box Design Study
(HW-68442 (1961) 14 S., 16 Fig.)

The following recommendations and conclusions are broken down into two groups. The first group is specifically slanted towards the design of the CAC-880 Project main process hoods where access is from one side only. The second group may serve as data applicable to design of other project hoods. Throughout this report, the terms "hood" and "glove box" are synonymous.

HW-68442
3/4
Fig.: 3 4
(6) NSA-1963-16141 RL

Whitfield, W.J. 1413
The Design of a Dust-Controlled Vented Hood Utilizing Laminar Air Flow
(SC-4905(RR)(1963) 20 S., 11 Fig.)

This report describes a laminar air flow vented clean hood and presents performance data for it. This open-front hood provides a clean work area for operations which require removal of particles or noxious gases. This hood provides dust levels of less than 1000 particles per cubic foot 0.32 micron and larger.

SC-4905(RR)
3
(4) RL

Hessen, V.B. 1447
Improved Arrangements for Handling Radioactive Materials
(Brit.Pat.866,515 (1957/61) 3 S.)

The present invention consists in an arrangement for handling radioactive materials comprising a chamber in which the radioactive material can be placed, said chamber having walls acting as a screen to prevent the escape of harmful radiation from radioactive material in the chamber and a manipulating device to allow handling of radioactive material within the chamber, wherein a television camera is arranged inside the chamber and means are provided outside the chamber for remotely controlling the camera for movement in pan and tilt so that it can view different parts of the chamber and for reproducing a television picture from the camera, which picture reproducing means can be viewed by an operator outside the chamber to assist in the handling of the radioactive material by the manipulating device.

Brit.Pat. 866,515
3/4
(5) NSA-1961-18176 RL

Monk, G.S. 1420
Overall Optical Viewer
(U.S.Pat.2,875,346 (1946/59) 6 S., 9 Fig.)

My invention relates to an optical system that is suitable for viewing objects that are in a region of relatively high radioactivity or high neutron activity. More specifically, it has reference to an optical system that will absorb penetrating radiations, such as neutrons and gamma rays, emitted by radioactive objects viewed or by radioactive objects in the vicinity of the material or objects viewed, thereby protecting personnel from the harmful biological effects of such penetrating radiations.

U.S.Pat. 2,875,346
3
Fig.: 3
(4) RL

Thuro, G. 1448
Periskop mit Abschirmung fur radioaktive Strahlung, insbesondere zur Beobachtung in Kernreaktoren
(DBP 1 079 346 (1958/60) 1 S., 1 Fig.)

Periskop zur Untersuchung oder Beobachtung von Objekten, von denen eine storende oder gefahrdende radioaktive Strahlung ausgeht, dadurch gekennzeichnet, daß der Strahlengang im Beobachtungsrohr durch die Auswahl geeigneter Linsensysteme so gewahlt ist, daß an einer oder an mehreren Stellen im Beobachtungsrohr das abbildende Lichtbundel in einer Ebene senkrecht zur optischen Achse einen moglichst kleinen Querschnitt besitzt und daß der Raum außerhalb dieses Lichtbundels durch Absorber fur radioaktive Strahlung ausgefullt ist.

DBP 1 079 346
3
Fig.: 3
(4) RL

Bondarenko, I.P., Budarova, N.V. 1421
(Russ.) Grundlagen der Dosimetrie und des Strahlenschutzes.
Moskva: Gos.izd."Vyssaja skola" 1962. 197 S., 145 Fig., 14 Tab.)

Es wird unter anderem über die Einrichtung und Ausstattung von Laboratorien mit radioaktiven Stoffen berichtet. Zahlreiche Abbildungen zeigen Spezialzangen, Manipulatoren, Pipetten, Abzüge, Handschuhkästen, spezielle Labortische, Schutzkleidung, Handschuhe usw.

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Fig.: 3 4 5
(6) RL

Wälischmiller, H. 1449
Gehause fur ein in eine Strahlenschutzwand einzubauendes Fenster
(DBP 1 070 808 (1957/60) 1 S., 2 Fig.)

Gehäuse fur ein in eine Strahlenschutzwand einzubauendes Fenster, dadurch gekennzeichnet, daß die Seitenflachen des auf die ganze Wandtiefe durchgehenden Gehauses von der senkrecht zur Wand verlaufenden Mittelachse des Fensters aus gesehen konvex gekrummt sind.

DBP 1 070 808
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Fig.: 3
(4) RL

Commissariat à l'Energie Atomique 1451
Improvements in or Relating to Gas Filters
(Brit.Pat.850,308 (1957/60) 3 S., 2 Fig.)

The invention is more especially concerned with such devices for holding filter elements intended to stop radioactive particles. A device for holding a filter element intended to stop particles in suspension in a gaseous stream, and in particular radioactive particles, the device including two tubular sockets adapted to be fixed in gastight fashion on the respective ends of two portions of the circuit through which said gaseous stream is flowing.

Brit.Pat. 850,308
3
Fig.: 3

(4) NSA-1961-6085 RL

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957)VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A two-chambered hot cell has been designed, built, and used. The hot cell is suitable for radioactive material testing, hot chemistry or handling of radioactive sources. The access door to each chamber has a zinc bromide window and a pair of ANL Model 8 manipulators mounted on it. A 2-ton traveling bridge crane serves both sides of the cell. A Jordan Remote Area Monitoring System Model I was installed in the cell when it was built.

WADC-TR-57-498
AD-142157
PB-131619
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Tab.: 2 3 4 5
Fig.: 2 3 4 5

(12) NSA-12(1958)-5748 Forts. RL

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460 Forts.
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A filtered exhaust system was provided to prevent contamination of areas outside the cell. A CC_2 fire extinguisher system is installed with two nozzles in each chamber of the cell.

WADC-TR-57-498
AD-142157
PB-131619
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Tab.: 2 3 4 5
Fig.: 2 3 4 5

(12) NSA-12 (1958)-5748 RL

Corbin, L.T., Winsbro, W.R., Lamb, C.E., Kelley, M.T. 1462
Design and Construction of ORNL High-Radiation-Level Analytical Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.3-10, 5 Fig.)

The High-Radiation-Level Analytical Laboratory is designed and built for use in the chemical analysis of highly radioactive materials. The in-line hot-cell bank has separate cells for unloading, storing, performing analyses (six cells), and nondestructive testing. Supporting areas include laboratories and rooms for assemblying equipment, decontaminating equipment, and changing clothes. The salient features are an intercell conveyor, transfer drawer, maintenance cart, cask-transfer cart and interchangeable work pans. All areas in which radioactive operations are performed and which are adjacent to these operating areas are equipped for the safe handling and confinement of radioactive materials.

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Fig.: 2 4

(9) RL

Moore, P.F., Allen, J.D. 1463
Los Alamos Radiochemistry Hot Cells
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.11-16, 2 Fig.)

A major expansion of the hot cell facilities at the Los Alamos Radiochemistry Building in 1962-63 included adding a new wing on the building; increasing the number of cells from three to sixteen. Rapid transfer of materials was provided for by the use of overhead monorail hoists and by a small railroad train passing through all cells. Building size and cost were held down by designing for light-duty manipulators and by simplification or elimination of some of the usual secondary systems. Over-all cost of the project was about one million dollars. The windows were to provide shielding for 100 curies in the chemistry cells and 1000 curies in the dispensary cell.

2
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4
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Fig.: 2 4

(7) RL

Brebant, C., Dick, H., Junca, A., Portal, A., Wallet, P. 1464
LECA - Irradiated Fuel Study Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.17-32, 13 Fig.)

The building containing the laboratory is a two story building with a basement. Total cost, including installed cell equipment (windows, manipulators, conveyor, transfer devices) was $3,200,000. The laboratory and its particular features are described. The entire building is ventilated and air conditioned.
(11)

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5
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Fig.: 2 4 5

RL

Climent, V.H., Watson, J.M. 1469
Design Considerations for University-Size Hot Cell Facilities. A University of Chicago Radiochemistry Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.113-38, 13 Fig., 3 Tab.)

A practical procedure for shielding estimates and a body of data on shielding design, selection of components and economics, as applied to "1 - 1000 curie" hot cell laboratories, is presented. The paper is divided as follows: I. General considerations: A. Shielding, B. Measurements, C. Standards, D. Errors, E. Systematics. II. The Radiochemistry Laboratory Project: A. Hot Cell, B. Ventilation, C. Laboratory, D. Cost Analysis.

3
4
Fig.: 2 3 4
Tab.: 3 4

(5) RL

Morton, J.E., Parker, H.A., Wyatt, E.I., Corbin, L.T. 1471
Shielded Facility for Use in the Analysis of Radioisotopes
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.161-67, 4 Fig.)

A new all-metal shielded facility was constructed at ORNL for use as an aid in the analysis of radioisotopes. Remotely controlled equipment makes possible the preparation of dilutions and the performance of other simple chemical operations inside the cells. Unique features of the facility are the inside-outside analytical balance, the waste-disposal system, and the ease of access to all parts of the cells. Included in the equipment of the cells are a small furnace, filter photometer, pipetter, titrator, and centrifuge.

3
4
Fig.: 4

(7) RL

Merker, L.G., Bloomster, C.H. 1472
Plutonium Fuel-Casting Facility
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.169-74, 3 Fig.)

An induction heated glove box enclosed casting facility has been used at Hanford for the melting and casting of experimental plutonium-containing fuel alloys. A 300 ft^3 static-inert atmosphere glove box encloses the furnaces and is operated at a negative pressure of one inch of water. The glove box pressure is maintained by an automatic ventilation system which also provides for controlled purging and high emergency exhaust flows.

3/4 Fig.: 4

(5) RL

Schraidt, J.H., Coleman, L.F., Holcomb, W.F., Levenson, M., Ludlow, J.O. 1473
Establishment and Maintaining a High Purity Inert Atmosphere in EBR-II Fuel Cycle Facility Argon Cell
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.181-90, 3 Fig.)

This inert atmosphere is circular in plan. It is completely lined with continuously welded steel plate and shielded with five feet of high-density concrete. There are twenty-two large windows, sixty-five multi-line service sleeve penetrations, three transfer locks, four rectangular cooling ducts, thirty-three stepped penetrations ranging in diameter from two inches to eighteen inches, over three hundred conductors in MI cables, and numerous additional penetrations through the shielding and liner.

3/4 Fig.: 4

(8) RL

Valentin, A. 1476
Two Years of Operating an Alpha-Beta-Gamma Laboratory at Saclay
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.211-21, 5 Fig.)

This laboratory is essentially intended for metallurgical research and is composed of five cells in which α sealed dry boxes are associated with magnetic transmission manipulators. Nitrogen circulating in a closed loop forms the atmosphere of the boxes. The manipulators are of the magnetic transmission indirect type.

3/4 Fig.: 2 3

(4) RL

Corrigan, J.E., Stearns, R.F. 1479
In-Cell Alpha Enclosure for Disassembly and Examination of Plutonium-Enriched Fuel-Element Capsules
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.245-54, 5 Fig.)

Since March of 1963, an alpha enclosure for the disassembly and examination of plutonium-enriched fuel capsules has been in operation in one of the Radioactive Materials Laboratory megacurie cells of the Vallecitos Atomic Laboratory. A complete ventilation system consisting of blowers and filters is attached to the bottom of the enclosure and at 20 cfm flow maintains the enclosure negative pressure relative to the cell at 1/2-inch of water.

3/4 Fig.: 4

(5) Forts. RL

Corrigan, J.E., Stearns, R.F. 1479 Forts.
In-Cell Alpha Enclosure for Disassembly and Examination of Plutonium-Enriched Fuel-Element Capsules
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.245-54, 5 Fig.)

Two Model 8 manipulators protected with polyvinyl chloride booting, similar to that in use at the Lawrence Radiation Laboratory, Berkeley, California, perform all operations within the enclosure, and two standard unbooted Model 8 manipulators are used for the pass-in and pass-out operations. The front window of the enclosure (1/4-inch thick radiation resistant glass) is sized so that the enclosure front offers no restriction to viewing through the cell window.

3/4 Fig.: 4

(5) RL

Hardtke, F.C., Ferguson, K.R. 1489
The Fracture by Electrical Discharge of Gamma-Irradiated Shielded Window Glass
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.369-81, 12 Fig., 2 Tab.)

Four-inch cubes of commercial shielding window glasses have been tested for susceptibility to fracture by electrical discharge following intense gamma irradiation. All glasses tested were easily discharged by an impact probe after an exposure of 1 to 10 megaroentgens. A serious effect for shielding windows, is that a small dendritic fracture, once formed, will continue to grow with subsequent exposure. Recommendations are made concerning the design of windows to reduce their susceptibility to fracture.

3 Fig.: 3 Tab.: 3

(4) RL

Ernsberger, F.M., McGary, T.E. 1490
Gamma-Radiation-Induced Conductivity in Nuclear Shielding Glasses as Determined by Space Charge Decay
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.383-93, 6 Fig., 2 Tab.)

The radiation-induced electrical breakage of nuclear shielding windows becomes a severe problem when hot cells are to be designed for high intensity radiation sources. This paper will describe some work which revealed facts that should prove helpful in any eventual understanding of the phenomenon.

3 Fig.: 3 Tab.: 3

(4) RL

Rizzo, F.X., Muller, A.C., Zucker, M.S. 1491
Electrical Discharge in Gamma Irradiated Lead Shielding Glass
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.395-412, 13 Fig., 3 Tab.)

A mathematical model, describing discharge of shielding glass as a result of gamma irradiation has been formulated and experimentally verified to be a good order-of-magnitude approximation. Experimental results indicate an electronic process, associated with storage of electrons in color centers similar to those of cerium, is involved. Studies indicate further that lead in glass may serve to decrease dielectric breakdown strength. Sodium ion has beneficial effect in that it may serve to decrease buildup of net charge and inhibit coloration of glass.

3 Fig.: 3 Tab.: 3

(5) RL

First Report on the Activities of the Eurochemic Company 1959-1961 1507
Paris: Crganisation for Economic Co-Cperation and Development, European Nuclear Energy Agency (1962)
380 S., 121 Fig., 32 Tab.
(NP-12804)

The main process building will consist of 31 process cells with adjacent access areas and two rows of service corridors on six different floor levels. Additional installations will include an analytical laboratory (adjoining the main process building), a fission product storage building, final product storage, an effluent station for the concentration of medium and low active liquid waste streams, and inactive storage unit. A research laboratory, consisting of a "cold" wing, "hot" laboratories, "hot" cells and an engineering hall has

NP-12804
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Fig.:
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(7) NSA-17-25357 Forts. RL

First Report on the Activities of the Eurochemic Company 1959-1961 1507 Forts.
Paris: Crganisation for Economic Co-Cperation and Development, European Nuclear Energy Agency (1962)
380 S., 121 Fig., 32 Tab.
(NP-12804)

been designed by a team of architects from Switzerland, Denmark and Spain. It will be located in the vicinity of the Eurochemic re-processing building. The total investment has been estimated to be $ 24 million, including site development.

NP-12804
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4
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Fig.:
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(7) NSA-17-25357 RL

Wervers, H.J., Vrijburg, O.B. 1513
Remote Handling at Petten. The Laboratory for Highly Radioactive Cbjects (LSC)
(Atoomenergie en Haar Toepassingen, 4 (1962) S.272-7, 6 Fig.)

The LSC building covers an area of 51 x 35 metres. The "active maintenance area" is a hall, measuring 12 x 43 metres, with a height of 12 metres, which forms the central part of the building. The high-activity cell line, which terminates at both ends in so-called "loading-bays", is situated along the southern side of the active maintenance area. The cell line operations are controlled from the southern part of the corridor, which is called "operations hall". Five high-density glass windows, affording a shielding equivalent to 1.20 m barytes concrete, permit wide angle observation of the interior. Forts.

2
3
4
Fig.:
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(6) NSA-17(1963)-14548 RL

Wervers, H.J., Vrijburg, C.B. 1513 Forts.
Remote Handling at Petten. The Laboratory for Highly Radioactive Cbjects (LSC)
(Atoomenergie en Haar Toepassingen, 4 (1962) S.272-7, 6 Fig.)

Each window station is equipped with a pair of 'master-slave' manipulators. Maintenance men can enter the cells through a 1.80 metre high opening provided for that purpose in the rear wall of each cell, which is normally closed by means of a concrete-filled plug.

2
3
4
Fig.:
2

(6) NSA-17(1963)-14548 RL

Arcelli, G., Rosa, U., Scassellati, G.A. 1519
Descrizione di una cella calda per l'analisi chimica di materiali radioattivi
(Energia nucleare, 9 (1962) S.472-80, 4 Fig.)

A description is given of the criteria followed in the design, construction, and assembling of a shielded hot cell intended for analytical chemistry work on radioactive substances, ß and emitters, and fission products. The external and the internal structure, the shielding and the handling devices, and all the facilities of the cell are described, with special regard to the ventilation and the radioactive waste collection systems.

3
4
Fig.:
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(6) NSA-16(1962)-30519 RL

Bailey, H.M. 1524
Right-Angle Closed Circuit TV System for Hot Cell Cperation
(Atomics, Vol. 16, No. 2 (1963) S. 54-56, 4 Fig.)

A closed-circuit TV system was needed that would give operators a precise view within a windowless reactor test cell. The first and most obvious solution was a stereo television system that would match the depth-perception method used by the human eyes and the brain. Several stereo arrangements were evaluated and one complete system actually built. At the same time, however, a simpler arrangement of two (or more) cameras moving on right-angle tracks was developed and tested.

3
Fig.:
3

(3) Forts. RL

Bailey, H.M. 1524 Forts.
Right-Angle Closed Circuit TV System for Hot Cell Cperation
(Atomics, Vol. 16, No. 2 (1963) S. 54-56, 4 Fig.)

High-definition cameras with ZCCM lenses and pan-tilt mounts were used, and the result was so outstandingly successful that no further effort was made to develop a stereo 3-D system. Indeed, operators who have become adapt at using the traverse TV arrangement prefer to continue using it even when the work is in a staging area within the field of vision of a leaded glass viewing window.

3
Fig.:
3

(3) RL

Upson, U.L., Roberts, F.P. 1529
An In-Cell Gamma Analyzer
(TID-7629: Analytical Chemistry in Nuclear Reactor Technology. Fifth Conference, Gatlinburg, Tenn., Cctober 10-12, 1961 (1962) S.42-53, 8 Fig., 2 Tab.) TID-7629

A close-coupled gamma spectrometer for viewing samples inside the hot cell has been utilized to provide analytical control in the Hanford Laboratories' High-Level Radiochemical Facility, yielding rapid and accurate isotopic analyses of undiluted samples. Two through-the-wall access tubes were utilized to accommodate two detectors, each of which views two sample positions. The two positions for each detector were designed to yield geometries differing by a factor of 10, and the two detectors were collimated to differ by about 100, yielding four sample positions in approximate decade steps.

3
4
Fig.:
4

(6) NSA-16-23618 RL

Parrish, E.C., Schneider, R.W. 1531
Tests of High-Efficiency Filters and Filter Installations at CRNL
(CRNL-3442 (1963) III, 44 S., 19 Fig., 3 Tab.)

High-efficiency filters are used in air handling systems as the primary means of minimizing the amount of radioactive particulate matter released to the atmosphere. The feasibility of measuring the filtration efficiency of "systems" containing such filters has been established at CRNL. Since the middle of 1962 the efficiency of more than 650 systems has been successfully measured in situ using an aerosol of dioctylphthalate and a forward light scattering photometer. In addition, over 1500 new filters have been checked prior to being placed in CRNL stores stock. (auth)

CRNL-3442
3
Fig.: 3

(5) NSA-17-25387 RL

Smith, R.J. (Ed.) 1534
Civil Engineering Bibliography on the Design and Construction of Nuclear Facilities
(NP-11896 (1962) IV, 66 S.)

A total of 459 references to unclassified reports and published literature is presented on civil engineering and architectural aspects of the nuclear field. The period from 1945 to early 1959 is thoroughly covered; later information is represented by several selected citations to bibliographies and publications of wide scope. An author index is provided.

NP-11896
1
2
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(7) RL

Macfarlane, C.J., Beal, R.J. 1535
Special Equipment for Decontamination and Control of Radiation Hazards at Chalk River
(AECL-1465 (1962) 24 S., 8 Fig.)
(CRRIS-1071 (1962) 24 S., 8 Fig.)

This account describes some items of decontamination and monitoring equipment developed by the Radiation Hazards Control Branch at Chalk River, the reasons for their construction and the shape or form of the items. Operational performance is also discussed (Mobile Air Exhaust Units, Mobile Air Sampler, Mobile Change Room Trailer, Shielded Settling Box and Shielded High Efficiency Filter, the Steam-Detergent Decontamination Gun, Mobile, Remote-Controlled, Radiation Monitor, Inflatable Tent). (auth)

AECL-1465
CRRIS-1071
3
5
Fig.: 3
5

(7) NSA-16-24009 RL

Foster, M.S., Johnson, C.E., Crouthamel, C.E. 1536
Helium-Purification Unit for High-Purity Inert-Atmosphere Boxes
(ANL-6652 (1962) 17 S., 9 Fig.)

A device for purifying and recycling the helium atmosphere of two dryboxes having a combined volume of 60 ft^3 is described. Trace impurities are removed by passing the helium through a palladium-catalyst container and a molecular sieve bed, and then cooling to -195 °C before passing through an activated charcoal bed. Flow rates of 10 scfm and purity levels are estimated. Regeneration procedures are given.

ANL-6652
3
4

(7) NSA-17-10772 RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

The hot cell contains and shields the high activity level chemical process equipment. The space for active process equipment is 35 ft long, 11 1/2 ft wide, and about 14 ft high. The hot-cell equipment is mounted on eleven racks; two spare racks have been included to permit future modification and expansion of the process system. The decontamination cell is 12 1/2 ft long, about 14 ft wide, and slightly less than 17 ft high; it is equipped with wash-down facilities. The decontamination cell has one shielding window, one pair of heavy-duty manipulators,

TID-7650
(Book I)
2
3
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Fig.: 2
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(9) NSA-17-28461 2 Forts. RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540 1. Forts.
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

and special wall plugs duplicating the north-wall plug system in the hot cell. There are two doors in the decontamination cell; one to the decontamination area and one to the hot cell. The warm cell is equipped with glass shielding windows, a pair of manipulators for each of nine windows, and a single manipulator for the tenth window. The equipment also includes a General Mills No. 100 mechanical arm and a 3-ton hoist of the General Mills type, which are used primarily to assist in servicing the machines and transferring material. A plan of the ground floor of the

TID-7650
(Book I)
2
3
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Fig.: 2
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(9) NSA-17-28461 Forts. RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540 2. Forts
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

process building is shown. The plant is ventilated by three separate systems: one services the areas where hot phases of the process are carried out, one the potentially contaminated (warm) areas of the processing building, and the third the cold area or office wing.

TID-7650
(Book I)
2
3
4
Fig.: 2
4

(9) NSA-17-28461 RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

To accomplish the objectives, four operating cells and two service cells will be required. The first floor plan of the building is shown. The four operating cells are arranged in a line with one of the service cells, which is to be used for decontamination and as a radiation lock, teeing off from the line at the point where the two large central cells join. Another service cell, to be used for storage of contaminated equipment, is located at the basement level and joins the Decontamination Cell via a hatch in the Decontamination Cell floor.

TID-7650
(Book I)
2
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4
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Fig.: 2
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(8) NSA-17-28462 2. Forts. RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility 1. Forts.
Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel
Cycle Symposium, Gatlinburg, Tenn., December 5-7,
1962 (o.J.) S.333-350, 9 Fig.)

All operating cells will have a common roof line; TID-7650
however, the floor level will vary to provide dif- (Book I)
ferent inside cell heights. The lifeline of the cell 2
complex is the transportation system. This consists 3
of a pair of overhead bridge cranes which can travel 4
over essentially all the area in the Glove Maintenance 6
Room, Decontamination, Contaminated Fabrication, Fig.:
Mechanical Processing, and Chemical Cells. The 2
window will consist of two major assemblies: a seal 3
glass removable from inside the cell, and a shield- 4
ing window removable from the non-radioactive side.

(8) NSA-17-28462 Forts. RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility 2. Forts.
Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel
Cycle Symposium, Gatlinburg, Tenn., December 5-7,
1962 (o.J.) S.333-350, 9 Fig.)

The window will be a composite unit consisting of TID-7650
approximately 6 in. of glass and 60 in. of zinc (Book I)
bromide solution. The cost of this facility is 2
estimated to be $\$ 6 \times 10^{6}$ exclusive of process 3
equipment but inclusive of manipulators, remote 4
cranes, viewing windows, design, and inspection. 6

(8) NSA-17-28462 Fig.:
2
3
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Duthie, R.E.C., Sachs, F.L. (Ed.) 1547
Engineering Materials List. Cumulative Index
Through Supplement 12
(TID-4100 (1st Rev.) Index 2 (1962) 149 S.)

This cumulative index to the Engineering Materials TID-4100
List (EML) covers the CAPE-numbered packages (1st rev.)
of engineering materials that have been announced Index 2
in TID-4100 (1st Rev.) and Supplements 1 through 12.
It completely supersedes all indexes issued previously. 1
The Engineering Materials List is published by the 3
U.S. Atomic Energy Commission to announce en- 4
gineering materials which are available and were
developed in conjunction with nuclear science pro-
jects undertaken by the AEC.

(7) NSA-16-30515 RL

Koschany, G. 1553
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S.565-580, 71 Fig.,
16 Tab.)

Der vorliegende Beitrag befaßt sich primär mit den 2
speziellen Problemen beim Bau von Laboratorien und 3
Instituten, in denen mit Kernenergie gearbeitet wird 4
und erwähnt die sonstige technische Einrichtung nur, 5
soweit sie von grundsätzlicher Bedeutung und in diesem Fig.:
Zusammenhang interessant ist. Es sei hier auf die ent- 2
sprechende Standardliteratur hingewiesen. Die Raum- 3
gruppierung unter dem Aspekt der Radioaktivität er- 4
fordert zunächst deren Einordnung in ein System der 5
Strahlungsstärken, etwa mit folgenden Einheiten:

(6) Forts. RL

Koschany, G. 1553
Kerntechnik - Bautechnik. E. Isotopenlaboratorien Forts.
(Deutsche Bauzeitschrift, 8 (1960) S.565-580, 71 Fig.,
16 Tab.)

Bereich bis zu 10 μC, Bereich bis zu 100 mC, Bereich 2
mehr als 100 mC ("heiße Zonen"). Der inaktive Teil des 3
Labors sollte durch Schleusen und angegliederte Rei- 4
nigungs- und Umkleideräume von der aktiven Zone ge- 5
trennt sein. Über die Auswahl der Materialien für Fig.:
Fußböden, Wände, Decken sowie über Fenster, Türen, 2
Lüftung und Feuerlöschvorrichtungen wird berichtet. 3
4
(6) 5

RL

Stewart, D.C. 1554
A Large-Scale Facility for Chemical Research With
Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9: Analytical Chemistry,
3, P.7 (1962) S.238-65, 6 Fig., 4 Tab.)

The facility to be described in this chapter, the 2
Chemistry Division's new hot laboratory at Argonne 3
National Laboratory, is unique in several features. 4
The new hot laboratory is attached to the rear of the 6
Argonne Chemistry Building along an existing access Fig.:
driveway. A complicated ventilation system is proba- 2
bly the primary (and usually the most expensive) 4
engineering feature distinguishing radiochemical from 6
ordinary laboratory design. The main air supply is
brought in at the service floor level where it is pre-
filtered, tempered, and conditioned. This supply is
used for the offices, corridors, laboratories, shops,
and cave areas. The remaining regions of the building

(6) Forts. RL

Stewart, D.C. 1554
A Large-Scale Facility for Chemical Research With Forts.
Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9: Analytical Chemistry,
3, P.7 (1962) S.238-65, 6 Fig., 4 Tab.)

are ventilated separately. Essentially all of the glove 2
boxes and radiochemistry hoods as well as the associ- 3
ated duct-work are fabricated of glass-reinforced poly- 4
ester resin. Dimensions and details of the cave cells 6
are included. The three megacurie and the two large Fig.:
kilocurie cells are all similar in design. The primary 2
face of each has two working positions, with a third 4
window on the side wall away from the shielding door 6
and a fourth window in the back wall. All of the view-
ing windows are simple tanks cast directly in the wall.
These tanks are filled with concentrated zinc bromide
solution. Costs for the building, hoods, glove boxes and
shielding windows are shown.

(6) RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes
Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques,
1963, No.68, S.3-15, 23 Fig.)

Les caractéristiques essentielles de ce bâtiment sont 2
les suivantes: Il comporte 4 tranches à peu près sembla- 3
bles d'environ 40 m x 50 m (alors que le projet initial 4
en prévoyait 6), 2 tranches étant disposées côte à côte, 5
les 2 autres étant symétriques des précédentes par rap- 6
port au grand côté des halls. L'ensemble mesure ainsi Fig.:
80 m x 100 m. Dans chaque tranche, 4 laboratoires 2
parallèles (14 m x 7, 8 m) sont compris entre le couloir 4
"personnel" et le couloir "matériel", un couloir trans-
versal permet en plus une communication directe entre
ces deux couloirs sans obliger à traverser les labora-
toires. L'air arrive par un diffuseur au centre du pla- Forts.
fond et par des bouches au-dessus de la porte d'entrée.

(7) NSA-17-23390 RL

Trouvé, S. 1555 Forts.
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Chaque hall est divisé en 2 parties: l'une (7 m x 39 m) de hauteur voisine de celle des laboratoires (4 m); l'autre (11 m x 39 m) de grande hauteur (8,50 m) avec un pont roulant de 5 t. Le coût total de ce bâtiment, sans les aménagements intérieurs spécialisés se monte environ à 20 millions.

2, 3, 4, 5, 6; Fig.: 2, 4

(7) NSA-17-23390 RL

Artur, Y. 1556
"Armor"
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.17-21, 2 Fig.)

La chaîne Armor est une enceinte $\alpha\ \gamma$ construite dans la partie sud-est du hall 010. C'est une chaîne linéaire de huit boîtes à pinces dont la protection est assurée par un blindage de 10 cm de plomb, et l'étanchéité par des boîtes de matière plastique. L'étanchéité est assurée par des boîtes en lucoflex et plexiglas soudés qui se trouvent dans chacune des cellules. Chaque boîte possède à sa partie supérieure un filtre d'entrée et deux filtres de sortie (filtres papier rose). Le filtre de sortie est relié à une gaine de ventilation située sur le plafond de l'enceinte. Cette gaine est elle-même reliée au système général de ventilation des boîtes à gants.

3, 4; Fig.: 4

(4) NSA-17-23469 RL

Artur, Y. 1557
"Gascogne"
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.23-27, 2 Fig.)

L'ensemble gascogne est constitué par deux enceintes $\alpha\ \gamma$. La chaîne complète a les dimensions extérieures suivantes: - longueur, 17,810 m; - largeur, 1,470 m; - hauteur, 2,310 m. Le système de ventilation adopté permet l'appel d'air de la zone froide vers la zone tiède, puis de la zone tiède vers la zone chaude. L'air est ensuite aspiré à travers 2 filtres papier dans une gaine reliée à la ventilation générale.

3, 4; Fig.: 4

(4) NSA-17-23391 RL

Siewert, G. 1571
Laborbau und Laboreinrichtung - technischer Strahlenschutz in Arbeitsräumen
(Kernenergie, 6 (1963) S.428-436, 10 Fig.)

Es wird eine Übersicht über Entwicklung und Stand des Laborbaus in der DDR bei der Einrichtung von Laboratorien für Arbeiten mit radioaktiven Stoffen gegeben. Die abgebildeten Abzüge zeigen als Besonderheit - an den Ständen sichtbar - zusätzliche Lüftungsklappen, die sich in Abhängigkeit von der Stellung des Abzugsfensters mehr oder weniger öffnen oder schließen. Sie halten so die über die Entlüftung des Abzuges abgesaugte Luftmenge konstant, ohne die Strömungsgeschwindigkeit der Luft in den Arbeitsöffnungen unzulässig zu erhöhen. Der Innenraum der Abzüge, die Fensterrahmen und das Armaturenbrett sind aus feingeschliffenem, nichtrostendem Stahlblech in Schweißkonstruktion hergestellt. Forts.

2, 3, 4; Fig.: 2, 4

(5) NSA-17(1963)-39229 RL

Siewert, G. 1571 Forts.
Laborbau und Laboreinrichtung - technischer Strahlenschutz in Arbeitsräumen
(Kernenergie, 6 (1963) S.428-436, 10 Fig.)

Die Fenster wurden teils aus organischem Glas (Piacryl), teils aus Sicherheitsglas hergestellt. Bei heißen Zellen ist die Arbeitszone eine hermetische Kammer aus nichtrostendem Stahl. Auf der Cperatorseite trägt sie ein Fenster, dem in der Strahlenschutzwand ein Strahlenschutzfenster aus Bleiglas gegenübersteht. Eine Schleusenanlage für 7 männliche und 7 weibliche Beschäftigte wird beschrieben. Der Grundriß ist abgebildet.

2, 3, 4; Fig.: 2, 4

(5) NSA-17(1963)-39229 RL

Tomlinson, R.E. 1576
Safety Review of Manufacturing Facilities Chemical Processing Department
(HW-69586(Rev.)(1961) 17 S.)

The plant is contained in a three-story structural steel frame building with a partial basement. The structural steel frame has an outer sheathing of insulated aluminum panels. The floors are of concrete or steel. The roof is insulated metal decking covered with asphalt and gravel. The process area within the building is contained within a reinforced concrete shell. As an aid to contamination control, the building is divided into four zones. The working areas of the plant are well ventilated, with air pressures so regulated that the flow of air is toward the areas of increasing contamination.

HW-69586; 2, 3

(5) NSA-16(1962)-29025 Forts. RL

Tomlinson, R.E. 1576 Forts.
Safety Review of Manufacturing Facilities Chemical Processing Department
(HW-69586(Rev.)(1961) 17 S.)

The ventilation air is exhausted to the atmosphere through a 200-foot stack after being filtered through "AEC absolute" packaged filters composed of cellulose-asbestos or fiber-glass asbestos paper. The building and process areas are equipped with fire detectors and manually-operated fire fighting systems.

HW-69586; 2, 3

(5) NSA-16(1962)-29025 RL

Chrn, C.H. 1582
Radiation Shielding Window
(U.S.Pat.3,045,120 (1958/1962) 3 S., 5 Fig.)

What is claimed is: 1. A radiation shielding window comprising two spaced sheets of glass adapted to be substantially parallel with the walls in which the window is mounted, a copper liner having two side sections and a bottom section arranged in a U-shaped configuration, said copper liner confirming to at least part of the periphery of said spaced sheets and in sealing engagement therewith so as to form an enclosure, and a copper plate supported by said side sections of said U-shaped copper liner forming the top of said enclosure, said enclosure being at least partially filled with a radiation absorbing media.

U.S.Pat. 3,045,120; 3; Fig.: 3

(4) NSA-16(1962)-27182 RL

Euratom 1587
An Observation Port in a Wall Shielding Radio-Active Radiation
(Brit. Pat. 921, 884 (1961/1963) 3 S., 2 Fig.)
(Belg. Pat. 478107 (1961).)

In a wall for shielding radio-active radiation (e.g. the wall of a reaction chamber such as an experimental cell containing radio-active materials), an observation port comprising a casing resistant to penetration by such radiation and rotatable about an axis within the wall and substantially parallel to the plane of the wall, said casing having two diametrically opposed windows or window openings arranged for positioning by rotation of the casing, one at each side of the wall, an obstruction embodying material resistant to penetration by such radiation within the casing on the said axis and in the direct path between the two windows, said obstruction and

Brit. Pat. 921, 884
Belg. Pat. 478107
3
Fig.: 3

(5) NSA-17(1963)-20135 Forts. RL

Euratom 1587 Forts.
An Observation Port in a Wall Shielding Radio-Active Radiation
(Brit. Pat. 921, 884 (1961/1963) 3 S., 2 Fig.)
(Belg. Pat. 478107 (1961).)

the interior of said casing being spaced apart to provide at least one bent light path between the windows or openings, and mirrors on the obstruction and on the interior of the casing arranged for co-operation to transmit by successive reflections an image of objects as seen through a window or opening on one side of the wall, along the aforesaid bent light path and out through the window or opening on the other side of the wall.

Brit. Pat. 921, 884
Belg. Pat. 478107
3
Fig.: 3

(5) NSA-17(1963)-20135 RL

Clavé, S.R. 1591
Devices for Protection Against Ionizing Radiation and Contamination by Harmful Dusts, for Apparatus for Observing the Interior of Sealed Chambers
(U.S. Pat. 3, 052, 151 (1958/1962) 3 S., 10 Fig.)

Optical apparatus for observing the interior of sealed chambers containing radioactive material, comprising: means defining an opening in one wall of said chamber; a tube having its inner end portion slidably mounted within said opening and serving as a housing for a series of radiation screens having non-aligned openings; prism means mounted in optical alignment in said tube for diverting light rays from one end of said tube to the other through said last-mentioned openings;

U.S. Pat. 3, 052, 151
3
Fig.: 3

(4) NSA-16(1962)-30538 Forts. RL

Clavé, S.R. 1591 Forts.
Devices for Protection Against Ionizing Radiation and Contamination by Harmful Dusts, for Apparatus for Observing the Interior of Sealed Chambers
(U.S. Pat. 3, 052, 151 (1958/1962) 3 S., 10 Fig.)

bellows means having one end surrounding and sealed to the outer end portion of said tube and adapted to expand to progressively encompass the inner end portion of said tube as said remainder is withdrawn outwardly through said opening; and sealing means for closing the inner end of said inner end portion of said bellows after said tube is withdrawn into said bellows.

U.S. Pat. 3, 052, 151
3
Fig.: 3

(4) NSA-16(1962)-30538 RL

Clave, S., Clave, M. 1598
Improvements in Observation Ports for Enclosures
(Brit. Pat. 931, 474 (1961/1963) 4 S., 3 Fig.)
(Brevet fr. 851, 838 (1961/63).)

An improved observation port comprising in combination afocal optical field reducing and field enlarging means in optical alignment with each other, each afocal optical means comprising plano-concave and plano-convex members separated by a distance equal to the difference between their focal lengths, and transparent means made of a material affording protection against radiation from one side of the port to the other, said transparent means being positioned in the optical path between the plano-convex and plano-concave members of at least one of said field reducing and enlarging means.

Brit. Pat. 931, 474
Brevet fr. 851, 838
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Fig.: 3

(6) NSA-17(1963)-32235 RL

Jackson, D. 1602
Improvements in or Relating to Television Camera Arrangements
(Brit. Pat. 923, 815 (1958/63) 5 S., 4 Fig.)

The present invention relates to television cameras which are intended for use within an atomic reactor or other environment subject to atomic or nuclear radiation. According to the present invention, a television camera unit comprises an elongated tubular casing containing a television pick-up tube and its associated head amplifier and beam deflecting means, the pick-up tube being arranged with its target facing towards an opening or lens disposed at one end of the casing and the opposite end of the casing carrying one part of the multi-contact pin and socket connector of which the contacts are connected to the components in the cartridge and are arranged to make connection

Brit. Pat. 923, 815
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Fig.: 3

(4) NSA-17(1963)-20139 Forts. RL

Jackson, D. 1602 Forts.
Improvements in or Relating to Television Camera Arrangements
(Brit. Pat. 923, 815 (1958/63) 5 S., 4 Fig.)

with the contacts of a complementary part of the pin and socket connector located in a tubular holder when the camera unit is inserted therein by sliding movement in a direction parallel to its axis.

Brit. Pat. 923, 815
3
Fig.: 3

(4) NSA-17(1963)-20139 RL

Graf, P., Metzger, K., Stöhr, R. 1603
Der Bau des Hot- und Isotopenlaboratoriums
(Neue Technik, 5, No. 9 (1963) S. 490-497, 6 Fig.)

Der Gebäudekomplex des Hot- und Isotopenlaboratoriums (Erdgeschoßfläche 2120 m^2, umbauter Raum 22170 m^3) wurde entsprechend den in den verschiedenen Räumen gehandhabten Aktivitäten und den daraus zu folgernden Gefahrenmomenten in verschiedene Zonen unterteilt (Inaktiver Gebäudetrakt, Radiochemietrakt, Heizzellentrakt). Die Anlage und Installationen der in sich geschlossenen Gebäudetrakte werden beschrieben.

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Fig.: 2
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(7) NSA-17(1963)-5448 RL

Corning Glass Works, Corning, N.Y. 1611
Double Glazed Prismatic Window
(Brit. Pat. 899, 516 (1959/62) 2 S., 4 Fig.)
(U.S. Pat. 797 223 (1959).)

The present invention relates to double glazed windows and is particularly concerned with the provision of a window of a form especially useful in viewing the interior of a radioactive radiation chamber through its radiation shield window, although not being necessarily limited to such use.

Brit. Pat. 899, 516
U.S. Pat. 797 223
3
Fig.: 3

(5) NSA-16(1962)-27171 RL

Commissariat à l'Energie Atomique, Paris 1612
Improvements in or Relating to High-Activity Cells
(Brit. Pat. 901, 137 (1959/62) 4 S., 7 Fig.)
(Br. fr. 804, 243 (1959))

The invention relates to a process for limiting opacification of a glass slab subject to radiation, and to a window assembly for a high activity cell.

Brit. Pat. 901, 137
Br. fr. 804, 243
3
Fig.: 3

(5) NSA-16(1962)-27176 RL

Corning Glass Works, Corning, N.Y. 1618
High Density, Soft Phosphate Glass and Method of Making it
(Brit. Pat. 903, 450 (1959/62) 6 S., 1 Fig., 2 Tab.)
(U.S. Pat. 849, 055 (1959).)

The principal object of this invention is to provide a transparent glass which will not darken upon exposure to high-levels of shortwave radiation. Another object of this invention is to provide a glass with a density of at least 2.5 and a viscosity at room temperature (25 °C) of at least 10^4 poise. A still further object of this invention is to provide a glass which will not accumulate an electrical charge thereon when subjected to high levels of irradiation.

Brit. Pat. 903, 450
U.S. Pat. 849.055
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Fig.: 3

(5) NSA-16(1962)-27618 RL

Commissariat à l'Energie Atomique, Paris 1619
Improvements in or Relating to Endoscopic Telescopes
(Brit. Pat. 926, 779 (1960/63) 3 S., 1 Fig.)
(Br. fr. 823, 147 (1960))

The present invention relates to endoscopic telescopes and has for an object an endoscopic telescope for observing the inside of an enclosure through a wall of considerable thickness. The telescope may be used for the examination of "hot" enclosures, i.e. those containing radioactive products or installations. These enclosures comprise a wall of lead of a thickness in the neighbourhood of 15 centimetres or a wall of concrete of a greater thickness, in the neighbourhood of 1 metre, for example.

Brit. Pat. 926, 779
Br. fr. 823, 147
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Fig.: 3

(5) NSA-17(1963)-29058 Forts. RL

Commissariat à l'Energie Atomique, Paris 1619 Forts.
Improvements in or Relating to Endoscopic Telescopes
(Brit. Pat. 926, 779 (1960/63) 3 S., 1 Fig.)
(Br. fr. 823, 147 (1960))

In the examination of "hot" enclosures, these telescopes are introduced into openings located in the enclosure walls as required in order to observe everything which cannot be seen through the normal lead glass portholes fitted into the walls.

Brit. Pat. 926, 779
Br. fr. 823, 147
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Fig.: 3

(5) NSA-17(1963)-29058 RL

Brown, J.E. 1624
Preliminary Report of Advanced Viewing Studies for Remote Handling Operations
(DC-60-8-32 (1960) 15 S., 6 Fig.)

This report discusses the problems of proper viewing of remote handling operations and surveys presently known methods of remote viewing. It is concluded that only small improvements in methods presently employed in the Hot Shop are possible. Television should be used for remote handling operations only where direct, mirrored, or optical systems cannot be used or in conjunction with these superior viewing methods. The higher resolution 900 - 1000 line television systems should be applied if other than general surveillance viewing is required. The design of a flexible, mobile periscope for application to remote handling viewing is possible.

DC-60-8-32
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Fig.: 3

(4) NSA-16(1962)-20562 RL

Smith, S.E., Hall, F.J., Holmes, W.E. 1626
Safety Aspects of the Design of Filtered Ventilation Systems
(TID-7677: 8th AEC Air Cleaning Conference, Oak Ridge, Tenn., Oct. 22-25, 1963 (1963) S. 56-72, 6 Fig.)

A number of safety aspects of the design of filtered ventilation systems for radioactive and toxic buildings have been considered. These include theoretical and experimental assessments of the heat release from fires of various kinds in workrooms, fume cupboards, glove boxes, and extract systems, the use of spark and flame arrestors, the ignitability of dust deposits in extract systems and filters, the cooling of hot gases in exhaust ducts. As a result of this work, it is possible to formulate principles which should be followed in the layout and design of such systems, in the future; existing systems have been found not to require any serious modification apart from installation of glass paper filters.

TID-7677
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Fig.: 2 3 4

(7) RL

Fuller, A.B. 1627
Design Considerations for Exhaust Systems Involving Radioactive Particulates
(TID-7677: 8th AEC Air Cleaning Conference, Oak Ridge, Tenn., Oct. 22-25, 1963 (1963) S. 73-85)

The dependability required of exhaust ventilation systems handling radioactive particulates makes it essential that: (1) thorough investigations concerning needs be made, and (2) good engineering practices be applied. Many features peculiar to such systems are not clearly understood by inexperienced designers. A number of these "designer shortcomings" are discussed, with references listed, to enable designers to brief themselves prior to planning, reviewing, and designing such exhaust systems. (auth)

TID-7677
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(4) (RL)

Bottenfield, B.F., Burch, W.D., Nichols, J.P., Yarbro, C.C., Unger, W.E. 1628
Containment and Ventilation Systems in the Transuranium Processing Plant
(TID-7677: 8th AEC Air Cleaning Conference, Oak Ridge, Tenn., Oct. 22-25, 1963 (1963) S.86-101, 5 Fig., 2 Tab.)

The unique features of the ventilation and containment systems incorporated into the Transuranium Processing Plant, which is under construction at the Oak Ridge National Laboratory, are described. The building is a two-story structure, approximately 120 feet square roughly divided into two equal parts, the first containing the cell bank, limited access area and cell operating areas, and the other containing eight laboratories, building service and office areas.

TID-7677
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Fig.: 2 3

(8) Forts. RL

Spencer, N.C., Parsons, T.C., Howe, P.W. 1639
Close-Capture Adsorption System for Remote Radioisotope Chemistry
(UCRL-9659 (1961) III, 27 S., 10 Fig.)

Molecular sieves are used as the basic adsorber in a close-capture air recirculation system designed primarily for remote operation with master-slave equipment. Moisture and acid vapors from the chemical operations are pumped from the main box and adsorbed on the molecular sieves in a separate enclosure. The dry air is then returned to the main box.

UCRL-9659
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(7) RL

Bottenfield, B.F., Burch, W.D., Nichols, J.P., Yarbro, C.C., Unger, W.E. 1628 Forts.
Containment and Ventilation Systems in the Transuranium Processing Plant
(TID-7677: 8th AEC Air Cleaning Conference, Oak Ridge, Tenn., Oct.22-25, 1963 (1963) S.86-101, 5 Fig., 2 Tab.)

The cell bank contains nine cells, seven for process use and two for analytical purposes. Four primary zones of containment, defined by the degree of activity contained, are included in the cell bank ventilation system. Flows from 300-1000 CFM are maintained through each cell, depending on heat removal requirements, which are in turn governed chiefly by the number and size of evaporator vessels within the cell.

TID-7677
3
Fig.: 2 3

(8) RL

Climent, V.H. 1642
Specifications for a Hot Cave Radiochemistry Laboratory Project
(TID-17903-and Add. 1 (1963) 23, 12 S., 4 Fig.)

A new radiochemistry laboratory, provided with a hot cave, is planned. The hot cave will be a modification of the Argonne National Laboratory "Junior" type. The new laboratory will contain the following existing equipment: two sinks, two working benches and wall cabinets, two hoods, and the related service utilities. The cave is designed to handle gram quantities of alpha emitters together with activities up to 10 curies of one-Mev gamma. It can be assembled from prefabricated sections, and disassembled, moved and re-assembled. The window of the cave, located in the front wall, will have a viewing area of at least 41" wide x 32" high x 18" thick. The ventilating system is capable of ventilating simultaneously the two existing hoods and the entire laboratory area. (5) NSA-17(1963)-12184 RL

TID-17903-and Add. 1
3
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Fig.: 4

Lane, W.B., Nuckolls, M.J. 1630
An Improved Zinc Bromide Shielding Window
(USNRDL-TR-594 = AD-291585 (1962) II, 11 S., 1 Fig., 1 Tab.)

An improved zinc bromide-filled shielding window for hot cell use was designed, constructed and performance-tested. Bare steel surface under an argon atmosphere satisfactorily contained zinc bromide solution. No corrosion or deterioration of optical properties appear in a window which was installed in May 1961. This system is an improvement over the previously used painted surfaces in an air atmosphere.

USNRDL-TR-594
AD-291585
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Fig.: 3
Tab.: 3

(6) NSA-17(1963)-7498 RL

Berry, G.B., Bottenfield, B.F., Breeding, E.J, Hannon, F.L., Morgan, W.L. 1648
Design of the TRU Process Plant
(ORNL-3408: Ferguson, D.E. (Comp.): Transuranium Quarterly Progress Report for Period Ending Nov. 30, 1962 (1962) S.81-86, 1 Fig., 2 Tab.)

All drawings and specifications were received from the architect-engineer for initial ORNL Title II review, and about 95 % were reviewed and returned. ORNL will also obtain the detailed design and fabrication of the ten cell-viewing windows (lead-glass and oil), complete with the alpha-seal feature and equipment for replacement of the bulk shielding windows and the alpha-seal components from the cell wall.

ORNL-3408
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(9) NSA-1963-25058 RL

Kane, J.F. 1634
Nuclear Plant Electrical Maintenance Problems, Chemical Processing Department
(HW-SA-3030 (1963) 7 S.)

Some maintenance problems encountered by the chemical processing of radioactive materials are described. The problems deal primarily with cranes and electrical motors. Closed circuit television has proved itself useful in certain aspects of the maintenance of equipment and facilities when high radiation levels prohibit access by men.

HW-SA-3030
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(5) NSA-17(1963)-21928 RL

Graf, P., Griner, W., Meier, F., Schärer, Studer, H. 1649
Die Ventilationsanlagen des Hot- und Isotopenlaboratoriums
(Neue Technik, 5, No.9 (1963) S.509-20, 9 Fig., 2 Tab.)

Der Lüftungsanlage kommen im Hot- und Isotopenlaboratorium die folgenden Aufgaben zu: - Aufrechterhaltung eines Unterdruckes (10-30 mm WS) in den Versuchszellen (Glove-Boxen, Bleiabschirmgehäuse, Heiße Zellen) gegenüber den Arbeitsräumen. - Erwirken einer genügenden Luftströmung (30-50 cm/sec) in den Experimentierkapellen und geöffneten Hotzellen. - Gewährleistung eines Unterdruckes im ganzen Gebäude gegenüber der Außenatmosphäre. - Vermeidung gefährlicher Konzentrationen radioaktiver Aerosole in den Arbeitsräumen durch genügende Frischluftzufuhr (10- bis 15stundliche Luftwechsel). Forts.

3
Fig.: 3
Tab.: 3

(7) NSA-18(1964)-5450 RL

Graf, P., Griner, W., Meier, F., Schärer, Studer, H. 1649 Forts.
Die Ventilationsanlagen des Hot- und Isotopenlaboratoriums
(Neue Technik, 5, No. 9 (1963) S. 509-20, 9 Fig., 2 Tab.)

Das Raumabluftsystem erfaßt die gesamte Abluft, soweit diese nicht durch Kapellen oder Versuchszellen abgesogen wird, und führt direkt zu einer gemeinsamen Filtergruppe von großflächigen, hitzebeständigen Feinstfilterzellen aus unbrennbarem, enggefälteltem Glasfaserpapier mit Kunstharzvergußmasse (Araldit). Der Abscheidungsgrad der Filter beträgt 99,98 % für 0,4-μ-Partikel. Der größte Teil der Luft aus den Radiochemie- und Isotopenlabors wurd durch die Kapellen abgesogen. Die Kapellenrückwände sind zu diesem Zwecke als Saugwand ausgeführt, versehen mit Glaswollevorfiltermatten (50 mm dick) in Polyesterrahmen.
3 Fig.: 3 Tab.: 3
(7) NSA-18(1964)-5450 RL

Lane, W.B., Nuckolls, M.J. 1656
Argon Improves $ZnBr_2$ Shielding Windows
(Nucleonics, 22, No. 2 (1964) S. 88-89, 1 Fig.)

A window was constructed as shown in the figure from materials described in the table. All welded parts were stress-relieved after welding. Welds were ground smooth and free of pits, flux and cracks. The thicknesses of both spacers were determined by the contractor to allow sufficient gasket squeeze to withstand a hydrostatic test of 5 psi. This was accomplished by allowing 0.040 in. for gasket compression. The cost of the completed window, exclusive of zinc bromide, was under $1,000. No difficulties were reported during construction and delivery was made in less than 30 days.
3 6 Tab.: 3
(5) NSA-18(1964)-11363 RL

Meyer, F. 1658
Lüftungsanlage und Raumheizung im Hot- und Isotopenlaboratorium des Eidgenossischen Institutes für Reaktorforschung in Würenlingen
(Technische Rundschau Sulzer, 46, No. 2 (1964) S. 57-65, 13 Fig.)

Im Gegensatz zu Laboratorien konventioneller Bauart, in denen die Experimente offen durchgeführt werden, vollziehen sich in einem Heißen Laboratorium alle Arbeiten mit radioaktiven Stoffen in geschlossenen Unterdruckgehausen mit der erforderlichen Strahlabschirmung unter Verwendung von Fernbetatigungseinrichtungen. Besonders hohe Anforderungen stellen solche Forschungsstatten namentlich an die Lüftungsanlagen. Wie Gebruder Sulzer im einzelnen die zahlreichen mit der Belüftung wie auch mit der Heizung des Hot- und Isotopenlaboratoriums Wurenlingen zusammenhangenden Probleme gelost haben, beschreibt unser Beitrag. (4)
2 3 Fig.: 2 3 4 5
RL

New Dounreay Laboratories Exemplify Current British Practice 1660
(Nuclear Power, 2 (1957) S. 317, 2 Fig.)

Most buildings in the Chemical Group at Dounreay are divided into working and plant areas. Filtered and warmed fresh air enters the working areas through ceiling grilles and is then extracted from the plant areas to the main extract duct. All duct work is in the ceiling void. This arrangement ensures that personnel are always working in a fresh air atmosphere, and should a leak develop on the plant side, the direction of flow would ensure that any contamination would be carried away in the extract system.
3 Fig.: 3
(3) RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L. 1662
Transuranium Processing Facility Design
(Nuclear Science and Engineering, 17 (1963) S. 479-85, 6 Fig.)

The facility will consist of nine heavily shielded process cells and eight laboratories. The toxicity of the heavier transuranium elements justifies a refined building containment and ventilation system. The building is scheduled for full-scale operation by December, 1965, at an estimated cost of $8.7 million. The nine shielded process cells are arranged in line. Removable top plugs provide access to the cells. The entire building will operate at a normal pressure of 0.3 in. water gauge below atmospheric pressure at all times to ensure against escape of any airborne contaminants. Normally occupied personnel areas are supplied with a once-through air flow system. A preliminary cost estimate of the TRU Facility, including process equipment, is given.
2 3 4 6 Fig.: 2 4
(8) RL

Hesson, J.C., Feldman, M.J., Burris, L. 1666
Description and Proposed Operation of the Fuel Cycle Facility for the Second Experimental Breeder Reactor (EBR-II)
(ANL-6605 (1963) 193 S., 54 Fig., 17 Tab.)

The Fuel Cycle Facility consists primarily of an argon-atmosphere cell where fuel processing is done, an adjacent air-atmosphere cell where reactor subassemblies are assembled and disassembled, and an operating area (for personnel) which surrounds the two cells. Because of the high levels of activity excepted, the fuel-handling-and-processing equipment is designed for remote operation. Remote processing is accomplished with the aid of bridge cranes, electromagnetic bridge manipulators, and master-slave manipulators.
ANL-6605 2 3 4 Fig.: 2 3 4
(8) Forts. RL

Hesson, J.C., Feldman, M.J., Burris, L. 1666 Forts.
Description and Proposed Operation of the Fuel Cycle Facility for the Second Experimental Breeder Reactor (EBR-II)
(ANL-6605 (1963) 193 S., 54 Fig., 17 Tab.)

Transfer ports and air locks are used in the transfer of materials and equipment into the air-atmosphere cell and between the two cells. The walls between the argon-atmosphere and air-atmosphere cells and the operating area are heavily shielded, and viewing is done through thick shielding windows.
ANL-6605 2 3 4 Fig.: 2 3 4
(8) RL

Sease, J.D., Lotts, A.L., Davis, F.C. 1674
Thorium-Uranium-233 Oxide (Kilorod) Facility - Rod Fabrication Process and Equipment
(ORNL-3539 (1964) iv, 99 S., zahlr. Fig.)

The facility consists of a number of permanent alpha-tight cubicles which are shielded with 4 1/4-in. steel. The fabrication process is carried out remotely in these cubicles with the exception of several gloved-hand operations which occur where the dexterity required for manipulation exceeds that of the remote castle-type tongs. The facility ventilation system was designed so that the operating cubicles will be maintained at a pressure below atmospheric through the use of existing ventilation systems in the vicinity of the cell. A special multipurpose port is employed in the facility that may be fitted either a glove or a castle-type manipulator, and these units may be interchanged while maintaining an alpha-tight seal. (8) NSA-18(1964)-16455
ORNL-3539 2 3 4 Fig.: 2 3 4
RL

Cheever, C.L. 1677
New Air Cleaning Activities at Argonne National Laboratory
(TID-7677: Eighth AEC Air Cleaning Conference held at Oak Ridge National Laboratory, Oct. 22-25, 1963 (1963) S. 222-34, 7 Fig.)

The emergency exhaust filter system for ANL's new zero power reactor cells and uranine efficiency tests on this system are described. The system has been designed to handle high temperature and high pressure discharge from the cells. Exhaust air cleaning changes being made in the Chemical Engineering Division's principal cave facility are also discussed. These changes will improve removal of radioiodine from the cave exhaust. (auth)

TID-7677
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Fig.:
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(4) NSA-18(1964)-14122 RL

Parrish, E.C., Schneider, R.W. 1678
In-Place Testing of High-Efficiency Filters at ORNL
(TID-7677: Eighth AEC Air Cleaning Conference held at Oak Ridge National Laboratory, Oct. 22-25, 1963 (1963) S. 484-93, 5 Fig., 1 Tab.)

In most exhaust systems the high-efficiency filter is the primary means of minimizing atmospheric contamination during normal operation or during the accidental release of radioactive particulate material. Any effective contamination-control program must include a routine test for measuring the filtration efficiency of each system with its operational filters in place. The program of testing filter systems in situ at this Laboratory has clearly demonstrated the importance of this contamination-control technique. (auth)

TID-7677
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Fig.:
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(5) NSA-18(1964)-14002 RL

Olsen, A.R., Nichols, J.P., Peterson, S. 1679
Safety Analysis of the Operation of the High-Radiation-Level Examination Laboratory
(ORNL-3479 (1963) III, 87 S., zahlr. Fig. u. Tab.)

The High-Radiation-Level Examination Laboratory is basically a two-story brick building with a partial basement for housing some of the essential ventilation equipment. The structure provides a gross floor area of approximately 26,500 ft^2, exclusive of the floor area occupied by the shielded cell complex, which has a working area of 950 ft^2 shielded for high-level gamma activity. The operating and service areas occupy approximately 223,000 ft^3. The shielded cell complex, which is the very heart of the facility, is centrally located and occupies the full building height. The shielding windows are the oil-filled, lead-glass variety and of proper thickness and density to match the 3 ft of high-density concrete shielding provided by the cell walls. (8) NSA-18(1964)-4025 RL

ORNL-3479
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Fig.:
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Forts.

Olsen, A.R., Nichols, J.P., Peterson, S. 1679 Forts.
Safety Analysis of the Operation of the High-Radiation-Level Examination Laboratory
(ORNL-3479 (1963) III, 87 S., zahlr. Fig. u. Tab.)
The inside surfaces of the cell banks are lined with stainless steel sheet to provide containment of particulate matter. Within each cell bank, heavy objects are moved by the General Mills Model 303 electromechanical manipulation and a companion 3-ton bridge crane. The cell banks are ventilated by a system of individual recirculation units and a single exhaust system, as described.

ORNL-3479
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Fig.:
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(8) NSA-18(1964)-4025 RL

Hot Laboratory and Special Handling Equipment 1684
(Atomics, 17 (1964) No. 3, S. 19-30, 21 Fig.)

The design of one of the most modern hot laboratories to be placed in service - that of the new hot laboratory for the Chemistry Division at Argonne National Laboratory - following which some special features of other installations will be reviewed. The bulk of the laboratories are located to the east (right hand) end of the main floor, while the shielded cave complex occupies both floors at the west end of the building. The cave complex or shielded cell facility consists of two floors of shielded cells with exhaust fans and filters, and a contaminated storage area on the roof. All walls on the lower floor are four feet thick and the ceiling 40 inches thick.

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Fig.:
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(5) NSA-18(1964)-25641 Forts. RL

Hot Laboratory and Special Handling Equipment 1684 Forts.
(Atomics, 17 (1964) No. 3, S. 19-30, 21 Fig.)
The window openings at the cell interior range in general from 3 ft wide by 2.5 ft high to 5 ft wide by 3 ft high, and they range up to 7 ft in thickness. The thick windows are actually tanks consisting of an inner and outer glass plate with the space between filled with a zinc bromide solution or in some cases with oil.

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Fig.:
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(5) NSA-18(1964)-25641 RL

Niezborala, F. 1685
Les cellules actives
(Bulletin d'informations scientifiques et techniques, 1963, No. 68, S. 53-64, 8 Fig.)

Dans cet article, on se propose de décrire, d'une part, les éléments de structure des cellules actives de l'Atelier-Pilote comportant l'ossature métallique, la protection γ, les moyens de vision et la ventilation, d'autre part, le matériel de chimie industrielle proprement dit, les matériaux utilisés, l'installation intérieure, l'alimentation des cellules, les organes de transfert et les possibilités de décontamination. En plus, sera donné un aperçu des moyens de contrôle utilisés et des prises d'échantillons.

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Fig.:
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(4) RL

Vié, R. 1687
Le contrôle analytique
(Bulletin d'informations scientifiques et techniques 1963, No. 68, S. 75-78, 3 Fig.)

Le laboratoire α - γ est une salle de 30 m de long, 8,50 m de large et 4,80 m de hauteur qui communique avec le hall par l'intermédiaire de deux sas. La ventilation est celle des laboratoires chauds: gaines soufflantes au plafond et gaines d'extraction au sol; elle est réglée pour assurer une dépression de 15 mm d'eau par rapport à l'extérieur. Un pont roulant de force 5 tonnes assure la manutention des blocs de protection et des cellules étanches. Les laboratoires α couvrent une superficie d'environ 150 m^2. Ils sont équipés de boîtes à gants ventilées en lucoflex déjà éprouvées pour les manipulations chimiques des produits présentant une radioactivité α.

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4
Fig.:
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(4) Forts. RL

Vié, R. 1687
Le contrôle analytique Forts.
(Bulletin d' informations scientifiques et techniques 1963, No. 68, S. 75-78, 3 Fig.)

La vision est assurée par des hublots mixtes de verre de densités 6,2 et 3,3 à raison d'un par cellule d'analyse et de deux pour la cellule sas qui est plus grande. Les manipulateurs sont des M 7 Hobson à débattement vertical de 86 cm, aucune pince à rotule n'est prévue. La ventilation normale des cellules et du tunnel du convoyeur assure une dépression contrôlée de 15 mm d'eau par rapport au laboratoire.

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Fig.:
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(4) RL

Fuel Cycle Facility 1689
(ANL-6635: Reactor Development Program Progress Report, Oct. 1962 (1962) S. 18-20)

To aid in the examination of cell equipment, monocular viewers are being provided for viewing through the shielding windows of the Air and Argon Cells. Monocular viewers of two focusing ranges are being made available. With achievement of design flow rates and correct flow distribution, the testing and balancing of the ventilating system was completed. A minor leak in one of the shielding window tank units, discovered some time ago, was located and repaired. The installation of master-slave manipulators in the air cell of the Fuel Cycle Facility has been completed. Two sealed master-slave manipulators have been received for argon cell installation, and consideration is being given to providing honed sleeves to allow later installation of additional manipulators of this type.

ANL-6635
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(5) RL

Viswanathan Pillai, T.N., Kamath, P.R., Somasundaram, S. 1690
Handling Hazards of Natural Thorium
(A.E.E.T./HP/SM-5 (1959) 27 S., 2 Fig., 6 Tab.)

The factory should have a built in ventilation system to keep the air activity (particulate as well as thoron) inside the buildings far below the recommended maximum permissible levels. Suitable filters should be incorporated in the ventilation system to prevent the escape of excessive amounts of activity to neighbouring populated areas. All workers should be supplied with protective clothing consisting of coveralls, overshoes and linen caps to prevent the contamination of the body as well as of personal clothing. These should be washed from time to time in an 'active laundry'. In testing and control laboratories, all processes should be carried out in fumehoods fitted with exit filters.

AEET/HP/SM-5
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5

(7) RL

Boehme, G., Gottlob, P. 1692
Design and Equipment of the Alpha-Gamma Hot-Cell Facility at the Karlsruhe Nuclear Research Center
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 9-13, 4 Fig.)

Five gastight hot cells are provided for examination of reactor experiments and irradiated fuel elements. The cells are equipped for handling alpha-gamma active material. This equipment has been designed to permit remote insertion and removal as well as maintenance, disassembly, repair, and reassembly by remote control. The manipulators are of a novel design offering some advantages over conventional models. Remote viewing equipment consists of dry, high-density lead glass windows and special periscopes.

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4
6
Fig.:
2
4

(6) Forts. RL

Boehme, G., Gottlob, P. 1692
Design and Equipment of the Alpha-Gamma Hot-Cell Facility at the Karlsruhe Nuclear Research Center Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 9-13, 4 Fig.)

The cells may be operated for some years under gastight conditions without any personnel entering them. The over-all cost of the five hot cells with a total of eleven working stations, including equipment, amounts to some $1.5 million.

3
4
6
Fig.:
2
4

(6) RL

Lefort, G., Paquis, R. 1693
A New Type of Chemistry Cell for High Specific Activity at Fontenay-aux-Roses
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 15-24, 8 Fig.)

An alpha, beta, gamma cell is described which was recently built at Fontenay-aux-Roses. It will serve for the recovery of highly active irradiated fuel elements. The gamma shielding is 10-inches thick. The alpha cell is subdivided into three sections; (two working cells measuring 165-inches by 50-inches by 45-inches and one interconnecting central cell measuring 78-inches by 39-inches by 41-inches).

3
4
6
Fig.:
4

(6) Forts. RL

Lefort, G., Paquis, R. 1693
A New Type of Chemistry Cell for High Specific Activity at Fontenay-aux-Roses Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 15-24, 8 Fig.)

Altogether there are seven working places. The most important details of the cell construction and the auxiliary equipment are described. Although the main building is properly ventilated, absolute filters are also provided at the intake and exhaust of the cell. The costs of the installation are $700,000.

3
4
6
Fig.:
4

(6) RL

Jefferson, R.M. 1694
50-Kilocurie Gamma Irradiation Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 25-29, 2 Fig.)

The facility consists essentially of two hot cells above a pool. Through the use of self-contained handling equipment, sources may be readily introduced and removed from these cells. Provisions are included for visual, physical, and electrical access as well as control to provide the necessary safety. Several problems encountered in the operation of this facility are also discussed. Overall cost of the building, excluding land and site improvements but including utilities, was $431,420. The cell ventilation system is described.

2
3
4
6
Fig.:
2

(6) RL

Barthelemy, P., Bonnet, G., Junger, J.M., Cauwe, J., Klersy, R. 1695
Concrete Hot Cells for Dismantling and Machining at the Ispra Research Center
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 31-38, 4 Fig.)

Discussed in this paper are only the three cells devoted to dismantling and machining, namely two gamma cells, one of which is associated with Ispral Reactor and the other with the Orgel Critical Experiment Reactor, and one alpha-gamma cell which is located at the base of a U-line of cells in the hot metallurgical laboratory. A special ventilator is provided for the ventilation of the whole group of cells and is able to give a depression of 25 mm of water column for 40 air changes maximum.
(8) RL

3 / 4 Fig.: 4

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 45-53, 5 Fig.)

The five in-line hot cells are equipped for metallographic preparation and examination, physical and mechanical testing, and machine-shop operations. The supporting areas include a radiochemistry laboratory, facilities for decontamination, isotope storage, liquid radioactive waste disposal, and miscellaneous supporting laboratories and shops. The special features of the laboratory include transfer ports, electrical patch panels, access openings, intercell transfer gates, isolation cubicles, a decontamination room, and an isotope storage area.
(7) Forts. RL

2 3 / 4 5 Fig.: 2 4

Watson, H.E., Steele, L.E. 1696 Forts.
The U.S. Naval Research Laboratory High Level Radiation Laboratory
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 45-53, 5 Fig.)

The ventilation system of the entire laboratory is equipped to provide fresh air continuously without recirculation of the air inside the building. Gamma-detection area monitors are strategically positioned throughout the laboratory. In addition, gamma-detection alarms are situated at critical points on the second floor, above and beside the hot cells. A fire detection, alarm, and extinguishing system is being planned for the hot cells.
(7) RL

2 3 / 4 5 Fig.: 2 4

Dascenzo, R.W., Hammill, K.H., Merker, L.G. 1697
The Fuels Recycle Pilot Plant
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 55-64, 3 Fig., 3 Tab.)

The building is divided into four primary functional areas: (1) radiochemical engineering cells, (2) shielded metallurgical cells, (3) low level canyon, and (4) cold canyon. The basic requirement of the ventilation system is to maintain an established negative pressure in the cells and building structure. This is accomplished by pulling air through the building by the exhaust fans. The cost of constructing the FRPP is $5, 560, 000.
(8) RL

2 3 / 4 6 Fig.: 2 Tab.: 2 4

Heremans, R., Schmets, J., Broothaerts, J., Haegeman, M., de Beukelaer, R., Buyle, A., Leponge, H. 1701
Pilot Scale Alpha-Gamma Facility for Reprocessing of Spent Reactor Ceramic Fuels by Volatilization of Fluorides
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 137-48, 4 Fig.)

For various reasons the process apparatus are located in two different α boxes. The α_1 box is constructed of painted 10 mm thick mild steel. All remote operations inside the α_1 box may be done by two different manipulation systems. Tongs mounted on ball manipulators, a "General Mills" model 150 manipulator and a 250 kg movable crane, complete the remote manipulation systems.
(10) Forts. RL

3 / 4 Fig.: 2 4

Heremans, R., Schmets, J., Broothaerts, J., Haegeman, M., de Beukelaer, R., Buyle, A., Leponge, H. 1701 Forts.
Pilot Scale Alpha-Gamma Facility for Reprocessing of Spent Reactor Ceramic Fuels by Volatilization of Fluorides
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 137-48, 4 Fig.)

Conveniently situated vision globes protected by lead glass and a movable T.V. camera inside the α_1 box allow the operator to follow the different operations visually. The ventilation system of the α_1 and α_2 boxes is described.
(10) RL

3 / 4 Fig.: 2 4

Mas, R., Tarbé de Saint-Hardouin, A., Leccuvreur, P. 1702
ADAC-Design of Alpha-Beta-Gamma Cells with Alpha Back Cells and Transfer Facilities
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 149-57, 8 Fig.)

The hot cells of the Shop for Cutting Fuel Assemblies are designed as a sealed unit with the shielded cells in front and adjacent to the back cells in which a man wearing a frogman suit can work. Following a description of the layout of the cells and back cells, the remote handling equipment and the sealed lead out connections will be described. Television cameras are provided in both the cells, back cells and underground floors to monitor the position of the active components and operational equipment from the operating area.
(7) RL

2 3 / 4 Fig.: 2 4

Goertz, R.C., Ferguson, K.R., Lindberg, J.F., Mingesz, D.P., Blesch, R.A., Potts, C.W., Grimson, J.H., Forster, G.A., Brown, F.L., Armstrong, J.L. 1710
The ANL Alpha-Gamma Metallurgy Hot Cell - its Design Philosophy and Components
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964, (1964) S. 285-306, 13 Fig., 1 Tab.)

The hot cell complex has a main working area (11 x 32 ft.) capable of containing a high-purity nitrogen atmosphere, and several integral, shielded service areas (with only an air atmosphere) to provide for storage of contaminated equipment, remote repair, glove repair, transfers, and so forth. The facility is designed so that when fully equipped, it can be operated for extended periods of time without personnel entry into the area which become contaminated (14) Forts. RL

2 3 / 4 Fig.: 2 3 4

Goertz, R.C., Ferguson K.R., Lindberg, J.F., Mingesz, D.P., Blesch, R.A., Potts, C.W., Grimson, J.H., Forster, G.A., Brown, F.L., Armstrong, J.L. 1710 Forts.

The ANL Alpha-Gamma Metallurgy Hot Cell - its Design Philosophy and Components

(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S.285-306, 13 Fig., 1 Tab.)

under normal operation. However, to achieve the intended degree of remote operation, the unilateral electric manipulators now installed must be replaced with electric master-slave manipulators mounted on vehicles and overhead support systems. The air ventilation system has been designed according to the generally accepted practice of providing flow from areas of least contamination risk to areas of greater contamination risk. (14)

2 3 4 Fig.: 2 3 4

RL

Duteil, J. 1720 Forts.

Utilization of Specialized Filter Housings Incorporating Bag-Out Features for Radioactive Contamination Control

(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 377-80, 2 Fig.)

3. Limited contamination of the filter housing by particulate matter carried by the effluent air stream. 4. Simple replacement of filter elements. 5. Error-proof replacement of filter units. 6. Ease of installation into the effluent gas ducting. A typical installation is shown.

3 Fig.: 3

(3) RL

Koprowski, B.J., Livernash, W.H., Brown, F.L. 1712

A System for a Nitrogen Atmosphere in an Alpha-Gamma Hot Cell

(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 315-22, 2 Fig.)

The hot cell, designed and constructed to enable studies to be made on irradiated ceramic and metal fuel materials containing plutonium, consists of two distinct areas: (1) a Main Operating Area of approximately 107.5 cubic meters (3,800 cubic feet) that contains a nitrogen atmosphere and, (2) an auxiliary area for maintenance, repair and storage that contains an air atmosphere. The adjoining enclosures, the "air-side," used for storage and equipment repair, are provided with an air-ventilation system. Transfer locks, used for moving equipment between the "air-side" and the "gas-side" of the facility, help maintain the purity of the gas atmosphere. (6)

3 4 Fig.: 2 3

RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723

Installation d' un laboratoire pour la manipulation de substances radio-actives

(Bulletin technique de la Suisse Romande, (1964) No. 5, 6 S., 1 Fig., 2 Tab. (Sonderdruck))

Le laboratoire se divise en quatre zones qui permettent de mieux échelonner les mesures de radioprotection: I. Secrétariat, consigne et vestiaire extérieur II. Locaux destinés à l' exploitation normale (distribution normale). III. Locaux prévus pour l' exploitation spéciale (synthèses radiochimiques). IV. Locaux pour la manipulation de très hautes radioactivités (où la manipulation d' activités excédant celles de la classe B pourraient être exceptionnellement autorisées). Dans chacune des zones, la ventilation s' opère des locaux les moins contaminés (vestiaires, laboratoires de mesure, de préparation ou de décontamination)

2 3 4 5 Fig.: 2

(9) Forts. RL

Coops, M.S., Hanson, C.L., Hawk, L.R., Scribner, V.E. 1715

Remotely Operated Trans-Plutonium Chemical Process Cells

(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 337-53, 11 Fig.)

The basic cell construction is of interlocking six-inch-thick lead blocks on the front face; the side walls, ceiling and rear walls are constructed of standard concrete. The six-inch front wall allows the use of through-the-wall manipulators. The enclosures or "cell boxes" are fabricated from mild steel and are corrosion-proofed with baked phenoloc resins. Viewing windows are of 5009 series plexiglas, as are the translucent panels in the rear of the enclosure. The ventilation system provides about an air change per minute of fresh, filtered air to each enclosure.

3 4 Fig.: 4

(7) RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723 1. Forts.

Installation d' un laboratoire pour la manipulation de substances radio-actives

(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

aux salles de manipulation, et plus particulièrement aux cellules de manipulation elles-mêmes (hottes ou boîtes à gants). Les installations de radioprotection fixes sont disposées comme des hottes de laboratoire. Les manipulateurs à rotule ont été commandés à la Société française F.C.R.; la rotule est enchâssée dans une brique occupant la place d' une brique normale. La longueur des tiges de manipulateurs varie: 40 cm, 60 cm, 80 cm, 1,20 m suivant les fonctions. Les sols existants sont protégés par un revêtement plastique synthétique sans joints à base de chlorure

2 3 4 5 Fig.: 2

Forts. RL

Duteil, J. 1720

Utilization of Specialized Filter Housings Incorporating Bag-Out Features for Radioactive Contamination Control

(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 377-80, 2 Fig.)

One of the recent developments involves the removal of contaminated filter elements into vinyl bags without breaking the integral air seal during the replacement operation. Saint Gobain Nucléaire has developed and patented a specially designed filter housing that incorporates the following features: 1. A completely air-tight welded filter housing. 2. Air-tight gasketing of the filter element to the filter housing.

3 Fig.: 3

(3) Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723 2. Forts.

Installation d' un laboratoire pour la manipulation de substances radio-actives

(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

de polyvinyle. Toutes les portes sont munies d' un ferme-porte automatique; les poignées sont prolongées et orientées de telle sorte qu' elles puissent être manoeuvrées à l' aide des coudes. Les boîtes à gants qui occupent le laboratoire 8 servent à manipuler les substances radioactives pulvérulentes ou volatiles. Elles sont construites en résine synthétique dure et résistante, par la firme Saint-Gobain Nucléaire à Courbevoie, en France.

2 3 4 5 Fig.: 2

(9) RL

Nowak, W., Hausdorf, S. 1732
Das Isotopenlaboratorium.
Leipzig: VEB Deutscher Verl.f.Grundstoffindustrie 1961.
108 S., 32 Fig., 7 Tab.

Die vorliegende Broschüre unterrichtet über einige wichtige, mit dem Bau, der Einrichtung und der Tätigkeit im Isotopenlaboratorium zusammenhängende Fragen. Es werden folgende Laboratorien unterschieden: Forschungslaboratorien, Industrielaboratorien, Unterrichtslaboratorien und fahrbare Laboratorien. Verschiedene Kapitel befassen sich mit den Merkmalen solcher Laboratorien, ihrer Einrichtung, Be- und Entlüftung, ihrer Grundrißgestalung und dem Raumprogramm. Der Strahlenschutz im Isotopenlaboratorium behandelt bauliche Strahlenschutzmaßnahmen sowie apparative Maßnahmen zur Kontaminationsüberwachung.

2 3 4 5 Fig.: 2 3 4 5

(7) RL

Krupčatnikov, V.M. 1733
(Russ.) Ventiljacija pri pabotach s radioaktivnymi veščestvami
(Ventilation bei der Arbeit mit radioaktiven Substanzen)
(Moskva: Atomizdat 1964. 199 S., zahlr. Fig.u.Tab.)

Das Buch enthält Beschreibungen von Lüftungsanlagen für Reaktoren, Beschleuniger und Räume, in denen radioaktive Substanzen aufbewahrt werden oder mit ihnen gearbeitet wird. Ferner werden Filter zur Abluftreinigung besprochen. Ein weiteres Kapitel behandelt die Abluftkamine. Das Schlußkapitel bringt nähere Einzelangaben über Ventilatoren, Regeleinrichtungen und Materialien, die bei den Entlüftungsanlagen Verwendung finden.

3 Fig.: 3 Tab.: 3

(3) RL

Wälischmiller, H. 1735
Einrichtung zur Beobachtung von unter hohem Druck und hoher Temperatur stehenden heißen Zellen, insbesondere bei Kernreaktoranlagen
(DAS 1,165,778 (1961/64) 2 S., 3 Fig.)

Die Erfindung betrifft: 1. Eine Einrichtung zur Beobachtung des Innenraumes von unter hohem Druck und hoher Temperatur stehenden heißen Zellen, insbesondere bei Kernreaktoranlagen, dadurch gekennzeichnet, daß sie aus zwei zusammenwirkenden, aber voneinander räumlich getrennten Beobachtungsmitteln besteht, von denen das eine von einem oder mehreren in die Zellenwand eingesetzten, entsprechend dem herrschenden Druck und der Temperatur bemessenen, kleinflächigen Kontrollfenstern gebildet wird, während das vor dieser Fenstereinheit angeordnete zweite Beobachtungsmittel ausschließlich

DAS 1,165,778
3 Fig.: 3

(4) NSA-18(1964)-22217 Forts. RL

Wälischmiller, H. 1735 Forts.
Einrichtung zur Beobachtung von unter hohem Druck und hoher Temperatur stehenden heißen Zellen, insbesondere bei Kernreaktoranlagen
DAS 1,165,778 (1961/64) 2 S., 3 Fig.)

für ausreichenden Strahlenschutz bemessen ist.
2. Eine Einrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das zweite Beobachtungsmittel aus einem Periskop besteht, dessen Okular sich in einem strahlengeschützten Raum und dessen Objektiv sich vor dem Zellenfenster befindet oder von dem geschützten Raum aus in die erforderlichen Beobachtungsrichtungen am Fenster einstellbar ist.

DAS 1,165,778
3 Fig.: 3

(4) NSA-18(1964)-22217 RL

Lanier, S.F. (Comp.) 1736
Fire and Explosion Protection of Glove-Box Facilities. A Literature Search
(TID-3578 (1964) III, 52 S.)

A total of 379 references are cited on the safety design of facilities handling radioactive materials. Included are references on glove boxes, fire hazards and control, explosion hazards and control, laboratory design, ventilation systems, and filter systems.

TID-3578
1 3 4 5

(7) NSA-18(1964)-39414 RL

Hamada, M., Oae, S. 1741
Design of Tracer Laboratory
(Annual Report of the Radiation Center of Osaka Prefecture, 2 (1961) S.91-4, 4 Fig.)

In this paper the outline of design and several characteristics of arrangements are shown. In each room near entrance where low level radioactivity is used, one or two built-in unopenable windows are arranged, whereas no window is accommodated in the room where semi-high activity is handled. Built-in or movable type experimental tables, side tables and fume hoods are equipped in each room. On the side table, both sinks for inactive and active waste water are provided, the former is made by lead and the latter, stainless steel. In this laboratory, clean air, temperature and humidity of which are controlled is blown into each room through

2 3 4 Fig.: 2 4

(6) NSA-16(1962)-20568 Forts. RL

Hamada, M., Oae, S. 1741 Forts.
Design of Tracer Laboratory
(Annual Report of the Radiation Center of Osaka Prefecture, 2 (1961) S.91-4, 4 Fig.)

the grill of ceiling, while contaminated air is drawn out from each room through fume hoods or exhaust grill, and ultimately put through the filtrating system. The filtering system is consisted of wet filters and dry absolute filters. When the electricity stopped accidentally, ventilation fans are immediately operated and lights along the wall are turned on by means of emergency electric generator in order to avoid the contamination by radioactivity.

2 3 4 Fig.: 2 4

(6) NSA-16(1962)-20568 RL

Rouguin, A., Donguy, R. 1744
Improvements in or Relating to Dismountable Filter Supports
(Brit.Pat.933,794 (1960/63) 5 S., 3 Fig.)
(Br.fr.827,472 (1960))

The present invention relates to a novel support device for a dismountable filter utilisable for the treatment of fluids under pressure in general and, particularly, for the filtration of gases containing radioactive dusts.

Brit.Pat. 933,794
Br.fr. 827,472
3 Fig.: 3

(6) NSA-17(1963)-39234

RL

Bonnet, G., Petit, J. 1751
Process of Operation of a Window for a High-Activity Cell
(U.S.Pat.3,114,945 (1960/63) 2 S., 4 Fig.)
(Br.fr.50,024 (1959))

The window of the invention consists essentially of two identical slabs of glass located edge to edge in the same frame and displaceable by a translatory movement in the plane of the slabs, in front of an aperture or opening in the wall of the cell, and two protective screens surrounding the aperture at a distance from the wall sufficient to allow passage to the slabs of the glass, the first slab being in use in front of the aperture while the second is located behind one of the screens and vice versa.

U.S.Pat. 3,114,945 Br.fr. 50,024 3 Fig.: 3

(6) NSA-18(1964)-6918 Forts. RL

Bonnet, G., Petit, J. 1751 Forts.
Process of Operation of a Window for a High-Activity Cell
(U.S.Pat.3,114,945 (1960/63) 2 S., 4 Fig.)
(Br.fr.50,024 (1959))

A recess for receiving the glass slabs and screens may be formed in the wall of the cell. The recess may be provided in the internal or in the external surface or may even be in the form of an opening through the wall. In either case, the window aperture is locatedin the central portion of the recess.

U.S.Pat. 3,114,945 Br.fr. 50,024 3 Fig.: 3

(6) NSA-18(1964)-6918 RL

Hottenstein, E.R. 1752
Design Aspects of the Saxton Radioactive Waste Disposal Facility
(American Society of Mechanical Engineers, Paper No 61-WA-224 (1961) 8 S., 2 Fig.)

The waste-treatment plant is a building that has been divided into six compartments or rooms. Essentially the high-activity regions are separated from the low-activity. In general, the waste-treatment plant is constructed from ordinary reinforced concrete. The control and storage rooms are constructed with concrete-block walls. The three ventilating systems and the common exhaust fan discharging to the stack are shown. The negative pressure insures that leakage will be into the duct and no radioactively contaminated air will leak into the surrounding environment.

2 3

(4) NSA-17(1963)-2644 RL

Jahn, W. 1758
Die Einwirkung von radioaktiver Strahlung auf Glas
(Glastechnische Berichte, 31 (1958) S.41-53, 15 Fig.)

Heiße Zellen mit größeren Aktivitäten erfordern Schutzfenster, die aus mehreren, bis zu 25 cm dicken Einzelscheiben bestehen können. Die Gläser sind in einem Stahlrahmen gefaßt, zwischen den einzelnen Scheiben befindet sich ein Luftspalt. Waagrechte Hohlspalten, die bei der Fassung und Montage notwendigerweise entstehen, werden mit Bleiwolle oder Bleipulver abgedichtet. Falls größere Glasdicken und damit eine größere Anzahl Einzelscheiben (mehr als drei) notwendig sind, werden die Zwischenräume zwischen den einzelnen Glasplatten häufig mit einer Ölimmersion geeigneter Brechkraft gefüllt, um die beträchtlichen Reflexionsverluste an den vielen Glasflächen auszuschalten.

3 Fig.: 3

(3) Forts. RL

Jahn, W. 1758 Forts.
Die Einwirkung von radioaktiver Strahlung auf Glas
(Glastechnische Berichte, 31 (1958) S.41-53, 15 Fig.)

Diese Schutzfenster werden zweckmäßig stufenförmig ausgeführt. Die Gesamtdicke der Fenster scheint nicht selten 90 cm zu erreichen, während die Fensterbreite 1 m und mehr betragen kann. Es soll noch erwähnt werden, daß zum Schutz gegen γ-Strahlung auch Flüssigkeitsfenster in Gebrauch sind. Als Flüssigkeit verwendet man eine gesättigte Zinkbromidlösung mit einer Dichte von 2,52.

3 Fig.: 3

(3) RL

Jahn, W. 1762
Spezialglassorten für die Verwendung in Isotopen- und Kernforschungslaboratorien
(Technische Mitteilungen (Essen), 53 (1960) S.92-8, 12 Fig.)

Ein wichtiges Beispiel für die Verwendung von Gläsern in Isotopen- und Kernforschungslaboratorien sind die Strahlenschutzfenster, die in Dicken von beispielsweise 10 cm für kleinere Fenster bis zu Dicken von 1 m und mehr benötigt werden. Solche großen Dicken sind für heiße Zellen erforderlich, in denen beispielsweise die chemische Aufarbeitung von Spaltprodukten, Brennstoffelementen und dergleichen vor sich geht, wobei Aktivitäten von 1000 bis zu vielen 1000 Curie in diesen heißen Zellen auftreten können. Es soll noch erwähnt werden, daß zum Schutz gegen γ-Strahlung auch Flüssigkeitsfenster in Gebrauch sind. Forts.

3 Fig.: 3

(3) Gmelin 1960 B/8, S.632 RL

Jahn, W. 1762 Forts.
Spezialglassorten für die Verwendung in Isotopen- und Kernforschungslaboratorien
(Technische Mitteilungen (Essen), 53 (1960) S.92-8, 12 Fig.)

Als absorbierende Flüssigkeit verwendet man eine gesättigte Zinkbromidlösung, deren Dichte etwa 2,52 beträgt. Die Absorption entspricht damit etwa der eines einfachen Calciumsilikatglases gleicher Dicke. Eine Variante des Flüssigkeitsfensters ist das Glas-Flüssigkeitsfenster, bei dem sich Flüssigkeit zwischen einer größeren Anzahl von parallel angeordneten Glasscheiben befindet.

3 Fig.: 3

(3) Gmelin 1960 B/8, S.632 RL

Cermak, H. 1763
Ein Isotopenlaboratorium für die Baustofforschung
(Silikattechnik, 11 (1960) S.577-9, 7 Fig.)

Der inaktive und der aktive Laborteil sind durch zwei Schleusen (für männliches und weibliches Personal) miteinander verbunden. Diese Schleusen sind notwendig, damit ein Verschleppen radioaktiver Substanzen aus dem aktiven Laborteil mit Sicherheit vermieden wird. Zu diesem Zweck muß jede Person die Oberbekleidung wechseln, bevor der aktive Laborteil betreten wird; das gleiche gilt beim Verlassen der aktiven Räume. Die Raumlufterneuerung zur Vermeidung einer Inkorporierung gas- oder staubförmiger radioaktiver Stoffe wird mit Hilfe von Zu- und Abluftaggregaten erreicht, wobei die zuerst genannten im Keller des Laboratoriums, die als zweite genannten im Dachgeschoß des Gebäudes untergebracht sind.

3 4 Fig.: 3 4

(4) NSA-16(1962)-23981 RL

Judson, B. F. 1764
Design of Plutonium Processing Plants
(Chemical Engineering Progress Symposium Series, 55, No 22 (1959) S. 33-6, 4 Fig.)

Large, transparent, and sealed hoods enclosing the processing equipment can be effectively employed as the prime contamination control measure in a plutonium plant. A slight vacuum is maintained within the hoods, so that any air leakage is directed inward to the source of contamination. The individual hoods are large enough to contain complete, multi-component processing systems but are relatively narrow to facilitate direct maintenance of the equipment.

3/4 Fig.: 3

(4) NSA-14(1960)-3577 RL

Winsbro, W.R., Burch, W.D., Ryon, A.D. 1765
Safety Requirements for the Design of Radiochemical Processing Facilities
(CF-58-10-112 (1958) 14 S.)

Design safety requirements applicable to the selection of a radiochemical processing building site and applicable to the layout and general arrangement of operating, control, administrative, and access areas which surround the process containment areas within the process building are presented. Emergency exits shall be provided but shall be designed to prevent the entrance or exit of personnel except during emergencies.

CF-58-10-112
2 3/5

(8) RL

Mackey, T.S. 1767
TRU Glove Box Fire Test Results
(ORNL-TM-923 (1964) 9 S., 2 Fig.)

The transuranium glove box will be very similar to the one presently in use in the 3508 building. Fire tests were performed. The dimensions of the box are 36 in. long, 27 in. in depth, 30 in. in height, with a top width of 16 in. The ventilation system is described. The air discharged from the glove box through the Fiberglas roughing filter, then through the absolute filter into the manifold which was held at a negative pressure. The fire extinguishing system consisted of a Fenwall thermoswitch which, when activated, opened the solenoid valve 18 which permitted carbon dioxide gas to enter the glove box.

ORNL-TM-923
3/4 5 Fig.: 3 4

(6) NSA-18(1964)-35766 Forts. RL

Mackey, T.S. 1767 Forts.
TRU Glove Box Fire Test Results
(ORNL-TM-923 (1964) 9 S., 2 Fig.)

The glove box fire tests demonstrated that two hazards are encountered as a result of a fire. The first is the possibility of containment loss due to the burn through of the rubber gloves and the second is the explosion hazard which follows a fire as a result of the increased evaporation rate of the solvent due to the heat buildup in the glove box floor.

ORNL-TM-923
3/4 5 Fig.: 3 4

(6) NSA-18(1964)-35766 RL

Smith, C.W. 1769
Engineering Studies Fission Product Plants at Hanford
(HW-SA-3377 (1964) 40 S., 16 Fig.)

The process area of the plant is a cylindrical, concrete structure, 103-feet in diameter extending about 75-feet above grade and 20-feet below grade. This portion of the building is surrounded by an 18-feet wide operating gallery. The process area includes eight wet chemistry cells, eleven manipulator cells, a cell access area, a service gallery, and an operating gallery. Entries to all of the cells are provided through removable cover blocks and through shielded personnel access doors for all cells except the product storage cell.

HW-SA-3377
2 3/4 Fig.: 4

(6) NSA-18(1964)-13914 Forts. RL

Smith, C.W. 1769 Forts.
Engineering Studies Fission Product Plants at Hanford
(HW-SA-3377 (1964) 40 S., 16 Fig.)

The process ventilation system is designed in accordance with the established Hanford practice for radioactive process area. The ventilation system is a once through system, in which filtered, washed, and heated (in winter) air is supplied to the process area. The exhaust air is cleaned of radioactive particles by passage through high efficiency filters and is discharged through a 200-feet high stack.

HW-SA-337
2 3/4 Fig.: 4

(6) NSA-18(1964)-13914 RL

Lakey, L.T., Bower, J.R. (Ed.) 1773
ICPP Waste Calcining Facility Safety Analysis Report
(IDO-14620 (1963) getr. Zählg., zahlr. Fig. u. Tab.)

The process building is a single unit 110 feet long and 70 feet wide. Radiation shielding is provided by the thick reinforced-concrete walls of the "hot" process cells. The building has six levels or floors which provide access to all rooms and cells. Heating and ventilation air is supplied through a branch duct from the main heating and ventilation duct system. Ventilation systems, laboratories and cells are described. The fire alarm system is a manual system. The alarm can be actuated at any of four pull-lever fire boxes located throughout the facility. There are several portable fire extinguishers which are strategically located throughout the building.

IDO-14620
2 3/4 5 Fig.: 2

(8) RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1775
Development of Plutonium Bearing Fuel Materials. Progress Report for January 1 Through March 31, 1960
(NUMEC-P-20 (1960) 17 S., 20 Fig., 2 Tab.)

Major effect has been directed towards glove-box and equipment setup (NUMEC Plutonium Facility). All exhaust fans, filter housings, ventilation ducts and manifolds for the plant have been installed. Three glove boxes have been installed to the plant exhaust manifold. Hot laboratory details are given. The cell exterior has been sand finished and painted. The interior walls were sand finished, ground smooth with a carborundum stone, sealed with Rustoleum Seal-Cote, and painted with two coats of Rustoleum gloss enamel.

NUMEC-P-20
3/4 5 Fig.: 4

Forts.

(6) RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1775 Forts.
Development of Plutonium Bearing Fuel Materials. Progress Report for January 1 Through March 31, 1960
(NUMEC-P-20 (1960) 17 S., 20 Fig., 2 Tab.)

Each cell window consists of a cylindrical, stepped carbon steel tank with welded flanges on the ends having "O" ring grooves and tapped blind holes for seal of the glass cover plates and support of the cover plate flanges, respectively.

NUMEC-P-20
3/4
5
Fig.: 4

(6) RL

Johnson, A.A., Crawley, J.E., Hoffmann, J.M., Huntoon, R.T., Orth, D.A. 1776
Commercial Fabrication of Plutonium Fuel
(DP-838 (1963) getr. Zählg., zahlr. Fig. u. Tab.)

The building was assumed to be constructed of concrete block, with steel columns and beams. The processing area and office are on the main flow. Heating and ventilating equipment is housed in a small second flow area above the processing area. The exterior concrete block walls are plastered on the inside to present a smooth surface. Floors are covered with vinyl plastic floor covering in the process area, and with asphalt tile in the office wing. The first aid room is included in the regulated area so that it will be readily accessible to people working in the process rooms.

DP-838
2
3

(9) NSA-18(1964)-7160 Forts. RL

Johnson, A.A., Crawley, J.E., Hoffmann, J.M. Huntoon, R.T., Orth, D.A. 1776 Forts.
Commercial Fabrication of Plutonium Fuel
(DP-838 (1963) getr. Zählg., zahlreiche Fig. u. Tab.)

Air is supplied to the building on a "once through" basis, with the air flowing from "clean areas" to progressively "dirtier" areas. All air discharged from the building will be filtered with absolute filters.

DP-838
2
3

(9) NSA-18(1964)-7160 RL

Tadmor, J., Galron, H. 1780
Guide for the Hazards Evaluation of a Chemo-Nuclear Installation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/508 (1964) 19 S.)

We present in this paper an outline and discussion of the particular points which we consider should be taken into account in planning the safety precaution of a chemo-nuclear establishment and which should be considered in a report evaluating the hazards in such an installation. Description of design of the building, thickness and materials of construction of the walls, roof and floor. Position and dimensions of doors and windows (indicate double doors with airlocks) and the degree to which they are leakproof, direction of opening, and mate-

A/Conf.28/P/508
2
3/5

(7) Forts. RL

Tadmor, J., Galron, H. 1780 Forts.
Guide for the Hazards Evaluation of a Chemo-Nuclear Installation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964, A/Conf.28/P/508 (1964) 19 S.)

rials of construction. Interlock and bypass provisions for airlocks. Emergency escape doors. Detailed description of each of the rooms of the building; size, thickness of the walls, materials of construction, paintwork, degree of resistance to fire and to radioactive contamination. Indication of method of introduction and removal of materials into and from the various facilities (including description of change of gloves in the glove boxes). General description of the ventilation system, including joints and welds in the ventilation ducts and their tightness to leaks. Number of air changes per unit time in the different facilities.

A/Conf.28/P/508
2
3/5

(7) RL

Lister, B.A.J. 1783
Plutonium Containment
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.2/3.1-2/3.13, 23 Fig., 1 Tab.)

In glove box design, four points are of importance; i) good containment during normal operation to prevent plutonium from entering the operating area; ii) comfortable and straightforward working conditions including good lighting. Early boxes had wooden frames but, because of the fire hazard and the difficulty of decontaminating wooden surfaces, wood is now replaced by steel or fibre-glass. For the viewing panels no more generally suitable organic material has been found than Perspex.

AERE-L 151
3/4
5
Fig.: 4
5

(6) Forts. RL

Lister, B.A.J. 1783 Forts.
Plutonium Containment
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.2/3.1-2/3.13, 23 Fig., 1 Tab.)

Usually complete box sides are made of Perspex, but where a serious fire hazard exists, consideration should be given to the use of small viewing panels. Description of fume cupboards and types of glove boxes and fillings, gloves and glove changing, pressurized suits as well as fire and explosion hazards is given.

AERE-L 151
3/4
5
Fig.: 4
5

(6) RL

Lister, B.A.J. 1784
Plutonium Monitoring - Air Sampling
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.4.1-4.10, 26 Fig., 1 Tab.)

In a large building installed air samplers can with advantage be connected to a central pumping system. We find that it is an advantage to fit them with a flexible arm so that the collector can be placed in the most convenient and suitable position. The type of filter medium adopted again depends on the application. The cellulose fibre type has relatively low resistance to air flow but the particles penetrate into the thickness of the paper thereby resulting in some loss of counting efficiency. A number of instruments are currently being developed at Harwell Forts. (5)

AERE-L-151
3/5
Fig.: 5

RL

Lister, B.A.J. 1784 Forts.
Plutonium Monitoring - Air Sampling
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.4.1-4.10, 26 Fig., 1 Tab.)

for continuous plutonium monitoring. One type is set to measure total alpha activity and gives an alarm and indication when an exceptional release of activity occurs. Samples were collected from three types of area: 1) Pressurized suit access area, 2) Powder metallurgy glove box areas, 3) General purpose glove box areas in which both metallurgical and chemical operations are carried out.

AERE-L-151

3/5

Fig.: 5

(5) RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1786
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs, and Specifications ....
(TID-4100 (1957) getr. Zählg.)

Cape-1: MTR Hot Cell Windows. Large (30 x 36 in.) and small (20 x 30 in.) shield windows consisting of $ZnBr_2$ solution and high-density lead glass, non-browning glass, and water-white lime glass. The MTR hot cell using these windows is capable of handling 10-20 kilocuries, 1.5-3.0 MeV gamma emitters. Cape-5: Lead Shielded Manipulator Box. The Berkeley lead shielded manipulator box enables personnel to perform chemical operations in a total enclosed system. The box is a hood with filtered air intake and outlet. Box is installed on a dolly for mobility.

TID-4100

Cape-1
Cape-5
Cape-13

3

(6) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1786 Forts.
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs, and Specifications ....
(TID-4100 (1957) getr. Zählg.)

Cape-13: Chain Drive Manipulator. Assembly and detail drawings of the central items of remote-control equipment in a UCRL standard two-inch lead-shielded manipulator box. Operation is by rotation of the knobs outside the shield while observing the motion inside through a lead-glass window.

TID-4100

Cape-I
Cape-5
Cape-13

3

(6) RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1787
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs and Specifications ....
(TID-4100(Suppl. 1)(1957) getr. Zählg.)

Cape-28: Hot Analytical Facility. Specification and architectural, structural, service piping, drainage, heating ventilation, electrical, and mechanical drawings for the Hot Analytical Facility at ORNL are given. Package includes laboratory equipment such as manipulator, conveyors, and transfer drawers for hot cells. Cape-30: Extraman Manipulator. Extraman Manipulators, designed for performing remote handling odd jobs, are capable of operating through a 1-in pipe which penetrates 3-inch cell walls; they can be extended for use.

TID-4100 (Suppl. 1)

Cape-28
Cape-30
Cape-33
Cape-37
Cape-42
Cape-47
Cape-61

3/4

(11) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1787 1. Forts.
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs and Specifications ....
(TID-4100(Suppl. 1)(1957) getr. Zählg.)

Cape-33: Ball Joint Manipulator-Model 2. Assembly and detailed drawings are given for a ball joint manipulator to be used in a junior cave for low-level chemistry work. Cape-37: Ball Swivel Manipulator Tongs. Ball-swivel manipulator tongs for a general purpose handling device may be either hand-held or supported by a ball-swivel joint, mounted in a protective shield. The design uses detachable heads. The tongs consist of a pistol grip, trigger, and trigger release, and operating rod enclosed in a barrel. Cape-42: H.C. 6" Lead Cave Chain Drive Manipulator. Assembly and detail drawings are available for remotely controlled equipment for

TID-4100 (Suppl. 1)

Cape-28
Cape-30
Cape-33
Cape-37
Cape-42
Cape-47
Cape-61

3/4

(11) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1787 2. Forts.
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs and Specifications ....
(TID-4100(Suppl. 1)(1957) getr. Zählg.)

small chemistry boxes for easy transfer of centrifuge cones to various items of equipment which are set up on intersecting circles with the chain drive manipulator. Cape-47: Hanford Manipulator Model II. A complete set of drawings and a parts list for constructing and assembling the Hanford Manipulator Model II is given. Cape-61: Hot Lab Addition. Drawings are given for new high level shielded hot cells to be used primarily for examination and to conduct physical operations and tests on solid reactor materials of source strengths of several million curies of old fission product activity. The hot drain system for the cells are included in this package.

TID-4100 (Suppl. 1)

Cape-28
Cape-30
Cape-33
Cape-37
Cape-42
Cape-47
Cape-61

3/4

(11) RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.)

Cape-219: Ball Socket Manipulator-6" Ball. This manipulator is made of stainless steel with a lead shield and ring, a neoprene gasket, and a graphite bearing. Cape-327: Periscope for Hot Cell Microscopy. This extended periscope is of good optical quality and definition, with sufficient field size to be used with a hardness-tester microscope in a hot cell for examination of irradiated metallurgical specimens. The section of the periscope passing

TID-4100 (1st Rev., Suppl. 4)

Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419

3/4

(19) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790 1. Forts.
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

through the cell wall is about 57 in. long and the section within the cell is about 19 in. high. Cape-336: Remote Cutoff Wheel, Model 3. The cutoff wheel was designed to facilitate the removal of components from a cell maintenance or repair of apparatus. A specimen to be cut is loaded into a vise, and the cover carrying the cutting wheel and vise is closed. Cape-372: Auxiliary Plug-In Fingers for Master-Slave Jaws. The slim fingers facilitate the handling of small oddly shaped parts by the Argonne Master Slave Manipulator tongs. The duralumin fingers fit into duralumin fixtures bolted on to the jaws of the manipulator.

TID-4100 (1st Rev., Suppl. 4)

Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419

(19) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1790, 2. Forts.
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

Cape-373: Expendable Plastic Cubicle and Manipulator Sleeve. The plastic sleeve is used to protect mechanical parts of the slave end of a manipulator from contamination and is made of 0.004 in. thick vinyl chloride acetate film. Cape-393: Hot Lab Periscope for Open Top Cells. The periscope is used to view the interior of a front-wall-shielded open top cell. It rides on a carriage mounted on top of the front shielding wall and can travel the length of the cell. Cape-397: Shielded Manipulator Dry Box. The box is 3 ft. by 3 ft. long of 3/16 in. stainless steel. The sloping front is a safety plate-glass window which may be covered by a 4 in. lead door for gamma protection.

(19) Forts.

TID-4100 (1st Rev., Suppl. 4), Cape-219, Cape-327, Cape-336, Cape-372, Cape-373, Cape-393, Cape-397, Cape-398, Cape-406, Cape-410, Cape-411, Cape-416, Cape-419, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1790, 3. Forts.
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

Lead glass windows permit visibility during shielded operations. Cape-398: Hot Cell Access System. The system provides a method of quickly transferring radioactive samples into and out of small hot cells without the use of a radiation lock. Cape-406: Beaker Handling Device. The manipulator is an aluminum tube 3 to 10 ft. long with a spring-loaded expandable steel band at one end. Tension on the band is controlled by a lever on the handle. A different manipulator is used for each size beaker.

(19) Forts.

RL

TID-4100 (1st Rev., Suppl. 4), Cape-219, Cape-327, Cape-336, Cape-372, Cape-373, Cape-393, Cape-397, Cape-398, Cape-406, Cape-410, Cape-411, Cape-416, Cape-419

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1790, 4. Forts.
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

Cape-410: General Purpose Hood. The hood is well suited to alpha activity work. In high level experiments a glove-port panel replaces the sliding window. The hood, 48 in. wide, 36 in. deep and 59-1/2 in. high is on a 36 in. high base. The interior has strippable paint. Cape-411: Remotely Controlled Lathe. This is a standard lathe modified by remote controls and mounted on its end in a hot cell to save space and ease chip collection. Cape-416: Remotely Controlled Micropipetter. The pipetter is used in analytical laboratory sampling and is oper-

(19) Forts.

RL

TID-4100 (1st Rev., Suppl. 4), Cape-219, Cape-327, Cape-336, Cape-372, Cape-373, Cape-393, Cape-397, Cape-398, Cape-406, Cape-410, Cape-411, Cape-416, Cape-419

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1790, 5. Forts.
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

ated by hand or by flexible cable extension with a rotating ring stand. The body is aluminum and the fittings are aluminum or stainless steel. Cape-419: Model B Pipetter. The pipetter is a device designed to pipe aliquots of highly radioactive samples. Samples are delivered by driving the plunger into the chamber in precise increments, and expelling sample solution as desired.

(19)

TID-4100 (1st Rev., Suppl. 4), Cape-219, Cape-327, Cape-336, Cape-372, Cape-373, Cape-393, Cape-397, Cape-398, Cape-406, Cape-410, Cape-411, Cape-416, Cape-419, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1794
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

Cape-636: Standard Hood (LASL). The standard hood is 85-3/8 in. high, 48 in. wide and 32-1/2 in. deep, and is constructed of sheet metal. It has one door 39-3/4 in. wide and 35-1/2 in. high and is made of safety glass 1/4 in. thick. The balance control damper (see Cape-641) is used with this hood. Cape-800: Neutron Facility (UCRL). The neutron facility consists of a chemistry box 65 in. long x 48 in. x 48 in. made of 11 gage cold rolled, mild steel, with a water window. There are a polyethylene lined storage well, transfer box and carrier, a magnetic lift capable of lifting

(18) NSA-18(1964)-367 Forts.

Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986

TID-4100 (1st Rev., Suppl. 18), 3/4/5, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1794, 1. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

500 lb, an overhead crane, and a manipulator device capable of raising and lowering 65 lb. Cape-861: Plastic Glove Box (SRL). The box is useful in housing short-term experiments with radioisotopes to contain the emitted ß and low energy γ radiation, or limited amounts of α activity. The box is 46-7/8 in. x 34-1/4 in. x 20-1/8 in. It has two ports 8-11/16 in. in dia. The box ist constructed of fire-resistant, self-extinguishing, polyester resin that is reinforced with glass fibers. Cape-885: High Intensity Food Irradiator Facility (HIFI)(CWC). The facility is used to treat food and other materials with gamma radiation, using a multimega curie ^{60}Co source. The radiation cell is 32 ft 8 in. long, 22 ft

(18) NSA-18(1964)-367 Forts.

TID-4100 (1st Rev., Suppl. 18), Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986, 3/4/5, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1794, 2. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18 (1963) getr. Zählg.) 3/4/5

wide, and 11 ft high; and has an access corridor 7 ft wide. The shielding walls consist of 6 ft of compacted sand between 8 in. thick walls. The roof of the cell has a 5-1/2 in. concrete slab which is covered with 7 ft of compacted sand. Cape-886: Thorex Facility Building (ORNL). The concrete building consists of a basement, first floor, and attic with dimensions of 214 ft 8 in. long and 33 ft wide. A concrete platform, 174 ft long and 15 ft wide, has a small room opening onto it from the building. This room is 22 ft 6 in. wide x 12 ft 6 in. Cape-906: Remote Metallograph (HAPO). This remotized, Bausch and Lomb, research metallograph

(18) NSA-18(1964)-367 Forts.

TID-4100 (1st Rev., Suppl. 18), Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1794, 3. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18 (1963) getr. Zählg.) 3/4/5

is installed in a cast-iron blister attached to the side of a cast-iron cell in the radio-metallurgical laboratory. The blister is made of 10-1/2 in. thick cast iron of 7.0 density. The blister is 32 in. long x 39 in. high; the part containing the metallograph is 18 in. wide. A sample conveyor and manipulator serve the metallograph and are controlled mechanically outside the cell. Cape-912: Bag Passout Sealer for Water-Shielded Cave Facility (UCRL). The remotely operated, plastic-bag passout sealer is used in removing isotopic fractions for storage in the rear or for removing radioactive waste for placement in the waste storage containers.

(18) NSA-18(1964)-367 Forts.

TID-4100 (1st Rev., Suppl. 18), Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 4. Forts.
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

The unit is accessible by both the primary inclosure master-slaves and the service area master-slaves. Cape-924: Shielded Personnel Monitoring Station (HAPO). This shielded monitoring station is used for whole body counting. The station is located in a small, concrete block house 40 ft x 40 ft 6 in. The cell is 9 ft x 10 ft with 10-1/4 in. steel walls having a stainless steel facing. The door is the same construction and moves on rollers to open. Cape-930: Hot Canyon Crane (SRL). The 221-F 411, 50-ton capacity, remotely controlled crane is used for installing, removing, and maintaining canyon process equipment. There is a specially shielded cab which houses the operating controls.

(18) NSA-18(1964)-367 Forts.

3/4, 5 — TID-4100 (1st Rev., Suppl. 18), Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 5. Forts.
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

Cape-951: Glove Box-Introduction Port (BNL). The port used for introducing materials into a glove box is a door made in two sections. The inner section is 1/2 in. thick and 10-1/4 in. in dia. The outside of the door is 9-7/8 in. in dia. and 1/2 in. thick. Light teflon-covered "O" rings separate the two parts of the door. A teflon washer is used at the knob. Cape-986: Metallography Cell and Storage Facility (KAPL). The metallography cell is constructed of concrete 2 ft 4 in. thick. The outside dimensions are 28 ft 9 in. long, 9 ft 8 in. wide, and 16 ft high. The cell has a 6 in. thick steel door 6 ft 11 in. wide and 12 ft 1-1/2 in. high which operates on a worm-type mechanism.

(18) NSA-18(1964)-367 Forts.

3/4, 5 — TID-4100 (1st Rev., Suppl. 18), Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986, RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 6. Forts.
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

On a bridge in the cell is mounted an electromechanical manipulator. The cell is also equipped with a 2-ton electric hoist.

(18) NSA-18(1964)-367

3/4, 5 — TID-4100 (1st Rev., Suppl. 18), Cape-636, Cape-800, Cape-861, Cape-885, Cape-886, Cape-906, Cape-912, Cape-924, Cape-930, Cape-951, Cape-986, RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Cape-1050: Isotopes Production Plant. The conceptual design for the isotopes production plant consists of a circular process building 140 ft. in dia. and 69 ft high with an attached single-story service building 100 ft by 120 ft. The process building contains a circular, concrete-shielded structure 103 ft in dia. which is divided into 11 manipulator cells and eight process vaults. The eight wet chemistry cells are located below grade level. The cell floors are lined with stainless steel, and the walls and cover blocks are coated with radiation resistant paint. Each of the manipulator cells is 16 ft high. These cells are accessible by crane from the top and through doors in the back of the cells.

(14) Forts. RL

TID-4100 (Suppl. 22), Cape-1050, Cape-1059, Cape-1078, Cape-1089, Cape-1099, Cape-1125 — 3/4, 5

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List 1. Forts.
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Cape-1059: Vacuum Cleaner with Cyclone Separator. This vacuum cleaner is used to pick up radioactive material. Particulates are removed from the airstream with a small cyclone which is followed by an 8 in. square x 5-7/8 in. high efficiency filter. The vacuum cleaner employs an Electrolux motor and fan. Cape-1078: Miniature Centrifugal Contactor. The 16-stage contactor is suitable for remote operation with highly radioactive materials. The housing is of stainless steel and the stages are arranged in a circular configuration which allows a central gear drive for all of the bowls and a gear train drive for all of the mixers.

(14) Forts. RL

TID-4100 (Suppl. 22), Cape-1050, Cape-1059, Cape-1078, Cape-1089, Cape-1099, Cape-1125 — 3/4, 5

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List 2. Forts.
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Individual bowls and mixers are replaced by lifting out a single assembly. Cape-1089: Fallout Monitor/Q-2256/. This monitor is used in the Fallout Monitor System which is designed to measure fallout of radioactive particles that originate from a nuclear incident, failure of air-cleaning components, or to give warning when a present tolerance level has been reached. Cape-1099: Monocular Periscope Stage. The stage of the monocular periscope used in Cell No. 9 of the High Level Cells is described. The oval stage plate has a long axis of 6-6/8 in., a short axis of 4-6/8 in., and is fabricated of 1/2 in. stainless steel.

(14) Forts. RL

TID-4100 (Suppl. 22), Cape-1050, Cape-1059, Cape-1078, Cape-1089, Cape-1099, Cape-1125 — 3/4, 5

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List 3. Forts.
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

It is attached to a shaft 10-1/8 in. long which is mounted on a low tripod 1-3/4 in. high. Cape-1125: Extrusion Press, 280 Ton. The extrusion press is used in the fabrication of aluminum-plutonium spike enrichment fuel elements for the Plutonium Recycle Test Reactor (PRTR). The 280 ton press is enclosed in a glove box.

(14)

TID-4100 (Suppl. 22), Cape-1050, Cape-1059, Cape-1078, Cape-1089, Cape-1099, Cape-1125 — 3/4, 5, RL

Fassbender, H. (Hrsg.) 1799
Einführung in die Meßtechnik der Kernstrahlung und die Anwendung der Radioisotope. 2. Aufl.
Stuttgart: Thieme 1962. XVIII, 420 S., 240 Fig., 26 Tab.

In Kapitel E wird über die Einrichtung und über Hilfsmittel für Isotopenlaboratorien (Bauweise von Isotopenlaboratorien, Raumeinteilung- und Anordnung, Ausstattung der Räume, Wände und Fußböden, Be- und Entlüftung, Abzüge, Handschuhkästen) berichtet.

(5)

2, 3/4 — Fig.: 2, 3, 4 — RL

Jaeger, Thomas 1800
Grundzüge der Strahlenschutztechnik für Bauingenieure, Verfahrenstechniker, Gesundheitsingenieure, Physiker
Berlin, Göttingen, Heidelberg: Springer 1960. XV, 392 S., 224 Fig.

In Kapitel 13 wird über den Entwurf von Radioisoto- 3
pen-Laboratorien berichtet (Anordnung der Räume, 4
Ventilation, Abzüge, Handschuhkästen, heiße Zellen, 6
fernbediente Geräte und Maschinen, Manipulatoren, Fig.:
Sichtvorrichtungen). Zahlreiche Abbildungen sind 2
vorhanden. Die Kostenaufstellung eines heißen 3
Laboratoriums beträgt $ 268 000. 4

(5) RL

4 Beschreibung und apparative Ausrüstung von heißen Zellen und Arbeitskästen (Manipulatoren, Maschinen, Zangen, Vorrichtungen zur Untersuchung durch Fernkontrolle, Titrationsvorrichtungen, mikroskopische und metallographische Ausrüstung usw.)

Sichtvorrichtungen siehe 3

Bagnall, K.W., Robertson, D.S. 1374
Improvements in or Relating to Equipment for Handling Dangerous Substances
(Brit.Pat.887 367 (1959/62) 5 S., 8 Fig.)

According to the present invention, equipment for use in carrying out operations on or treatments to a toxic or radioactive substance comprises a gas tight chamber substantially circular in plan, a window of transparent substance in the wall of the chamber, glove-ports in the window, a table within the chamber below the level of the glove-ports and is characterized in that a port is provided in the table and ports are provided in the base-plate of the chamber.

Brit.Pat. 887 367

4

Fig.: 4

(5) NSA-1962-7653 RL

Babcock & Wilcox Company, New York 1375
Improvements in Storage Arrangements for Radioactive Components
(Brit.Pat.886 294 (1959/62) 4 S., 5 Fig.)

This invention relates in general to storage arrangements suitable for storing radio-active components and more particularly to a storage arrangement for the storage of radio-active components after their use in a nuclear reactor.

Brit.Pat. 886 294

4

Fig.: 4

(4) NSA-1962-7650 RL

Jenne, C. 1376
Ingenieurtechnische Gesichtspunkte der Projektierung der Reprocessing-Anlage Eurochemic
(Chemie, Ingenieur-Technik, 33 (1961) S.139-45, 13 Fig., 1 Tab.)

Nach allgemeinen Gesichtspunkten zur Auslegung von Reprocessing-Anlagen, wie Eingriffsmöglichkeiten, Strahlungsabschirmung, Dichtheit usw., werden die Auflöseapparate für Brennstoffelemente bei satzweisem und kontinuierlichem Betrieb sowie die Verfahrensrichtlinien vor allem bei der Flüssig-Flüssig-Extraktion in pulsierenden Kolonnen besprochen. Außerdem werden bei unterkritischen Apparaten die Maßnahmen zur Vermeidung der Kritikalitätserscheinungen erörtert und Fragen des Transports von radioaktiven Flüssigkeiten in verschiedenen Pumpentypen diskutiert.

4

Fig.: 4

(3) RL

Graf, P. 1377
Die Einrichtungen zur Bearbeitung und Untersuchung von Bestrahlungsexperimenten im Hot- und Isotopenlaboratorium in Würenlingen
(Neue Technik, 5, No.3 (1963) S.128-39, 6 Fig., 3 Tab.)

Die Abschirmzellen des Heißen und des Isotopenlaboratoriums im Reaktorzentrum Würenlingen und ihre Fernbedienungseinrichtungen zur mechanischen Bearbeitung, metallurgischen und chemischen Untersuchung hochaktiver Materialien werden beschrieben. Der Beobachtung des Zellenraums dient ein gestuftes Abschirmfenster: außen (kalte Seite): 76 x 46 cm hoch, innen (aktive Seite): 96 x 76 cm hoch, aus strahlenstabilisiertem Bleiglas (d 3,3 und 6,2 g/cm^3), mit einem den Zellenfrontwänden entsprechenden Abschirmvermögen und einem seitlichen Blickwinkelverlust von 5°. Ein Paar mechanische Manipulatoren (ANL Mod.9) mit simultaner Parallelübertragung der Bewegungen des Bedienungsarmes außen auf den Arbeitsarm innen bilden das allgemeine Fernbedienungs-Handwerkzeug.

3

4

Fig.: 2 4

Tab.: 4

(4) RL

Schumacher, H., Stauffer, M. 1378
Méthodes d' examen postirradiatoire
(Neue Technik, 5, No.3 (1963) S.140-52, 9 Fig.)

Ferngesteuerte oder automatisierte Maschinen und Einrichtungen erlauben das Schneiden einer Probe, das Einbetten in Kunststoff, das Schleifen und Polieren - wobei sich Vibrationspolierscheiben offenbar besser bewähren als normale Automaten -, das Ätzen und das Reinigen mit Ultraschall. Zur Beobachtung und photographischen Aufnahme der Probe dient ein ferngesteuertes Mikroskop, dessen Objektträger und Objektive sich in der Zelle, die übrigen Teile der Optik außerhalb der Zelle befinden. Alle mechanischen Antriebe können von außen bedient werden.

4

Fig.: 4

(4) RL

Gardiner, L.A.J. 1379
Universal Manipulator
(Nuclear Energy, 1963, July, S.191-95, 12 Fig.)

An account is given of the design, construction and development of a prototype manipulator for use in lead shielded cells. The manipulator has an elbow joint located inside the cell which allows the clamping jaws to be rotated and positioned where required. A load of 2 lb can be manipulated in any position at a distance of 48 in. from the cell face and the maximum operating torque is 7 lb. in.

4

Fig.: 4

(3) RL

Dukes, J.A., Parish, F. 1380
Opposed Impeller Mixer-Settler [Notiz]
(Atom, 1957, No.5, S.23)
(U.K. Application No.03406/56)

In the present invention a level mixer settler plant is operated without the need for pumping by virtue of the fact that homogeneous mixing is maintained throughout the volume of the mixers. This is achieved by use of a double paddle mixer, one paddle being above the mixer outlet port and one below. The paddle operates in such a way that the lower paddle tends to lift the heavier phase while the upper paddle tends to depress the lighter phase.

4

(4) RL

Hanthorn, H.E. 1381
Calculated Costs of Fabrication of Plutonium-Enriched Fuel Elements
(HW-74304 (1962) VI, 125 S., 12 Fig., 35 Tab.)

In part 3b and c plant layouts and conceptual machine design descriptions are discussed.
In part 4 are presented construction cost study estimates for the fuel element fabrication plants described in parts 2 and 3.

HW-74304

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4

6

Fig.: 2

(6) RL

Strasser, A.A. 1382
Plutonium Fuel Programs of the United Nuclear Corporation
(HW-75007: Proceedings Plutonium as a Power Reactor Fuel, Dec. 1962 (1962) S. D3.1-D3.5, 4 Fig.)

Two plutonium facilities were designed, constructed and put into operation. Both facilities operate on the principle of complete plutonium containment, within helium mass spectrometer leak tight boxes. The facilities have operated satisfactorily at zero level of contamination for about a year and a half. The carborundum facility has a work space of 15 by 37 feet, which houses six aluminum frame glove boxes. Three boxes have a helium atmosphere, and three have an air atmosphere.

HW-75007
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Fig.:
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(4) Forts. RL

Strasser, A.A. 1382 Forts.
Plutonium Fuel Programs of the United Nuclear Corporation
(HW-75007: Proceedings Plutonium as a Power Reactor Fuel, Dec. 1962 (1962) S. D3.1-D3.5, 4 Fig.)

The United Nuclear facility has a work space of 28 by 32 feet, which houses ten carbon steel glove boxes coated with a corrosion resistant lining and two hoods. One box has a helium atmosphere, six boxes a nitrogen atmosphere, and three boxes an air atmosphere.

HW-75007
4
Fig.:
4

(4) RL

Vanden Bemden, E. 1383
Description of the Belgonucléaire - C.E.N. Plutonium Project
(HW-75007: Proceedings Plutonium as a Power Reactor Fuel, Dec. 1962 (1962) S. 22.1-22.36, 29 Fig., 1 Tab.)

The general lay-out of the plutonium facilities located in the hot wing of the C.E.N. chemistry building is shown. The four laboratories on the left side of the wing are completely installed and in operation. The laboratory was first operated in early 1960. The last two laboratories on the right side of the wing are still under construction. The location of the various glove boxes in the laboratories are shown.

HW-75007
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Fig.:
2
4

(5) RL

Regnaud, F. 1384
L'analyse du plutonium
(Chimie analytique, 46 (1964) S. 133-37, 3 Fig.)

Si le plutonium est un élément dangereux à manipuler, l'analyse n'en est pas moins effectuée dans des conditions de sécurité satisfaisantes. Ce résultat n'est obtenu qu'au moyen d'installations coûteuses et compliquées qu'on peut diviser en trois catégories, suivant la nature et la quantité des échantillons traités: - La sorbonne ventilée, ou la boîte semi-étanche, pour les solutions peu actives mettant en oeuvre des quantités le plus souvent de l'ordre du microgramme. - La boîte à gants pour les échantillons de plutonium plus conséquents. L'enceinte α γ est constituée d'une boîte à gants ou d'une chaîne de boîtes à gants

4
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Fig.:
4

Forts.

(4) RL

Regnaud, F. 1384 Forts.
L'analyse du plutonium
(Chimie analytique, 46 (1964) S. 133-37, 3 Fig.)

entourée d'une protection, de plomb le plus souvent, pour éviter l'irradiation par les émetteurs γ. Les manipulations sont effectuées par l'intermédiaire de télémanipulateurs ou de pinces articulées sur rotules. Une boîte à gants vaut de 3000 à 4000 francs et elle ne peut servir qu'à une opération assez restreinte. Une enceinte α γ, d'une surface de travail utile de 4 m^2, avec une protection de plomb de 5 cm, coûte 250 à 300 000 francs.

4
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Fig.:
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(4) RL

Sethna, H.N., Srinivasan, N. 1386
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

A Purex type process has been chosen for its flexibility as well as the advantages it offers in the matter of concentration of the fission product raffinates. The Plant has a co-decontamination cycle, a partition cycle and two separate parallel cycles for the purification of uranium and plutonium. For the extraction cycles, 30 % TBP is used as solvent. Initially 1.0 M, 2.0 M, and 0.01 M have been chosen as the concentration of nitric acid in the feed, scrub and strip respectively, with sodium nitrite in the feed solution to stabilise the valencies of uranium and plutonium. Ferrous sulphamate is used as a reducing agent for the partitioning of plutonium from uranium. (8) NSA-18(1964)-37283 Forts. RL

A/Conf.28/P/786
2
3
4
6
Fig.:
2
4

Sethna, H.N., Srinivasan, N. 1386 1. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

The plutonium separated from the bulk of the uranium is purified by an anion exchange process, for which Dowex-1 with 4 % cross linkage is used with loading and washing in 7.2 nitric acid medium and elution with 0.35 M nitric acid. The radioactive part of the Plant in the Main Process Buildings is housed in eight cells with a total volume of about 3600 cubic metres. The walls and the roof of the cells and the stagings are lined with stainless steel in three out of the eight cells, the rest are protected by acid resistant paint. The floors of all cells are lined with stainless steel with 30 cm of skirting.

A/Conf.28/P/786
2
3
4
6
Fig.:
2
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(8) NSA-18(1964)-37283 Forts. RL

Sethna, H.N., Srinivasan, N. 1386 2. Forts.
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

On one side of the cells are the access corridor, the service corridor, the operating gallery and the transmitter and tank space. The entrance doors to all the cells are situated at the access corridor (ground floor) level. The control laboratory has a lead shielded cell for work with highly active samples and other associated fumehoods and glove boxes for medium level and low level analytical work and for plutonium handling.

A/Conf.28/P/786
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3
4
6
Fig.:
2
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(8) NSA-18(1964)-37283 Forts. RL

Sethna, H.N., Srinivasan, N. 1386
Fuel Reprocessing Plant at Trombay 3. Forts.
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 2o S., 10 Fig., 1 Tab.)

For the active laboratories and the plutonium laboratory the conditioned air is rendered dust-free with absolute filters and is exhausted through fumehoods to maintain the minimum velocity of the air required across the face of the fumehoods. While final cost figures are likely to be available after some time, approximate indications are given.

A/Conf.28/ P/786
2
3
4
6
Fig.:
2
4

(8) NSA-18(1964)-37283

RL

Lead Development Association, London 1387
Lead for Radiation Shielding. No.2: Design and Construction of Lead Shielded Containers
London: Lead Development Association 1963, 18 S., 7 Fig.

The following notes on the design and construction of lead shielded containers are intended for the guidance of designer so that they can take into account the problems of manufacture in preparing designs, and thus facilitate the use of techniques that best overcome these problems.

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(4) RL

Imre, L., Nagy, J. 1388
(Ungarisch.) Isotope Laboratory of the Institute for Physical Chemistry, Lajos Kossuth University. II. Technical Equipments of the Laboratory
(Magyar Kemikusok Lapja, 19 (1964) S.185-8)

The technical design of the laboratory is based on the requirement of being able to technically educate a certain number of students. In compliance with this lab working places of customary type have been provided. The layout of the rooms has been performed as to hinder any radioactive contamination from the hot booth to get to the measuring apartments or to the tracing lab either by personal communication or by water or air flow. The working mechanism of the air cleaning equipment made on the basis of Hungarian projects is an object of dosimetry research over the recording of automatic activity measuring instruments. (6) NSA-18(1964)-35439 RL

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Gyoergyi, S., Gazeó, J. 1389
(Ungarisch.) Precision Remote Control Pipette for Work with Radioactive Solutions
(Kiserletes Orvostudomany, 15 (1963) S.669-70)

This precision remote control pipette possesses the advantages over commercial remote control pipettes that, because of its coarse and fine vertical calibration, it allows sucking up by means of the bulb and the certain and accurate separation of small amounts of the supernatant fluid. One person can easily manage it. Should it become contaminated it is easily decontaminated.

4

(4) NSA-18(1964)-35619 RL

Dykes, F.W. 1390
Remote Analysis Apparatus
(IDO-14636: Annual Report of Division Analytical Branch for 1963 (1964) S.10-11)

An extended pan balance was installed in the recess adjacent to the last box in the B line. A chamber of lead bricks serves as shielding for the pan. Transfer between the box and the recess is by a crank-operated conveyor. A distillation apparatus was installed in another box for the determination of total nitrogen, computed as nitrate. A separate box was equipped with a can sealer for disposal of hot waste. In a fourth box, samples are prepared for X-ray diffraction analysis to measure alpha alumina content. To prevent particulate matter from passing into the plant exhaust system, an absolute filter was installed in the exhaust duct of each of the four boxes. A vane-axial fan was placed downstream of each filter to maintain the necessary air flow. (5) RL

IDO-14636
3
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Schadek, J., Ujhelyi, C. 1391
(Ungarisch) Simple Tools for Remote Radioactive Operations
(Magyar Tudományos Akademia Atommag Kutató Intezéte (Debrecen). Közlemények, 4 (1961) S.235-6)

A few relatively simple but effective tools have been developed in the shops of the Institute of Nuclear Research of the Hungarian Academy of Sciences in Debrecen for the remote handling of experimental equipment. They include special clamps, found useful for handling and grasping cylindrical objects such as sources, glass ampules, beakers, etc. A special head facilitates operations involving wires or similar very thin objects. An automatically grasping, spring-loaded tool rendered good service for manipulating sealed sources; a thin steel or plastic wire was used to open the clamp against the pressure of the spring.
(4) NSA-16(1962)-19019 RL

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Duthie, R.E.C., Sachs, F.L. (ed.) 1393
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1.Rev., Suppl.5) 24 Bl.)

Cape-218: Ball Socket Manipulator -4" Ball. The four in. ball socket manipulator is used for simple manipulations behind a lead shield or in a dry box in low level gamma activity. It consists of a stainless steel rod 55 3/16 in. long with a handle on one end and a tong on the other. Cape-414: Remote Shielded Metallograph. In adapting a standard Bausch and Lomb research metallograph for use in a hot cell, it was necessary to design shielding, remote control equipment, and transfer mechanisms. Lead-glass windows permit viewing. The mechanical transfer system shuttles the irradiated specimens between the cave and the metallograph which is located adjacent to the cave. (8) NSA-1960-4409 RL

TID-4100 (1.Rev., Suppl.5)
CAPE-218
CAPE-414
1
4

Duthie, R.E.C., Sachs, F.L. (eds.) 1394
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl.6)(1960) 21 Bl.)

Cape-430: Shielded Pipette Control. The shielded pipette control protects the hand from ß and low level γ radiation. A 5/8 inch CD Lucite tube is attached as a handle and a housing for a 2-ml syringe. A 1/8 in. ID Tygon tube through the shield connects the syringe and micropipetts. The thumb actuates the syringe. Cape-436: Remotely Controlled Balance. The modified Ainsworth "Right-A-Way" balance is mounted on top of the junior cave to facilitate weighing materials inside the cave. Cape-442: Shielded Autoclave Equipment. The Autoclave is loaded and unloaded in a hot cell but operated outside in a thin wall contamination enclosure. The shield is a 20 in. diameter cask

TID-4100 (1st.Rev., Suppl.6)
Cape-430
Cape-436
Cape-442
Cape-447
Cape-459
Cape-497
1
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(12) NSA-1960-8519 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1394
Supplemental Insert Sheets for Engineering Materials List 1. Forts
(TID-4100(1st Rev., Suppl.6)(1960) 21 Bl.)

with the center board out and extra shielding at the bottom. Cape-447: Hand Changer Fixture for BNL Rectilinear Manipulators. The fixture facilitates the interchange of different types of hands used on BNL Rectilinear Manipulators. It consists of a flat plate on legs with 2 slots that fit around the manipulator jaws. Cape-459: Remotely Controlled Analytical Balance. The balance is used to accurately weigh metallurgical and other radioactive materials from 0.1 mg to 200 g in a hot cell. The balance was made by modifying a standard balance so weights could be shifted, zero adjustments made and the beam locked by motors and potentiometers.

TID-4100 (1st Rev., Suppl.6) Cape-430 Cape-436 Cape-442 Cape-447 Cape-459 Cape-497 1 4

(12) NSA-1960-8519 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1394
Supplemental Insert Sheets for Engineering Materials List 2. Forts.
(TID-4100(1st Rev., Suppl.6)(1960) 21 Bl.)

Cape-497: Potentiometric Acid Apparatus. This remotely controlled apparatus is used for typical potentiometric, amperometric, and conductometric titrations of highly radioactive samples.

(12) NSA-1960-8519

TID-4100 (1st Rev., Suppl.6) Cape-430 Cape-436 Cape-442 Cape-447 Cape-459 Cape-497 1 4 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl.9)(1960) 56 Bl.)

Cape-456: Bag Sealer. To keep contamination at a low level, plastic bags are used in hot cells and gloved boxes. This bag sealer is an apparatus for sealing the plastic bags. Included in the package is an outlet ring for a gloved box used to remove the sealed plastic bag from the box. Cape-482: Metal Glove Box. The box has two glove ports, each 6 1/6 in. in diameter, and a safety-glass window in a metal frame 18 in. by 36 7/8 in. with fluorescent lighting at the top. Cape-534: Cenham Hoods. The Chemical Engineering Division hoods are built in modules. This module is 42 in. high, 42 in. long, and 42 in. deep. The fronts and backs have 4 glove ports each.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1 3 4 5

(15 NSA-1961-4087 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395
Supplemental Insert Sheets for Engineering Materials List 1. Forts.
(TID-4100 (1st Rev., Suppl.9)(1960) 56 Bl.

Cape-556: Syntron Polisher. The polisher is used in a hot cell with a vibrator to polish metal samples for metallographic examination. Cape-568: Glove Type Hoods. The hood is used to safely handle highly toxic or reactive materials. The hood contains an inert or treated atmosphere under regulated pressures. Equipment is operated manually through gauntlet gloves secured and sealed to the hood sides. Cape-603: Automatic Alpha Hand Counter, Model HC-2. The automatic, personnel-operated α particle hand meter is a qualitative instrument indicating that hands are hot or cold.

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1 3 4 5

(15) NSA-1961-4087 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1395
Supplemental Insert Sheets for Engineering Materials List 2. Forts.
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.)

Cape-628: Dry Box Equipment. Dry box equipment includes a pneumatic airlock door, an edge filter, and a centrifuge housing. The pneumatic door is a guillotine type, air-cylinder-actuated door that is used where space does not permit the use of a hinged door.

(15) NSA-1961-4087

TID-4100 (1st Rev., Suppl. 9) Cape-456 Cape-482 Cape-534 Cape-556 Cape-568 Cape-603 Cape-628 1 3 4 5 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1396
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

Cape-30: Extraman Manipulator. These manipulators, designed to perform remote handling odd jobs, are capable of operating through a 1-in. pipe which penetrates 3-inch thick cell walls. Cape-37: Ball Swivel Manipulator Tongs. Ball-swivel manipulator tongs for a general-purpose, handling-device may be either hand-held or supported by a ball-swivel joint that is mounted in a protective shield. Cape-315: Health ChemistryManipulator. The manipulator is used with a 4 in. lead shield and is known as a Castle manipulator. A tong-holder system replaces the previously used ball-socket accomodation for tongs.

1 4

TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 3 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1396
Supplemental Insert Sheets for Engineering Materials List 1. Forts.
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

Cape-676: Jumbo Mixer-Settler Units. The 24 stage mixer-settler unit consist of 4 six stage Jumbo units. Each state is 16 in. wide, 30 in. high and 131 in. long containing an interface weir section, an aqueous inlet section, a solvent inlet section, a mixing section, and a settling section. Cape-677: Slab Extractor, 10 Stage. The 10 stage extractor is a "pump mix" mixer-settler used in liquid-liquid extraction processes. Cape-685: Defilming Tongs. The tong handles very small specimens with a minimum contact between specimen & tong. Cape-686: Utility Tongs. The tool is used to handle small articles within a shielded enclosure, by use through

1 4

TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1396
Supplemental Insert Sheets for Engineering Materials List 2. Fort
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

a ball socket manipulator. Cape-687: Wire Cutting Tongs. The tongs are used to cut wires remotely by pinching them between a stationary knife blade and a moving anvil. Cape-688: Modified Wiggle Tong. The tong is used through a ball joint or rotating cylinder. Cape-689: Handling Tongs for HRE. The tong is used for general handling. Cape-692: Retriever Tool for Remote Maintenance. This cable-actuated, retriever tool is used for handling flange bolts or other objects in a hot cell. Cape-694: Disassembly Tools. The tools have offset handles to be used through a hole in the lead shield without

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TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

(19) NSA-1961-19499 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1396 3. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 11)(1961) 70 Bl.)

exposure to the radiation beam. The tools consist of a tube and wire cutter, a remote wrench and a special soldering gun. Cape-698: Slave Robot. This electronically controlled slave-robot performs the numerous unforseen operations, such as maintenance, repair, and transfer of equipment and materials, where the other handling equipment is not usable.

TID-4100 (1st Rev., Suppl. 11) Cape-30 Cape-37 Cape-315 Cape-676 Cape-677 Cape-685 Cape-686 Cape-687 Cape-688 Cape-689 Cape-692 Cape-694 Cape-698

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(19) NSA-1961-19499 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1397
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-298: Sleeved Tong, Model 2. This experimental-type, stainless steel, sleeved tong is used with a manipulator as slip on fingers. Cape-712: Ball Socket Manipulator. The manipulator operates through a 10 in. square opening in an 8 in. thick shielding wall. Cape-716: Intermediate Level Triple-Cell Cave. The cave is used for metallographic process operations. A small conveyor transfers the specimens. Cape-718: Glass Shielding Windows. Shielding windows provide an unrestricted view for operations involving radioactive materials. The windows consist of a tank filled with one inch glass plates immersed in mineral oil.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740

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(15) NSA-1961-24922 2 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1397 1. Forts
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-719: Portable Shielding for Chemistry Hood. The portable shield is used in handling fractional curie quantities of radioactive materials. The shield is used with standard hood shielded on the sides, back, and bottom with steel plates. Cape-729: X-Ray Diffractometer Facility. The x-ray diffractometer facility is located in the physical and metallurgical hot laboratory and is a 2.3 density concrete cave with a capacity of 100 curies. Cape-739: Hot Laboratory Creep Test Facility. The facility tests irradiated samples with the same accuracy as is obtained with non-irradiated samples.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740

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(15) NSA-1961-24922 Forts. RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1397 2. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 12)(1961) 47 Bl.)

Cape-740: Power Reactor Fuel Processing Plant. The cells used are an adaptation of segmenting cells with the main processing operations carried out in Cell A and stored in the storage cell. Maintenance is performed from the top of the cell.

TID-4100 (1st Rev., Suppl. 12) Cape-298 Cape-712 Cape-716 Cape-718 Cape-719 Cape-729 Cape-739 Cape-740

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(15) NSA-1961-24922 RL

Duthie, R.E.C., Sachs, F.L. (eds.) 1398
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl. 13)(1961) 24 Bl.)

Cape-631: Remote Analytical Facility. The building is of reinforced concrete and is 88 ft by 83 ft. It is divided into three parallel areas; analytical lab., decontamination area, and a multicurie cell. Cape-735: Heating and Ventilating Equipment for Purex. The laboratory is 144 ft long by 56 ft wide. It contains: 3 hot labs, one cold lab, a decontamination room, sample storage room, instrument shop, glass shop, counting room, x-ray room, fluorometer room, 3 offices, hot and cold change facilities for men and women, and a lunch room.

TID-4100 (1st Rev., Suppl. 13) CAPE-631 CAPE-735

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(9) NSA-1961-26130 RL

Development of Manipulators for Handling Radioactive Materials 1399
(ANL-6672: Reactor Development Program Progress Report, Dec. 1962 (1963) S. 31-32)

The electrically connected master-slave manipulator Mark IV will have a load capacity of 50 lb and will be designed to be mounted either on an overhead carriage system or on a vehicular system. The arm and overall configuration will be designed to achieve good dexterity, operating ease, and remote repairability. A pair of similar arms should be capable of repairing a manipulator by replacement of subassemblies. The design will also emphasize the reliability of all system components and the moderate cost of fabrication.

ANL-6672

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(4) NSA-17-11936 RL

Mayfield, R.M., Tope, W.G., Shuck, A.B. 1400
The Facility 350 Helium-Atmosphere System
(ANL-6489 (1962) 45 S., 25 Fig.)

The helium atmosphere system in Argonne's Facility 350 is described in detail. The system is straightforward, employing drying and carbon towers for the removal of moisture, oxygen, and other impurities. The bulk of the 15,000 ft^3 of helium atmosphere is continuously recirculated at nearly atmospheric pressure. The operation is continuous, requiring a minimum of maintenance and operational manpower. The helium atmosphere is supplied to the gloveboxes with impurity levels below 3,000 ppm (0.3 %) nitrogen, 1,000 ppm (0.1 %) oxygen, and 50 ppm moisture. Such purity levels prevent oxidation and combustion of the plutonium materials being processed.

ANL-6489

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Fig.: 4

(7) NSA-17-16171 RL

Halteman, E.K., Jones, L.J., MacGeary, R.K., Horgos, R.M., Koeneman, J.K., Turkanis, M.M. 1401
Fabrication and Evaluation of Fuel Shapes
(NUMEC-P-50: Development of Plutonium Bearing Fuel Materials (1961) S. 30-33)

As a result of a safety review of the box operations, a number of operational tests were recommended, and several minor modifications to the box and equipment were suggested. In order to provide space within the glove box line for a small machine shop, consisting of a metal turning lathe, drill press, vise, and numerous hand tools, the physical measurements apparatus has been transferred to the box containing the powder preparation and hand pressing equipment.

NUMEC-P-50

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(9) RL

Adams, R.M. (ed.) 1402
Development of Manipulators for Handling Radioactive Materials
(ANL-6580: Reactor Development Program Progress Report, June 1962 (1962) S.39-40)

Work is progressing on a control system for use with future master-slave electric manipulators with 50 lb load capacity. This system will probably be used first with the Mark 4 manipulator. It will use separate power amplifiers for master and slave arms. Preliminary studies of the requirements for a radio link for master-slave electric manipulators indicate that considerable improvement over commonly used systems is required.

ANL-6580
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(4) RL

Paprocki, S.J., Keller, D.L., Alexander, C.A., Pardue, W.M. 1403
Equipment Design and Construction, Powder-Metallurgy Glove Box
(BMI-X-170(Del.): Properties of PuC_2 and PuC_2-ThC_2 Ceramics (1961) S.5-7)

All powder metallurgical operations were performed in a glove box with the shape of a horizontally positioned cylinder and constructed of 1/4-in. stainless steel in two 8-ft-long sections 38 in. internal diameter. Six 1-in.-thick safety-glass windows each having a viewing area measuring 7 by 13 in., are provided, as well as twelve 8-in.-internal-diameter-glove ports with attached shoulder-length lead-impregnated neoprene gloves. Dissolution and preparatory steps in the analysis of the condensate from the transpiration

BMI-X-170 (Del.)
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(8) Forts. RL

Paprocki, S.J., Keller, D.L., Alexander, C.A., Pardue, W.M. 1403 Forts.
Equipment Design and Construction, Powder-Metallurgy Glove Box
(BMI-X-170(Del.): Properties of PuC_2 and PuC_2-ThC_2 Ceramics (1961) S.5-7)

condenser were carried out in open-front flowing-air chemistry hoods. The air velocity can be varied in these hoods with a minimum value of 125 ft^3 per min.

BMI-X-170 (Del.)
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(8) RL

Alter, H.W., Codding, J.W. 1405
A Recent Model of the Miniature Mixer-Settler
(KAPL-1246 (1954) 22 S., 10 Fig.)

A new modification of the miniature mixer-settler is described. The new bank is fabricated from stainless steel and fluorothene, and it can be used for elevated temperature operation. Changes in stage design increase phase separation and minimize back-mixing. Described also is a new feed system, composed of Zenith Gear Pumps, pictures and production drawings are included.

KAPL-1246
4
Fig.: 4

(5) RL

Howarth, A.J., Jones, F., Wortley, G. 1406
Improvements in or Relating to Remote-Handling Manipulators for Radio-Active-Substances
(Brit.Pat.867,297(1957/1961) 6 S., 5 Fig.)

This invention relates to remote-handling manipulators for handling radioactive materials, and is particularly concerned with such manipulators for handling substances emitting gamma rays in shielded cubicles.

Brit.Pat. 867,297
4
Fig.: 4

(6) NSA-1961-18179 RL

Chardy, L.U., Dardy, G.R. 1408
Vorrichtung zur Handhabung von Lasten innerhalb einer mit dichten Schutzwanden umgebenen Kammer
(D.A.S.1,065,147 (1958/59) 3 S., 14 Fig.)

Die Erfindung betrifft eine Vorrichtung fur die waagerechte und lotrechte Handhabung von Lasten innerhalb einer mit dichten Schutzwanden umgebenen Kammer. Eine derartige Vorrichtung wird insbesondere bei Kernenergiezentralen benotigt, in welchen verhaltnismaßig schwere, bestrahlte Stoffe enthaltende Behälter gehandhabt und zeitweilig z.B. in Abstellagern abgestellt werden mussen, welche mit dichten Schutzwanden versehen sind, um die Verunreinigung der Atmosphare mit radioaktivem Staub und die Bestrahlung des Personals zu vermeiden.

D.A.S. 1,065,147
4
Fig.: 4

(5) RL

Savouyaud, J., Vertut, J., Lemer, J., Piron, C. 1409
Aufbewahrungs- und Transportbehalter fur radioaktive Flüssigkeiten
(D.A.S. 1,097,584 (1959/61) 2 S., 1 Fig.)

Aufbewahrungs- und Transportbehälter für radioaktive Flussigkeiten nach Patent 1 075 233 oder dessen Zusatzpatent 1 084 847, dadurch gekennzeichnet, daß ein mit Flussigkeit angefullter Mantel zwischen dem eigentlichen Behalter und der Schale angeordnet ist und daß Einrichtungen vorgesehen sind, um diese Flussigkeit in geschlossenem Kreislauf uber den Flüssigkeitsmantel, ein Anzeigegerat fur schadliche Strahlen und eine Warmeaustauscheinrichtung fließen zu lassen.

D.A.S. 1,097,584
4
Fig.: 4

(7) RL

Geisow, J.C.H. 1410
Umsteuerbare Vorrichtung zum Stapeln und Entstapeln von plattenformigen Körpern etwa gleicher Abmessung, insbesondere von radioaktiven Korpern
(D.A.S.1,087,078 (1957/60) 3 S., 6 Fig.)

Es wird eine umsteuerbare Vorrichtung zum Stapeln und Entstapeln von plattenformigen Körpern etwa gleicher Abmessung, insbesondere von radioaktiven Korpern, beschrieben.

D.A.S. 1,087,078
4

(4) RL

Dreiheller, H., Graul, E.H. 1411
Glovebox für Arbeiten mit radioaktivem Material
(Atompraxis, 4 (1958) S. 52-53, 3 Fig.)

Es wird eine spezielle Konstruktion einer Glovebox beschrieben, die als abgeschlossenes System bei Arbeiten mit gefährlichen radioaktiven Isotopen benutzt wird und einen Schutz gegen Inkorporierung und gegen ß-Strahlung bietet. Die aus 10 mm starkem durchsichtigem Kunststoff hergestellte Glovebox ist von Vorder- und Rückseite durch Handschuhe zugänglich. Sie kann mit Vorteil auch für Arbeiten unter Schutzgasatmosphäre eingesetzt werden. Die Luft wird sowohl beim Eintritt in die Kammer als auch beim Austritt aus der Kammer gefiltert. Der Ventilator sorgt für leichten Unterdruck in der Kammer. (auth)

4 / Fig.: 4

(4) RL

Bussy, P. 1412
The Plutonium-Based Fuel Production Programmes in France
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel. Am.Nucl.Soc.Top. Meeting, Richland, Washington-Sept.13 and 14, 1962 (1962) S.3.1-3.24, 22 Fig.)

The building is described roughly into three sections. One contains 12 active plants of about 120 M² each powerfully ventilated, in which are placed most of the glove boxes for manipulations on pure plutonium, alloys or refractory compounds containing plutonium. The second part contains the general utilities of the building: mechanical plant, reception centre, stores, radiation protection centre etc. In the third part is a hall and a number of less strongly ventilated rooms which are used for canning operations (welding, machining, polishing, cleaning of the finished elements and for metallurgical transformation operations on alloys already canned (rolling, drawing, hammering etc.).

HW-75007 / 2 / 4 / Fig.: 2 / 4

(5) RL

Marsh, J.A., Bates, L.T., Humphreys, D. 1414
Power-Operated Manipulator
(Brit.Pat.859,162 (1958/61) 9 S., 7 Fig.)

The present invention relates to manipulators intended for the remote manipulation of objects inside a building, cave, laboratory or cell within which radioactive conditions make it impossible to perform direct manipulation.

Brit.Pat. 859,162 / 4 / Fig.: 4

(6) NSA-1961-7476 RL

Bergsland, C.H., Hedin, R.S. 1415
Remote Controlled Handling List
(U.S.Pat.2,861,701 (1954/58) 9 S., 12 Fig.)

The present invention relates to material handling units and more particularly to units operated by remote control and capable of operations which simulate certain movements of the human body such as the shoulder, upper arm, forearm, wrist and hand.

U.S.Pat. 2,861,701 / 4 / Fig.: 4

(5) RL

James, T.R. 1416
Remote Control Handling Unit
(U.S.Pat.2,861,700 (1951/58) 16 S., 30 Fig.)

The present invention relates to material handling units and particularly to units capable of operations which simulate certain movements of the human body, such as the shoulder, upper arm, forearm, wrist, and grip, and which are capable of remote control. One object of the present invention is to provide a material handling unit capable of a wide range of movements and operations. A further object is the provision of such a unit with improved control means for operation from a remote point. Still another object is the provision of a material handling unit in which a vertically movable shoulder portion is carried on a carriage or trolley for movement to any desired point within a horizontal plane.

U.S.Pat. 2,861,700 / 4 / Fig.: 4

(4) RL

Savouyaud, J., Vertut, J. 1417
Aufbewahrungs- und Transportbehälter für radioaktive Flüssigkeiten
(D.A.S.1,075,233 (1958/60) 3 S., 1 Fig.)

Die Erfindung betrifft Aufbewahrungs- und Transportbehälter für radioaktive Stoffe, welche Strahlen aussenden konnen, gegen welche der Benutzer geschützt werden soll, wobei sich diese Stoffe in flüssigem oder praktisch flussigem Zustand befinden. Der Behälter besteht im wesentlichen aus zwei dicken Schalen, nämlich einer oberen Schale und einer unteren, welche durch ihre Zusammenfügung einen geschlossenen Behälter bilden, dessen Wand uberall eine praktisch konstante Dicke aufweist.

D.A.S. 1,075,233 / 4 / Fig.: 4

(5) RL

King, D.W. 1418
Hand Truck for Handling Equipment
(U.S.Pat.2,874,860(1959) 2 S., 3 Fig.)

This invention relates to a handling truck or dolly for the handling of large and relatively heavy pieces of equipment and particularly for handling of ion source units for use in calutrons. A calutron is in general a device or system for the electromagnetic separation of isotopes.

U.S.Pat. 2,874,860 / 4 / Fig.: 4

(4) RL

Nicoll, D. 1419
Method and Apparatus for Handling Radioactive Products
(U.S.Pat.2,875,345 (1956/59) 3 S., 7 Fig.)

This invention relates to a method and apparatus for handling and storage of radioactive materials. More specifically the invention relates to a method and apparatus whereby radioactive materials in the form of solid bodies may be removed from a liquid contaminated with radioactivity and stored in a clean body of liquid without introducing into the clean liquid contamination other than the solid body thus removed.

U.S.Pat. 2,875,345 / 4 / Fig.: 4

(4) RL

Bondarenko, I.P., Budarova, N.V. **1421**
(Russ.) Grundlagen der Dosimetrie und des Strahlenschutzes.
Moskva: Gos.izd."Vyssaja skola" 1962. 197 S., 145 Fig., 14 Tab.)

Es wird unter anderem über die Einrichtung und Ausstattung von Laboratorien mit radioaktiven Stoffen berichtet. Zahlreiche Abbildungen zeigen Spezialzangen, Manipulatoren, Pipetten, Abzüge, Handschuhkästen, spezielle Labortische, Schutzkleidung, Handschuhe usw.

(6)

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Fig.:
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5
RL

Ruehle, W.G. 1422
Shielding Manipulator for Radio-Active Material
(U.S.Pat.2,889,464 (1954/59) 4 S., 5 Fig.)

This invention relates to manipulators for radio-active materials, that is, mechanisms whereby such materials may be subjected to various chemical and physical treatments without subjecting the operator to dangerous radiation.

(4)

U.S.Pat. 2,889,464
4
Fig.: 4
RL

Prest, R.J. 1423
Manipulating Radioactive Material
(U.S.Pat.2,976,423 (1956/61) 5 S., 10 Fig.)

This invention relates to a system of manipulating radioactive material, such as sources of gamma radiation consisting of an incapsulated cobalt isotope.

(4)

U.S.Pat. 2,976,423
4
Fig.: 4
RL

Goertz, R.C., Grimson, J.H., Kohut, F.A. 1424
Manipulator for Slave Robot
(U.S.Pat.2,978,118 (1959/61) 8 S., 16 Fig.)

This invention relates to a remote-control manipulator in which slave and master units are electrically interconnected. More specifically, the invention relates to such a manipulator in which two slave units are mounted side by side on a mobile vehicle.

(6)

U.S.Pat. 2,978,118
4
Fig.: 4
RL

Longhurst, G.E. 1425
Tool Assembly with BI-Directional Bearing
(U.S.Pat.2,992,048 (1960/61) 2 S., 5 Fig.)

This invention relates to a tool assembly and more specifically to a cylindrical tool assembly having a bearing connected thereto so as to permit axial and rotational movement of the tool assembly within a bore.

(4) NSA-1961-22416

U.S.Pat. 2,992,048
4
Fig.: 4
RL

United Kingdom Atomic Energy Authority 1426
Appareil de contact liquide-liquide
(Belg.Pat.582,925 (1958/59) Abstract)

Le mélangeur-précipitateur comprend des conduits d'écoulement qui sont connectés chacun, à un certain nombre de niveaux, à leurs compartiments mélangeurs correspondants.

(4)

Belg.Pat. 582,925
4
RL

Electricité de France 1427
Manipulateur
(Belg.Pat.587,775 (1959/60) Abstract)

Le manipulateur comporte un premier bras portant des moyens susceptibles d'assurer son déplacement dans un tunnel, un deuxième bras, articulé au premier et muni de moyens pour le faire tourner, un troisième bras, articulé sur le deuxième bras autour d'un axe perpendiculaire à l'axe d'articulation du deuxième et une pince placée sur le troisième bras et munie de moyens pour assurer l'ouverture et la fermeture de la pince. Utilisé dans les réacteurs nucléaires.

(4)

Belg.Pat. 587,775
4
RL

United Kingdom Atomic Energy Authority 1428
Improvements in our Relating to Equipment for Handling Dangerous e.g. Radioactive Substances (Glove Boxes)
(Brit.Pat.848,199 (1955/60) Abstract)

Equipment for the handling, processing or treatment of dangerous substances, which may constitute a health hazard, comprising a chamber of substantially circular cross-section and having a personnel passage of rectangular section extending therefrom, a gastight door serving to shut off communication between the chamber and the passage, a window of transparent substance in the wall of the said chamber, glove ports in the window, a circular table within the chamber below the level of the glove ports capable of being rotated, means to effect rotation of the table,

(4) NSA-1961-6084 Forts. RL

Brit.Pat. 848,199
4

United Kingdom Atomic Energy Authority 1428 Forts.
Improvements in our Relating to Equipment for Handling Dangerous e.g. Radioactive Substances (Glove Boxes)
(Brit.Pat.848,199 (1955/60) Abstract)

a tunnel or secondary chamber for introducing substances into or withdrawing them from the circular chamber and the combination of a glove box and a fume chamber, the glove box adjoining the tunnel or secondary chamber and the fume chamber adjoining the glove box, there being means of access from the glove box to the fume chamber and the tunnel or secondary chamber.

Brit.Pat. 848,199
4

(4) NSA-1961-6084 RL

Commissariat à l'énergie atomique 1429
Perfectionnement aux rotules pour outils à distance
(B.F.1,241,723 (1959/60) Abstract)

Un perfectionnement aux rotules pour outils à distance, qui permet de supprimer pratiquement tout frottement, et de généraliser l'emploi de ces rotules à des parois d'épaisseur élevée. La rotule usinée de manière à présenter deux chemins de roulement tourne sur quatre roulements tels que. Ces roulements sont solidaires d'une butée à axe vertical, installée dans la brique inférieure du logement sphérique. La tige de manoeuvre de l'outil peut se déplacer. On a réalisé ainsi une rotule de 150 kg (pour des parois de 150 mm) très aisément manoeuvrable.

B.F. 1,241,723
4

(4) RL

Commissariat à l'énergie atomique 1430
Procédé et dispositifs pour la manipulation d'objets, la transmission de mouvements et la réalisation directe de mouvements au moyen de chambres expansibles
(B.F.1,238,423 (1959/60) Abstract)

Procédé pour la manipulation d'objets, la transmission de mouvements et la réalisation directe de mouvements au moyen de chambres expansibles, caractérisé par l'emploi d'une ou plusieurs chambres expansibles dont les parois sont en un matériel possédant une bonne aptitude à la déformation et un coefficient de frottement élevé, et dont l'expansion ou la contraction dimensionnelle est obtenue par variation de la pression du gaz qu'elles contiennent, l'expansion de cette chambre étant limitée, lors du gonflage sur certaines de leurs faces de façon à ce que le déplacement soit de transmettre un

B.F. 1,238,423
4

(4) Forts. RL

Commissariat a l'énergie atomique 1430 Forts.
Procédé et dispositifs pour la manipulation d'objets, la transmission de mouvements et la réalisation directe de mouvements au moyen de chambres expansibles
(B.F.1,238,423 (1959/60) Abstract)

permette, soit de saisir un objet, soit de transmettre un mouvement, soit de réaliser directement le mouvement de l'organe avec lequel elles sont en contact.

B.F. 1,238,423
4

(4) RL

Commissariat à l'énergie atomique 1431
Gaffe à pince de préhension commandée pneumatiquement
(B.F.1,228,915 (1959/61) Abstract)

La présente invention a pour objet une gaffe à pince de préhension commandée pneumatiquement pour saisir et manutentionner des objets divers, telles que pièces radio-actives immergées dans l'eau caractérisée par la combinaison en un même ensemble en forme générale d'un tige plus ou moins longue, d'une pince de préhension à mâchoires moteur pneumatique pourvu d'un distributeur à commande manuelle, qui permet à l'opérateur de mettre ce moteur en ou hors d'action pour provoquer la fermeture ou l'ouverture instanée des mâchoires de la pince.

B.F. 1,228,915
4

(4) RL

Kesel, G.P., Baker, R.C. 1432
CAC-880 Pu Reclamation Facility - Z Plant Glove Box Design Study
(HW-68442 (1961) 14 S., 16 Fig.)

The following recommendations and conclusions are broken down into two groups. The first group is specifically slanted towards the design of the CAC-880 Project main process hoods where access is from one side only. The second group may serve as data applicable to design of other project hoods. Throughout this report, the terms "hood" and "glove box" are synonymous.

HW-68442
3
4
Fig.:
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(6) NSA-1963-16141 RL

Cherel, G. 1433
Bras de manoeuvre à pince pour manipulateur à distance
(Belg.Pat.570,114 (1957/58) 4 S., 5 Fig.)

Bras de manoeuvre à pince de manipulateur à distance, muni d'organes de commande des mâchoires de la pince et caractérisé en ce qu'il comporte: un support; une pince montée par emmanchement sur ledit support; au moins un crochet monté sur la pince pour maintenir celle-ci en position sur son support, un organe de commande de déblocage étant de plus prévu pour déterminer le déplacement du crochet et permettre la séparation de la pince et de son support, ledit organe de commande du déblocage étant situé du côté du support par rapport au corps de la pince de façon qu'une traction du bras amenant ledit organe de commande sur une butée fixe détermine à la fois le déplacement du crochet par action sur ledit organe de commande, et la séparation de la pince et de son support. (4)

Belg.Pat. 570,114
4

RL

Cherel, G., Dalesme, R., Boclet, R. 1434
Télémanipulateur
(Belg.Pat.569,340 (1957/58) 4 S., 2 Fig.)

Télémanipulateur du type comportant un bras et un avant-bras terminé par une pince, monté sur un chariot susceptible de se mouvoir transversalement sur un pont roulant, et caractérisé en ce qu'il est porté par une tourelle rotative sur ledit chariot, tous les mouvements dans un plan horizontal de rotation de la tourelle et/ou de translation du chariot étant commandés mécaniquement, et les mouvements du bras, de l'avant-bras et de la pince étant contrôlés à l'aide de vérins à air comprimé.

Belg.Pat. 569,340
4
Fig.:
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(6) RL

Dean, S. 1435
Dispositif de manipulation à distance
(Helv.Pat.342,669 (1955/60) 3 S., 9 Fig.)

L'invention est relative à un dispositif de manipulation à distance, par exemple pour le maniement des corps radioactifs. Ce dispositif se caractérise, suivant l'invention, en ce qu'il comporte deux cadres, l'un manoeuvrable directement par l'opérateur, l'autre propre à agir sur objet à manipuler, et que trois mécanismes distincts identiques sont prévus pour relier chacun un point de l'un desdits cadres respectivement à un point homologue de l'autre cadre de façon que tout déplacement imposé à l'un desdits premiers points entraîne un déplacement identique dudit second point correspondant, en sorte que deux vecteurs équipollents liés respectivement à chacun des cadres conservent leur équipollence pour toutes les positions de ces cadres.

Helv.Pat. 342,669

4/Fig.: 4

(4) RL

Commissariat à l'Energie Atomique 1439
Nouvelle pince de manutention automatique
(Brevet franç.1,217,059 (1958/60) 5 S., 7 Fig.)

La présente invention a pour objet une nouvelle pince de manutention telle que les opérations de préhension et de lâchage soient déclenchées par le dispositif même qui détermine les déplacements d'ensemble de la pince.

Brevet franç. 1,217,059

4/Fig.: 4

(4) RL

Parker, H.F. 1436
Récipients de traitement chimique
(Brevet franç.1,222,135 (1958/60) 2 S., 1 Fig.)

Récipient de traitement contenant une matière fissile, caracterisé par les points suivants séparément ou en combinaisons: 1° Il comprend un récipient cylindrique, un réservoir sous forme d'une plaque espacé du récipient, des conduites de communication outre le récipient et le réservoir en vue d'une circulation par conversion entre le réservoir et le récipient, le récipient, le réservoir, les conduites, et les espaces compris entre eux présentant de façon inhérente des dimensions de sécurité pour la matière fissile qu'ils contiennent.

Brevet franç. 1,222,135

4/Fig.: 4

(4) NSA-1961-14378 RL

Whatley, M.E. 1440
Mixer-Settler
(U.S.Pat.2,754,179 (1954/56) 3 S., 5 Fig.)

In combination, a first plurality of settling chambers arranged in a horizontal line in spaced relation to one another, each settling chamber having an inlet port, a first plurality of mixing chambers arranged in a line in between the settling chambers of the first plurality, each mixing chamber having an outlet port, a first plurality of feeding chambers arranged in a line between the settling chambers of the first plurality, each feeding chamber being above a mixing chamber of the first plurality, a first plurality of weir tubes, one extending from the top of each mixing chamber through the base of the feeding chamber.

U.S.Pat. 2,754,179

4/Fig.: 4

(4) RL

Babcock & Wilcox 1437
Perfectionnements aux installations de manipulation de matériaux
(Brevet franç.1,172,768 (1956/59) 5 S., 7 Fig.)

La présente invention se rapporte aux installations de manipulation de matériaux et plus particulièrement à une installation pour manipuler les éléments combustibles usés après enlèvement de ceux-ci des réacteurs nucléaires.

Brevet franç. 1,172,768

4/Fig.: 4

(5) RL

Thornton, J.D. 1441
Liquid-Liquid Extraction Columns
(U.S.Pat.2,818,324 (1954/57) 2 S., 4 Fig.)

A liquid-liquid extraction column comprising a packed column, an inlet pipe for the dispersed phase and an outlet pipe for the continuous liquid phase located in direct communication with the liquid in the lower part of said column, an inlet pipe for the continuous liquid phase and an outlet for the dispersed liquid phase located in direct communication with the liquid in the upper part of said column, a tube having one end communicating with liquid in the lower part of said column and having its upper end located above the level of said outlet

U.S.Pat. 2,818,324

4/Fig.: 4

(4) Forts. RL

Babcock & Wilcox 1438
Perfectionnements aux installations de manipulation de matériaux
(Brevet franç.1,173,402 (1957/59) 5 S., 5 Fig.)

Installation de manipulation d'éléments combustibles radio-actifs de réacteurs nucléaires comprenant un transporteur pour déplacer un cercueil d'éléments combustibles entre une première station située au-dessus du niveau liquide d'un étang, où le cercueil doit être muni de son couvercle, et une seconde station à l'intérieur de l'étang où le cercueil doit être ouvert.

Brevet fran 1,173,402

4/Fig.: 4

(4) RL

Thornton, J.D. 1441 Forts.
Liquid-Liquid Extraction Columns
(U.S.Pat.2,818,324 (1954/57) 2 S., 4 Fig.)

pipe for the dispersed phase, and a piston and cylinder connected to the upper end of said tube for applying a pulsating pneumatic pressure to the surface of the liquid in said tube so that said surface rises and falls in said tube.

U.S.Pat. 2,818,324

4/Fig.: 4

(4) RL

Burger, L.L. 1442
Solvent Extraction Equipment
(U.S.Pat.2,743,170 (1952/56) 3 S., 1 Fig.)

What is claimed is an apparatus for intimately contacting and separating substantially immiscible fluids of different specific gravities comprising a column, a plurality of perforated plates horizontally disposed at spaced intervals within the column, a first inlet line for light fluid communicating with the bottom of the column, a second line for heavy fluid communicating with the top of the column.

U.S.Pat. 2,743,170
4
Fig.: 4

(4) RL

Hessen, V.B. 1447
Improved Arrangements for Handling Radioactive Materials
(Brit.Pat.866,515 (1957/61) 3 S.)

The present invention consists in an arrangement for handling radioactive materials comprising a chamber in which the radioactive material can be placed, said chamber having walls acting as a screen to prevent the escape of harmful radiation from radioactive material in the chamber and a manipulating device to allow handling of radioactive material within the chamber, wherein a television camera is arranged inside the chamber and means are provided outside the chamber for remotely controlling the camera for movement in pan and tilt so that it can view different parts of the chamber and for reproducing a television picture from the camera, which picture reproducing means can be viewed by an operator outside the chamber to assist in the handling of the radioactive material by the manipulating device.

Brit.Pat. 866,515
3
4

(5) NSA-1961-18176 RL

Kaspaul, A., Vogel, P. 1443
Apparatus for Handling Radioactive Materials
(U.S.Pat.2,931,680 (1955/60) 3 S., 7 Fig.)

This invention relates to remotely controlled apparatus for handling radioactive materials comprising in combination, a handle number including a hand gripping member, said handle member having a first longitudinally positioned bore therethrough, a first tubular member positioned, at at least one end thereof, in said first bore and projecting from said bore, a first rod member slideably positioned.

U.S.Pat. 2,931,680
4
Fig.: 4

(5) RL

General Mills, Inc., Minneapolis, Minn. 1450
Articulated Manipulator
(Brit.Pat.865,517 (1958/61) 6 S., 9 Fig.)

This invention relates to improvements in material handling units or manipulators, for use in performing a wide range of manipulations in uninhabitable environments, such as areas that are radioactive, toxic, high and low temperature or vacuum in nature.

Brit.Pat. 865,517
4
Fig.: 4

(4) NSA-1961-17043 RL

Hartley, K., Maclennan, G., Macdonald, C. 1445
Improvements in or Relating to Sealing Means
(Brit.Pat. 861,485(1958/61) 3 S., 2 Fig.)

It is an object of the present invention to provide sealing means in combination with a duct giving access to a container, which means can be readily operated by a mechanical remote handling manipulator and furthermore, does not necessitate employment of a sealing gasket.

Brit.Pat. 861,485
4
Fig.: 4

(6) NSA-1961-13324 RL

Nicol, J.M., Young, J.A., Jakobek, T.Z. 1452
Improvements in Radioactive Handling Plant
(Brit.Pat. 857,558(1958/60) 9 S., 11 Fig.)

This invention relates to material handling plant for moving a radioactive charge between upper and lower stations including a hoist having a carriage arranged to run on a track within a space enclosed by biological shielding means.

Brit.Pat. 857,558
4
Fig.: 4

(6) NSA-1961-7473 RL

Kemp, L.A.W.E., Leach, J.O. 1446
Apparatus for Storage of Radioactive Needles
(Brit.Pat.869,940 (1959/61) 7 S., 14 Fig.)

The object of the invention is to provide a safe in which radio-active needles can be stored in appropriate storage chambers and which permits of ready extraction of individual needles when they are required for use. The safe will normally include a plurality of storage chambers each for storing needles of one particular type.

Brit.Pat. 869,940
4
Fig.: 4

(5) NSA-1961-20822 RL

United States Atomic Energy Commission 1453
Remote-Control Manipulator
(Brit.Pat.834,244 (1955/60) 9 S., 37 Fig.)

A remote-control manipulator comprising spaced master and slave arms having respectively a handle and grasper connected therewith, a support extending between the arms, means mounting the arms on the support for movement with respect to the support, means interconnecting said arms by which movements of the handle are reproduced by the grasper, a protective boot enclosing the end of the slave arm adjacent the grasper, said grasper being positioned outside of the boot, and counterweights for the master and slave arms, respectively, slidably mounted in guides connected to the master arm.

Brit.Pat. 834,244
4
Fig.: 4

(4) RL

Chanut, L.U., Dardy, G.R. 1454
Improvements in Hoist Systems for Handling Articles Inside a Fluidtight Chamber
(Brit.Pat.833,831 (1957/60) 6 S., 14 Fig.)

Such a system is particularly useful in nuclear energy plant where it is necessary to handle relatively heavy vessels which contain irradiated materials and which are temporarily stored up in a chamber which must be fluidtight for obvious safety reasons.

Brit.Pat. 833,831

4
Fig.: 4

(5) RL

Thomas, C.M. 1458
Plutonium Reclamation Facility - Human Engineering Considerations for Glove Box Design
(HW-64888 (1960) 11 S., 16 Fig.)

This report is intended to define maximum accessible areas of the human hands through glove boxes for a specific application. It should not prelude the use of fixtures, tools, remote devices or other extension mechanisms that can be handled from the accessible area to manipulate equipment beyond reach.

HW-64888

4
Fig.: 4

(4) NSA-1963-23545 RL

Bass, J., Bass, D. 1455
Improvements in or Relating to Isolating Cabinets and the Like
(Brit.Pat.831,886 (1957/60) 5 S., 4 Fig.)

A sealed cabinet fitted with an airlock chamber and glove ports for enabling manual manipulations on materials to be performed therein, wherein the air-lock chamber comprises a door-carrying mount secured to a wall of the cabinet and a body part detachably connected to the mount by releasable means which when released allows withdrawal of the body part for cleaning or replacement without requiring detachment of the mount.

Brit.Pat. 831,886

4
Fig.: 4

(5) RL

Howarth, A.J., Jones, F., Wortley, G. 1459
Manipulateurs pour traitement à distance
(Br.fr.1.179.038 (1957/59) 3 S., 5 Fig.)

La présente invention a trait aux manipulateurs de traitement à distance pour le traitement de matières radioactives et concerne en particulier de tels manipulateurs pour le traitement de substances émettrices de rayons gamma dans des cellules à bouclier protecteur.

Br.fr. 1.179.038

4
Fig.: 4

(6) RL

Knights, H.C. 1456
Improvements in or Relating to Winches for Lifting Radioactive Articles
(Brit.Pat.836,228 (1958/60) 3 S., 2 Fig.)

This invention relates to winches for lifting radioactive articles and it is an object of the invention to provide a shielded winch in which the drum is accessible for maintenance.

Brit.Pat. 836,228

4
Fig.: 4

(4) RL

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957)VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A two-chambered hot cell has been designed, built, and used. The hot cell is suitable for radioactive material testing, hot chemistry or handling of radioactive sources. The access door to each chamber has a zinc bromide window and a pair of ANL Model 8 manipulators mounted on it. A 2-ton traveling bridge crane serves both sides of the cell. A Jordan Remote Area Monitoring System Model I was installed in the cell when it was built.

WADC-TR-57-498
AD-142157
PB-131619

2
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4
5

Tab.:	Fig.:
2	2
3	3
4	4
5	5

(12) NSA-12(1958)-5748 Forts. RL

Sefton, H.E.A., Groves, D.A. 1457
Pestle and Mortar
(Brit.Pat.858,297 (1958/61) 2 S., 2 Fig.)

It is often necessary to reduce the particle size of solid material, for example, solid material which is radioactive, toxic and of high value, without allowing the powder produced to escape into the atmosphere. The present pestle and mortar has particular application in the reduction of the particle size of such materials. Examples of such materials are uranium isotopes 233 and 235, beryllium, and the oxides of these metals.

Brit.Pat. 858,297

4
Fig.: 4

(5) NSA-1961-7474 RL

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460 Forts.
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A filtered exhaust system was provided to prevent contamination of areas outside the cell. A CO_2 fire extinguisher system is installed with two nozzles in each chamber of the cell.

WADC-TR-57-498
AD-142157
PB-131619

2
3
4
5

Tab.:	Fig.:
2	2
3	3
4	4
5	5

(12) NSA-12 (1958)-5748 RL

Farlow, N., Wiel, S., Polissar, J. 1461
A Pipetting Device for Volumes of 10^{-4} to 10^{-9} Millilitres
(USNRDL-TR-389 (1959) III, 15 S., 4 Fig.)

A pipetting device for the measurement and transfer of small liquid samples in the volume region 10^{-4} to 10^{-9} millilitres is described. The instrument employs a micro-manipulator to hold and maneuver a fine glass capillary pipette under a wide field stereoscopic microscope. USNRDL-TR-389 4 Fig.: 4

(6) NSA-1956-9371 RL

Corbin, L.T., Winsbro, W.R., Lamb, C.E., Kelley, M.T. 1462
Design and Construction of ORNL High-Radiation-Level Analytical Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.3-10, 5 Fig.)

The High-Radiation-Level Analytical Laboratory is designed and built for use in the chemical analysis of highly radioactive materials. The in-line hot-cell bank has separate cells for unloading, storing, performing analyses (six cells), and nondestructive testing. Supporting areas include laboratories and rooms for assemblying equipment, decontaminating equipment, and changing clothes. The salient features are an intercell conveyor, transfer drawer, maintenance cart, cask-transfer cart and interchangeable work pans. All areas in which radioactive operations are performed and which are adjacent to these operating areas are equipped for the safe handling and confinement of radioactive materials. 2 3 4 5 Fig.: 2 4

(9) RL

Moore, P.F., Allen, J.D. 1463
Los Alamos Radiochemistry Hot Cells
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.11-16, 2 Fig.)

A major expansion of the hot cell facilities at the Los Alamos Radiochemistry Building in 1962-63 included adding a new wing on the building; increasing the number of cells from three to sixteen. Rapid transfer of materials was provided for by the use of overhead monorail hoists and by a small railroad train passing through all cells. Building size and cost were held down by designing for light-duty manipulators and by simplification or elimination of some of the usual secondary systems. Over-all cost of the project was about one million dollars. The windows were to provide shielding for 100 curies in the chemistry cells and 1000 curies in the dispensary cell. 2 3 4 6 Fig.: 2 4

(7) RL

Brebant, C., Dick, H., Junca, A., Portal, A., Wallet, P. 1464
LECA - Irradiated Fuel Study Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.17-32, 13 Fig.)

The building containing the laboratory is a two story building with a basement. Total cost, including installed cell equipment (windows, manipulators, conveyor, transfer devices) was $3,200,000. The laboratory and its particular features are described. The entire building is ventilated and air conditioned. 2 3 4 5 6 Fig.: 2 4 5

(11) RL

Sease, J.D., Lotts, A.L. 1465
New Remote Facility and Equipment at the Oak Ridge National Laboratory for Fabrication of Fuel Rods Bearing Uranium-233 and Thorium Oxide
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.33-43, 7 Fig.)

A fabrication facility and its related process equipment required to fabricate fuel rods containing U^{233}-thorium oxide by the bulk oxide-vibratory compaction route has been constructed and is now commencing operation at the Oak Ridge National Laboratory. The fabrication equipment that is explained in detail includes the powder-conditioning equipment, the vibratory compactor, the end-cap welding unit, and the gamma absorptiometer for density scanning. 4 Fig.: 4

(4) RL

Kelsch, R.D. 1466
Hot Metallurgy Facility at Savannah River Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.45-74, 19 Fig., 6 Tab.)

This paper describes the evolution of hot metallography at SRL since 1958, the factors that have determined its present state, and the equipment and operating techniques that have been developed. The 1958 Facility was located in Cells 4 and 5 of the High Level Caves. The 1960 Facility was located in Cells 6,7, and 8 and Cell 5 was added in 1962. These cells are 6 x 6 feet in floor area. Each cell is equipped with a pair of Model 8 masterslave manipulators and an electro-mechanical heavy duty manipulator is available. 2 4 Fig.: 2 4 Tab.: 4

(4) RL

Coogler, A.L., Craft, R.C., Tetzlaff, R.N. 1467
A Facility for the Production of Pu-238
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.75-87, 6 Fig.)

A pilot-scale chemical processing facility for recovering Pu-238 and unconverted Np-237 from irradiated Np-237 was assembled and was successfully and routinely operated for an extended period in shielded cells at the Savannah River Laboratory. The process equipment was enclosed in three containment enclosures of stainless steel, which were in turn installed in two general-purpose shielded cells of a ten-cell complex. 2 4 Fig.: 2 4

(6) RL

Faugeras, P., Boudry, J.-C., Lefort, G., Lheureux, C., Stratakis, J. 1468
CARMEN Chemistry Facility for Reprocessing Irradiated Fuels in Gas-Tight Shielded Enclosures
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.89-111, 15 Fig.)

The "CARMEN" series of cells is an α β γ facility now in operation at Fontenay-aux-Roses. The line has four independent cells placed along a single row and which are interconnected through α γ locks equipped with conveyors. Each cell is made of a gastight, stainless steel glove box, entirely surrounded with 15 cm of self supporting steel shielding. Each cell is provided on the front side, with a viewing window and two Model 7 Manipulators. Each cell is connected to the glove box exhaust system of the building through absolute filters, model Schneider-Poelman. The outside air is exhausted through similar filters. The cost of the facility (without taxes) are listed. 4 6 Fig.: 4

(8) RL

Climent, V.H., Watson, J.M. 1469
Design Considerations for University-Size Hot Cell Facilities. A University of Chicago Radiochemistry Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.113-38, 13 Fig., 3 Tab.)

A practical procedure for shielding estimates and 3
a body of data on shielding design, selection of 4
components and economics, as applied to "1 - 1000 Fig.:
curie" hot cell laboratories, is presented. The 2
paper is divided as follows: I. General considera- 3
tions: A. Shielding, B. Measurements, C. Standards, 4
D. Errors, E. Systematics. II. The Radiochemistry Tab.:
Laboratory Project: A. Hot Cell, B. Ventilation, 3
C. Laboratory, D. Cost Analysis. 4

(5) RL

Allemann, R.T., Moore, R.L., Roberts, F.P., Upson, U.L. 1470
Hot Cell Operating Experience in the Calcination of Liquid Wastes
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.139-60, 14 Fig.)

The process operations of pumping, spray drying, 4
calcination, melting, condensation, gas purifica- Fig.:
tion, and gas and liquid sampling, as well as 4
calorimetry and gamma analysis, are performed within a 7 x 15-foot cell, behind four-foot-thick walls, by remote manipulation. This paper is concerned primarily with design, materials, equipment and operational considerations.

(6) RL

Morton, J.E., Parker, H.A., Wyatt, E.I., Corbin, L.T. 1471
Shielded Facility for Use in the Analysis of Radioisotopes
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.161-67, 4 Fig.)

A new all-metal shielded facility was constructed 3
at ORNL for use as an aid in the analysis of radio- 4
isotopes. Remotely controlled equipment makes Fig.:
possible the preparation of dilutions and the per- 4
formance of other simple chemical operations inside the cells. Unique features of the facility are the inside-outside analytical balance, the waste-disposal system, and the ease of access to all parts of the cells. Included in the equipment of the cells are a small furnace, filter photometer, pipetter, titrator, and centrifuge.

(7) RL

Merker, L.G., Bloomster, C.H. 1472
Plutonium Fuel-Casting Facility
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.169-74, 3 Fig.)

An induction heated glove box enclosed casting 3
facility has been used at Hanford for the melting 4
and casting of experimental plutonium-containing Fig.:
fuel alloys. A 300 ft^3 static-inert atmosphere 4
glove box encloses the furnaces and is operated at a negative pressure of one inch of water. The glove box pressure is maintained by an automatic ventilation system which also provides for controlled purging and high emergency exhaust flows.

(5) RL

Schraidt, J.H., Coleman, L.F., Holcomb, W.F., Levenson, M., Ludlow, J.O. 1473
Establishment and Maintaining a High Purity Inert Atmosphere in EBR-II Fuel Cycle Facility Argon Cell
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.181-90, 3 Fig.)

This inert atmosphere is circular in plan. It is 3
completely lined with continuously welded steel 4
plate and shielded with five feet of high-density Fig.:
concrete. There are twenty-two large windows, 4
sixty-five multi-line service sleeve penetrations, three transfer locks, four rectangular cooling ducts, thirty-three stepped penetrations ranging in diameter from two inches to eighteen inches, over three hundred conductors in MI cables, and numerous additional penetrations through the shielding and liner.

(8) RL

Vertut, J., Lafort, G., Rouillard, J., Cazalis, J.-P. 1474
Master-Slave Manipulator Model Through the Ceiling with Index Motion and Alpha-Beta-Gamma Shielding
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.191-96, 4 Fig.)

A new type of master-slave manipulator which works 4
in high activity enclosures is described. Through- Fig.:
the-ceiling operation of this manipulator permits 4
the use of much smaller viewing ports than previously possible and provides improved shielding on the ceiling. This new manipulator is suitable for work involving alpha, beta, and gamma radiation. Its design incorporates new types of hermetic seals which can be replaced without interfering with the vacuum inside the cell. A special device enables the operator to make such a replacement without irradiation risks.

(6) RL

Wiesener, R.W. 1475
The Minotaur-I Remote Maintenance Machine
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.197-209, 10 Fig.,1 Tab.)

A remotely operable, electro-mechanical maintenance 4
machine (named MINOTAUR I) has been designed and Fig.:
built by General Mills Incorporated, to Los Alamos 4
Scientific Laboratory specifications and design Tab.:
criteria. The machine included two electromechanical 4
manipulators, closed circuit TV cameras, 500-pound hoist, lights, and an audio system, which are mounted on a spherical casting. MINOTAUR I is mounted on a telescoping tube assembly, which is suspended from an overhead bridge crane.

(3) RL

Valentin, A. 1476
Two Years of Operating an Alpha-Beta-Gamma Laboratory at Saclay
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.211-21, 5 Fig.)

This laboratory is essentially intended for metal- 3
lurgical research and is composed of five cells 4
in which α sealed dry boxes are associated with Fig.:
magnetic transmission manipulators. Nitrogen 2
circulating in a closed loop forms the atmosphere 3
of the boxes. The manipulators are of the magnetic transmission indirect type.

(4) RL

Boyd, C.L. 1477
Microsampling of Irradiated Materials
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.223-31, 4 Fig.)

Equipment and techniques developed for remote microsampling of irradiated ceramic materials by microdrilling are being used in the study of fission product migration phenomena. Design of the equipment includes provisions for read-out of sampling locations, remote changing of drills, remote collection of microsamples, magnified visual control of the drilling operation, and micrometer control of drill in-feed.

4 / Fig.: 4

(3) RL

Wilson, M.T., Thorn, L.L. 1478
Automated Fuel Element Gamma Counting and Weighing for High Production Post-Mortem Analysis
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.233-44, 6 Fig.)

Equipment has been developed for the rapid handling of irradiated fuel elements for post-mortem analysis. Element weights and total gamma energy outputs are obtained, and this data is presented visually and on punched tape for computer correction and plotting. The electrically and pneumatically powered equipment is operated by a crew of three men.

4 / Fig.: 4

(4) RL

Corrigan, J.E., Stearns, R.F. 1479
In-Cell Alpha Enclosure for Disassembly and Examination of Plutonium-Enriched Fuel-Element Capsules
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.245-54, 5 Fig.)

Since March of 1963, an alpha enclosure for the disassembly and examination of plutonium-enriched fuel capsules has been in operation in one of the Radioactive Materials Laboratory megacurie cells of the Vallecitos Atomic Laboratory. A complete ventilation system consisting of blowers and filters is attached to the bottom of the enclosure and at 20 cfm flow maintains the enclosure negative pressure relative to the cell at 1/2-inch of water.

3 / 4 / Fig.: 4

(5) Forts. RL

Corrigan, J.E., Stearns, R.F. 1479 Forts.
In-Cell Alpha Enclosure for Disassembly and Examination of Plutonium-Enriched Fuel-Element Capsules
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.245-54, 5 Fig.)

Two Model 8 manipulators protected with polyvinyl chloride booting, similar to that in use at the Lawrence Radiation Laboratory, Berkeley, California, perform all operations within the enclosure, and two standard unbooted Model 8 manipulators are used for the pass-in and pass-out operations. The front window of the enclosure (1/4-inch thick radiation resistant glass) is sized so that the enclosure front offers no restriction to viewing through the cell window.

3 / 4 / Fig.: 4

(5) RL

Lambert, T.G. 1480
Ultrasonic Inspection of Irradiated Fuel Rods
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.255-65, 6 Fig.)

This paper describes an immersion ultrasonic testing facility in use at the General Electric Radioactive Materials Laboratory, Vallecitos Atomic Laboratory, Pleasanton, California, for examining irradiated fuel rods. All equipment has been designed especially for in-cell use, with most set-up and maintenance done remotely by manipulators.

4 / Fig.: 4

(3) RL

Youngquist, C.H., Lind, D.J., Mack, G.A., Mohr, W.C., Van Loon, J.A. 1481
Transport System in Argonne Chemistry Cave
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.267-79, 7 Fig., 2 Tab.)

The Argonne Chemistry Cave is laid out with a rail system that connects the individual cells with the central radiation lock corridor as well as a loading dock. A 20 ton capacity rail car carries large shipping casks from the loading dock to the interior of the cave for unloading. A radio controlled flat car traverses the narrow gauge rail system throughout the cave and obeys up to eight commands sent from a small radio transmitter. A remotely operated elevator whose tracks line up with rails in the floor carries the flat car between the two cave floors and a storage area on the third floor. Cost of two manipulator vehicles, complete with two consoles, two control units and an ample supply of cable was under $40,000.

4 / 6 / Fig.: 4

(8) RL

Filer, E.W., Leighton, S.A. 1484
Post-Irradiation Metallographic Laboratory at GE-NMPO
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.295-310, 18 Fig., 2 Tab.)

The construction of the cell and equipment used in preparing irradiated materials for metallographic evaluation are discussed. The inside wall of the cell is lined with 3/4 inch steel boiler plate covered with a 1/16 inch sheet of stainless steel to facilitate cleaning and decontamination. The cell is serviced by a pair of Model No.7 Master Slave Manipulators. Most of the equipment used throughout the cell is controlled from the panel located under the large viewing window. The radiation level in the room is monitored by 3 units. Fastened on the wall in back of the operator is an Eberline radiation monitor (model RM-1A).

4 / 5 / Fig.: 4

(5) RL

Vertut, J. 1485
Cendrillon Containers for the Transport and Dispensing of Radioactive Liquids
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.339-45, 3 Fig.)

Novel containers developed and used by the French Atomic Energy Commission permit safe transport and foolproof dispensing of radioactive liquids. Four different sizes, varying in capacity from 3.5 litres to 50 litres, are now available. However, liquids with criticality hazards cannot be handled in these containers.

4 / Fig.: 4

(3) RL

Rhude, H.V., Kelman, L.R. 1486
A Simplified Procedure for Alteration and Maintenance of Plutonium Gloveboxes
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.347-51, 2 Fig.)

In the Fuels Technology Center at Argonne National 4
Laboratory a portable housing has been developed Fig.:
which greatly simplifies plutonium glovebox altera- 4
tions or maintenance which might release contamination. With this housing alterations and maintenance can be done in the laboratory where the glovebox is used, without hindering research in adjacent gloveboxes. The housing is essentially a very shallow glovebox that can be moved up to another glovebox and attached to it by means of tape and a plastic transition piece.

(4) RL

Lefort, G., Vertut, J., Cazalis, J.-P. 1487
New Interchangeable Seals for Ports in Alpha-Beta-Gamma Cells
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.353-360, 4 Fig.)

Hermetic seals on cells and enclosures containing 4
radioactive materials (emanating α β γ rays or Fig.:
neutrons) can now be made with the aid of a new 4
type of double-action flexible lip joint which is only connected to the inner enclosure so that the outer shielding can be removed without interfering with the air-tight system. The hermetic seal incorporates rigid, semi-rigid and flexible components which interact in such a way that the protective attachment in the interior of the cell can be exchanged without breaking the seal. The exchange of a glove is described in detail.

(5) RL

Mingesz, D.P., Czernik, D.E. 1488
Problems Associated with the Use of Inflatable Seals for Enclosures Containing High-Purity Atmospheres
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.361-68, 4 Fig.)

Several problems are directly associated with the 4
use of inflatable seals in high-purity atmosphere Fig.:
applications. Some of these were overcome during 4
the design and testing of seal doors for a large transfer lock in an alpha-gamma research cave. However, it was only after considerable experimentation with different seals and retaining methods that we were able to make the inflatable seals function adequately. Two seals, with a nitrogen pressurized annulus between them, are used on each of the doors.

(4) RL

Wilson, [illegible], Thorn, L.L. 1492
Remotized Microhardness Tester
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.413-21, 4 Fig.)

Two Model AK Kentron Microhardness Testers were 4
remotized for use in high radiation fields. One Fig.:
of the machines is mounted in an alpha box for use 4
on irradiated plutonium specimens. Unique features of these machines are: the use of a lazy-susan for carrying the dead weight loads, a stage that holds a specimen by the polished surface so that no vertical stage motion is required, ability to remotely change the microscope illumination lamp, and use of geared down coarse focus for fine focus adjustment.

(4) RL

Womack, R.E. 1494
Modulus of Elasticity Equipment for Hot Cell Application
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.447-52, 3 Fig.)

Equipment has been developed for in-cell deter- 4
mination of the modulus of elasticity of materials Fig:
by the resonance method. Size, cost, and ease of 4
replacement are favorable factors.

(3) RL

Richards, P. 1495
Hot Cell Operations at BNL
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.455-56)

Brookhaven National Laboratory has three major hot 2
cell facilities: a three-cell chemical processing 4
complex, a high-level metallurgy facility, and a high-level gamma irradiation facility. The chemical processing cells have three feet of regular concrete shielding except the operating face, which is shielded by hydraulically operated steel doors. The metallurgy facility consists of a three-section cell shielded with three feet of high-density concrete, suitable for handling kilocurie amounts of acitivity. Each section is equipped with Model 8 manipulators, hoists, oil-filled lead glass windows and periscopes. The High Intensity Radiation Development Laboratory (HIRDL) consists of two high-level cells and a connecting canal, designed to handle megacurie quantities of Co 60 and Cs 137. (4) RL

La Rocque, D.D. 1496
Hot Lab Operations at Knolls Atomic Power Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.456-58)

The Hot Lab consists of nine cells (five for 4
general purpose work and four for special purpose work). Four of the general purpose cells are of the back to back type with three foot thick heavy-density concrete walls. Each cell has a radiation lock and three work stations or modules. Each cell is equipped with a General Mills electromechanical manipulator, six model 8 master-slave manipulators and four windows. The fifth cell is a small steel cell (9 inch thick walls plus 1 inch of lead) equipped with six model 4 over-the-wall type master-slave manipulators and three windows. The special purpose cells are described.

(3) RL

Schulte, J.W. 1497
Power Reactor and Rover Hot Cell Facility
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.458-59)

The facility consists of sixteen cells arranged in 2
two banks of eight each; in each bank the cells are 4
located back to back with a common corridor between them. The cells may be isolated from each other and from the corridor by hydraulically operated cast iron doors. The cell walls are constructed of ferro-phosphorous concrete having a density of 300 lbs./$ft.^3$ and a thickness of 32". Viewing is provided by oil-filled lead glass windows. Two periscopes, which can be placed in any cell, are also provided. Building support services include: a decontamination room, hot storage facility, low level laboratories, mock-up area and a hot machine shop.

(4) RL

Westphal, R.C. 1498
Atomics International Components Development Hot Cell Facility
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.459-60)

The facility comprises four rather large shielded cells of megacurie capacity. The cells have the following floor dimensions: one 10 x 32 ft., one 10 x 20 ft., and two 10 x 16 ft. Each cell is provided with a number of lead glass, oil filled viewing windows and serviced by master slaves, electric manipulators, and two-ton crane. Probably the most unique feature of the facility is the ability to provide a nitrogen atmosphere in the cells to insure safety in handling Na and NaK, as well as offering protection in the course of examination of pyrophoric and atmosphere affected fuel materials.

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(4) RL

Doe, W.B. 1499
Argonne Physical and Metallurgical Hot Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.460-61)

Facilities include four cells with capacities of about 10,000 curies and four cells of about 100 curies. The most usual operations are the opening of irradiated capsules, sectioning of fuel for metallography and burn-up samples, and measurement of dimensional changes. The cells were originally constructed to handle materials which were primarily beta-gamma emitters. Over the past two years, is has become necessary to handle gram quantitities of irradiated plutonium.

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(3) Forts. RL

Doe, W.B. 1499 Forts.
Argonne Physical and Metallurgical Hot Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.460-61)

The increased containment required has been obtained by providing inert gas-filled boxes under negative pressure. Transfers have been by carefully executed beta-gamma methods. These boxes have been operated for periods of more than nine months without the cell air outside the box exceeding tolerance limits for plutonium.

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(3) RL

Stearns, R.F. 1500
GE-Radioactive Materials Laboratory Vallecitos Atomic Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.461-62, 1 Fig.)

The RML facility consists of four high-level general purpose cells and a low-level metallography cell. Each of the high-level cells contain three work sections, three pairs of master-slave manipulators, and a radiation lock. A general purpose General Mills manipulator and three-ton bridge crane services the whole cell and radiation lock. All cell doors open to a large extending to a loading dock on the outside of the building. Adjacent to this corridor are located a Radiochemistry laboratory, Decontamination Room, manipulator repair area, Isotope Processing area, and a 16'x8'x16' deep pool for underwater operations. The ventilation system is designed so that all air flows toward higher contamination areas. (4)

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Fig.:
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RL

Rigaut, H., Dieval, M. 1501
Measurement Assembly for High Gamma Flux
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.463-67, 2 Fig.)

The equipment described in this paper has been designed and constructed to permit high gamma flux survey and measurement. This instrument is an essential component of the high activity cells where remote handling, transformation and examination of irradiated fuels or highly active radioisotopes are performed. The instrument can also be used in irradiation facilities and other nuclear installations such as reactors and accelerators.

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Fig.:
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(5) RL

Ferguson, K.R. 1502
The Estimation of Gamma-Ray Shielding for Hot Cells
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.469-75, 3 Fig., 2 Tab.)

The determination of the thickness of gamma-ray shielding required for remote handling facilities, particularly those with capacities of a kilocurie or more, is an estimating process. This technical note outlines the considerations involved in estimating the shield thickness, points out some significant sources of error, and describes some simplified attenuation factor curves for making shielding estimates quickly and usually with sufficient accuracy for final design purposes.

4
Fig.:
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(3) RL

Coste de Bagneaux, C., Demelou, G., Mitault, G. 1503
Les facilités expérimentales et la cellule chaude
(Bulletin d'informations scientifiques et techniques, 1963, No.78, S.69-83, 10 Fig., 2 Tab.)

La cellule est en béton lourd, de densité environ 3,5 et d'épaisseur 1 m, sauf sur le toit et la face avant où la protection n'est que de 0,90 m et sur le plancher, où elle n'est que de 0,10 m. Sur le côté droit, un grand hublot en verre de densité 3,3 stabilisé assure une bonne visibilité en tous points de l'espace utile. Dimensions côté chaud: 1,15 x 1,60 m environ. Sur le côté gauche, une porte de 2,10 x 1,16 m donne accès à la cellule. 2 manipulateurs PYE type LD 3985. Ces manipulateurs battent tout l'espace utile sur une hauteur minimum de 0,90 m à partir de la table de travail. 1 micro pont roulant à 3 mouvements, d'une force de 500 kg, bat toute la cellule.

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Fig.:
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(5) RL

Blosser, T.V., Freestone, R.M. 1504
The ORNL Mobile Radiation Measurement Laboratory
(Nucleonics, 21, No.2 (1963) S.56, 2 Fig.)

The truck is an essentially unmodified Ford Vanette. Shock-mounted electronic equipment occupies most of the interior with a work-table area forward of the driver's seat. Beneath one of the racks is a lead-shielded scintillation counter. An air-conditioning system ensures that all racks are cooled. Neutron and gamma detectors are interchangeably connected to the counting equipment by 250-ft coaxial cables. The detection and counting equipment is conventional.

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Fig.:
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(5) NSA-17(1963)-10877 RL

Betzler, K.-E. 1505
Der Aufbau eines heißen Labors
(Kerntechnik, 5 (1963) S.254-6, 10 Fig.)

Der Gesamtaufbau des heißen Labors des Forschungsreaktors München wurde in verschiedene Abschnitte geteilt, die bei der Erstellung des Rohbaues durch horizontale Ebenen gekennzeichnet waren. Es wird über die einzelnen Bauabschnitte und die Anbringung der Ausrüstung der Zelle und des Tresors berichtet.

2
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Fig.:
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(4) NSA-17(1963)-32211 RL

Curtis, W.K. 1506
The Development of the Master-Slave Manipulator
(Nuclear Energy, 1963, January, S.4-16, 20 Fig.)

A great deal has been written about handling cells and remote operations in which the master-slave manipulator has been used; in fact, to have stimulated considerable interest in these machines. Little has been written, however, of their construction and function. This brief review will help to put these interesting machines in their proper perspective.

4
Fig.:
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(3) NSA-17(1963)-10787 RL

First Report on the Activities of the Eurochemic Company 1959-1961 1507
Paris: Organisation for Economic Co-Operation and Development, European Nuclear Energy Agency (1962) 380 S., 121 Fig., 32 Tab.
(NP-12804)

The main process building will consist of 31 process cells with adjacent access areas and two rows of service corridors on six different floor levels. Additional installations will include an analytical laboratory (adjoining the main process building), a fission product storage building, final product storage, an effluent station for the concentration of medium and low active liquid waste streams, and inactive storage unit. A research laboratory, consisting of a "cold" wing, "hot" laboratories, "hot" cells and an engineering hall has

NP-12804
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Fig.:
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(7) NSA-17-25357 Forts. RL

First Report on the Activities of the Eurochemic Company 1959-1961 1507 Forts.
Paris: Organisation for Economic Co-Operation and Development, European Nuclear Energy Agency (1962) 380 S., 121 Fig., 32 Tab.
(NP-12804)

been designed by a team of architects from Switzerland, Denmark and Spain. It will be located in the vicinity of the Eurochemic re-processing building. The total investment has been estimated to be $ 24 million, including site development.

NP-12804
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Fig.:
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(7) NSA-17-25357 RL

Hanson, C., Kaye, D.A. 1508
General Design of High-Capacity Mixer-Settlers. Part I
(Chemical and Process Engineering, 44 (1963) S.27-30, 6 Fig.)

The development of advanced-type nuclear reactors will result in a requirement for geometrically limited chemical processing plant capable of handling high volumetric throughputs. Two possible designs of mixer-settler meeting this criterion are discussed in the paper. Both appear to have considerable promise and obviate some of the disadvantages found in earlier equipment. Whilst developed for nuclear purposes, they should be equally applicable to other processes involving solvent extraction since one of their main attractions is low hold-up and small space requirement.

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Fig.:
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Tab.:
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(4) NSA-17(1963)-10786 RL

Merker, L.G., Thomas, I.D. 1509
Hanford Plutonium Fuel Development Laboratory
(Transactions of the American Nuclear Society, 6, No.1 (1963) S.160-161, 1 Fig.)

The Plutonium Fabrication Pilot Plant (PFPP) at Hanford is a versatile pilot-scale laboratory with glove-box-enclosed equipment for plutonium fuels research. The two-story, concrete and masonry, air-tight structure contains 32,000 ft^2 of process area. Standard PFPP glove boxes provide complete alpha containment but little protection against penetrating radiation. Additional radiation protection has been provided on glove boxes where necessary to allow fuel material containing high concentrations of Pu-240 to be fabricated without causing excessive operator exposure. Lead-glass panels, lead-impregnated hood gloves, shielded glove-port covers, and movable in-hood shielding have been used. Forts.

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Fig.:
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(4) NSA-17(1963)-26182 RL

Merker, L.G., Thomas, I.D. 1509 Forts.
Hanford Plutonium Fuel Development Laboratory
(Transactions of the American Nuclear Society, 6, No.1 (1963) S.160-161, 1 Fig.)

These measures have reduced the dose rates from fuel materials with high Pu-240 contents to working levels comparable to those experienced with fuel materials containing lesser amounts of Pu-240.

4
Fig.:
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(4) NSA-17(1963)-26182 RL

Looking into Glove Boxes 1510
(Nuclear Engineering, 8, No. 86 (1963) S.234-6, 10 Fig.)

A review is presented of glove boxes and their design, use, and manufacture. The design philosophy is discussed, and the Harwell standard boxes described.

4
Fig.:
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(3) NSA-17(1963)-29045 RL

The Windscale Caves 1511
(Nuclear Engineering, 8, No.86 (1963) S.242-4, 5 Fig.)

The caves themselves are not built according to the (relatively) conventional pattern with an operating face in front and a maintenance area behind but are built in the form of a series of bays leading out from an interconnecting transport corridor. In all there are five pairs of caves set back to back and one single cave, each one measuring 34 1/2 ft by 8 1/2 ft by 10 ft high internal dimensions. The connecting transport corridor is 264 ft long, 8 ft wide and 14 1/2 ft high. The twelfth cave is a half size unit designed particularly for equipment decontamination, and this leads into an active workshop where machines, etc., can be refurbished after decontamination. For the most part zinc bromide windows are used for viewing, five being provided along the length of a cave; these are of the fibre glass type. NSA-17(1963)-29046 (3) RL

4 Fig.: 4

Hot Cells. World Survey. Part 1. [A Chart] 1512
(Nuclear Engineering, 8, No.86(1963) S.245-47)

A chart is presented of the principal details of some of the world's hot cells in operation and under construction. The quantities tabulated include purpose, size, shielding, windows, viewing systems, manipulator equipment, and status.

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(3) NSA-17(1963)-29047 RL

Wervers, H.J., Vrijburg, O.B. 1513
Remote Handling at Petten. The Laboratory for Highly Radioactive Objects (LSC)
(Atoomenergie en Haar Toepassingen, 4 (1962) S.272-7, 6 Fig.)

The LSC building covers an area of 51 x 35 metres. The "active maintenance area" is a hall, measuring 12 x 43 metres, with a height of 12 metres, which forms the central part of the building. The high-activity cell line, which terminates at both ends in so-called "loading-bays", is situated along the southern side of the active maintenance area. The cell line operations are controlled from the southern part of the corridor, which is called "operations hall". Five high-density glass windows, affording a shielding equivalent to 1.20 m barytes concrete, permit wide angle observation of the interior. Forts.

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4 Fig.: 2

(6) NSA-17(1963)-14548 RL

Wervers, H.J., Vrijburg, C.B. 1513 Forts.
Remote Handling at Petten. The Laboratory for Highly Radioactive Objects (LSC)
(Atoomenergie en Haar Toepassingen, 4 (1962) S.272-7, 6 Fig.)

Each window station is equipped with a pair of 'master-slave' manipulators. Maintenance men can enter the cells through a 1.80 metre high opening provided for that purpose in the rear wall of each cell, which is normally closed by means of a concrete-filled plug.

2
3
4 Fig.: 2

(6) NSA-17(1963)-14548 RL

Laken, R.A. van der, Sens, P.F., Verheugen, J.H.N. 1514
Fuel Material and Fuel Element Development
(Atoomenergie en Haar Toepassingen, 4 (1962) S.284-7, 4 Fig.)

A low temperature water-cooled irradiation facility will go into operation in the HFR during the course of the year. The post-irradiation examination will be carried out in the three lead cells at present available, as the hot-lab with concrete cells will not be completed before the beginning of 1964. The heaviest cell (10" lead thickness) has been designed for operation to be performed with a whole fuel element. A second cell consists of a single lead wall, 7" thick, on a concrete base. The other walls of the cubicle have been built of heavy concrete blocks. Forts.

4 Fig.: 4

(5) NSA-17(1963)-14754 RL

Laken, R.A. van der, Sens, P.F., Verheugen, J.H.N. 1514 Forts.
Fuel Material and Fuel Element Development
(Atoomenergie en Haar Toepassingen, 4 (1962) S.284-7, 4 Fig.)

Behind the lead wall, three perspex boxes have been placed. These boxes form a metallographic line with equipment for grinding, polishing, etching and cleaning of metallographic specimens. In one of the boxes a remote controlled metallographic microscope has been placed.

4 Fig.: 4

(5) NSA-17(1963)-14754 RL

Nater, K.A., Verkerk, B. 1515
The Development of Plutonium-Containing Ceramic Fuels
(Atoomenergie en Haar Toepassingen, 4 (1962) S.291-2, 2 Fig.)

At Petten experience has been gained on the fabrication of uranium ceramics. Thus it was natural to undertake a study of plutonium ceramics. Initially only a small plutonium laboratory, containing about 10 glove boxes, is necessary for this programme. This is in the process of being installed. The boxes for chemical work are of an allplastic type; the boxes for the metallurgical work are of metal.

4 Fig.: 4

(4) NSA-17(1963)-14755 RL

Böhme, G., Köhler, W. 1516
Westeuropäische Forschungslaboratorien für hochradioaktive Stoffe
(Kerntechnik, 4 (1962) S.580-2, 1 Tab.)

Da jeder Umbau von heißen Zellen für ein anderes Arbeitsprogramm nur unter besonderen Schwierigkeiten möglich sein würde, hat sich auch in Europa das in den USA entwickelte Bauprinzip von ortsfesten, großräumigen Zellen mit maximal erforderlicher Abschirmung, hochentwickelten Beobachtungs- und Fernbedienungseinrichtungen sowie umfangreichen Installationen durchgesetzt. Diese Anlagen weisen im allgemeinen die notwendige Flexibilität auf und können den meisten Aufgaben angepaßt werden.

4 Tab.: 4

(4) NSA-17(1963)-6157 RL

Keim, O., Wildner, G.P. 1518
Isotopen-Box zur Obduktion radioisotopenhaltiger Leichen
(Isotopen-Technik, 2 (1962) S. 338-340, 3 Fig.)

Die Funktion einer solchen Box besteht darin, während der Obduktion jede unkontrollierte Verbreitung radioaktiver Substanzen und die unbemerkte Inkorporation aktiven Materials sowie die äußere Strahlenbelastung des Obduzenten auf ein Minimum zu verringern, ohne den Sektionsvorgang, der aus den gleichen Gründen in möglichst kurzer Zeit ablaufen muß, übermäßig zu behindern. Die Isotopen-Box, aus Plexiglas gefertigt, ist transportable, leicht, durchsichtig und abwaschbar. Mit Hilfe einer Manipulierumlaufbahn kann man schnell und ungehindert darin hantieren. Genormte, auswechselbare Elemente erlauben die Zuführung elektrischer Kraft-, Stark- und Schwachstrom-Anschlüsse für automatische bzw. halbautomatische Geräte für Operationen und Sektionen (Kalottensäge, Sprengklemme, Rippenschere,

4
Fig.:
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(4) NSA-17(1963)-8454 Forts. RL

Keim, C., Wildner, G.P. 1518 Forts.
Isotopen-Box zur Obduktion radioisotopenhaltiger Leichen
(Isotopen-Technik, 2 (1962) S. 338-340, 3 Fig.)

Wirbelsäulen-Schneidfräse usw.). In gleicher Weise können warmes und kaltes Wasser und Gas zugeführt sowie Spülwasser und Exsudat durch Absaugaggregate abgeführt werden. Leichte Bedienungsmöglichkeit durch den Sekanten im Innern der Box ist gegeben. Eine doppelt gesicherte Einsatzschleuse erlaubt ungefährdet die Zuführung von Instrumenten und sonstigem Material und die Entnahme von Organen. Die Box ist mit einer abnehmbaren Abzugsfilteranlage versehen. Durch Anschluß an eine Abzugsanlage wird die kontinuierlich einströmende Luft ständig abgesaugt.

4
Fig.:
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(4) NSA-17(1963)-8454 RL

Arcelli, G., Rosa, U., Scassellati, G.A. 1519
Descrizione di una cella calda per l'analisi chimica di materiali radioattivi
(Energia nucleare, 9 (1962) S. 472-80, 4 Fig.)

A description is given of the criteria followed in the design, construction, and assembling of a shielded hot cell intended for analytical chemistry work on radioactive substances, ß and γ emitters, and fission products. The external and the internal structure, the shielding and the handling devices, and all the facilities of the cell are described, with special regard to the ventilation and the radioactive waste collection systems.

3
4
Fig.:
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(6) NSA-16(1962)-30519 RL

Hanson, C., Kaye, D.A. 1520
Laboratory Nuclear Fuel Processing Plant
(Chemical and Process Engineering, 43 (1962) S. 113-6, 5 Fig.)

At the Bradford Institute of Technology a uranium solvent extraction unit has been specially designed, based on the mixer-settler principle. The unit is described in this article and its importance in a chemical engineering curriculum is stressed. The mixer-settlers are constructed in Perspex so that all the operations are visible. The three units consist respectively of 20, 20 and 16 stages. Uranium is highly toxic and strict precautions must be taken against ingestion.

4
Fig.:
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Forts.

(4) NSA-16(1962)-13132 RL

Hanson, C., Kaye, D.A. 1520 Forts.
Laboratory Nuclear Fuel Processing Plant
(Chemical and Process Engineering, 43 (1962) S. 113-6, 5 Fig.)

In the first instance, the hazard is isolated from the general laboratory by fencing the plant in a separate active area. Access is through a small change room where all personnel don overshoes, gloves and a laboratory coat. They leave the area by the same route and, after a thorough wash, monitor their hands and clothing to detect any contamination.

4
Fig.:
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(4) NSA-16(1962)-13132 RL

Mościcki, W., Zastawny, A. 1521
Apparatus Used in the Laboratory of Absolute Geochronology for Determining the Age of Samples by the ^{14}C Procedure
(Nukleonika, 7 (1962) S. 801-17, 8 Fig.)

In the newly organized laboratory of "Absolute Geochronology IBJ" the technique developed by de Vries and Barendsen (1952-53) was therefore applied. Consequently the proportional counter filled with pure CO_2 is now used as a detector. The whole chemical apparatus as well as electronics was constructed by the staff of the laboratory itself of materials manufactured in this country. Since only a small number of laboratories applies this technique, and some elements have been introduced in Gdańsk into the technical equipment of the laboratory it seems reasonable to give a more detailed description of the laboratory equipment notwithstanding that in principle the essential elements of this technique have been already published earlier.

4
Fig.:
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(4) NSA-17(1963)-10834 RL

Ruddy, J.M. 1523
How to Select Gamma Shielding Doors
(Nucleonics, 20, No. 6 (1962) S. 94-95, 5 Fig.)

Shield doors for hot cells, gamma-irradiation cells, x-ray machines and accelerators are available in a variety of configurations. If we know basic features and requirements of various door types, we can decide quickly the kind most likely to fulfill the needs of any particular facility. The choice of door type depends on user plans for cell arrangement, type of work anticipated and traffic access - as well as on door characteristics such as methods of support and motion, size, material, auxiliary shielding, price, drive mechanism and space needed.

4
Fig.:
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(3) NSA-16-19022 RL

Feldman, M.J., Lilienthal, J.R., Olsen, A.R., Dummer, J.E., Goertz, R.C., Steele, R.V., Duggan, H.G. 1526
Nucleonics Roundtable: Trends in Hot Cell Design
(Nucleonics, 21, No. 3 (1963) S. 66-71, 4 Fig.)

The Annual Hot Laboratory and Equipment Conferences are invaluable sources of information on new techniques and equipment for remote handling of intensely radioactive materials. It is evident from these conferences that various groups have developed divergent hot-cell-design philosophies, particularly for handling materials that are both alpha and gamma active. Nucleonics convened a panel of hot-laboratory experts, in conjunction with the Tenth Conference on Hot Laboratories and Equipment (Washington, D.C., November, 1962), to debate the pros and cons of these philosophies.

4
Fig.:
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(9) NSA-17-14434 RL

Hazards Control. Quarterly Report No. 8 (January-March 1962) 1528
(UCRL-6936 (1962) IV, 45 S., 18 Fig., 2 Tab.)

Building 171 Gloved Box Systems. Enclosures in this building are constructed of extruded aluminum frames with acrylic plastic (Plexiglas 5009) window panels. Eight-inch-diameter glove ports are mounted in the windows. Ports are fitted with Charleston 30-mil neoprene gauntlet gloves. Each port is equipped with an aluminum cover plate which is secured over the glove when the box is not in used. Argon is used as the inert atmosphere. Box exhaust is filtered by two high-efficiency filters in parallel. This report discusses techniques employed for determining leak rates in Bldg. 171 (Metallurgical Lab.) where special glove boxes are available for plutonium investigations.

UCRL-6936
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Fig.:
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Tab.:
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(5) NSA-16-30682 RL

Upson, U. L., Roberts, F. P. 1529
An In-Cell Gamma Analyzer
(TID-7629: Analytical Chemistry in Nuclear Reactor Technology. Fifth Conference, Gatlinburg, Tenn., October 10-12, 1961 (1962) S. 42-53, 8 Fig., 2 Tab.)

TID-7629
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Fig.:
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A close-coupled gamma spectrometer for viewing samples inside the hot cell has been utilized to provide analytical control in the Hanford Laboratories' High-Level Radiochemical Facility, yielding rapid and accurate isotopic analyses of undiluted samples. Two through-the-wall access tubes were utilized to accommodate two detectors, each of which views two sample positions. The two positions for each detector were designed to yield geometries differing by a factor of 10, and the two detectors were collimated to differ by about 100, yielding four sample positions in approximate decade steps.

(6) NSA-16-23618 RL

Ferguson, D. E. (Comp.) 1532
Transuranium Quarterly Progress Report for Period Ending August 31, 1962
(CRNL-3375 (1963) V, 54 S., 18 Fig., 14 Tab.)

The process-test facility will be located in cells 3 and 4 of Building 4507. Cell 4 will contain solvent extraction process equipment. The head-end equipment, consisting of a dissolver and the accompanying gas-handling equipment will be located in cell 3. The cell walls proper were coated with epoxy glass-fiber lining in preparation for the installation of piping and other process equipment. The equipment-removal cubicle, makeup-area equipment, and some cell process equipment are being built. Thirty-one protective coatings on steel and concrete were tested for their tendency to fix surface contamination. The Amercoat 66 epoxy system, not shown on the table, seems to be the most acceptable coating, so far.

CRNL-3375
4
5
Tab.:
5

(5) NSA-17-12183 RL

Ferguson, D. E. (Comp.) 1533
Transuranium Quarterly Progress Report for Period Ending February 28, 1962
(CRNL-3290 (1962) IV, 88 S., 52 Fig., 6 Tab.)

The scope of the Transuranium Processing Facility was changed from a $ 14,000,000 project to $ 8,700,000 in late September. In early November it was found necessary to modify the cell configuration at the west end of the cell bank to allow entry to the analytical cells directly through the rear of the cell. Both cells were decreased to 7 by 7.5 ft and a 4 by 7 ft shield access door was added in the rear wall. The pit area behind these cells is covered with 4-ft-thick shielding plugs. The current building layout is shown in Fig. 5.15.

CRNL-3290
2
4
Fig.:
2

Forts.

(5) NSA-16-23528 RL

Ferguson, D. E. (Comp.) 1533 Forts.
Transuranium Quarterly Progress Report for Period Ending February 28, 1962
(CRNL-3290 (1962) IV, 88 S., 52 Fig., 6 Tab.)

The equipment will be installed so that it may be removed by heavy duty manipulators, an impact wrench, and a crane mounted in the large equipment-removal cubicle located on the top of the cell bank. The equipment will be in a modular arrangement to allow relocation or replacement of all cell tanks in a standard support frame.

CRNL-3290
2
4
Fig.:
2

(5) NSA-16-23528 RL

Smith, R. J. (Ed.) 1534
Civil Engineering Bibliography on the Design and Construction of Nuclear Facilities
(NP-11896 (1962) IV, 66 S.)

A total of 459 references to unclassified reports and published literature is presented on civil engineering and architectural aspects of the nuclear field. The period from 1945 to early 1959 is thoroughly covered; later information is represented by several selected citations to bibliographies and publications of wide scope. An author index is provided.

NP-11896
1
2
3
4

(7) RL

Foster, M. S., Johnson, C. E., Crouthamel, C. E. 1536
Helium-Purification Unit for High-Purity Inert-Atmosphere Boxes
(ANL-6652 (1962) 17 S., 9 Fig.)

A device for purifying and recycling the helium atmosphere of two dryboxes having a combined volume of 60 ft^3 is described. Trace impurities are removed by passing the helium through a palladium-catalyst container and a molecular sieve bed, and then cooling to -195 °C before passing through an activated charcoal bed. Flow rates of 10 scfm and purity levels are estimated. Regeneration procedures are given.

ANL-6652
3
4

(7) NSA-17-10772 RL

Robertson, D. S. 1537
A Multi-Purpose Glove Box
(Nuclear Engineering, 8, No. 86 (1963) S. 236-7, 2 Fig.)

The system described in this article has been designed to reduce the inflexibility of protective systems and enable the safe handling of any type of radioactive material. The box is equipped with a pair of remote handling tongs for use with the platform at the lower level. They can be withdrawn to permit free movement of the platform to the upper level. A lead glass viewing panel is set into the protective wall above the tongs. Ventilation is through a filter system situated in the roof of the steel chamber within easy reach of the gloves for servicing.

4
Fig.:
4

(3) RL

Roussel, E., Vignesoult, N. 1538
Equipement de la cellule de métallographie No 10 du L.E.C.I.
(CEA-2256 (1963) 9 S., zahlr. Fig.)

1° - L'installation de la cellule de métallographie s'inscrit dans le cadre de l'évolution du L.E.C.I. vers des cellules facilement décontaminables grâce à l'implantation: a) d'un plan de travail facilement démontable, b) de petits appareils simples, posés sur le plan de travail. 2° - La facilité de manipulation des appareils a permis d'accroître notablement la cadence des échantillons métallographiques examinés.

CEA-2256
4
Fig.: 4

(5) NSA-17-22090 RL

Rousseau, P. 1539
Microscopie à haute température (1. Thèse)
(CEA-2082 (1961) 73 S., 32 Fig.)

Le but de ce travail est la réalisation d'un appareillage permettant l'observation à chaud et sous vide d'échantillons métalliques radioactifs. Cet appareillage fonctionne dans les conditions suivantes: - l'échantillon est chauffé sous une pression de l'ordre de 10^{-6} mm de mercure afin de limiter l'oxydation du matériau examiné. L'utilisation éventuelle d'un groupe de pompage pour ultra vide est prévue; - l'échantillon peut être porté à une température comprise entre quelques degrés et 1200 °C; - la température du four est régulée; - l'observation s'effectue soit en lumière polarisée soit en contraste interférentiel; - l'appareil

CEA-2082
4
Fig.: 4

(4) NSA-16-23839 RL

Forts.

Rousseau, P. 1539 Forts.
Microscopie à haute température (1. Thèse)
(CEA-2082 (1961) 73 S., 32 Fig.)

est disposé dans une boîte à gants afin d'assurer la protection de l'opérateur contre les poussières radioactives; les transformations $\alpha \nearrow \beta$, $\beta \nearrow \gamma$ de l'uranium ont été observées. Un film a été réalisé.

CEA-2082
4
Fig.: 4

(4) NSA-16-23839 RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

The hot cell contains and shields the high activity level chemical process equipment. The space for active process equipment is 35 ft long, 11 1/2 ft wide, and about 14 ft high. The hot-cell equipment is mounted on eleven racks; two spare racks have been included to permit future modification and expansion of the process system. The decontamination cell is 12 1/2 ft long, about 14 ft wide, and slightly less than 17 ft high; it is equipped with wash-down facilities. The decontamination cell has one shielding window, one pair of heavy-duty manipulators,

TID-7650 (Book I)
2
3
4
Fig.: 2
4

(9) NSA-17-28461 2 Forts. RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540 1. Forts
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

and special wall plugs duplicating the north-wall plug system in the hot cell. There are two doors in the decontamination cell; one to the decontamination area and one to the hot cell. The warm cell is equipped with glass shielding windows, a pair of manipulators for each of nine windows, and a single manipulator for the tenth window. The equipment also includes a General Mills No. 100 mechanical arm and a 3-ton hoist of the General Mills type, which are used primarily to assist in servicing the machines and transferring material. A plan of the ground floor of the

TID-7650 (Book I)
2
3
4
Fig.: 2
4

(9) NSA-17-28461 Forts. RL

Davidson, J.K., Orsenigo, G., Pedretti, A., Schafer, A.C. 1540 2. Forts.
PCUT, A Program for Recycle of Power Reactor Fuel
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.285-332, 19 Fig.)

process building is shown. The plant is ventilated by three separate systems: one services the areas where hot phases of the process are carried out, one the potentially contaminated (warm) areas of the processing building, and the third the cold area or office wing.

TID-7650 (Book I)
2
3
4
Fig.: 2
4

(9) NSA-17-28461 RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

To accomplish the objectives, four operating cells and two service cells will be required. The first floor plan of the building is shown. The four operating cells are arranged in a line with one of the service cells, which is to be used for decontamination and as a radiation lock, teeing off from the line at the point where the two large central cells join. Another service cell, to be used for storage of contaminated equipment, is located at the basement level and joins the Decontamination Cell via a hatch in the Decontamination Cell floor.

TID-7650 (Book I)
2
3
4
6
Fig.: 2
3
4

(8) NSA-17-28462 2. Forts. RL

Irvine, A.R., Lotts, A.L. 1541 1. Forts.
The Thorium Fuel Cycle Development Facility Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

All operating cells will have a common roof line; however, the floor level will vary to provide different inside cell heights. The lifeline of the cell complex is the transportation system. This consists of a pair of overhead bridge cranes which can travel over essentially all the area in the Glove Maintenance Room, Decontamination, Contaminated Fabrication, Mechanical Processing, and Chemical Cells. The window will consist of two major assemblies: a seal glass removable from inside the cell, and a shielding window removable from the non-radioactive side.

TID-7650 (Book I)
2
3
4
6
Fig.: 2
3
4

(8) NSA-17-28462 Forts. RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility Conceptual Design 2. Forts.
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

The window will be a composite unit consisting of approximately 6 in. of glass and 60 in. of zinc bromide solution. The cost of this facility is estimated to be $ 6 x 10^6 exclusive of process equipment but inclusive of manipulators, remote cranes, viewing windows, design, and inspection.

TID-7650 (Book I) 2 3 4 6 Fig.: 2 3 4

(8) NSA-17-28462 RL

Lotts, A.L., Sease, J.D., Brooksbank, R.E., Irvine, A.R., Davis, F.W. 1542
The Oak Ridge National Laboratory Kilorod Facility
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.351-83, 15 Fig., 1 Tab.)

The powder preparation equipment was designed to afford maximum dust confinement and to utilize gravity feed for transporting the fuel from one equipment unit to the next. All of the equipment in the powder preparation shaft, is remotely controlled, either electrically or by flexible shafts. Minor repairs to the equipment can be made in place through glove access ports. For major repairs, the equipment is mounted on movable racks in the front half of the shaft, and the offending piece of equipment can be removed by pushing the equipment rack to the rear and lifting the piece with a hoist to the glove maintenance area.

TID-7650 (Book I) 4 Fig.: 4

(8) RL

Coffman, R.T. 1543
Remote Control Manipulator
(U.S.Pat.3,065,864 (1961/1962) 2 S., 7 Fig.)

This invention relates to a remote-control manipulator for handling objects from behind a shielding wall. More particularly, the invention involves a manipulator of the above type in which a flexible shaft plays an important role. The present manipulator has the necessary three-dimensional movement and control of gripping jaws while being relatively low in cost and simple in construction and operation. This manipulator has two flexible shafts and a bent tube receiving them; the shafts have individual and joint rotation and joint longitudinal movement, and the tube having longitudinal movement and rotation.

U.S.Pat. 3,065,864 4 Fig.: 4

(4) NSA-17(1963)-8312 RL

Leroy, R., Fortin, A., Vertut, J., Fortin, M. 1544
Ball and Socket Joints for Remote Controls
(U.S.Pat.3,082,045 (1959/1963) 3 S., 9 Fig.)

The present invention has the object of providing improvements in ball and socket joints for remote controls, which permit virtually all friction to be eliminated and to generise the use of such joints in walls of large thickness.

U.S.Pat. 3,082,045 4 Fig.: 4

(7) NSA-17(1963)-16219 RL

Schouten, F. 1545
Remote Control Isotope Manipulator
(U.S.Pat.3,087,632 (1961/1963) 2 S., 8 Fig.)

This invention relates to a portable field device for lifting a high-intensity gamma radiation source from its shield (steel-jacketed lead cylinders) without exposing the personnel involved to harmful radiation.

U.S.Pat. 3,087,632 4 Fig.: 4

(4) NSA-17(1963)-25403 RL

Duthie, R.E.C., Sachs, F.L. 1546
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1.Rev., Suppl.15)(1962) 27 Bl.)

Cape-877: Manipulator Cell. The manipulator cell is shielded with 3 foot thick walls of high density concrete. Two rolling doors in the rear of the cell are 12 ft high, 6 ft 3 3/4 in. wide and 3 ft thick. These also are of high density concrete. There is a small lead door 1 ft 5 1/4 in. wide, 1 ft 2 3/4 in. high and 6 in. thick. The inside of the cell measures 5 ft 6 in. deep, 4 ft 9 in. wide and 7 ft high, but there is a tray across the cell 3 ft 6 in. from the floor. Forts.

TID-4100 (1.Rev., Suppl.15) Cape-877 1 4

(7) NSA-16-14846 RL

Duthie, R.E.C., Sachs, F.L. 1546
Supplemental Insert Sheets for Engineering Materials List Forts.
(TID-4100 (1.Rev., Suppl.15)(1962) 27 Bl.)

The stepped viewing window consists of a piece of plate glass 21 5/8 in. x 32 3/8 in. by 1 in; lead glass 19 in. x 30 in. by 8 1/2 in.; 3 non-browning lead glass panes, 22 in. x 32 in. x 9 in., 26 in. x 34 in. x 9 in., and 30 in. x 36 in. x 7 in.; and a sheet of non-browning lime glass 34 1/8 in. x 39 3/8 in. x 1 in. The cell is lined with a 3/16 in. stainless steel liner, stainless-steel-lined manipulator sleeves, a bridge trolley, and hoist are included. The set consists of 37 items including plot plans, structural, electrical and piping drawings.

TID-4100 (1.Rev., Suppl.15) Cape-877 1 4

(7) NSA-16-14[illegible] RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1547
Engineering Materials List. Cumulative Index Through Supplement 12
(TID-4100 (1st Rev.) Index 2 (1962) 149 S.)

This cumulative index to the Engineering Materials List (EML) covers the CAPE-numbered packages of engineering materials that have been announced in TID-4100 (1st Rev.) and Supplements 1 through 12. It completely supersedes all indexes issued previously. The Engineering Materials List is published by the U.S. Atomic Energy Commission to announce engineering materials which are available and were developed in conjunction with nuclear science projects undertaken by the AEC.

TID-4100 (1st rev.) Index 2 1 3 4

(7) NSA-16-30515 RL

Connolly, T. F. 1548
Bibliography on Nuclear Reactor Fuel Reprocessing and Waste Disposal. Vol. 5: Plants and Equipment
(CRNL-2971 (Vol. 5)(um 1962) 203 S.)

This volume includes Section 5.0 of eight sections of a bibliography on nuclear reactor fuel reprocessing and waste disposal. The collection will be a unit, and cross references are made between volumes. The complete collection includes about 7000 abstracts, nearly all from Nuclear Science Abstracts, representing books, bibliographies, symposia, journals, and contractors' topical reports. Most of the material dates from the 1955 Geneva Conference to the present.

CRNL-2971 (Vol. 5)
1
4

(5) NSA-16-30496 RL

Glove Box Installation at Aldermaston 1549
(Nuclear Engineering, 8, No. 86 (1963) S. 237-9, 2 Fig.)

The boxes are installed in four rows on the ground floor and are interconnected by an overhead conveyor tunnel on the floor immediately above. The whole installation provides a gas-tight closed system with a very high standard of sealing against possible leakage. The boxes operate with a reduced argon or nitrogen atmosphere. Each glove box has 10 1 in thick Perspex windows covering approximately 70 per cent of the total surface area of the box. Each box houses a miniature electric travelling crane capable of covering the whole of the working and transit area. The mild steel boxes are all finished internally with special protective paint treatment and provided with stainless steel anti-flood traps.

4
Fig.:
4

(3) RL

Glove Box Market. Products of Some Manufacturers 1550
(Nuclear Engineering, 8, No. 86 (1963) S. 239-41, 10 Fig.)

Die Handschuhkasten-Modelle zahlreicher Firmen werden kurz beschrieben. Abbildungen sind vorhanden.

4
Fig.:
4

(3) RL

Higatsberger, M. J. 1551
Österreichs Reaktorzentrum Seibersdorf
3. Untere Heiße Zelle. 4. Obere Heiße Zelle.
(Atomwirtschaft, 6 (1961) S. 7-8, 2 Fig.)

Über der unteren "heißen" Zelle befindet sich eine weitere Zelle, die trocken und nicht flutbar ist. Diese obere "heiße" Zelle dient zum Auf- und Abbau bestrahlter Experimente. Sie ist von der unteren "heißen" Zelle durch ein wasserdichtes Tor getrennt. Um möglichst vielseitige Verwendungsmöglichkeiten zu erzielen, ist die obere "heiße" Zelle mit einem von außen zu bedienenden 1-t-Kran, zwei Manipulatoren, einem entsprechenden Bleiglasfenster und allen nötigen Bedienungsanschlüssen, wie Strom, Wasser, Druckluft etc., ausgerüstet. Eine abhebbare Betonabdeckung im Bereich des Obergeschosses ermöglicht bei Einführung und Entnahme von Experimenten sowie für Instandhaltungsarbeiten den Zugang zur oberen "heißen" Zelle.

4
Fig.:
4

(3) RL

Meyer-Jungnick, W. 1552
Heiße Zellen und ihre Einrichtung. Bericht über die "Eighth Conference on Hot Laboratories and Equipment", San Francisco - 13. bis 15.12.1960.
(Atomwirtschaft, 6 (1961) S. 239-240)

Es wird ein kurzer Überblick über die Vorträge der Konferenz gegeben.

2
4

(4) RL

Koschany, G. 1553
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S. 565-580, 71 Fig., 16 Tab.)

Der vorliegende Beitrag befaßt sich primar mit den speziellen Problemen beim Bau von Laboratorien und Instituten, in denen mit Kernenergie gearbeitet wird und erwahnt die sonstige technische Einrichtung nur, soweit sie von grundsätzlicher Bedeutung und in diesem Zusammenhang interessant ist. Es sei hier auf die entsprechende Standardliteratur hingewiesen. Die Raumgruppierung unter dem Aspekt der Radioaktivität erfordert zunächst deren Einordnung in ein System der Strahlungsstärken, etwa mit folgenden Einheiten:

2
3
4
5
Fig.:
2
3
4
5

(6) Forts. RL

Koschany, G. 1553 Forts.
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S. 565-580, 71 Fig., 16 Tab.)

Bereich bis zu 10 μC, Bereich bis zu 100 mC, Bereich mehr als 100 mC ("heiße Zonen"). Der inaktive Teil des Labors sollte durch Schleusen und angegliederte Reinigungs- und Umkleideräume von der aktiven Zone getrennt sein. Über die Auswahl der Materialien für Fußböden, Wände, Decken sowie über Fenster, Turen, Luftung und Feuerlöschvorrichtungen wird berichtet.

2
3
4
5
Fig.:
2
3
4
5

(6) RL

Stewart, D. C. 1554
A Large-Scale Facility for Chemical Research With Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9: Analytical Chemistry, 3, P. 7 (1962) S. 238-65, 6 Fig., 4 Tab.)

The facility to be described in this chapter, the Chemistry Division's new hot laboratory at Argonne National Laboratory, is unique in several features. The new hot laboratory is attached to the rear of the Argonne Chemistry Building along an existing access driveway. A complicated ventilation system is probably the primary (and usually the most expensive) engineering feature distinguishing radiochemical from ordinary laboratory design. The main air supply is brought in at the service floor level where it is prefiltered, tempered, and conditioned. This supply is used for the offices, corridors, laboratories, shops, and cave areas. The remaining regions of the building

2
3
4
6
Fig.:
2
4
6

(6) Forts. RL

Stewart, D.C. 1554
A Large-Scale Facility for Chemical Research With Forts.
Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9:Analytical Chemistry, 3, P. 7 (1962) S.238-65, 6 Fig., 4 Tab.)

are ventilated separately. Essentially all of the glove 2
boxes and radiochemistry hoods as well as the associ- 3
ated duct-work are fabricated of glass-reinforced poly- 4
ester resin. Dimensions and details of the cave cells 6
are included. The three megacurie and the two large Fig.:
kilocurie cells are all similar in design. The primary 2
face of each has two working positions, with a third 4
window on the side wall away from the shielding door 6
and a fourth window in the back wall. All of the view-
ing windows are simple tanks cast directly in the wall.
These tanks are filled with concentrated zinc bromide
solution. Costs for the building, hoods, glove boxes and
shielding windows are shown.

(6) RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Les caractéristiques essentielles de ce bâtiment sont 2
les suivantes: Il comporte 4 tranches à peu près sembla- 3
bles d'environ 40 m x 50 m (alors que le projet initial 4
en prévoyait 6), 2 tranches étant disposées côte à côte, 5
les 2 autres étant symétriques des précédentes par rap- 6
port au grand côté des halls. L'ensemble mesure ainsi Fig.:
80 m x 100 m. Dans chaque tranche, 4 laboratoires 2
parallèles (14 m x 7, 8 m) sont compris entre le couloir 4
"personnel" et le couloir "matériel", un couloir trans-
versal permet en plus une communication directe entre
ces deux couloirs sans obliger à traverser les labora-
toires. L'air arrive par un diffuseur au centre du pla- Forts.
fond et par des bouches au-dessus de la porte d'entrée.

(7) NSA-17-23390 RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes Forts.
Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Chaque hall est divisé en 2 parties: l'une (7 m x 39 m) 2
de hauteur voisine de celle des laboratoires (4 m); 3
l'autre (11 m x 39 m) de grande hauteur (8, 50 m) 4
avec un pont roulant de 5 t. Le coût total de ce 5
bâtiment, sans les aménagements intérieurs spé- 6
cialisés se monte environ à 20 millions. Fig.:
2
4

(7) NSA-17-23390 RL

Artur, Y. 1556
"Armor"
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.17-21, 2 Fig.)

La chaîne Armor est une enceinte α γ construite dans 3
la partie sud-est du hall 010. C'est une chaîne linéaire 4
de huit boîtes à pinces dont la protection est assurée Fig.:
par un blindage de 10 cm de plomb, et l'étanchéité par 4
des boîtes de matière plastique. L'étanchéité est assurée
par des boîtes en lucoflex et plexiglas soudés qui se
trouvent dans chacune des cellules. Chaque boîte possède
à sa partie supérieure un filtre d'entrée et deux filtres
de sortie (filtres papier rose). Le filtre de sortie est
relié à une gaine de ventilation située sur le plafond
de l'enceinte. Cette gaine est elle-même reliée au
système général de ventilation des boîtes à gants.

(4) NSA-17-23469 RL

Artur, Y. 1557
"Gascogne"
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.23-27, 2 Fig.)

L'ensemble gascogne est constitué par deux enceintes 3
α γ. La chaîne complète a les dimensions extérieures 4
suivantes: - longueur, 17, 810 m; - largeur, 1, 470 m; - Fig.:
hauteur, 2, 310 m. Le système de ventilation adopté 4
permet l'appel d'air de la zone froide vers la zone tiède,
puis de la zone tiède vers la zone chaude. L'air est ensuite
aspiré à travers 2 filtres papier dans une gaine reliée à
la ventilation générale.

(4) NSA-17-23391 RL

Lheureux, C., Lefort, G. 1558
"Carmen". Chaîne de sorbonnes de radiochimie alpha, bêta, gamma
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.29-36, 7 Fig.)

Cet ensemble comprend quatre sorbonnes indépendantes, 4
accouplées par des sas α γ situés entre chaque cellule. 6
Les introductions et les sorties de matériel ont été Fig.:
groupées dans la première enceinte. Chaque poste de 4
travail consistue une véritable boîte à gants étanche,
complètement protégée par un blindage de 15 cm
d'acier. Toutes les ouvertures, y compris les sas,
ont une protection γ mobile et un système d'étan-
chéité α, généralement constitué par une manche
de chlorure de polyvinyle. Les opérations chimiques
sont réalisées: -

(5) NSA-17-23392 Forts. RL

Lheureux, C., Lefort, G. 1558
"Carmen". Chaîne de sorbonnes de radiochimie alpha, Forts.
bêta, gamma
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.29-36, 7 Fig.)

soit directement au moyen de manipulateurs Argonne 7; - 4
soit par l'intermédiaire d'accessoires motorisés. Une 6
description des cellules est donnée. Le prix de re- Fig.:
vient hors taxes de cette installation monte à 4
1000 000 F.

(5) NSA-17-23392 RL

Stratakis, J. 1559
L'état des recherches sur la télémanipulation dans le traitement des combustibles irradiés
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.37-42, 5 Fig.)

Les télémanipulateurs se répartissent en deux classes: 4
les manipulateurs dits "maître-esclave" où la seule Fig.:
énergie mis en jeu est celle de l'opérateur et les mani- 4
pulateurs que nous appellerons "mécaniques". Nous di-
rons tout de suite que les manipulateurs "maître-esclave"
sont inutilisables pour l'entretien à distance des instal-
lations industrielles, par suite de la faiblesse des efforts
transmissibles (de l'ordre d'une dizaine de kilos au
maximum). Deux types de manipulateurs mécaniques
ont été expérimentés au S.E.T.C.I.: des manipula-
teurs à moteurs électriques et des manipulateurs à
moteurs hydrauliques.

(3) NSA-17-23441 RL

Guillet, H. 1560
L'atelier pilote de traitement des combustibles irradiés. Description et caractéristiques générales
(Bulletin d'informations scientifiques et techniques, 1963, No. 68, S. 43-51, 6 Fig., 1 Tab.)

Le bâtiment principal, l'Atelier-Pilote est orienté 2
approximativement Nord-Sud et se présente sous la 4
forme d'un hall de 90 m x 20 m environ et d'une hau- Fig.:
teur de 15 m sous faîte. C'est dans ce hall que sont 2
situées les cellules abritant les récipients et tuyaute- 4
ries nécessités par le traitement industriel des com- Tab.:
bustibles irradiés et autour desquelles se trouve l'ap- 2
pareillage de contrôle et de commande. Entourent ce
hall sur ces faces Est, Nord et Ouest: 1. Au rez-de- RL
chaussée: -cinq laboratoires dont un laboratoire équipé
d'une chaîne de onze cellules destinées aux analyses sur
produits radioactifs α, β, γ et qu'un autre article de Forts.
cette même revue décrit plus en détails; -

(4) NSA-17-23442

Guillet, H. 1560
L'atelier pilote de traitement des combustibles irradiés. Description et caractéristiques générales Forts.
(Bulletin d'informations scientifiques et techniques, 1963, No. 68, S. 43-51, 6 Fig., 1 Tab.)

des locaux destinés à la décontamination et au travail 2
d'atelier sur pièces décontaminées; - un couloir, dit 4
"couloir actif", qui, par trois sas étanches α, dessert Fig.:
les cellules situées dans le hall. 2

(4) NSA-17-23442 4

Tab.:
2

RL

Scheidhauer, J. 1563
Laboratoire de chimie et radioprotection
(Bulletin d'informations scientifique et techniques, 1963, No. 72/73, S. 73-77, 2 Fig.)

Pour que les analyses, les comptages soient effectués 4
dans les meilleurs conditions, il importe de séparer Fig.:
rigoureusement les divers niveaux de radioactivité. 4
Nous avons consacré une première cellule aux prélèvements issus de l'extérieur du Centre, et, éventuellement, au contrôle des terrains et des eaux du Site, à l'exclusion des bâtiments où sont manipulés des radioéléments. Pour les échantillons de radioactivité moyenne, du type de celles des effluents et des contaminations accidentelles, un deuxième laboratoire est employé. Un matériel léger de radioprotection est utilisé: le port des gants et un équipement en sorbonnes à débit d'air important en constituent l'essentiel.

(3) NSA-17-41049 Forts. RL

Scheidhauer, J. 1563
Laboratoire de chimie et radioprotection Forts.
(Bulletin d'informations scientifique et techniques, 1963, No. 72/73, S. 73-77, 2 Fig.)

Enfin, dans des cas particuliers du contrôle et pour 4
des études sur des échantillons fortement actifs, un Fig.:
troisième type de cellule est nécessaire. Celle dont 4
nous disposons est constituée par un petit laboratoire chaud, équipé en boîtes à gants, boîtes à pinces et, bientôt, d'une sorbonne blindée avec télémanipulateur.

(3) NSA-17-41049 RL

Johnson, J.E. 1565
Disassembly of a High Level Plutonium Glove Box System
(Health Physics, 9 (1963) S. 433-41, 9 Fig., 2 Tab.)

Multi-gram quantities of plutonium and uranium had 4
been handled in the sixteen interconnected glove boxes 5
that comprised the glove box train. All sixteen boxes Fig.:
were separated along with all systems located externally 3
of the train, which they served. The process of complete 4
dismantlement required 8 weeks. Approximately 300 ft^3 of high level alpha dry active waste removed during this period along with hundreds of feet of both contaminated and non-contaminated pipe and tubing and all pumps, gauges and other regulatory devices. There were no incidents of either internal or external radiation exposure during this period, and only one incident of an uncontrolled release of high level alpha contamination.

(4) RL

Runnalls, C.J.C. 1566
Plutonium Fuel Program in Canada
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel (1962) S. 8.1-8.26, 20 Fig.)

A new plutonium laboratory at Chalk River has been HW-75007
completed recently. A schematic layout of the labora- 2
tory which measures some 2500 ft^2 in area is shown. 4
Equipment has been installed to permit alloy prepara- Fig.:
tion and metal-working, ceramic sintering and grind- 2
ing, corrosion testing, metallography and mechanical 4
testing. In figure 2, two sintering furnaces in the ceramic fabrication line may be seen. All of the glove boxes are constructed of stainless steel with plastic viewing panels. Their atmosphere is filtered air at a pressure of 1 inch H_2O below that in the laboratory.

(5) RL

Puechl, K.H. 1567
Plutonium Fuel Development Programs at Nuclear Materials and Equipment Corporation
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel (1962) S. 9.1-9.19, 15 Fig.)

Figure 1 is a plan view of the facility as it will look HW-75007
in December 1962 after completion of construction 2
of a 14,000 square foot addition. With this addition, 4
the building will contain 38,000 square feet of floor Fig.:
space. The building is divided into a front "clean" 2
area and a rear working area with these areas 4
separated by change rooms. The hot cell facility contains a relatively large hot cell with walls composed of high density concrete. This cell is capable of handling up to 200,000 curies of cobalt-60 equivalent and is equipped with removable alpha enclosures to permit operation with alpha-active materials without contamination of the cell proper. Forts.

(5) RL

Puechl, K.H. 1567
Plutonium Fuel Development Programs at Nuclear Materials and Equipment Corporation Forts.
(HW-75007: Proceedings. Plutonium as a Power Reactor Fuel (1962) S. 9.1- 9.19, 15 Fig.)

Also included in this facility are two steel cells. HW-75007
These also contain alpha enclosures and are used for 2
postirradiation examination of small specimens in- 4
cluding metallography and fission gas release and Fig.:
burnout determinations. 2

(5) 4

RL

Foote, F.G. 1568
Plutonium Metallurgy at the Argonne National Laboratory
(Coffinberry, A.S., Miner, W.N. (ed.): The Metal Plutonium. - Chicago: University of Chicago Pr. 1961. Chapter 6, S.63-69, 2 Fig., 2 Tab.)

A brief description of existing and planned plutonium- 2
handling facilities in the Metallurgy Division at ANL 4
follows: Building 200 is a small and very crowded Fig.:
physical metallurgy laboratory installed some years 2
ago in three modules in the F-Wing of the Chemistry 4
Building. It consists of a series of interconnected stainless-steel glove boxes, most of which operate with a highly purified recirculated helium atmosphere. A general view of the laboratory is shown.

(4) NSA-17-16555 Forts. RL

Foote, F.G. 1568
Plutonium Metallurgy at the Argonne National Laboratory Forts.
(Coffinberry, A.S., Miner, W.N. (ed.): The Metal Plutonium. - Chicago: University of Chicago Pr. 1961. Chapter 6, S.63-69, 2 Fig., 2 Tab.)

Building 350 is a versatile plutonium-fabrication 2
facility still under construction. The facility consists 4
of a series of glove boxes interconnected by means Fig.:
of a central conveyor system. Figure 2 shows the 2
general plan of the working area. The equipment is 4
housed in one large room, 70 x 160 feet, and again is a tight glove-box system with helium atmosphere in those boxes where fire is a hazard.

(4) NSA-17-16555 RL

Active Metallurgy 1569
(The Nuclear Energy Research Centre Studsvik. Stockholm: Lidhströms Tryckeri 1960. Bl.6-7, 2 Fig.)

The laboratory for active metallurgy is primarily in- 2
tended for studies of fuel elements and structural 4
materials irradiated in the R2 materials testing Fig.:
reactor. The radiation shield inside the laboratory 2
consists of about 1 m thick concrete walls. A special 4
ventilation system prevents circulation of air-borne activity. The radioactive material is handled inside seven hot cells. Five of these have a floor of 2 x 2 m and the other two 2.5 x 4 m. Each cell has an inside height of 4 m. Through specially constructed shielding windows it is possible to view the active samples without danger from the radiation. The active material is handled by using remotely operated manipulators. The floor space in the laboratory is 1440 m^2 of which the cells only occupy 100 m^2. (4) RL

Siewert, G. 1571
Laborbau und Laboreinrichtung - technischer Strahlenschutz in Arbeitsräumen
(Kernenergie, 6 (1963) S.428-436, 10 Fig.)

Es wird eine Übersicht über Entwicklung und Stand des 2
Laborbaus in der DDR bei der Einrichtung von Labora- 3
torien für Arbeiten mit radioaktiven Stoffen gegeben. 4
Die abgebildeten Abzüge zeigen als Besonderheit - Fig.:
an den Ständen sichtbar - zusätzliche Lüftungsklappen, 2
die sich in Abhängigkeit von der Stellung des Abzugs- 4
fensters mehr oder weniger öffnen oder schließen. Sie halten so die über die Entlüftung des Abzuges abgesaugte Luftmenge konstant, ohne die Strömungsgeschwindigkeit der Luft in den Arbeitsöffnungen unzulässig zu erhöhen. Der Innenraum der Abzüge, die Fensterrahmen und das Armaturenbrett sind aus feingeschliffenem, nichtrostendem Stahlblech in Schweißkonstruktion hergestellt. Forts.

(5) NSA-17(1963)-39229 RL

Siewert, G. 1571
Laborbau und Laboreinrichtung - technischer Strahlenschutz in Arbeitsräumen Forts.
(Kernenergie, 6 (1963) S.428-436, 10 Fig.)

Die Fenster wurden teils aus organischem Glas (Pia- 2
cryl), teils aus Sicherheitsglas hergestellt. Bei hei- 3
ßen Zellen ist die Arbeitszone eine hermetische Kam- 4
mer aus nichtrostendem Stahl. Auf der Operatorseite Fig.:
trägt sie ein Fenster, dem in der Strahlenschutzwand 2
ein Strahlenschutzfenster aus Bleiglas gegenübersteht. 4
Eine Schleusenanlage für 7 männliche und 7 weibliche Beschäftigte wird beschrieben. Der Grundriß ist abgebildet.

(5) NSA-17(1963)-39229 RL

Lead for Radiation Shielding. No. 3: Design and Erection of Space Shielding. London: Lead Development Ass. 1964. 19 S., 12 Fig., 1 Tab. 1572

The use of lead, rather than other constructional mate- 4
rials, to provide the necessary additional shielding Fig.:
for the walls, floors and ceilings of existing buildings 4
will result in a considerable saving of the available floor space. The addition of lead to an existing flat surface involves no design problems, although special care is required at corners between two surfaces or at breaks in the surfaces i.e. where doors and vents occur.

(3) RL

Lead for Radiation Shielding. No. 4: Local Moveable Shields. London: Lead Development Ass. 1964. 12 S., 3 Bl., 5 Fig. 1573

Local moveable shields are required by hospitals and 4
factories, and by laboratories which handle radio- Fig.:
active materials for research purposes, process 4
and package them for sale to the medical establishments and industry, or treat them for safe disposal. The shields - which must be of a flexible design that is easy both to erect and dismantle - are needed to cover the removal of radioactive materials from their containers, and subsequent examination, manipulation or treatment by remote control. A lead-brick construction meets all these requirements, and this booklet describes the individual brick systems, and the advantages to be gained by using the standard units now available.

(3) RL

Automatic Fuel Can Welding 1574
(Nuclear Engineering, 7, No. 73 (1962) S.251, 1 Fig.)

The machine comprises two units, a manipulator with 4
welding head and a control unit with a built-in power Fig.:
source giving a pure sine-wave output at all values 4
from 2 A to 200 A; the control gear can be used with d.c. if required. The manipulator and welding head can be turned through 90° if required, and provide for workpiece rotation, change of angle of the torch, movement of the torch to or from the welding area and, if required, automatic machining of the weld preparation and setting of the electrode gap.

(3) RL

Safe-Handling Cabinet 1575
(Nuclear Engineering, 7, No. 73 (1962) S. 252, 1 Fig.)

Originally designed to comply the regulations concerning the luminizing of instrument dials, the "Pandect" cabinet is now being marketed for general industrial and laboratory use where the handling of active or toxic substances, or the examination of specimens under clinical conditions is required. Of convenient design, with "angled" gloves and elbow-rests, the cabinet is internally lit by fluorescent tubes and provided with a viewing port of 70 in^2 (451 cm^2). Long-life "Harwell" sub-micron filters are provided for incoming and outgoing air and the fan provides a negative pressure of 1/4 in (6.35 mm) w.g. within the cabinet.

4 / Fig.: 4

(3) RL

Kelsch, R.D. 1579
A Machine for Cutting Radioactive Materials
(DP-769 (1962) 10 S., 7 Fig.)

A remotely operable cutting machine was developed for cutting specimens of radioactive materials for metallographic examinations and chemical studies in a hot cell. The vise of the machine will clamp materials of various sizes and shapes ranging from a 1/4-inch cube to a 3-1/2 x 35-inch bar. Auxiliary clamping devices are not needed. Either an abrasive or diamond wheel may be used for cutting. The materials are cut under water in a box to contain radioactive waste. The machine is operated with the master-slave manipulators, and can be installed or removed from the cell by remote handling techniques.

DP-769
4 / Fig.: 4

(4) NSA-16(1962)-30512 RL

Egnor, W.D., Romine, G.L. 1580
Sample Can Handling Mechanism
(U.S. Pat. 3, 090, 480 (1952/1963) 3 S., 10 Fig.)

This invention relates generally to remotely operated manipulative devices, and in particular it pertains to a turntable assembly used in conjunction with the processing of radioactive or otherwise toxic material.

U.S. Pat. 3, 090, 480
4 / Fig.: 4

(5) NSA-17(1963)-21869 RL

Cherel, G., Forey, H. 1581
Remote-Controlled Manipulating Apparatus
(U.S. Pat. 3, 090, 500 (1960/1963) 3 S., 2 Fig.)

A "telemanipulator" comprising a first group of control units disposed outside the sealed chamber and actuating a second group of corresponding operating units disposed inside the chamber, in which the connections between the control units and the operating units of each group were effected by rotary movement transmission means of a known type comprising two rotary magnets disposed one on each side of a wall of non-magnetic material, was characterized in that the outer control magnets were actuated by rotary members capable of being displaced parallel to the non-magnetic wall bounding the sealed chamber.

U.S. Pat. 3, 090, 500
4 / Fig.: 4

(5) NSA-17(1963)-29062 RL

Saunders, C.E. 1583
Remote Control Manipulator
(U.S. Pat. 3, 065, 863 (1961/1962) 5 S., 10 Fig.)

It is an object of the present invention to provide an improved remote control manipulator in which the reach of axial extension of the slave arm is significantly extended without detracting from the normal corresponding operations of master and slave arms. It is a further object of the invention to provide a manipulator that permits axial extension of the slave arm relative to the master arm. Additionally, it is an object of the invention to provide a remote control manipulator of greater versatility without the necessity of changing the tape lengths linking the master and slave arms.

U.S. Pat. 3, 065, 863
4 / Fig.: 4

(4) NSA-17(1963)-4659 RL

Oppenheimer, P., Martin, M. 1586
Master and Slave Manipulators
(Brit. Pat. 917, 545 (1960/1963) 3 S., 3 Fig.)

A manipulator for the purpose specified comprising a pair of manually operable and relatively movable arms, means for translating relative movement of the arms into movement of a piston within a master cylinder, a pair of relatively movable grippers, a slave cylinder containing a piston, means for translating movement of the piston in the slave cylinder into relative movement of the grippers, a hydraulic circuit interconnecting the master and slave cylinders, and servo mechanism connected in the hydraulic circuit, whereby pressure applied to the piston in the master cylinder will result in a magnified pressure being applied to the piston in the slave cylinder.

Brit. Pat. 917, 545
4 / Fig.: 4

(5) NSA-17(1963)-12408 RL

Leroy, R., Fortin, A., Vertut, J., Fortin, M. 1588
Improvements in or Relating to Pivot Mountings for Remote Controls
(Brit. Pat. 928, 052 (1959/1963) 4 S., 9 Fig.)
(Brevet fr. 799, 484 (1959))
(Brevet fr. 824, 985 (1960))

A ball and socket joint for passing a remote control through a sealing wall, comprising a sphere of radiation-absorbent material wholly or partly encased in a casing of hard material, a diametrical passage arranged to receive a control-carrying shank member and provided with race means formed in the hard casing symmetrically with respect to a great circle of the sphere, the sphere being supported by first bearing means engaging the race means and permitting rotary movement of the sphere

Brit. Pat. 928, 052
Brevet fr. 799, 484
Brevet fr. 824, 985
4 / Fig.: 4

(9) NSA-17(1963)-27522 Forts. RL

Leroy, R., Fortin, A., Vertut, J., Fortin, M. 1588 Forts.
Improvements in or Relating to Pivot Mountings for Remote Controls
(Brit. Pat. 928, 052 (1959/1963) 4 S., 9 Fig.)
(Brevet fr. 799, 484 (1959).)
(Brevet fr. 824, 985 (1960).)

about an axis perpendicular to the race means and passing through the centre of the sphere and being supported through the first bearing means by second bearing means, permitting the sphere and the first bearing means to pivot about a vertical axis passing through the centre of the sphere.

Brit. Pat. 928, 052
Brevet fr. 799, 484
Brevet fr. 824, 985
4 / Fig.: 4

(9) NSA-17(1963)-27522 RL

Ainsworth, A. 1589

Improvements in or Relating to Manipulating Devices
(Brit. Pat. 931, 729 (1960/1963) 4 S., 7 Fig.)

This invention relates to manipulators of the kind comprising an arm assembly supported on and slidable in a pivot, the arm assembly having at one end an operating mechanism and at the other end a manipulating mechanism responsive to the operating mechanism. Such devices find common use in the handling of radio-active or toxic materials, a common form of the device providing ong facilities by an arm supported on and slidable in a ball socket.

Brit. Pat. 931, 729 — 4 — Fig.: 4

(4) NSA-17(1963)-32237 RL

Bagnall, K. W., Robertson, D. St. 1590

Equipment for Handling Dangerous Substances
(U.S. Pat. 3, 038, 787 (1959/1962) 2 S., 8 Fig.)

According to the present invention, equipment for use in carrying out operations on or treatments to a toxic substance comprises a gas tight chamber substantially circular in plan, a window of transparent substance in the wall of the chamber, glove-ports in the window, a table within the chamber below the level of the glove-ports and is characterised in that a port is provided in the table and ports are provided in the base plate of the chamber with which said port in the table may be brought into register by relative rotation of the table and the chamber whereby articles or substances can be introduced or withdrawn from the chamber through said ports when in register.

U. S. Pat. 3, 038, 787 — 4 — Fig.: 4

(5) NSA-16(1962)-20585 RL

Jackson, D. 1593

Master and Slave Manipulating Arrangements
(Brit. Pat. 929, 352 (1959/1963) 4 S., 2 Fig.)

An arrangement comprising a manipulating device for the remote handling of objects and having a master portion which can be controlled and moved by an operator and a slave portion which moves in dependence upon movements imparted to the master portion by the operator, or by actuation of controls on the master portion, and a viewing device arranged to view the tongs or other manipulating part of the slave portion, said viewing device being mounted for movement with movement of the slave portion of the manipulator so that the viewing device automatically views the manipulating part of the slave portion despite movements of the latter.

Brit. Pat. 929, 352 — 4 — Fig.: 4

(4) NSA-17(1963)-27527 RL

Jenks, L., Viner, H.S.G. 1594

Improvements in or Relating to Remote Operating Tools
(Brit. Pat. 931, 441 (1958/1963) 5 S., 4 Fig.)

This invention relates to reachers or long arm devices, such as are used to reach inaccessible articles, including particularly such devices as are intended for handling and manipulating articles or substances which are separated from the operator by means of protective walls or screen. An example of this is the handling of isotopes and other radio-active substances and the control of radio-active apparatus or machines. For convenience such devices will be referred to hereinafter as "long-arm reachers" or simply as "reachers".

Brit. Pat. 931, 441 — 4 — Fig.: 4

(5) NSA-17(1963)-32231 RL

Jenks, L., Viner, H.S.G. 1595

Improvements in or Relating to Remote Operating Tools
(Brit. Pat. 931, 442 (1958/1963) 3 S., 1 Fig.)

This invention relates to remote operating tools or devices such as are used for handling articles or apparatus at a position which is separated or screened from that of the operator. In laboratory and other work involving the use of radio-active materials or apparatus it is common to make use of a protective wall or screen, which is interposed between the source of radio-activity and the operator. The latter then carries out the necessary operations by means of a tool or mechanism having jaws or other gripping or actuating elements (hereinafter referred to as "jaws") on one side of the wall or screen, which are operated by manipulations carried out by the operator on the other side thereof.

Brit. Pat. 931, 442 — 4 — Fig.: 4

(5) NSA-17(1963)-32232 RL

Jenks, L., Viner, H.S.G. 1596

Improvements in or Relating to Remote Operating Tools
(Brit. Pat. 931, 443 (1958/1963) 4 S., 2 Fig.)

A long arm reacher comprising an arm having a head at one end carrying relatively movable jaws for engaging and gripping an article to be handled, a handle unit at its other end including a pair of relatively movable handles and means operatively connecting the handle unit with the head for operating the jaws, wherein for convenience in use the angular position of the handle unit relatively to the arm is adjustable without such adjustment substantially affecting the range of movement of the jaws produced by operation of the handles.

Brit. Pat. 931, 443 — 4 — Fig.: 4

(5) NSA-17(1963)-32233 RL

Jenks, L., Viner, H.S.G. 1597

Improvements in or Relating to Remote Operating Tools
(Brit. Pat. 931, 444 (1958/1963) 3 S., 2 Fig.)

A long arm reacher comprising three arm sections which are rigidly connected together at their ends at fixed angles to each other such that when the reacher is used to operate over a wall with the intermediate one of its sections extending across the top of the latter, another of the arm sections, which carries at its free end a head having jaws for engaging an article to be handled, extends down on one side of the wall, while the third arm section, which carries an actuating member for operating the jaws, extends down on the other side of the wall, connecting means being provided between the actuating member and the head such that operation of the actuating member on one side of the wall operates the jaws on the other side thereof.

Brit. Pat. 931, 444 — 4 — Fig.: 4

(5) NSA-17(1963)-32234 RL

Mettetal, J.-C., Fritz, G. 1599

Greifvorrichtung
(DBP 1, 162, 529 (1960/64) 12 S., 12 Fig.)
(Br. fr. 801, 344 (1959))
(Brit. Pat. 915.633 (1959/63) 8 S., 12 Fig.)

The invention relates to a handling apparatus adapted to position, convey or remove an article inside a chamber which can be reached only through a duct, and is particularly adapted for the remote handling of fuel elements in a nuclear reactor.

DBP 1, 162, 529 — Br. fr. 801, 344 — Brit. Pat. 915.633 — 4 — Fig.: 4

(7) NSA-17(1963)-12403
NSA-18(1964)-22216

RL

American Machine & Foundry Company **1600**
Force Multiplier Heavy Duty Manipulator Handle
(Brit. Pat. 918, 649 (1960/1963) 5 S., 5 Fig.)
(U.S. Pat. 19277 (1960).)

Brit. Pat. 918, 649 U.S. Pat. 19277 4 Fig.: 4

This invention relates to a method of multiplying a force, e.g., a gripping force, to tension a cable and to a device for carrying out the method. According to the invention a method is provided for multiplying a force, e.g., a gripping force, to tension a cable in two separate stages by means of a force transmitting device to which the cable is coupled and in which the gripping force is multipled by means of a mechanical transmission comprising two arrangements of linkwork having different leverage effects, characterized by shifting from the lower to the higher of the two leverage effects after applying an initial tension to the cable through the lower leverage effect.
(5) NSA-17(1963)-16204 RL

Grant, J. **1601**
Improvements in or Relating to Remote Handling Tongs
(Brit. Pat. 925, 596 (1960/63) 2 S., 6 Fig.)

Brit. Pat. 925, 596 4 Fig.: 4

This invention relates to remote handling tongs and is particularly concerned with tongs adapted to engage the end of a rod-like article, such as a nuclear radiation source tube. According to the invention, a handling tong comprises a pivoted hand grip portion, a rod connected to, and axially moveable by, said grip portion, a hollow shaft, a sleeve attached to the operative end of said shaft, a sliding member within said sleeve, two bell crank levers pivoted on the sliding member and operable, by a first axial movement of the rod, to engage the end
(4) NSA-17-(1963)-29055 Forts. RL

Grant, J. **1601** Forts.
Improvements on or Relating to Remote Handling Tongs
(Brit. Pat. 925, 596 (1960/63) 2 S., 6 Fig.)

Brit. Pat. 925, 596 4 Fig.: 4

of a rod-like article and means whereby a second and further axial movement of the rod will retract said sliding member further into the sleeve until a shoulder on the article abuts the end of the sleeve.
(4) NSA-17(1963)-29055 RL

Graf, P., Metzger, K., Stöhr, R. **1603**
Der Bau des Hot- und Isotopenlaboratoriums
(Neue Technik, 5, No. 9 (1963) S. 490-497, 6 Fig.)

2 3 4 Fig.: 2 4

Der Gebäudekomplex des Hot- und Isotopenlaboratoriums (Erdgeschoßfläche 2120 m^2, umbauter Raum 22170 m^3) wurde entsprechend den in den verschiedenen Räumen gehandhabten Aktivitäten und den daraus zu folgernden Gefahrenmomenten in verschiedene Zonen unterteilt (Inaktiver Gebäudetrakt, Radiochemietrakt, Hotzellentrakt). Die Anlage und Installationen der in sich geschlossenen Gebäudetrakte werden beschrieben.
(7) NSA-17(1963)-5448 RL

Smith, A.M. **1604**
Improvements Relating to Gripping Devices
(Brit. Pat. 922, 968 (1960/63) 2 S., 2 Fig.)

Brit. Pat. 922, 968 4 Fig.: 4

According to the present invention, a remotely operable grab has two interfitting relatively rotatable tubes each carrying adjacent corresponding ends, an internal jaw plate with an eccentric aperture, the jaw plates being disposed to overlie one another with the apertures overlapping so that by relative rotation of the tubes under remote control the unmasked area of the overlap is variable for closing the jaw plates around an article to be grasped.
(4) NSA-17(1963)-20137 RL

McFarlane, K. **1605**
Improvements in Universal Mountings for Manipulating Extending through Radiation Shielding Walls
(Brit. Pat. 918, 183 (1960/63) 2 S., 3 Fig.)

Brit. Pat. 918. 183 4 Fig.: 4

This invention is concerned with a universal mounting whereby motion may be transmitted through the shielding wall of an enclosure containing radioactive material. The present invention provides a universal mounting for the above stated purpose which includes no gaps affording a direct path for passage of radiation through it and comprises an inner sphere, having in it a centred hole to accommodate the manipulator and rotatable about a first axis in relation to a surrounding shell having spherical inner and outer housing which can be fitted to an aperture in the shielding wall.
(4) NSA-17(1963)-12411 RL

Dachkevitch, V. **1606**
Travelling Crane for Precise Operation
(Brit. Pat. 917, 137 (1963)
(Br. fr. 764, 922 (1958/63) 5 S., 3 Fig.)

Brit. Pat. 917, 137 Br. fr. 764, 922 4 Fig.: 4

The present invention relates to a travelling crane for precise operation in which precision is obtained automatically without intervention by the operator for adjusting the position of the mobile elements. This apparatus may be employed for performing cycles of operation automatically or semiautomatically. It may also serve for handling dangerous substances, for example, radioactive substances, because the operator can control operation from a protective shelter which prevents him from seeing the apparatus in operation.
(5) NSA-17(1963)-12407 RL

Graf, P., Greter, P., Stauffer, M., Suter, K.H. **1607**
Konstruktion und Bau der Hotzellen
(Neue Technik, 5, No. 9 (1963) S. 497-503, 6 Fig., 3 Tab.)

4 Fig.: 4 Tab.: 4

Die 5 Hotzellen bilden in reihenförmiger Anordnung einen freistehenden, zusammenhängenden Hotzellenblock von 19, 5 m Länge, 4, 4 m Breite und 4, 8 m Höhe. Die Abschirmung ist an der Frontwand 90 cm dick, an den Rück- und Seitenwänden des Zellenblocks 100 cm zwecks Kompensation eingebauter Leitungsrohre; die Decke ist 70 cm stark. Die abgeschirmte Arbeitsfläche von 17, 4 x 2, 5 m ist durch bewegliche Zwischenwände in 5 Heiße Zellen unterteilt. Die Abschirmungsberechnungen fur die Hotzellen verlangten als Fullbeton zwischen den Stahlblechverschalungen Schwerbeton verschiedener Dichten, entsprechend der geforderten Abschirmwirkung und den gegebenen geometrischen Verhältnissen.
(6) NSA-18(1964)-5449 RL

Vidal. P. 1608
Electro-Magnetic Gripping Device
(Brit. Pat. 907, 634 (1959/62) 2 S., 1 Fig.)
(Br.fr. 808, 994 (1959))

Devices of this type are generally not adapted for gripping or handling articles or elements of small dimensions and it is an object of this invention to fill this gap by providing a gripping device particularly suitable for manipulating small objects, especially when such objects are of such a nature that, for various reasons, they should not come into contact with the operator's hands. This is the case when radiation sources are concerned.

Brit. Pat. 907, 634
Br.fr. 808, 994
4
Fig.: 4

(5) NSA-17(1963)-12401 RL

Vosahlik, L. 1609
An Apparatus for Automatic Conveying of Radio-Active Preparations During Measuring
(Brit. Pat. 905, 220 (1959/62) 3 S., 3 Fig.)

This invention relates to an apparatus for automatic conveying of radio-active preparations during measuring, said apparatus being adapted to pick up the radio-active preparations from a first container, to put them under a feeler adapted to measure their radioactivity and to carry the measured preparations into a second container. The object of such devices is to dispense with hand treatment of preparations and to replace manual work during measurement.

Brit. Pat. 905, 220
4
Fig.: 4

(4) NSA-17(1963)-12400 RL

Douis, M., Laurent, H. 1613
Improvements in or Relating to Autoclaves
(Brit. Pat. 896, 465 (1959/62) 4 S., 4 Fig.)

The invention relates to autoclaves, that is to say apparatus for carrying out sterilisations, for example of instruments or substances, by heating the latter to sterilisation temperatures above 100° and for a period sufficient to kill the microbes, bacteria and like organisms. The principal object of the invention is to render autoclaves such that they can be used to carry out the sterilisation of radioactive substances, and in particular radioactive substances emitting gamma rays, without danger for the operator.

Brit. Pat. 896, 465
4
Fig.: 4

(5) NSA-16(1962)-19025 RL

Cogez, P., Humbert, J. 1614
Improvements in or Relating to Airtight Dismountable Enclosures
(Brit. Pat. 926, 226 (1959/63) 3 S., 5 Fig.)
(Br.fr. 812, 696 (1959).)

The invention relates to airtight dismountable enclosures, for example intended for use as "glove boxes" for the manipulation of radioactive products (plutonium, etc.) or for permitting work to be done in vacuum or controlled atmospheres.

Brit. Pat. 926, 226
Br.fr. 812, 696
4
Fig.: 4

(6) NSA-17(1963)-29057 RL

Pictet, J.-M. 1615
Calculs des protections pour les cellules chaudes
(Neue Technik, 5, No. 9(1963) S. 504-08, 3 Fig., 3 Tab.)

Les calculs de protection présentés ont servi à établir les épaisseurs et densités de béton nécessaires pour les parois des cellules chaudes; ces cellules étant achevées, il a été possible de procéder à une vérification expérimentale de la protection. Nous avons calculé que la densité du béton exigée pour les cellules de 1000 curies de Co-60 était de 3, 15 g . cm^{-3} pour une épaisseur de mur de 90 cm; le taux de dose derrière la protection devrait alors être de 2, 5 mr/h.

4
Fig.: 4

(3) NSA-18(1964)-6410 RL

Prest, R.J. 1616
Apparatus for Manipulating Radioactive Material
(Brit. Pat. 904, 988 (1960/62) 6 S., 10 Fig.)

According to the invention there is provided apparatus for manipulating a container for a quantity of radioactive material, for transferring said container between first and second shielding devices, comprising first and second tubular guide means for said container, each of said guide means being adapted to lead at one end to one of said shielding devices.

Brit. Pat. 904, 988
4
Fig.: 4

(4) NSA-16(1962)-30351 RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1617
Apparatus for Cathodic Etching Objects
(Brit. Pat. 903, 790 (1959/62) 6 S., 9 Fig.)
(U.S. Pat. 786, 516 (1959).)

Apparatus for cathodic etching of an object including a chamber within which said object is mounted in a gas at low pressure which may be as low as 1 micron but is usually between about 20 and 300 microns and means connected to said object for producing an ionising electric discharge to said object as a cathode characterised by that the object is embedded in an insulator which exposes only a predetermined limited portion of the total surface area of said object to be etched to the ionizing electric discharge.

Brit. Pat. 903, 790
U.S. Pat. 786, 516
4

(5) NSA-16(1962)-30526 RL

Landon, E.R. 1620
Improvements in or Relating to Gas-Tight Chambers for Handling Toxic Substances
(Brit. Pat. 928, 849 (1960/63) 2 S., 2 Fig.)

This invention relates to equipment for use in carrying out operations on, or treatments to a toxic substance. According to the invention equipment for use in carrying out operations on or treatments to a toxic substance comprising a gas tight chamber, a posting port and a window of transparent substance in the wall of the chamber and glove ports in the window, is characterised in that the chamber is mounted for rotation about its central vertical axis. Preferably the chamber rotates about a relatively fixed hollow spindle.

Brit. Pat 928, 849
4
Fig.: 4

(4) NSA-17(1963)-27526 RL

Karinen, R., Figenshau, J., Hainer, W., Sullivan, R., Hamernik, R., Hakomaki, R., Novak, A. 1621
Remote Handling Technology and Equipment Investigation
(AFSWC-TDR-62-117 (1962) XI, 222 S., 84 Fig., 6 Tab.)
(AD-290750)

The subject of remote handling is discussed. A general description of the types of remote handling equipment in existence, illustration and specifications of standard manipulators available, lists of remote handling equipment manufacturers throughout the world and a comprehensive bibliography of available literature are presented. Technological progress and advanced developmental concepts in the field of remote manipulation are also described. (auth)

AFSWC-TDR-62-117
AD-290750
4
Fig.: 4
Tab.: 4

(11) NSA-17(1963)-8273 RL

Johnson, J.E. 1622
Disassembly of a High Level Plutonium Glove Box System
(TID-16203 (1962) 25 S., 9 Fig., 4 Tab.)

Dismantling operations of the Plutonium Metallurgy Research Laboratory, first put into operation seven years ago at Argonne National Laboratory, began on September 16, 1961. Multi-gram quantities of plutonium and uranium had been handled in the sixteen interconnected glove boxes that comprised the glove box train. All sixteen boxes were separated along with all systems located externally to the train which they served. The process of complete dismantlement required eight weeks.

TID-16203
4
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Fig.: 4

(5) NSA-17(1963)-10866 Forts. RL

Johnson, J.E. 1622 Forts.
Disassembly of a High Level Plutonium Glove Box System
(TID-16203 (1962) 25 S., 9 Fig., 4 Tab.)

Approximately 300 ft^3 of high level alpha dry active waste was removed during this period along with hundreds of feet of both contaminated and non-contaminated pipe and tubing and all pumps, gauges, and other regulatory devices. There were no incidents of either internal or external radiation exposure during this period and only one incident of a gross spread of alpha contamination.

TID-16203
4
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Fig.: 4

(5) NSA-17(1963)-10866 RL

Ruddy, J.M. 1623
Design and Fabrication of Metal Work for Two High Intensity Radiation Experimental Cells
(BNL-5850 (1961) 13 Bl., 6 Fig.)

Metal work required in the construction of a hot cell is discussed. Two hot cells built for fundamental and development research work in the field of the effects of larger quantities of ionizing radiation on substances packaged and unpackaged are described. (auth)

BNL-5850
4
Fig.: 4

(4) NSA-17(1963)-6204 RL

Swanton, W.F., Hyman, M.L. 1625
Liquid Radioactive Waste Disposal Facility. A Final Engineering Report
(NP-11496 (1962) VII, 40 S., 11 Fig., 10 Bl. Tab.)
(AD-273977)

The facility is a self-contained, transportable, semi-automatic assembly of monitoring, feed, and residue tanks, pumps, control panel, and ancillary equipment mounted on a skid. The site for the facility should be at least 20 ft x 16 ft in size and essentially level. It should be capable of supporting 200 lb/sq ft of live loads or 6000-pound concentrated loads under the leveling lugs. Head-room over the area should be 13 ft with additional room over the evaporator, E-1, for removal and installation of the rotor and drive assembly.

NP-11496
AD-273977
4
5
Fig.: 4 5
Tab.: 4 5

(7) NSA-16(1962)-18705 RL

Swanton, W.F., Hyman, M.L. 1625 Forts.
Liquid Radioactive Waste Disposal Facility. A Final Engineering Report
(NP-11496 (1962) VII, 40 S., 11 Fig., 10 Bl. Tab.)
(AD-273977)

Total head-room for this operation is 12 ft plus that required for a 1-ton hoist and hook above, or about 14 ft. The unit can be moved short distances by a 4-ton crane or two fork trucks.

NP-11496
AD-273977
4
5
Fig.: 4 5
Tab.: 4 5

(7) NSA-16(1962)-18705 RL

Niezborala, F., Calame, A. 1629
La télémanipulation à l'atelier-pilote de traitement des combustibles irradiés
(Energie Nucléaire, 5 (1963) S.326-28, 3 Fig.)

Pour pratiquer l'intervention en enceinte active il faut que l'appareil soit accessible aux agents chargés de l'opération, et qu'il soit décontaminé soigneusement et ses abords contrôlés. Pour diminuer les conséquences de ces travaux de décontamination, longs et difficiles, a été envisagée la télémanipulation, c'est-à-dire un démontage par un engin commandé à distance. C'est un manipulateur "Som Berthiot" hydraulique, de 300 kg. Il est monté et télécommandé de la même manière que le General Mills. Ses mâchoires de prise sont étudiées et la force de serrage est contrôlée par un manomètre, pour ne pas risquer de déformer les appareils fragiles par un serrage excessif.

4
Fig.: 4

(4) NSA-17(1963)-39206 RL

Ruddy, J.M. 1631
Hot Cell Layout Criteria
(BNL-5820 (1961) 8 S., 2 Fig.)

The space relationships requiring consideration for "hot" cell complexes are those between "cold", "semihot", and "hot" areas which are the operating, the charging and service areas, and the "hot" cell itself. The basic layout criteria for planning is different between beta-gamma and alpha-gamma cell complexes because of contamination in the latter from radioactive materials. The criteria affecting all size and access, ancillary space type and size, general cell complex access and traffic, and personnel and radiation control are defined for both complexes plus contamination control for alpha-gamma cell complexes. The difference between production type and experimental cells is described for all types of cells.

BNL-5820
2
4
Fig.: 4

(5) NSA-17(1963)-6203 RL

Allemann, R.T., Moore, R.L., Roberts, F.P., Upson, U.L. 1633
Hot-Cell Studies on the Solidification of Hanford High-Level Wastes by Radiant-Heat Spray and Pot Calcination
(HW-SA-2877 (1963) 20 S., 17 Fig., 2 Tab.)

This report briefly describes the hot-cell calciner equipment and its mode of operation. A problem in the design of the hot-cell calcination equipment was to scale the calciner to fit an existing 7 1/2 x 15 x 15 foot high heavily-shielded cell. The off-gas is drawn from the calciner by an air jet, and exhausts into the cell, being swept with the cell ventilation air to the building stack.

HW-SA-2877
4
Fig.: 4

(7) NSA-17(1963)-19701 RL

Kane, J.F. 1634
Nuclear Plant Electrical Maintenance Problems, Chemical Processing Department
(HW-SA-3030 (1963) 7 S.)

Some maintenance problems encountered by the chemical processing of radioactive materials are described. The problems deal primarily with cranes and electrical motors. Closed circuit television has proved itself useful in certain aspects of the maintenance of equipment and facilities when high radiation levels prohibit access by men.

HW-SA-3030
3
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(5) NSA-17(1963)-21928 RL

Harrington, F.E., Weeren, H.C. 1635
Design Criteria for the High- and Intermediate-Level Liquid Waste Facility
(CRNL-TM-211 (1962) 53 S., 12 Fig., 4 Tab.)

The facility will contain three process cells with the following inside dimensions: Evaporator Cell - Cell I: 14 x 26 x 20 ft deep, Condenser Cell - Cell II: 14 x 8 x 12 ft deep, VCG Cell - Cell III: 14 x 8 x 11 1/2 ft deep. These cells, the combination valve and pipe tunnel, and the ventilation filter pit constitute the primary containment zone. Access to Cells I, II and III is by means of removable roof plugs. These plugs should be sized so that the largest equipment item in each cell can be replaced.

CRNL-TM-211
4

(5) NSA-16(1962)-18707 RL

Dean, C.C., Brooksbank, R.E., Lotts, A.L. 1637
A New Process for the Remote Preparation and Fabrication of Fuel Elements Containing Uranium-233 Oxide-Thorium Oxide
(CRNL-TM-588 (1963) 40 S., 19 Fig., 3 Tab.)

The purpose of this paper is to present the objectives, design, development, and operational performance of the Kilorod Facility. The plant, though integrated will be discussed as three processing sections.

CRNL-TM-588
2
4
Fig.: 2
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(7) NSA-17(1963)-25746

RL

Dighton, A.L., Sampson, J.C., Stump, W.D. 1638
Plutonium Handling Facilities for Radiography
(RFP-175 (1962) 10 S., 10 Fig.)
(Materials Evaluation, 22 (1964) S.401-3, 9 Fig.)

The purpose of this paper is to discuss a specific plutonium facility for radiography and cover some considerations in designing such a facility as well as to mention possible alternate methods. An enclosed glove box was constructed to facilitate radiographic operations.

RFP-175
4
Fig.: 4

(6) NSA-17(1963)-23552 RL

Spencer, N.C., Parsons, T.C., Howe, P.W. 1639
Close-Capture Adsorption System for Remote Radioisotope Chemistry
(UCRL-9659 (1961) III, 27 S., 10 Fig.)

Molecular sieves are used as the basic adsorber in a close-capture air recirculation system designed primarily for remote operation with master-slave equipment. Moisture and acid vapors from the chemical operations are pumped from the main box and adsorbed on the molecular sieves in a separate enclosure. The dry air is then returned to the main box.

UCRL-9659
3
4

(7) RL

Parsons, T.C., Deckard, L.E., Howe, P.W. 1640
An Improved Socking Technique for Master Slaves
(UCRL-9658 (1962) 4 S., 2 Fig.)

A light weight, highly flexible manipulator socking that can be easily fabricated has been developed by the Health Chemistry Department of Lawrence Radiation Laboratory. A complete socking assembly for a pair of Standard Model 8 master-slave manipulators is shown, mounted on a hot-cell box designed for totally enclosed operation behind a shielding wall.

UCRL-9658
4
Fig.: 4

(6) NSA-17(1963)-29042 RL

Kelsch, R.D. 1641
Hot Metallography Facility at Savannah River Laboratory
(TID-18566 (1963) 4 S., 5 Fig.)

The facility is installed in five general-purpose hot cells, each 6 x 6 feet in flow area. Each major preparation step is performed in a separate cell: cutting, mounting and grinding, polishing, etching, and examination. Each cell is equipped with a pair of Model 8 master-slave manipulators, and an electrochemical heavy duty manipulator is available. All of the equipment installed in 1960 is still in good condition after 2 1/2 years of operation. Only two machines have failed in service.

TID-18566
4
Fig.: 4

(4) NSA-17(1963)-21808 RL

Climent, V.H. 1642
Specifications for a Hot Cave Radiochemistry Laboratory Project
(TID-17903-and Add. 1 (1963) 23, 12 S., 4 Fig.)

A new radiochemistry laboratory, provided with a hot cave, is planned. The hot cave will be a modification of the Argonne National Laboratory "Junior" type. The new laboratory will contain the following existing equipment: two sinks, two working benches and wall cabinets, two hoods, and the related service utilities. The cave is designed to handle gram quantities of alpha emitters together with activities up to 10 curies of one-Mev gamma. It can be assembled from prefabricated sections, and disassembled, moved and re-assembled. The window of the cave, located in the front wall, will have a viewing area of at least 41" wide x 32" high x 18" thick. The ventilating system is capable of ventilating simultaneously the two existing hoods and the entire laboratory area. (5) NSA-17(1963)-12184 RL

TID-17903-and Add. 1
3
4
Fig.: 4

Simon, J.P., Wehrle, R.B. 1643
EBR II Fuel Dismantling Equipment
(TID-16828 (1962) 13 S.)

A remotely operated prototype machine has been fabricated for the mechanical dismantling of the fuel subassembly of the Experimental Breeder Reactor. Radiation resistant materials were used for pneumatic seals, electrical insulation and lubrication to minimize the effects of radiation.

(5) NSA-16(1962)-31696 RL

TID-16828
4

Craft, R.C. 1644
Control of Contamination in High Level Caves at the Savannah River Laboratory
(TID-16181 (1962) 10 S., 2 Fig.)

Methods of controlling contamination in High Level Caves at Savannah River Laboratory are presented. A brief summary of recent operating experiences, including cell decontamination procedures, is presented.

(5) NSA-17(1963)-23556

TID-16181
4
5
Fig.: 2
5

RL

Taube, M. 1645
Plutonium. - Oxford: Pergamon Pr. 1964. VI, 258 S., 108 Fig., 49 Tab.
Übers. von (Nowa technika. No 16 (1958) 200 S.)

Work with quantities of more than 1 µg of plutonium should be carried out only with rubber gloves, e.g. surgeon's gloves without other precautions. Operations involving plutonium in amounts higher than 160 µg should be carried out in such protective devices as glove-boxes or radiochemical fume cupboards. The air-pressure in glove-boxes during work should be maintained at a level of 15 to 35 mm of water lower than the outside pressure. The air-velocity at the fume-cupboards' inlet should reach at least 35 m per min during work. The plutonium laboratory staff must wear protective clothing (surgeon's smocks, overalls, special protective footwear). NSA-15(1961)-680 (4) RL

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Fig.: 4
Tab.: 5

Peishel, F.L., Whitson, W.R., Burch, W.D., Howell, L.N. 1646
Hot Development Facility, Cells 3 and 4, Building 4507
(CRNL-3408: Ferguson, D.E. (Comp.): Transuranium Quarterly Progress Report for Period Ending Nov. 30, 1962 (1962) S. 70-71)

The presently planned usage for cell 4, consisting of transuranium process development and various processing commitments, will require that the cell be operated continuously through 1965. With this in mind, all equipment has been designed to be physically durable or remotely maintainable if the former criteria could not be met. Spare piping will be installed to replace any unforeseen failures in this component. Cell 3, as now planned, will be used as a supporting cell for cell 4.

(7) NSA-1963-25058 RL

CRNL-3408
4

Burch, W.D., Crump, B.J., Yarbro, C.C., Mackey, T.S., Breeding, E.J., Trent, T.L. 1647
Design of Chemical Processing Equipment
(CRNL-3408: Ferguson, D.E. (Comp.): Transuranium Quarterly Progress Report for Period Ending Nov. 30, 1962 (1962) S. 71-80, 5 Fig.)

Design work was continued towards refining the equipment and engineering flowsheets and preparing concept packages which define the work to be done in the final detailed equipment design. Start of the detailed design at K-25 has been delayed until all design work on the hot development facility in cell 4 of Building 4507 has been completed there.

(9) NSA-1963-25058 RL

CRNL-3408
4

Griner, W., Studer, H. 1650
Die Speisung des Hot- und Isotopenlaboratoriums mit elektrischer Energie
(Neue Technik, 5, No. 9 (1963) S. 536-37, 1 Fig., 1 Tab.)

Die Sicherheitsanforderungen an eine gesicherte Stromversorgung des Hot- und Isotopenlaboratoriums sind sehr hoch. Als Hauptgrund ist die ständige Anwesenheit von offenen hochradioaktiven Materialien in den Versuchseinrichtungen des Hotlabors zu nennen. Ein ganz besonders anspruchsvoller Verbraucher ist die umfangreiche Ventilations- und Klimaanlage, die unterbruchslos im Gebäude und in den Versuchszellen ein bestimmtes Druckdifferenzsystem zu gewährleisten hat, um das Entweichen und Verbreiten aktiver Gase und aktiver Aerosole in die Arbeitsräume oder die Umgebung zu verhindern. Die Konzeption der elektrischen Verteilanlagen im Hotlabor gestattet, die einzelnen Netze ohne Störung des Betriebes zu warten.

(5) NSA-18(1964)-5451 RL

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Hanson, C., Kaye, D.A. 1652
General Design of High-Capacity Mixer-Settlers. Part 2
(Chemical and Process Engineering, 44 (1963) S. 651-54, 7 Fig., 1 Tab.)

Two designs of high-throughput mixer-settlers are at present undergoing development; their general principles have been described in Part 1. The purpose of this paper is to present the results of an investigation into the hydraulic characteristics of the designs.

(4) NSA-18(1964)-3935 RL

4
Fig.: 4

Siewert, G. 1653
Neue Prinzipien der Konstruktion heißer Zellen
(Kernenergie, 7, Heft 5 (1964) S.333-35, 4 Fig.)

Es wird über die neue Konstruktion einer heißen Zelle berichtet, deren Körper als zylindrischer Behälter ausgebildet ist und ein selbständiges Bauteil für die Blockmontage darstellt. Die gezeigte Ausführungsform einer heißen Zelle als liegender kreiszylindrischer Behälter stellt ein neuartiges Bauteil für heiße Laboratorien dar. Dabei kann der Zellraum nach Durchmesser und Länge verändert werden; einer solchen Variation sind aber durch die Art und den Arbeitsbereich der verwendeten Manipulatoren Grenzen gesetzt. Die gezeigte Ausführung ist für eine optimale Ausnutzung des sowjetischen Manipulators M 22 bemessen.

4
Fig.: 4

(3) NSA-18(1964)-31698 RL

Seyfferth, L. 1654
Kraft-Manipulator für "Heiße Zellen". Power Manipulator for "Hot Cells"
(Kerntechnik, 6, Heft 4 (1964) S.172, 1 Fig.)

Es wird über einen Kraft-Manipulator mit einer maximalen Hubkraft von 340 kp, der von der General Electric Comp. Ltd., Großbritannien, entwickelt wurde und von M.A.N. hergestellt wird, berichtet. Auf einer Kranbahn längs der Zelle läuft eine Kranbrücke, auf der der eigentliche Manipulator quer zur Zelle verfahren werden kann. Andere Anordnungen, z.B. auf einem an der Wand befestigten Schwenkarm oder auf einem Fahrzeug, sind möglich. Die Steuerung des Manipulators erfolgt von einem fahrbaren Pult aus, das zur Beobachtung der Vorgänge vor Zellenfenster oder Fernseheinrichtung gestellt wird.

4
Fig.: 4

RL

(3) NSA-18(1964)-25644 Forts.

Seyfferth, L. 1654 Forts.
Kraft-Manipulator für "Heiße Zellen". Power Manipulator for "Hot Cells"
(Kerntechnik, 6, Heft 4 (1964) S.172, 1 Fig.)

Wegen der Forderung nach Wartungsfreiheit finden selbstschmierende Lager Verwendung, für die durch Dauerversuche unter extrem trockener Atmosphäre die günstigste Ölimprägnierung ermittelt wurde.

4
Fig.: 4

(3) NSA-18(1964)-25644 RL

Howell, L.N. 1655
Safety in Glove-Box Design and Operation
(Nuclear Safety, 5, No.1 (1963) S.87-94)

The safety aspects of glove-box operations are significant and are commanding attention from an increasing number of people. In particular, more effort is being expended on studying the prevention and control of fires and explosions in glove boxes. A program covering test and research on new explosion protection systems for glove-box applications was recently initiated by the USAEC Chicago Operations Office.

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(4) NSA-18(1964)-380 RL

Kruger, C.L., Armstrong, J.L. 1657
Interchangeable Hearth Arc Furnace
(Review of Scientific Instruments, 35, No.2(1964) S.156-58, 3 Fig.)

A laboratory arc furnace that can be used for making buttons and castings of special shapes is described. The furnace was constructed so that copper hearths of various configurations could be rapidly interchanged. Convenience of operation inside a glove box was one of the principal considerations in its design. (auth)

4
Fig.: 4

(4) NSA-18(1964)-10221 RL

Somerville, A. 1659
General Motors Builds Radioisotope Laboratory
(Nucleonics, 13, No.10 (1955) S.68, 2 Fig.)

A radioisotope laboratory, where industrial and research applications of radioisotopes will be explored, was completed in July at the GM Technical Center in suburban Detroit. Laboratory building, steel framework and concrete construction, has ground floor and basement. Of ground floor's 19,000 ft^2, 5000 ft^2 are equipped for handling radioisotopes, remaining area is devoted to offices, dark rooms, counting areas; concrete-slab floor supports 300 lb/ft^2; laboratory rooms are separated by 8-in.-thick concrete-block walls.

2
4
Fig.: 2

(4) RL

Dunster, H.J. 1661
The Designer and Radiation Protection
(Nuclear Engineering, 1 (1956) S.144-48, 5 Fig.)

When designing equipment and processes for the handling of radioactive materials consideration must be given to safety from direct radiation and contamination, concomitant with flexibility of operation and feasibility of maintenance. The designer must work in collaboration with specialists and understand the various problems that are involved. (auth)

4
5
Fig.: 4

(4) RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L. 1662
Transuranium Processing Facility Design
(Nuclear Science and Engineering, 17 (1963) S.479-85, 6 Fig.)

The facility will consist of nine heavily shielded process cells and eight laboratories. The toxicity of the heavier transuranium elements justifies a refined building containment and ventilation system. The building is scheduled for full-scale operation by December, 1965, at an estimated cost of $8.7 million. The nine shielded process cells are arranged in line. Removable top plugs provide access to the cells. The entire building will operate at a normal pressure of 0.3 in. water gauge below atmospheric pressure at all times to ensure against escape of any airborne contaminants. Normally occupied personnel areas are supplied with a once-through air flow system. A preliminary cost estimate of the TRU Facility, including process equipment, is given.

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3
4
6
Fig.: 2
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(8) RL

Walter, L. 1663

Monorail Handles Fissionable Material Automatically

(Atomics, 17, No. 2 (1964) S. 46-47, 2 Fig.)

The system is designed to transfer fissionable materials - reactor fuel elements - from assembly bays in the Fissionable Materials Store to sidings adjacent to experiments in the Reactor Hall. Fissionable material is transferred in the assembly bays to the sidings in steel boxes which are carried on specially designed transporters, towed by a British MonoRail MonoTractor unit. The transporter consists of two trolleys from which is suspended a frame carrying the hoisting gear. Mounted beneath the trolley is the load beam, carried on spring-loaded stabilizers, for restricting undue movement of the loaded transporter during travel.

4 / Fig.: 4

(3) RL

MacDonald, R. E., Wilson, I. L. 1665

In-Cell Sound Transmission System

(ORNL-TM-565 (1963) III, 15 S., 9 Fig.)

To transmit sounds from the High Radiation Level Examination Laboratory cells, a simple, rugged and inexpensive sound system has been developed, fabricated, and tested. The massive shielding walls effectively attenuate the in-cell sounds needed to monitor operations and minimize ennui. An omnidirectional microphone unit with wide-range response and good fidelity is molded into a radiation-resistant rubber jacket to aid in electrical coupling and protect against in-cell abuse. The wall mount connects with an out-of-cell speaker that has a headphone attachment.

ORNL-TM-565

4 / Fig.: 4

(5) NSA-17(1963)-25388 RL

Hesson, J. C., Feldman, M. J., Burris, L. 1666

Description and Proposed Operation of the Fuel Cycle Facility for the Second Experimental Breeder Reactor (EBR-II)

(ANL-6605 (1963) 193 S., 54 Fig., 17 Tab.)

The Fuel Cycle Facility consists primarily of an argon-atmosphere cell where fuel processing is done, an adjacent air-atmosphere cell where reactor subassemblies are assembled and disassembled, and an operating area (for personnel) which surrounds the two cells. Because of the high levels of activity excepted, the fuel-handling-and-processing equipment is designed for remote operation. Remote processing is accomplished with the aid of bridge cranes, electromagnetic bridge manipulators, and master-slave manipulators.

ANL-6605

2 3 4 / Fig.: 2 3 4

(8) Forts. RL

Hesson, J. C., Feldman, M. J., Burris, L. 1666 Forts.

Description and Proposed Operation of the Fuel Cycle Facility for the Second Experimental Breeder Reactor (EBR-II)

(ANL-6605 (1963) 193 S., 54 Fig., 17 Tab.)

Transfer ports and air locks are used in the transfer of materials and equipment into the air-atmosphere cell and between the two cells. The walls between the argon-atmosphere and air-atmosphere cells and the operating area are heavily shielded, and viewing is done through thick shielding windows.

ANL-6605

2 3 4 / Fig.: 2 3 4

(8) RL

Curtis, W.K. 1668

The Shielding and Sealing of a Master-Slave No. 7 Manipulator

(AERE-R 4085 (1964) 6 S., 15 Fig.)

This report describes a development by which a model 7 (over the wall type) Master Slave Manipulator, may be adapted for working a fully shielded cell, the latter being fitted with a gas tight container. Included are performance figures and maintenance data for the system. (auth)

AERE-R 4085

4 / Fig.: 4

(4) NSA-18(1964)-23753 RL

Valentin, A. 1669

Cellules pour examen d'éléments combustibles au plutonium irradiés. Deux ans d'exploitation - Mai 1961 Mai 1963

(CEA-2395 (1963) 77 S., 22 Fig., 6 Tab.)

This laboratory consists of five in line cells and a lead enclosure microscope. Each cell contains an α sealed removable box 4 ft 3 in. high, 4 ft 11 in. wide and 5 ft 1 in. deep, fitted with one or two magnetic transmission indirect manipulators. The boxes are contained in a $\beta\gamma$ shielded enclosure whose front face is constructed of cast iron panels 21-2/3 in. thick. Nitrogen circulating in a closed loop forms the atmosphere of the boxes. This laboratory is essentially intended for metallurgical research. The functions of the various cells are as follows: transferring and packing, cutting, density measurement and cathodic etching, storage and metallography.

CEA-2395

4 / Fig.: 4

(4) NSA-18(1964)-16163 RL

Maffei, H.P. 1671

Zircaloy-2 Pilot Plant Etching and Rinsing Facility

(HW-62942 (1959) 20 S., 1 Fig., 2 Tab.)

The facility consists of four rectangular cross-section 304L stainless steel tanks, 14 inches deep by 12 inches wide and 10 feet long. The etch tank is equipped with olyethylene crossbars spaced along the length to support fuel rods above the bottom of the tank. The facility contains such service equipment as a overhead monorail hoist, heat exchanger and inspection tables. The overhead monorail hoist has a 1/4-ton capacity, is air powered, and is located over the four tanks.

HW-62942

4 / Fig.: 4

(4) C.A. 1960-14069 RL

Sorensen, R.J. 1672

A Thermobalance for Studying the Chlorination of Plutonium Dioxide with Phosgene

(HW-79141 (1963) 22 S., 11 Fig.)

An automatic recording thermobalance for studying the chlorination of plutonium dioxide with phosgene is described. The thermobalance operates on the deflection balance principle in which the extension of a precision quartz helix spring is measured by a linear variable differential transformer. Because of the highly toxic nature of plutonium compounds and phosgene, the instrument was installed in a standard 4 x 6 x 8 ft Hanford glove box which opened into a fume hood.

HW-79141

4 / Fig.: 4

(4) NSA-18(1964)-1606 RL

Koch, L. 1673
Über ternäre Oxide des 5- und 6-wertigen Neptuniums und Plutoniums mit Lithium und Natrium
(KFK-196 (1964) 69 S., zahlr. Fig. u. Tab.)

Die Handschuhboxen wurden in den Werkstätten des Kernforschungszentrums hergestellt. Boden- und Schmalseiten bestehen aus Stahl, die übrigen Wände aus Plexiglas. An den Seitenwänden befinden sich Zuführungen für Kabel und Gase, sowie Öffnungen zu Schleusen, die den Transport von Gegenständen zwischen den beiden Boxen und aus den Boxen heraus ermöglichen. Über Dräger-Mikron-Filter waren die Boxen an das Laborentlüftungssystem angeschlossen, wobei im Mittel ein Unterdruck von 30-50 mm Wassersäule eingestellt wurde.

KFK-196
4
Fig.: 4

(4) RL

Sease, J. D., Lotts, A. L., Davis, F. C. 1674
Thorium-Uranium-233 Oxide (Kilorod) Facility - Rod Fabrication Process and Equipment
(ORNL-3539 (1964) iv, 99 S., zahlr. Fig.)

The facility consists of a number of permanent alpha-tight cubicles which are shielded with 4 1/4-in. steel. The fabrication process is carried out remotely in these cubicles with the exception of several gloved-hand operations which occur where the dexterity required for manipulation exceeds that of the remote castle-type tongs. The facility ventilation system was designed so that the operating cubicles will be maintained at a pressure below atmospheric through the use of existing ventilation systems in the vicinity of the cell. A special multipurpose port is employed in the facility that may be fitted either a glove or a castle-type manipulator, and these units may be interchanged while maintaining an alpha-tight seal. (8) NSA-18(1964)-16455 RL

ORNL-3539
2
3
4
Fig.: 2
3
4

Unger, W. E. 1675
Transuranium Processing Plant Design
(ORNL-3558: Transuranium Quarterly Progress Report for Period Ending August 31, 1963 (1964) S. 83-104, 13 Fig., 1 Tab.)

The design of cell-3 components was started, as was the procurement of some items. The main items are the dissolver; a condensate catch tank; and a rack of equipment consisting of an overhead condenser, scrubber, iodine trap, filter, and pump. These will be designed for easy removal from the cell by rolling into position beneath the existing large equipment opening in the roof of the cell. The remainder of the cell be used for work-table space and a service-disconnect bank for the experimental equipment boxes that are to be placed in the cell. Boxes will be transferred into and out of the cell through the roof opening, using alpha bagout techniques. (4) NSA-18(1964)-13919 RL

ORNL-3558
4
Fig.: 4

Fleischer, E.S., Snyder, A.B., Parsons, Th.C., Howe, P.W. 1676
Remote Pipetters for Use in Hot Cell Enclosures
(UCRL-9661 (1964)iii, 6 S., 5 Fig.)

This system presents a method for remote pipetting that features precision and excellence of control. The operator and Pipetter Controller are generally separated from the box-enclosed mobile Pipetter Head by shielding that may be up to several feet in thickness. In our 6-foot Water-Cave Neutron Facility a Kollmorgen periscope is used in conjunction with one pipetter for the taking of samples in the range of 1 λ to 10 λ. Pipettes can be replaced remotely in the Pipetter Head by the box manipulators. We have pipetter units of capacity 1 λ to 1 ml and 1 λ to 5 ml, and also macro units up to 30 ml. (auth)

UCRL-9661
4
Fig.: 4

(7) NSA-18(1964)-23842 RL

Olsen, A.R., Nichols, J.P., Peterson, S. 1679
Safety Analysis of the Operation of the High-Radiation-Level Examination Laboratory
(ORNL-3479 (1963) III, 87 S., zahlr. Fig. u. Tab.)

The High-Radiation-Level Examination Laboratory is basically a two-story brick building with a partial basement for housing some of the essential ventilation equipment. The structure provides a gross floor area of approximately 26, 500 ft^2, exclusive of the floor area occupied by the shielded cell complex, which has a working area of 950 ft^2 shielded for high-level gamma activity. The operating and service areas occupy approximately 223, 000 ft^3. The shielded cell complex, which is the very heart of the facility, is centrally located and occupies the full building height. The shielding windows are the oil-filled, lead-glass variety and of proper thickness and density to match the 3 ft of high-density concrete shielding provided by the cell walls. (8) NSA-18(1964)-4025 RL

ORNL-3479
2
3
4
Fig.: 2

Forts.

Olsen, A.R., Nichols, J.P., Peterson, S. 1679 Forts.
Safety Analysis of the Operation of the High-Radiation-Level Examination Laboratory
(ORNL-3479 (1963) III, 87 S., zahlr. Fig. u. Tab.)

The inside surfaces of the cell banks are lined with stainless steel sheet to provide containment of particulate matter. Within each cell bank, heavy objects are moved by the General Mills Model 303 electromechanical manipulation and a companion 3-ton bridge crane. The cell banks are ventilated by a system of individual recirculation units and a single exhaust system, as described.

ORNL-3479
2
3
4
Fig.: 2

(8) NSA-18(1964)-4025 RL

Postirradiation Examination Laboratory 1681
(ORNL-3470: Metals and Ceramics Division Annual Progress Report for Period Ending May 31, 1963 (1963) S. 248-51, 1 Fig.) ORNL-3470

Shielded research metallographs manufactured by Bausch & Lomb, Rochester, New York, and Reichert, Vienna, Austria, were installed in the HRLEL. Each metallograph is designed for alpha-beta-gamma shielding with 8 in. of steel. All offset joints in the shielding are sealed with neoprene and all the operational adjustments are relayed through the shielding as sealed rotary movements to minimize particulate contamination. A shield cover contains a leaded glass window for observing the stage.

4
Fig.: 4

(4) NSA-18(1964)-4305 RL

Samsahl, K., Schüller, W. 1682
Main Process Analytical Laboratory Requirements
(ETR-36 (1959) 7 S., 2 Fig., 4 Tab.)
(NP-7868 (1959) 11 S., 2 Fig., 4 Tab.)

The plan view included in the appendix shows a proposal for the layout of the main process analytical section. Hot laboratories have been arranged in line on one side, cold labs and general services on the other side of a central service corridor. Personnel access is provided by a cold and a hot corridor on opposite sides of this assembly. The hot personnel and service corridors are accessible from the cold section via change rooms. A separate change room with an air-lock is provided for the plutonium laboratory. Total gross floor area required for the analytical labs is 1354 m^2. As approximately 30 people are required for the analytical section, the average net laboratory floor space is 18 m^2/person. (7) RL

ETR-36
NP-7868
2
4
Fig.: 2

Hot Laboratory and Special Handling Equipment 1684
(Atomics, 17 (1964) No. 3, S. 19-30, 21 Fig.)

The design of one of the most modern hot laboratories to be placed in service - that of the new hot laboratory for the Chemistry Division at Argonne National Laboratory - following which some special features of other installations will be reviewed. The bulk of the laboratories are located to the east (right hand) end of the main floor, while the shielded cave complex occupies both floors at the west end of the building. The cave complex or shielded cell facility consists of two floors of shielded cells with exhaust fans and filters, and a contaminated storage area on the roof. All walls on the lower floor are four feet thick and the ceiling 40 inches thick.

2 3 4 Fig.: 2 3 4

(5) NSA-18(1964)-25641 Forts. RL

Hot Laboratory and Special Handling Equipment 1684
(Atomics, 17 (1964) No. 3, S. 19-30, 21 Fig.) Forts.

The window openings at the cell interior range in general from 3 ft wide by 2.5 ft high to 5 ft wide by 3 ft high, and they range up to 7 ft in thickness. The thick windows are actually tanks consisting of an inner and outer glass plate with the space between filled with a zinc bromide solution or in some cases with oil.

2 3 4 Fig.: 2 3 4

(5) NSA-18(1964)-25641 RL

Niezborala, F. 1685
Les cellules actives
(Bulletin d'informations scientifiques et techniques, 1963, No. 68, S. 53-64, 8 Fig.)

Dans cet article, on se propose de décrire, d'une part, les éléments de structure des cellules actives de l'Atelier-Pilote comportant l'ossature métallique, la protection γ, les moyens de vision et la ventilation, d'autre part, le matériel de chimie industrielle proprement dit, les matériaux utilisés, l'installation intérieure, l'alimentation des cellules, les organes de transfert et les possibilités de décontamination. En plus, sera donné un aperçu des moyens de contrôle utilisés et des prises d'échantillons.

3 4 Fig.: 4

(4) RL

Calame-Longjean, A. 1686
La télémanipulation
(Bulletin d'informations scientifiques et techniques, 1963, No. 68, S. 65-74, 9 Fig.)

La télémanipulation constitue une des originalités de l'Atelier-Pilote. On se propose de la décrire ici. Pour ce faire, après avoir situé le problème, on parlera de la télémanipulation, de l'entrée des cartouches et des sécurités. Pour télémanipuler, c'est-à-dire, désolidariser de l'ensemble et évacuer l'un des appareils de l'installation, il a été prévu 2 télémanipulateurs: - un télémanipulateur lourd de 300 kg (Som Berthiot) B; - un télémanipulateur léger de 30 kg (General Mills 150) C.

4 Fig.: 4

(3) RL

Vié, R. 1687
Le contrôle analytique
(Bulletin d'informations scientifiques et techniques 1963, No. 68, S. 75-78, 3 Fig.)

Le laboratoire α - γ est une salle de 30 m de long, 8, 50 m de large et 4, 80 m de hauteur qui communique avec le hall par l'intermédiaire de deux sas. La ventilation est celle des laboratoires chauds: gaines soufflantes au plafond et gaines d'extraction au sol; elle est réglée pour assurer une dépression de 15 mm d'eau par rapport à l'extérieur. Un pont roulant de force 5 tonnes assure la manutention des blocs de protection et des cellules étanches. Les laboratoires α couvrent une superficie d'environ 150 m^2. Ils sont équipés de boîtes à gants ventilées en lucoflex déjà éprouvées pour les manipulations chimiques des produits présentant une radioactivité α.

3 4 Fig.: 4

(4) Forts. RL

Vié, R. 1687
Le contrôle analytique Forts.
(Bulletin d'informations scientifiques et techniques 1963, No. 68, S. 75-78, 3 Fig.)

La vision est assurée par des hublots mixtes de verre de densités 6, 2 et 3, 3 à raison d'un par cellule d'analyse et de deux pour la cellule sas qui est plus grande. Les manipulateurs sont des M 7 Hobson à débattement vertical de 86 cm, aucune pince à rotule n'est prévue. La ventilation normale des cellules et du tunnel du convoyeur assure une dépression contrôlée de 15 mm d'eau par rapport au laboratoire.

3 4 Fig.: 4

(4) RL

Fuel Cycle Facility 1689
(ANL-6635: Reactor Development Program Progress Report, Oct. 1962 (1962) S. 18-20)

To aid in the examination of cell equipment, monocular viewers are being provided for viewing through the shielding windows of the Air and Argon Cells. Monocular viewers of two focusing ranges are being made available. With achievement of design flow rates and correct flow distribution, the testing and balancing of the ventilating system was completed. A minor leak in one of the shielding window tank units, discovered some time ago, was located and repaired. The installation of master-slave manipulators in the air cell of the Fuel Cycle Facility has been completed. Two sealed master-slave manipulators have been received for argon cell installation, and consideration is being given to providing honed sleeves to allow later installation of additional manipulators of this type.

ANL-6635 3 4

(5) RL

Saling, J.H., Lusk, E.C., Gates, J.E. 1691
A Nine-Station Alpha-Gamma Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 3-8, 3 Fig.)

A total of nine operating stations is available in a cell 60 feet long by 4.5 feet deep by 11 feet high. A general view of the front of the cells is shown. Shielding is provided by 6.75 inches of lead cast in place between 1-inch-thick steel plates. Each operating station consists of a movable wall section containing a lead glass window, a set of Model-8 manipulators, and a dry box in which the radioactive materials are handled. Filtered air is exhausted from the boxes directly into a plenum system connected to the presently operating beta-gamma cell exhaust system. Construction costs for the Alpha-Gamma Facility will total $250,000.

4 6 Fig.: 4

(6) RL

Boehme, G., Gottlob, P. 1692
Design and Equipment of the Alpha-Gamma Hot-Cell Facility at the Karlsruhe Nuclear Research Center
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 9-13, 4 Fig.)

Five gastight hot cells are provided for examination 3
of reactor experiments and irradiated fuel elements. 4
The cells are equipped for handling alpha-gamma 6
active material. This equipment has been designed Fig.:
to permit remote insertion and removal as well as 2
maintenance, disassembly, repair, and reassembly 4
by remote control. The manipulators are of a novel design offering some advantages over conventional models. Remote viewing equipment consists of dry, high-density lead glass windows and special periscopes.

(6) Forts. RL

Boehme, G., Gottlob, P. 1692
Design and Equipment of the Alpha-Gamma Hot-Cell Facility at the Karlsruhe Nuclear Research Center Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 9-13, 4 Fig.)

The cells may be operated for some years under gas- 3
tight conditions without any personnel entering them. 4
The over-all cost of the five hot cells with a total of 6
eleven working stations, including equipment, amounts Fig.:
to some $1.5 million. 2
4

(6) RL

Lefort, G., Paquis, R. 1693
A New Type of Chemistry Cell for High Specific Activity at Fontenay-aux-Roses
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 15-24, 8 Fig.)

An alpha, beta, gamma cell is described which was 3
recently built at Fontenay-aux-Roses. It will serve 4
for the recovery of highly active irradiated fuel 6
elements. The gamma shielding is 10-inches thick. Fig.:
The alpha cell is subdivided into three sections; 4
(two working cells measuring 165-inches by 50-inches by 45-inches and one interconnecting central cell measuring 78-inches by 39-inches by 41-inches).

(6) Forts. RL

Lefort, G., Paquis, R. 1693
A New Type of Chemistry Cell for High Specific Activity at Fontenay-aux-Roses Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 15-24, 8 Fig.)

Altogether there are seven working places. The most 3
important details of the cell construction and the 4
auxiliary equipment are described. Although the 6
main building is properly ventilated, absolute filters Fig.:
are also provided at the intake and exhaust of the cell. 4
The costs of the installation are $700,000.

(6) RL

Jefferson, R.M. 1694
50-Kilocurie Gamma Irradiation Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 25-29, 2 Fig.)

The facility consists essentially of two hot cells above 2
a pool. Through the use of self-contained handling 3
equipment, sources may be readily introduced and 4
removed from these cells. Provisions are included for 6
visual, physical, and electrical access as well as con- Fig.:
trol to provide the necessary safety. Several problems 2
encountered in the operation of this facility are also discussed. Overall cost of the building, excluding land and site improvements but including utilities, was $431,420. The cell ventilation system is described.

(6) RL

Barthelemy, P., Bonnet, G., Junger, J.M., Cauwe, J., Klersy, R. 1695
Concrete Hot Cells for Dismantling and Machining at the Ispra Research Center
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 31-38, 4 Fig.)

Discussed in this paper are only the three cells de- 3
voted to dismantling and machining, namely two 4
gamma cells, one of which is associated with Ispra1 Fig.:
Reactor and the other with the Orgel Critical Experi- 4
ment Reactor, and one alpha-gamma cell which is located at the base of a U-line of cells in the hot metallurgical laboratory. A special ventilator is provided for the ventilation of the whole group of cells and is able to give a depression of 25 mm of water column for 40 air changes maximum.

(8) RL

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 45-53, 5 Fig.)

The five in-line hot cells are equipped for metallo- 2
graphic preparation and examination, physical and 3
mechanical testing, and machine-shop operations. The 4
supporting areas include a radiochemistry laboratory, 5
facilities for decontamination, isotope storage, liquid Fig.:
radioactive waste disposal, and miscellaneous support- 2
ing laboratories and shops. The special features of the 4
laboratory include transfer ports, electrical patch panels, access openings, intercell transfer gates, isolation cubicles, a decontamination room, and an isotope storage area.

(7) Forts. RL

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 45-53, 5 Fig.)

The ventilation system of the entire laboratory is 2
equipped to provide fresh air continuously without 3
recirculation of the air inside the building. Gamma- 4
detection area monitors are strategically positioned 5
throughout the laboratory. In addition, gamma-de- Fig.:
tection alarms are situated at critical points on the 2
second floor, above and beside the hot cells. A fire 4
detection, alarm, and extinguishing system is being planned for the hot cells.

(7) RL

Dascenzo, R.W., Hammill, K.H., Merker, L.G. 1697
The Fuels Recycle Pilot Plant
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 55-64, 3 Fig., 3 Tab.)

The building is divided into four primary functional 2
areas: (1) radiochemical engineering cells, (2) shielded 3
metallurgical cells, (3) low level canyon, and (4) cold 4
canyon. The basic requirement of the ventilation 6
system is to maintain an established negative pressure Fig.:
in the cells and building structure. This is accom- 2
plished by pulling air through the building by the Tab.:
exhaust fans. The cost of constructing the FRPP 2
is $5,560,000. 4

(8) RL

Vertut, J. 1698
Through-the-Wall Master-Slave Manipulator with Indexing for Forward and Backward Movement
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 67-72, 3 Fig.)

This manipulator was designed for work in high activ- 4
ity cells of small dimensions. It incorporates an Fig.:
articulated arm which does not require any telescope 4
movement. Fitted with an indexing device for forward and backward movement, it can be used with small viewing ports. The manipulator penetrates the frontwall of the cell and is of a design permitting very simple and rapid insertion and removal. A protective sleeve fabricated from a flexible (plastic) material provides a hermetic seal of the inner face. This protective sleeve can be replaced without changing the pressure conditions inside the cell.
(3) RL

Galbiati, L., Mancini, C., Raimondi, T., Roncaglia, F. 1699
A Compact and Flexible Servosystem for Master-Slave Electric Manipulators
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 73-87, 5 Fig.)

This paper describes a force-reflecting servosystem 4
for 50-pound capacity electric master-slave manip- Fig.:
ulators, incorporating several improvements over the 4
previously developed models. The new system, which uses separate power amplifiers, is more flexible, in that provision is made for electrically balancing the manipulator arms and for improving the system's "feel" characteristics by suitable feed-back force signals. The power amplifiers, which are of the switch type, are highly efficient, compact and cooled by natural convection. These characteristics facilitate the installation
(6) Forts. RL

Galbiati, L., Mancini, C., Raimondi, T., Roncaglia, F. 1699 Forts.
A Compact and Flexible Servosystem for Master-Slave Electric Manipulators
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 73-87, 5 Fig.)

of the amplifier on the slave station as required for 4
a possible radio control. (auth) Fig.:
4

(6) RL

Goertz, R. 1700
Manipulator Systems Development at ANL
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 117-36, 33 Fig.)

This paper is a review of some of the significant de- 4
velopments of general-purpose manipulators and Fig.:
closely associated devices carried out at the Argonne 4
National Laboratory over the past decade and a half. Most of the work has been devoted to mechanically connected and electrically connected master-slave manipulators which have force feedback in all of the seven basic motions. The Mechanical Master-Slave Manipulator Model M8 is the most widely used and it is the last mechanical master-slave manipulator to be completely developed at ANL. The Electric Master-Slave Manipulator Model E3 is the latest of its type.
(3) RL

Heremans, R., Schmets, J., Broothaerts, J., Haegeman, M., de Beukelaer, R., Buyle, A., Leponge, H. 1701
Pilot Scale Alpha-Gamma Facility for Reprocessing of Spent Reactor Ceramic Fuels by Volatilization of Fluorides
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 137-48, 4 Fig.)

For various reasons the process apparatus are lo- 3
cated in two different α boxes. The α_1 box is con- 4
structed of painted 10 mm thick mild steel. All re- Fig.:
mote operations inside the α_1 box may be done by 2
two different manipulation systems. Tongs mounted 4
on ball manipulators, a "General Mills" model 150 manipulator and a 250 kg movable crane, complete the remote manipulation systems.
(10) Forts. RL

Heremans, R., Schmets, J., Broothaerts, J., Haegeman, M., de Beukelaer, R., Buyle, A., Leponge, H. 1701 Forts.
Pilot Scale Alpha-Gamma Facility for Reprocessing of Spent Reactor Ceramic Fuels by Volatilization of Fluorides
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 137-48, 4 Fig.)

Conveniently situated vision globes protected by lead 3
glass and a movable T.V. camera inside the α_1 box 4
allow the operator to follow the different operations Fig.:
visually. The ventilation system of the α_1 and α_2 boxes 2
is described. 4

(10) RL

Mas, R., Tarbé de Saint-Hardouin, A., Lecouvreur, P. 1702
ADAC-Design of Alpha-Beta-Gamma Cells with Alpha Back Cells and Transfer Facilities
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 149-57, 8 Fig.)

The hot cells of the Shop for Cutting Fuel Assemblies 2
are designed as a sealed unit with the shielded cells 3
in front and adjacent to the back cells in which a man 4
wearing a frogman suit can work. Following a de- Fig.:
scription of the layout of the cells and back cells, the 2
remote handling equipment and the sealed lead out 4
connections will be described. Television cameras are provided in both the cells, back cells and underground floors to monitor the position of the active components and operational equipment from the operating area.
(7) RL

Mas, R., Gerard, V., Tarbé de Saint-Hardouin, A. 1703
ADAC-Operation of a Fuel-Dismantling Line in a Cell Mockup
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 159-65, 6 Fig.)

The cell mockup included a back cell for making remote transfers, a viewing system consisting of a liquid window to simulate the field of vision of the ultimate window, and a pair of CRL Model A master slave manipulators. A General Mills, Model-150, remote manipulator mounted on a travelling crane and a 1-ton travelling bridge crane were installed in the cell. A lift-type and a plug-type door were installed between the work and back cells.

4
Fig.: 4

(5) RL

Lefort, G., Cazalis, J.P., Rouillard, J. 1704
A New Type of Air-Tight Tong for Master-Slave Manipulators
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 167-72, 3 Fig.)

A new air-tight booting connection system is described which can be used with master-slave manipulators. This system forms part of the protective sleeve. Four locking mechanisms based on ball catches is attached to the wrist of the slave arm while the lower part (transmission piece) is locked to the cable. A diaphragm is located between these two parts, to provide an air tight seal. This diaphragm is not subjected to mechanical stresses. The tong can easily be attached to this system. The various advantages of this system are critically reviewed. (auth) (5)

4
Fig.: 4

RL

Valentin, J.P. 1705
Operational Experience of the BR2 Hot Cells
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 183-91, 8 Fig.)

The hot cell arrangement is essentially a stack of three hot cell levels, all shielded with 1.37 m (4 ft. 6 in.) thick barytes 3.8 density concrete walls; the top cell, designed for primary dismantling of the rigs, is 16.2 m (53 ft. 2 in.) high and has three working stations; the intermediate level, designed for visual examination and special operations, has two working stations; the lower level is made of two caves designed for liquid waste handling and temporary storage of naked sources; this hot cell stack is surrounded, at each level, by an uncontaminated operating area and a contaminated service area.

4
Fig.: 2
4

(3) RL

Greenfield, M.A., Koontz, R.L. 1706
The Design Basis for Pinhole Gamma-Ray Cameras
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 193-206, 9 Fig.)

This report presents the results of a study of the design and use of pinhole gamma-ray cameras in examining irradiated fuel rods nondestructively at the Hallam Nuclear Power Facility. These cameras are being used at both the Component Development Hot Cell at Atomics International, and in a hot cell at the Hallam Nuclear Power Facility.

4
Fig.: 4

(4) RL

Eichenberg, J.D., Lennon, F.J., Rupp, K.L. 1707
Remotely Operable High-Precision Dimensioning Equipment
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 207-15, 5 Fig.)

Instruments have recently been designed and constructed at the Bettis Atomic Power Laboratory to measure remotely the dimensions of irradiated samples to an accuracy of $\pm$ 0.0002 in. The 0-to-3-inch range instrument utilizes a Bausch and Lomb optical micrometer coupled with a Bettis designed movable bottom anvil and positioning table. The 3-to-36-inch instrument (ultramicrometer) was designed and fabricated by Bettis. The design objectives have been achieved and both instruments have been in service in the high level at Bettis for over one year. (auth) (5)

4
Fig.: 4

RL

Burton, G., Shuck, A.B. 1708
An Inert Atmosphere Gloveboxed Extrusion Press
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 217-27, 5 Fig., 2 Tab.)

A 600-ton (545-tonne) capacity, automatic cycle, direct-indirect extrusion press was installed at Argonne National Laboratory for fabricating plutonium alloys and other reactive fuel materials. The extrusion press, stretcher-straightener detwister and auxiliary equipment are enclosed in a 2600-ft^3 (74-m^3) trisectional glovebox train. The enclosed volume is divided into three interconnecting sections: (1) storage and billet preparation, (2) extrusion press and (3) stretcher straightener. The gloveboxes used to house the press and the auxiliary equipment are constructed of extruded and welded aluminum alloy frames with allyl dicarbonate plastic windows. (4)

4
Fig.: 4

RL

Mohr, W.C., Van Loon, J.A. 1709
Fabrication of Americium-Beryllium Neutron Sources Using a System to Prevent Capsule Contamination
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 273-78, 3 Fig.)

An existing large gloved box was modified by installing a horizontal partition and adding another entrance lock to give access to both chambers. In effect two separate gloved boxes were created, one on top of the other. The air flow enters the lower chamber, passes through the partition via "ping-pong" ball check valves, and is exhausted through absolute filters mounted on the upper chamber. A 1 1/2 inch thick slab of Plexiglass was added to the window face of the box.

4
Fig.: 4

(4) RL

Goertz, R.C., Ferguson, K.R., Lindberg, J.F., Mingesz, D.P., Blesch, R.A., Potts, C.W., Grimson, J.H., Forster, G.A., Brown, F.L., Armstrong, J.L. 1710
The ANL Alpha-Gamma Metallurgy Hot Cell - its Design Philosophy and Components
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964, (1964) S. 285-306, 13 Fig., 1 Tab.)

The hot cell complex has a main working area (11 x 32 ft.) capable of containing a high-purity nitrogen atmosphere, and several integral, shielded service areas (with only an air atmosphere) to provide for storage of contaminated equipment, remote repair, glove repair, transfers, and so forth. The facility is designed so that when fully equipped, it can be operated for extended periods of time without personnel entry into the area which become contaminated (14) Forts. RL

2
3
4
Fig.: 2
3
4

Goertz, R.C., Ferguson K.R., Lindberg, J.F., Mingesz, D.P., Blesch, R.A., Potts, C.W., Grimson, J.H., Forster, G.A., Brown, F.L., Armstrong, J.L. 1710 Forts.
The ANL Alpha-Gamma Metallurgy Hot Cell - its Design Philosophy and Components
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 285-306, 13 Fig., 1 Tab.)

under normal operation. However, to achieve the intended degree of remote operation, the unilateral electric manipulators now installed must be replaced with electric master-slave manipulators mounted on vehicles and overhead support systems. The air ventilation system has been designed according to the generally accepted practice of providing flow from areas of least contamination risk to areas of greater contamination risk. (14)

2 3 4 Fig.: 2 3 4

RL

Brown, F.L., Koprowski, B.J. 1711
Startup of the ANL Alpha-Gamma Metallurgy Hot Cell
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 307-13, 1 Fig.)

The cell main working area is filled with dry nitrogen gas. Adjoining air-atmosphere cells, as shown in the figure, provide service areas for repair, maintenance, and storage of contaminated equipment, and waste disposal. These service areas are enclosed by alpha-gamma shield walls and are ventilated by a 56.6 m^3/min (2000 ft^3/min) air exhaust system. Pressure is maintained at minus 1.9 cm (0.75 in) of water column. Personnel dressed in air-line plastic suits regularly enter the contaminated service areas for routine service operations. Three types of manipulators provide for the general handling and maneuvering of test equipment, samples and supplies.
(5)

2 4 Fig.: 2

RL

Koprowski, B.J., Livernash, W.H., Brown, F.L. 1712
A System for a Nitrogen Atmosphere in an Alpha-Gamma Hot Cell
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 315-22, 2 Fig.)

The hot cell, designed and constructed to enable studies to be made on irradiated ceramic and metal fuel materials containing plutonium, consists of two distinct areas: (1) a Main Operating Area of approximately 107.5 cubic meters (3,800 cubic feet) that contains a nitrogen atmosphere and, (2) an auxiliary area for maintenance, repair and storage that contains an air atmosphere. The adjoining enclosures, the "air-side," used for storage and equipment repair, are provided with an air-ventilation system. Transfer locks, used for moving equipment between the "air-side" and the "gas-side" of the facility, help maintain the purity of the gas atmosphere. (6)

3 4 Fig.: 2 3

RL

Hughes, J.P., Schmitz, F.J. 1713
Accessories Developed for Fiberglas-Reinforced Plastic Gloveboxes in the Research Hot Laboratory
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 323-28, 5 Fig.)

Accessories described include housing for a spectrophotometer and for an analytical balance, an "in-box" monitor for measuring high levels of alpha activity, a check valve for vacuum lines leading into the boxes, an acid-scrubber for handling fumes produced during chemical operations, entrance and transfer ports, waste disposal ports and waste container supports, bulkhead fittings for introduction of instrument lines, and box doors, shelves, etc. Techniques used in cutting holes into a contaminated box are also described.
(4)

4 Fig.: 4

RL

Burwell, C.C., Schulte, J.W., Wilson, M.T. 1714
The Los Alamos 'Wing 9' Alpha-Gamma Box System
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 329-35, 5 Fig.)

This report describes the alpha-gamma box system and its associated standard accessories used in the Los Alamos "Wing 9" Hot Cell Facility. Equipment for specialized cell functions is not described. The box shape, material, illumination, and access ports are discussed from the standpoint of ease of manipulation, utilization of cell space, viewing and decontamination. The manipulator booting system in use facilitates remote replacement and full cell manipulator coverage with a minimum of interference with viewing. The air handling system emphasizes a small volume high pressure exhauster with a totally sealed box to permit small filter and piping sizes.
(5) Forts.

4 Fig.: 4

RL

Burwell, C.C., Schulte, J.W., Wilson, M.T. 1714 Forts.
The Los Alamos 'Wing 9' Alpha-Gamma Box System
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 329-35, 5 Fig.)

Standard box accessories include 7" and 18" transfer mechanisms and a 5" air lock for material transfers, an in-box hoist, a liquids-solids vacuum cleaner, a shielded storage vault, replaceable shelving, and an intercommunication system. (auth)
(5)

4 Fig.: 4

RL

Coops, M.S., Hanson, C.L., Hawk, L.R., Scribner, V.E. 1715
Remotely Operated Trans-Plutonium Chemical Process Cells
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 337-53, 11 Fig.)

The basic cell construction is of interlocking six-inch-thick lead blocks on the front face; the side walls, ceiling and rear walls are constructed of standard concrete. The six-inch front wall allows the use of through-the-wall manipulators. The enclosures or "cell boxes" are fabricated from mild steel and are corrosion-proofed with baked phenoloc resins. Viewing windows are of 5009 series plexiglas, as are the translucent panels in the rear of the enclosure. The ventilation system provides about an air change per minute of fresh, filtered air to each enclosure.
(7)

3 4 Fig.: 4

RL

Coops, M.S., Scribner, V.E., Hanson, C.L. 1716
Equipment Advances in the Trans-Curium Element Radiochemistry Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 355-60, 3 Fig.)

The Livermore neutron cave facility has been modified to accept extended-reach master-slave manipulators. Two additional process boxes, that are fully interchangeable with the original enclosure, have been constructed to accommodate specialized equipment necessary in remotely performing trans-curium element chemistry.
(5)

4 Fig.: 4

RL

Huszagh, D.W. 1717
Versatile Utility Tools for Hot-Cell Operation
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 367-72, 6 Fig.)

The important features of four general purpose utility tools for hot cell work are described. All of these "home made" devices fit in the gap between the available commercial machines, and the simple jigs and fixtures customarily devised by hot cell users. The exceptionally versatile tools herein described are in service at the High Intensity Radiation Development Laboratory at Brookhaven. All have application in the larger hot cells with little or no modification, and some of them will prove useful in any type of cell. They are generally inexpensive to build, and lend themselves readily to local manufacture with minimal shop facilities. Detailed construction drawings and specifications are available for each tool. (3) — 4 Fig.: 4 — RL

Mohr, W.C. 1718
Compact Capsule Opener for In-Cell Containment Boxes
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 373-74, 1 Fig.)

A small, lightweight capsule opener has been developed for use in containment boxes at the Argonne Chemistry Cave. The unit is designed to be handled and operated by Model 8 master slave manipulators and can be easily transferred into and out of in-cell containment boxes. — 4 Fig.: 4

(3) RL

Hughes, J.P., Mack, G.A., Schmitz, F.J. 1719
Remote Motor-Controlled Centrifuge for Hot Lab
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 375-76, 2 Fig.)

Convenient location and simple operation of a centrifuge is important to the operator during radio chemical operations such as separation of precipitates in a glove box. A variac control of the voltage applied to the centrifuge in place of the rheostat can be mounted below and outside the glove box for convenient manual and automatic operation. In many of the Argonne Chemistry Glove Boxes, a small motor is coupled to the variac for direct drive to regulate the centrifuge speed. By foot operated toggle switches the chemist controls the power to the unit and the motor for regulation of the centrifuge without moving his arms in or out of the gloves. (5) — 4 Fig.: 4 — RL

Burwell, C.C., Ferguson, W.E., Newbury, F.H. 1721
Techniques Used in the Remote Metallography of Irradiated Plutonium
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 381-85, 4 Fig.)

This technical note describes several metallographic techniques developed for and being used in the metallography of irradiated plutonium at the Los Alamos "Wing 9" Hot Cell Facility. Several techniques are applied to the remotization of a vibratory polisher which facilitate cloth changing and remote operation of the machine. Specimen viewing without metallograph contamination is possible through an optically clear window which is sealed to the box and yet follows the metallograph stage motion. — 4 Fig.: 4

(5) RL

Bowling, J.H., Rupp, K.L. 1722
Equipment for Viewing and Photographing with the Remote-Control Stereo-Zoom Microscope
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 387-90, 4 Fig.)

The Remote Control Stereo-Zoom Microscope is designed specifically for remote visual examination and 35 mm photography of radioactive materials. In use of the Bettis Hot Laboratory, the microscope is mounted in a port centered 84 inches above the floor. To move the samples into a position where they can be handled with the master slave manipulators, an elevating table was constructed. On top of the elevating table is a focusing table which provides the necessary motion translation for focusing and locating the samples. — 4 Fig.: 4

(4) RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande, (1964) No. 5, 6 S., 1 Fig., 2 Tab. (Sonderdruck))

Le laboratoire se divise en quatre zones qui permettent de mieux échelonner les mesures de radioprotection: I. Secrétariat, consigne et vestiaire extérieur II. Locaux destinés à l'exploitation normale (distribution normale). III. Locaux prévus pour l'exploitation spéciale (synthèses radiochimiques). IV. Locaux pour la manipulation de très hautes radioactivités (où la manipulation d'activités excédant celles de la classe B pourraient être exceptionnellement autorisées). Dans chacune des zones, la ventilation s'opère des locaux les moins contaminés (vestiaires, laboratoires de mesure, de préparation ou de décontamination) — 2 3 4 5 Fig.: 2

(9) Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723 1. Forts.
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

aux salles de manipulation, et plus particulièrement aux cellules de manipulation elles-mêmes (hottes ou boîtes à gants). Les installations de radioprotection fixes sont disposées comme des hottes de laboratoire. Les manipulateurs à rotule ont été commandés à la Société française F.C.R.; la rotule est enchâssée dans une brique occupant la place d'une brique normale. La longueur des tiges de manipulateurs varie: 40 cm, 60 cm, 80 cm, 1,20 m suivant les fonctions. Les sols existants sont protégés par un revêtement plastique synthétique sans joints à base de chlorure — 2 3 4 5 Fig.: 2 — Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723 2. Forts.
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

de polyvinyle. Toutes les portes sont munies d'un ferme-porte automatique; les poignées sont prolongées et orientées de telle sorte qu'elles puissent être manoeuvrées à l'aide des coudes. Les boîtes à gants qui occupent le laboratoire 8 servent à manipuler les substances radioactives pulvérulentes ou volatiles. Elles sont construites en résine synthétique dure et résistante, par la firme Saint-Gobain Nucléaire à Courbevoie, en France. — 2 3 4 5 Fig.: 2

(9) RL

Lemon, L.C. 1725
Plutonium-Bearing Fuel Element Welding Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 361-66, 3 Fig.)

A 26 ft^3 evacuable type facility for welding Zircaloy-clad plutonium-containing fuel rods in a helium atmosphere has been developed. The welding facility used for Zircaloy-clad rods is constructed of 1/2-inch thick stainless steel and 1-inch thick tempered safety glass, equipped with long rubber gloves, and connected to the plutonium-laboratory ventilation system.

4 Fig.: 4

(3) RL

Duckworth, J.P., Michels, L.R. 1728
New Neptunium Recovery Facility at the Hanford Purex Plant
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 302-6, 5 Fig.)

The design philosophy adopted called for remote operation and maintenance of equipment wherever possible. The entire package was to be "remoted" into and out of the cell. All equipment subject to mechanical failure or process obsolescence was to be remotely removable from the package, such as pumps, agitators, jets, valves, flowmeters, and control instrumentation. Although small pulse generators are essentially trouble-free, they were to be remoted as an added precaution. Pulse column cartridges were designed for remote replacement to provide added process flexibility since it was Forts.

4 Fig.: 4

(4) RL

Duckworth, J.P., Michels, L.R. 1728 Forts.
New Neptunium Recovery Facility at the Hanford Purex Plant
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 302-6, 5 Fig.)

not practical to remote the entire column. The nuclear safety philosophy finally adopted was to use favorable geometry wherever possible coupled with administrative controls where an "always-safe" geometry could not be provided. This resulted in the selection of 7-inch i.d. columns and 3-inch annular vessels.

4 Fig.: 4

(4) RL

Duckworth, J.P., Larivière, J.R. 1729
New Neptunium Purification Facility at the Hanford Purex Plant
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 306-8, 3 Fig.)

The Control Room, Hot Cell, Maintenance Room, Load-Out Room are described. The Hot Cell houses all of the neptunium purification equipment including a feed receiver, stripper-concentrator, column feed tank, ion exchange column, waste tank, condenser, two sump tanks, several seal pots, and the associated piping. All of this equipment is installed within a stainless steel hood with transparent plastic panels. The remaining area in the Hot Cell is for access and equipment removal operations. Forts.

4 Fig.: 4

(4) RL

Duckworth, J.P., Larivière, J.R. 1729 Forts.
New Neptunium Purification Facility at the Hanford Purex Plant
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 306-8, 3 Fig.)

The Maintenance Hood, located in the Maintenance Room, is a shielded enclosure faced with 1-inch thick stainless steel containing lead glass viewing ports and lead-covered glove ports. The Product Load-Out Hood is of standard fabrication, stainless steel and safety glass, and is equipped with glove and bagout ports for manual loading operations.

4 Fig.: 4

(4) RL

Dukes, E.K., Dorsett, R.S. 1730
Process Control in the Production of Pu 238 and Np 237
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 333-6, 1 Fig., 1 Tab.)

One standard analytical laboratory (12 x 24 feet) was equipped to perform all the analyses required to control the Pu 238-Np 237 process. In addition to the usual services, the laboratory contained a small shielded cell and transfer station, four gloved boxes, two radiobenches, and one hood. All areas except the vented containment boxes were maintained free from contamination. The floor was covered with a polyvinyl sheet to protect the tile and to facilitate removal of accidental contamination. Access was restricted to one entrance. Another portal was reserved for emergency exit. Forts.

2
4

(5) RL

Dukes, E.K., Dorsett, R.S. 1730 Forts.
Process Control in the Production of Pu 238 and Np 237
(Industrial and Engineering Chemistry. Process Design and Development, 3 (1964) S. 333-6, 1 Fig., 1 Tab.)

Shoe covers were worn and removed at a step-off pad located at the entrance to prevent spread of contamination to other parts of the building. Radiation monitoring instruments and other safety equipment were also located at this entrance.

2
4

(5) RL

Hughes, J.P., Schmitz, F.J., Bloomquist, A.A. 1731
Preparation of Gram Amounts of Americium for Encapsulation
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 391-93, 1 Fig.)

A double-sided glove box having floor dimensions of 42" x 50" was divided through the center by a Plexiglas partition to divide the unit into a "hot" and a "cool" side. The hot side was used for the chemical operations, whereas the cool side housed the balance used for precise weighing of the americium, and for bagging out the material for removal to the encapsulation hood. Quarter-inch sheet lead was fitted around the glove ports on each of the box working faces, and 1/8" sheet around the closed ends and on the floor. A 7 1/2" x 4 1/2" slab of 2" thick Plexiglas was fitted into the lead sheeting on each of the working faces to serve as viewing windows. (5) RL

4 Fig.: 4

Nowak, W., Hausdorf, S. 1732
Das Isotopenlaboratorium.
Leipzig: VEB Deutscher Verl.f.Grundstoffindustrie 1961. 108 S., 32 Fig., 7 Tab.

Die vorliegende Broschüre unterrichtet über einige wichtige, mit dem Bau, der Einrichtung und der Tätigkeit im Isotopenlaboratorium zusammenhängende Fragen. Es werden folgende Laboratorien unterschieden: Forschungslaboratorien, Industrielaboratorien, Unterrichtslaboratorien und fahrbare Laboratorien. Verschiedene Kapitel befassen sich mit den Merkmalen solcher Laboratorien, ihrer Einrichtung, Be- und Entlüftung, ihrer Grundrißgestalung und dem Raumprogramm. Der Strahlenschutz im Isotopenlaboratorium behandelt bauliche Strahlenschutzmaßnahmen sowie apparative Maßnahmen zur Kontaminationsüberwachung.

2 3 4 5 Fig.: 2 3 4 5

(7) RL

Lamer, S.F. (Comp.) 1736
Fire and Explosion Protection of Glove-Box Facilities. A Literature Search
(TID-3578 (1964) III, 52 S.)

A total of 379 references are cited on the safety design of facilities handling radioactive materials. Included are references on glove boxes, fire hazards and control, explosion hazards and control, laboratory design, ventilation systems, and filter systems.

TID-3578 1 3 4 5

(7) NSA-18(1964)-39414 RL

Simon, A. 1737
Disassembly and Decontamination Apparatus Especially for Calutrons
(U.S.Pat.3,143,119 (1961/1964) 5 Bl., 4 Fig.)
(Br.fr.236,880 (1961/1962))

The invention applies to the operations involved in handling a highly radioactive vessel, especially with a view to carrying out the disassembly as well as the decontamination of a calutron vessel. Since there is no apparatus which carries out all these operations, such operations usually have to be carried out directly in an active medium, the operators being protected by frogsuits; alternatively, the contaminated parts to be manipulated are isolated by protective covers of vinyl. Forts.

U.S.Pat. 3,143,119
Br.fr. 236,880
4 5 Fig.: 4

(6) NSA-18(1964)-37317 RL

Simon, A. 1737 Forts.
Disassembly and Decontamination Apparatus Especially for Calutrons
(U.S.Pat.3,143,119 (1961/1964) 5 Bl., 4 Fig.)
(Br.fr.236,880 (1961/1962))

These methods entail a large number of manipulations, and safety is not absolutely guaranteed. The present invention has for its object a disassembly and decontamination apparatus which overcomes the above-mentioned disadvantages.

U.S.Pat. 3,143,119
Br.fr. 236,880
4 5 Fig.: 4

(6) NSA-18(1964)-37317 RL

Saint-Gobain Nucléaire, Courbevoie, France 1738
Improvements in Mechanical Remotely-Actuated Manipulators
(Brit.Pat.963,930 (1962/1964) 8 S., 9 Fig.)
(Br.fr.849,280 (1961))

This invention relates to mechanical remotely-actuated manipulators for effecting operations from a distance within so-called "hot" enclosures, that is to say, enclosures containing radio-active objects, especially enclosures having very thick walls, with a view to ensuring the protection of personnel.

Brit.Pat. 963,930
Br.fr. 849,280
4 Fig.: 4

(5) NSA-18(1964)-33722 RL

Hermann, H. 1739
Manipulator Apparatus
(Brit.Pat.963,962 (1963/64) 7 S., 4 Fig.)
(Br.fr.885,571 (1962))

This invention relates to manipulator apparatus of a type especially though not exclusively useful in nuclear installations for the handling of objects in dangerously radioactive surroundings from a remote station. For this purpose, the manipulator arm devices used may have to attain very great lengths, and conventional such devices have required correspondingly large amounts of space for stowing them when in retracted condition. It is a general object of this invention to provide manipulator apparatus especially Forts.

Brit.Pat. 963,962
Br.fr. 885,571
4 Fig.: 4

(5) NSA-18(1964)-33724 RL

Hermann, H. 1739 Forts.
Manipulator Apparatus
(Brit.Pat.963,962 (1963/64) 7 S., 4 Fig.)
(Br.fr.885,571 (1962))

though not exclusively suitable for nuclear applications, including an extensible and retractable manipulator arm which will require relatively little space for stowage.

Brit.Pat. 963,962
Br.fr. 885,571
4 Fig.: 4

(5) NSA-18(1964)-33724 RL

Guilloteau, R. 1740
Improvements in or Relating to Pneumatically-Controlled Gripping Tongs
(Brit.Pat.966,644 (1962/64) 3 S., 3 Fig.)
(Br.fr.860,476 (1961))

The present invention relates to pneumatically-controlled gripping tongs which are particularly suitable for gripping objects in a radioactive atmosphere. The present invention has for an object pneumatically controlled gripping tongs designed so that when one of the members becomes inoperative, it may be changed in a very short time. It relates more particularly to pneumatic tongs, controlled by connecting its single conduit, either to a tank of gas under pressure or to the outer atmosphere.

Brit.Pat. 966,644
Br.fr. 860,476
4 Fig.: 4

(5) NSA-18(1964)-33726 RL

Hamada, M., Oae, S. 1741
Design of Tracer Laboratory
(Annual Report of the Radiation Center of Osaka Prefecture, 2 (1961) S. 91-4, 4 Fig.)

In this paper the outline of design and several 2
characteristics of arrangements are shown. In 3
each room near entrance where low level radio- 4
activity is used, one or two built-in unopenable Fig.:
windows are arranged, whereas no window is accom- 2
modated in the room where semi-high activity is 4
handled. Built-in or movable type experimental tables, side tables and fume hoods are equipped in each room. On the side table, both sinks for inactive and active waste water are provided, the former is made by lead and the latter, stainless steel. In this laboratory, clean air, temperature and humidity of which are controlled is blown into each room through

(6) NSA-16(1962)-20568 Forts. RL

Hamada, M., Oae, S. 1741 Forts.
Design of Tracer Laboratory
(Annual Report of the Radiation Center of Osaka Prefecture, 2 (1961) S. 91-4, 4 Fig.)

the grill of ceiling, while contaminated air is drawn 2
out from each room through fume hoods or exhaust 3
grill, and ultimately put through the filtrating system. 4
The filtering system is consisted of wet filters and Fig.:
dry absolute filters. When the electricity stopped ac- 2
cidentally, ventilation fans are immediately operated 4
and lights along the wall are turned on by means of emergency electric generator in order to avoid the contamination by radioactivity.

(6) NSA-16(1962)-20568 RL

Stephenson, P.H. 1743
Manipulating Devices Having Master and Slave Portions for the Remote Handling of Objects
(Brit. Pat. 873,077 (1958/61) 8 S., 4 Fig.)

Brit. Pat. 873,077
4
Fig.: 4

The present invention relates to manipulating devices for the remote handling of objects, such as radioactive materials, and consisting of a master portion which can be controlled and moved by an operator and a slave portion which moves in dependence upon movements imparted to the master portion by the operator, or by the actuation of controls on the master portion. According to the present invention in a manipulator having a mechanism for effecting relative lateral displacement between the master and slave ends of the manipulator, means are provided for at least partially counterbalancing the slave arm during such lateral movements.

(4) NSA-17(1963)-37324 RL

European Atomic Energy Community (EURATOM) 1745
Remotely Controlled Machine Tool
(Brit. Pat. 962,037 (1962/64) 5 S., 4 Fig.)
(Belg. Pat. 483,198 (1961))

Brit. Pat. 962,037
Belg. Pat. 483,198
4
Fig.: 4

A remotely controlled machine tool (e.g. for use in a hot chamber of an atomic power plant) comprising a tubular machine base or body, work-piece clamping elements within the base, rotatable means for effecting clamping operation of the elements, a driving cylinder or sleeve surrounding the base and co-axial therewith, a tool table carried by the driving cylinder and rotatable therewith around the axis of the machine base is described.

(5) NSA-18(1964)-31705 RL

Ainsworth, A. 1746
Remote-Control Master-Slave Manipulator
(Brit. Pat. 963,552 (1962/64) 7 S., 19 Fig.)

Brit. Pat. 963,552
4
Fig.: 4

A remote-control manipulator comprising a transverse beam, master and slave arms pivotally connected to the beam at shoulder joints spaced axially of the beam, a handgrip carried by the master arm, a work handler carried by the slave arm, relatively rotatable connecting rods extending axially along the arms and beam and mechanically interconnecting the handgrip and the handler to cause movements of the handgrip to be reproduced by the handler, and compensating mechanism to apply compensating rotary movement to the connecting rods when arm movements relative to the rods are made.

(4) NSA-18(1964)-31712 RL

Ainsworth, A. 1747
Remote-Control Master-Slave Manipulator
(Brit. Pat. 963,553 (1962/64) 7 S., 19 Fig.)

Brit. Pat. 963,553
4
Fig.: 4

This invention relates to a remote-control manipulator comprising a transverse beam, a master arm and a slave arm pivotally connected to the beam at shoulder joints spaced axially of the beam, a handgrip carried by the master arm, a work handler carried by the slave arm, and means interconnecting the handgrip and the handler to cause movements of the handgrip to be reproduced by the handler wherein the transverse beam comprises two tubular beam casings which are axially slidable and rotatable relative to each other and wherein means are provided to cause relative axial displacement of the two beam casings thereby to cause transverse displacement Forts.

(4) NSA-18(1964)-31713 RL

Ainsworth, A. 1747 Forts.
Remote-Control Master-Slave Manipulator
(Brit. Pat. 963,553 (1962/64) 7 S., 19 Fig.)

Brit. Pat. 963,553
4
Fig.: 4

of the handler relative to the handgrip and means are also provided to cause relative rotation of the two beam casings to permit lateral displacement of the slave arm relative to the master arm.

(4) NSA-18(1964)-31713 RL

Uguen, R. 1748
Installations et laboratoires connexes
(Programming and Utilization of Research Reactors. Proceedings of a Symposium held in Vienna, Oct. 16-21, 1961, 1 (1962) S. 153-81, 15 Fig.)

4

La cellule proprement dite est constituée par un bloc parallélépipédique de dimensions intérieures de 3 x 6 x 6 mètres. Les murs, d'épaisseur un mètre, sont en béton de baryte densité 3,2 et revêtue intérieurement d'acier doux d'épaisseur 10 mm. Le toit est constitué par des dalles amovibles, l'une d'elles comportant un obturateur permettant l'introduction de dispositifs verticaux par une hotte de défournement. Les faces frontales comportent: l'une deux hublots en verre au plomb offrant un champ de vision le plus grand possible; Forts.

(3) NSA-17(1963)-13830 RL

Uguen, R. 1748 Forts.
Installations et laboratoires connexes
(Programming and Utilization of Research Reactors. Proceedings of a Symposium held in Vienna, Oct. 16-21, 1961, 1 (1962) S. 153-81, 15 Fig.)

l'autre une dalle semimobile de 1 x 1 mètre environ. A l'intérieur sont disposés, du côté opposé aux fenêtres, deux manipulateurs lourds de 300 kg chacun pouvant soulever au crochet individuellement 1000 kg. Le choix du type peut être discuté, mais la solution à commande électromécanique offre de très nombreux avantages par rapport aux autres (pneumatiques, hydrauliques), en particulier une précision et une fidélité de réponse plus grandes.

4

(3) NSA-17(1963)-13830 RL

Bergh, H. van den 1749
Wanddurchführungen für Leitungen oder bewegliche Glieder
(DAS 1.161.730 (1960/64) 1 S. [Abstract J.]

Wall lead-in for supply lines and movable links. A device for the introduction of supply lines or movable links through openings of walls of hot cells is described. This device comprises a replaceable air-tight jacket which is partly fitted into the opening. As the remaining part of the jacket is stepped a ring-shaped space is formed between this part of the jacket and the opening. An air-tight insert is fitted into the space between the stepped part of the jacket and the inner surface of the opening. An essential feature of the device is that the steps of the insert are arranged in such a way that the step with the largest diameter is on the outside of the shield.

DAS 1.161.730

4

(4) NSA-18(1964)-22215 RL

Pesenti, P. 1750
Head for Remote Manipulators
(U.S. Pat. 3, 111, 230 (1960/63) 3 S., 3 Fig.)
(Br.fr. 46.699 (1959))

The present invention relates to manipulators and, more particularly, to remote manipulators intended to produce, from a control station, the remote manipulation of objects disposed in a receptor station and, in particular, radioactive materials.

U.S. Pat. 3, 111, 230

Br.fr. 46.699

4

Fig.: 4

(5) NSA-18(1964)-3949 RL

Pilger, J.P. 1753
Gripping Device for Cylindrical Objects
(U.S. Pat. 3, 118, 698 (1961/64) 2 S., 4 Fig.)

The invention relates to a novel gripping device for cylindrical objects, more particularly to a device with positively controlled gripping jaws to insure a circumferentially uniform and stress-free grip on rods or tubes, for drawing or straightening the same. It is, accordingly, an object of the invention to provide a gripping device capable of pulling thin-walled tubes for drawing or straightening them without deforming the end portions being gripped. It is another object to provide a gripping device for pulling thin-walled tubes or rods for drawing and straightening them, without excessively indenting the portions being gripped.

U.S. Pat. 3, 118, 698

4

Fig.: 4

(4) NSA-18(1964)-5456 RL

Frisch, E., Widmer, T.F. 1754
Linear Motion Device
(U.S. Pat. 3, 122, 027 (1960/64) 5 S., 4 Fig.)

The present invention is directed to linear motion devices and more particularly to such devices having gripper arms thereon for rectilinearly moving an element in a step by step manner. The present linear motion device is particularly adapted to move various elements in a linear direction to any desired position, such as the elements used in controlling a complex chemical process or to operate various elements of a complex machine tool. The elements to be positioned may be located within a sealed pressure vessel which requires some type of seal where the linear motion device enters the sealed pressure vessel.

U.S. Pat. 3, 122, 027

4

Fig.: 4

(5) NSA-18(1964)-10222 RL

Hebden, D. 1755
Liquid-Liquid Contacting Apparatus
(U.S. Pat. 3, 126, 258 (1959/64) 3 S., 8 Fig.)
(Brit. Pat. 841, 520 (1958/59))

The object of the invention is to provide mixer-settler apparatus wherein there is provided, in association with the mixer compartments of the apparatus, means for effectively mixing liquid phases without employing moving mechanical parts in contact with the liquids. Mixer-settler apparatus according to the present invention has fluid glow ducts for withdrawing and returning liquid from and to each mixer compartment and is characterised in that said ducts are each connected at a number of levels to their respective mixer compartments.

U.S. Pat. 3, 126, 258

Brit. Pat. 841, 520

4

Fig.: 4

(5) NSA-18(1964)-16158 RL

Le Guennec, R., Pesenti, P. 1756
Mechanical Manipulators for the Displacement of Objects Located in a Radioactive Medium
(U.S. Pat. 3, 128, 887 (1961/64) 5 S., 7 Fig.)
(Br.fr. 90, 991 (1960))

This invention relates to a mechanical manipulator for the displacement of objects in a radioactive medium comprising: a pilot member and a controlled member disposed symmetrically in parallel relation on opposite sides of one wall of an enclosure surrounding the radioactive medium; and articulated parallelogram connected to each of said members deformable in parallel planes.

U.S. Pat. 3, 128, 887

Br.fr. 90, 991

4

Fig.: 4

(6) NSA-18(1964)-22218

Tanner, M.C., Lowes, L. 1757
Liquid-Liquid Contacting Apparatus
(U.S. Pat. 3, 134, 650 (1958/64) 2 S., 4 Fig.)
(Brit. Pat. 707, 994 (1957/58))

This invention relates to liquid-liquid contacting apparatus and in particular to mixer-settler apparatus for the contacting of toxic, radioactive or otherwise dangerous liquids. The object of the present invention is to provide for effective mixing of liquid phases in the mixer compartments of a mixer-settler, an apparatus not employing moving mechanical parts in contact with the liquids. According to the present invention a mixer-settler apparatus has means for mixing of liquid phases comprising a pair of mixer tubes dipping into each mixer compartment and means for increasing and decreasing the pressure in the mixer tubes in and out of phase interrelationship.

U.S. Pat. 3, 134, 650

Brit. Pat. 707, 994

4

Fig.: 4

(6) NSA-18(1964)-25628 RL

Holmes, J.H., Schafer, A.C. 1759
Some Operating Characteristics of the Pump-Mix Mixer Settler
(Chemical Engineering Progress, 52 (1956) S.201-4, 8 Fig.)

The design principles of the pump-mix mixer settler are described briefly and some of its operating characteristics are presented. Twelve runs were made with a methyl isobutyl ketone-acetic acid-water system to show the relationship of stirrer speed and total flow to efficiency. With the proper selection of the variables, 95 to 100 % efficiency was obtained. Also, some comments based upon several years of pilot plant operation are presented. (auth)

4
Fig.: 4

(4) RL

Douis, M., Guillon, A., Laurent, H., Sauvagnac, R. 1760
Installation de chimie analytique pour produits radioactifs
(Compte rendu. 31e Congrès international de chimie industrielle, Liège (Belg.) 7-20 Sept. 1958 (1958) S.687-92, 5 Fig.)

La présente communication décrit une enceinte étanche et blindée permettant un travail et un contrôle analytique sur des produits radioactifs. Les techniques suivantes sont adaptées pour une manipulation à distance: pipettage, pesées, centrifugation, dessiccation, volumétrie, mesure de pH, potentiométrie, colorimétrie, polarographie. Cette liste n'est pas limitative.

4
Fig.: 4

(6) NSA-14(1960)-24045 Forts. RL

Douis, M., Guillon, A., Laurent, H., Sauvagnac, R. 1760 Forts.
Installation de chimie analytique pour produits radioactifs
(Compte rendu. 31e Congrès international de chimie industrielle, Liège (Belg.) 7-20 Sept. 1958 (1958) S.687-92, 5 Fig.)

La conception de l'installation permet la mise en place rapide d'autres appareils. Protégée par 5 cm de plomb et fortement ventilée, elle donne toute sécurité de manipulation jusqu'à un niveau d'activité de 400 millicuries en produits de fission à vie longue. (auth)

4
Fig.: 4

(6) NSA-14(1960)-24045 RL

Bloch, J. 1761
Etude radiocristallographiqué de matériaux fortement radioactifs
(Bulletin de la Société française de Minéralogie et de Cristallographie, 84 (1961) S.281-6, 4 Fig.)

Les cellules sont disposées en une ligne séparant d'une part une zone de travail dans laquelle se tient le personnel utilisant les cellules et où l'intensité du rayonnement reste inférieure au dixième de la limite admissible; d'autre part une zone arrière pouvant être contaminée et permettant l'accès à l'intérieur des cellules. La protection est assurée par des murs de béton de densité 2, 3 dont l'épaisseur est de 1 m. Chaque cellule (de dimensions intérieures 1, 80 x 2 m) est équipée sur la face avant d'une fenêtre en Forts.

4
Fig.: 4

(3) NSA-17-1963-6758 RL

Bloch, J. 1761 Forts.
Etude radiocristallographique de matériaux fortement radioactifs
(Bulletin de la Société francaise de Minéralogie et de Cristallographie, 84 (1961) S.281-6, 4 Fig.)

verre stabilisé constituée par un empilement de dalles de densité 2, 7, l'ensemble étant immergé dans l'huile. La manipulation à l'intérieur des cellules se fait à l'aide de deux manipulateurs Argonne modèle 8.

4
Fig.: 4

(3) NSA-17-1963-6758 RL

Cermak, H. 1763
Ein Isotopenlaboratorium für die Baustofforschung
(Silikattechnik, 11 (1960) S.577-9, 7 Fig.)

Der inaktive und der aktive Laborteil sind durch zwei Schleusen (für männliches und weibliches Personal) miteinander verbunden. Diese Schleusen sind notwendig, damit ein Verschleppen radioaktiver Substanzen aus dem aktiven Laborteil mit Sicherheit vermieden wird. Zu diesem Zweck muß jede Person die Oberbekleidung wechseln, bevor der aktive Laborteil betreten wird; das gleiche gilt beim Verlassen der aktiven Räume. Die Raumlufterneuerung zur Vermeidung einer Inkorporierung gas- oder staubförmiger radioaktiver Stoffe wird mit Hilfe von Zu- und Abluftaggregaten erreicht, wobei die zuerst genannten im Keller des Laboratoriums, die als zweite genannten im Dachgeschoß des Gebäudes untergebracht sind.

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Fig.: 3
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(4) NSA-16(1962)-23981 RL

Judson, B.F. 1764
Design of Plutonium Processing Plants
(Chemical Engineering Progress Symposium Series, 55, No 22 (1959) S.33-6, 4 Fig.)

Large, transparent, and sealed hoods enclosing the processing equipment can be effectively employed as the prime contamination control measure in a plutonium plant. A slight vacuum is maintained within the hoods, so that any air leakage is directed inward to the source of contamination. The individual hoods are large enough to contain complete, multicomponent processing systems but are relatively narrow to facilitate direct maintenance of the equipment.

3
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Fig.: 3

(4) NSA-14(1960)-3577 RL

Chismar, P.H. 1766
Gauntlet System for Master-Slave Manipulators
(DP-881 (1964) 7 S., 5 Fig.)

An improved gauntlet system was developed to reduce radioactive contamination of master-slave manipulators. The gauntlet protects the in-cell portion of the manipulator and prevents escape of contamination through the manipulator port in the cell wall.

DP-881
4
Fig.: 4

(4) NSA-18(1964)-22198 RL

Mackey, T.S. 1767
TRU Glove Box Fire Test Results
(ORNL-TM-923 (1964) 9 S., 2 Fig.)

The transuranium glove box will be very similar to the one presently in use in the 3508 building. Fire tests were performed. The dimensions of the box are 36 in. long, 27 in. in depth, 30 in. in height, with a top width of 16 in. The ventilation system is described. The air discharged from the glove box through the Fiberglas roughing filter, then through the absolute filter into the manifold which was held at a negative pressure. The fire extinguishing system consisted of a Fenwall thermoswitch which, when activated, opened the solenoid valve 18 which permitted carbon dioxide gas to enter the glove box.

ORNL-TM-923
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Fig.:
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(6) NSA-18(1964)-35766 Forts. RL

Mackey, T.S. 1767 Forts.
TRU Glove Box Fire Test Results
(ORNL-TM-923 (1964) 9 S., 2 Fig.)

The glove box fire tests demonstrated that two hazards are encountered as a result of a fire. The first is the possibility of containment loss due to the burn through of the rubber gloves and the second is the explosion hazard which follows a fire as a result of the increased evaporation rate of the solvent due to the heat buildup in the glove box floor.

ORNL-TM-923
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4
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Fig.:
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(6) NSA-18(1964)-35766 RL

Seagrean, H.E. 1768
Some Developments in Engineering, Fabrication, and Field Support of Laboratory Programs. Report 2: October 1962 - March 1963
(ORNL-TM-792 (1964) VI, 52 S., 28 Fig.)

The existing promethium-147 cell (Radioisotope Production Laboratory) has been modified. A one-foot thickness of normal concrete was added around the exterior of the existing 9-1/2-inch-thick armor-plate walls, and solid barytes-concrete blocks were dry stacked 12 inches high on top of the existing cell roof. Modification of an analytical balance now permits the weighing of minute quantities of materials inside a hot cell under reduced air pressure. A personnel safety interlock system has been designed and built for the cobalt-60 irradiation cell located in the northwest corner of the basement of Building 4501 (High Level Radiochemical Laboratory).

ORNL-TM-792
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Fig.:
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(4) NSA-18(1964)-20134 RL

Smith, C.W. 1769
Engineering Studies Fission Product Plants at Hanford
(HW-SA-3377 (1964) 40 S., 16 Fig.)

The process area of the plant is a cylindrical, concrete structure, 103-feet in diameter extending about 75-feet above grade and 20-feet below grade. This portion of the building is surrounded by an 18-feet wide operating gallery. The process area includes eight wet chemistry cells, eleven manipulator cells, a cell access area, a service gallery, and an operating gallery. Entries to all of the cells are provided through removable cover blocks and through shielded personnel access doors for all cells except the product storage cell.

HW-SA-3377
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3
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Fig.:
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(6) NSA-18(1964)-13914 Forts. RL

Smith, C.W. 1769 Forts.
Engineering Studies Fission Product Plants at Hanford
(HW-SA-3377 (1964) 40 S., 16 Fig.)

The process ventilation system is designed in accordance with the established Hanford practice for radioactive process area. The ventilation system is a once through system, in which filtered, washed, and heated (in winter) air is supplied to the process area. The exhaust air is cleaned of radioactive particles by passage through high efficiency filters and is discharged through a 200-feet high stack.

HW-SA-3377
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3
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Fig.:
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(6) NSA-18(1964)-13914 RL

Seagren, H.E. 1770
Some Developments in Engineering, Fabrication, and Field Support of Laboratory Programs, April - Sept. 1962
(ORNL-TM-791 (1964) VII, 71 S., zahlr. Fig.)

A new concept has been developed for the drive, positioning, and control of a conveyor for intercell transfers within a cell bank. - Radioactive samples of alpha-emitting materials may be transferred from one cell to another as a matter of routine operation by use of a newly developed cubicle port closure. Used in connection with an intercell conveyor system, transfers may be made between an alpha-tight canister and alpha-tight cell cubicles without loss of containment. - A lead-shielded, roll-film, pinhole camera has been designed and fabricated for use in hot cells. - Equipment for remotely processing, blending, weighing,

ORNL-TM-791
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Fig.:
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Forts.

(4) NSA-18(1964)-21715 RL

Seagren, H.E. 1770 Forts.
Some Developments in Engineering, Fabrication, and Field Support of Laboratory Programs, April - Sept. 1961
(ORNL-TM-791 (1964) VII, 71 S., zahlr. Fig.)

loading, sealing, cleaning, and testing of enriched fuel elements has been designed.

ORNL-TM-791
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Fig.:
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(4) NSA-18(1964)-21715 RL

Vogel, G.J., Carls, E.L., Murphy, W. 1772
Design and Construction of Plutonium Facility
(ANL-6725: Chemical Engineering Division Summary Report, April-June 1963 (1963) S. 155-57, 1 Tab.)

Construction is under way of a facility for engineering-scale investigation of the several steps of a fluid-bed fluoride volatility process for recovery of fissionable values from spent reactor fuel. Because of the high toxicity of Pu, it must be completely contained. Therefore, all equipment is being installed inside a large glove-box, 17 ft high by 25 ft long. The elevator lifts which provide personnel with complete access to glove ports at all levels of the large alpha box have been received and installed.

ANL-6725
4

(6) RL

Lakey, L.T., Bower, J.R. (Ed.) 1773

ICPP Waste Calcining Facility Safety Analysis Report

(IDO-14620 (1963) getr. Zählg., zahlr. Fig. u. Tab.)

The process building is a single unit 110 feet long and 70 feet wide. Radiation shielding is provided by the thick reinforced-concrete walls of the "hot" process cells. The building has six levels or floors which provide access to all rooms and cells. Heating and ventilation air is supplied through a branch duct from the main heating and ventilation duct system. Ventilation systems, laboratories and cells are described. The fire alarm system is a manual system. The alarm can be actuated at any of four pull-lever fire boxes located throughout the facility. There are several portable fire extinguishers which are strategically located throughout the building.

IDO-14620
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Fig.:
2

(8) RL

Bates, S.B. 1774

Method of Cutting Glove Portholes in Safety Plate and Leaded Glass

(HW-80750 (1958) 2 Bl., 2 Fig.)

Faced with the problem of cutting circular glove portholes in safety plaste glass used for radiation shielding in hoods, the author devised a method of cutting these holes which is summarized.

HW-80750
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Fig.:
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(4) NSA-18(1964)-12283 RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1775

Development of Plutonium Bearing Fuel Materials. Progress Report for January 1 Through March 31, 1960

(NUMEC-P-20 (1960) 17 S., 20 Fig., 2 Tab.)

Major effect has been directed towards glove-box and equipment setup (NUMEC Plutonium Facility). All exhaust fans, filter housings, ventilation ducts and manifolds for the plant have been installed. Three glove boxes have been installed to the plant exhaust manifold. Hot laboratory details are given. The cell exterior has been sand finished and painted. The interior walls were sand finished, ground smooth with a carborundum stone, sealed with Rustoleum Seal-Cote, and painted with two coats of Rustoleum gloss enamel.

NUMEC-P-20
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4
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Fig.:
4

Forts.

(6) RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1775 Forts.

Development of Plutonium Bearing Fuel Materials. Progress Report for January 1 Through March 31, 1960

(NUMEC-P-20 (1960) 17 S., 20 Fig., 2 Tab.)

Each cell window consists of a cylindrical, stepped carbon steel tank with welded flanges on the ends having "O" ring grooves and tapped blind holes for seal of the glass cover plates and support of the cover plate flanges, respectively.

NUMEC-P-20
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4
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Fig.:
4

(6) RL

Centeno, J. 1777

Critically Safe Mixer-Settlers

(ETR-138(Rev.)(1962) 16 S., 8 Fig., 3 Tab.)
(NP-13287)

A review of the most suitable types of mixer-settlers for processing concentrated solutions of fissionable materials is made in the present paper. The essential characteristics of the different types of extractors are compared. Critically-safe design, and efficiency prediction and scaling-up methods are also considered. The horizontal slab type (stages assembled side by side) and turbine type (in-line assembly) mixer-settlers seem to be the most suitable as "ever safe" extractors. For ease of maintenance, the air pulsed mixer-settler should be one of the types to be considered. (auth)

ETR-138
NP-13287
4
Fig.:
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(5) NSA 18(1964)-3879 RL

Fontaine, A. 1778

Les laboratoires de fabrication de l'usine d'extraction du plutonium de Marcoule. Expérience des 6 premières années de fonctionnement 1957-1963

(CEA-R 2700 (1964) 36, 10 S., 14 Fig., 8 Tab.)

Le présent rapport tente de faire le point de la situation des Laboratoires du Service Extraction du Plutonium. Après un rapide retour sur les origines et les objectifs, après quelques considérations sur le recrutement et la technologie situant le contexte de leurs progrès, nous étudierons les méthodes, leurs domaines d'application, leurs limites actuelles. Il y a des illustrations d'une chaîne de boîtes à gants, des cellules, des enceintes blindées, équipées de télémanipulateurs etc.

CEA-R-2700
4
Fig.:
4

(4) RL

Lopez-Menchero, E., Centeno, J. 1781

Improvements to CEN Minimixer-Settler Model: EUROCHEMIC Model No 1

(NP-12395 (1962) 17 S., 9 Fig., 1 Tab.)
(ETR-112 (1962))

A model based on the CEN minimixer-settler, described by R. De Witte, was developed. The following improvements were made: individual regulation of the height of each mixing pump, introduction of a technique to achieve quicker sampling and the use of acid- and solvent-resistant, transparent KEL-F as the basic material of construction.

NP-12395
ETR-112
4
Fig.:
4

(6) NSA-17(1963)-8246 RL

Lister, B.A.J. 1783

Plutonium Containment

(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.2/3.1-2/3.13, 23 Fig., 1 Tab.)

In glove box design, four points are of importance; i) good containment during normal operation to prevent plutonium from entering the operating area; ii) comfortable and straightforward working conditions including good lighting. Early boxes had wooden frames but, because of the fire hazard and the difficulty of decontaminating wooden surfaces, wood is now replaced by steel or fibre-glass. For the viewing panels no more generally suitable organic material has been found than Perspex.

AERE-L 151
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4
5
Fig.:
4
5

(6) Forts. RL

Lister, B.A.J. 1783
Plutonium Containment Forts.
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.2/3.1-2/3.13, 23 Fig., 1 Tab.)

Usually complete box sides are made of Perspex, but where a serious fire hazard exists, consideration should be given to the use of small viewing panels. Description of fume cupboards and types of glove boxes and fillings, gloves and glove changing, pressurized suits as well as fire and explosion hazards is given.

AERE-L 151
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4
5
Fig.:
4
5

(6) RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1787
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs and Specifications ....
(TID-4100(Suppl.1)(1957) getr. Zählg.)

Cape-28: Hot Analytical Facility. Specification and architectural, structural, service piping, drainage, heating ventilation, electrical, and mechanical drawings for the Hot Analytical Facility at ORNL are given. Package includes laboratory equipment such as manipulator, conveyors, and transfer drawers for hot cells. Cape-30: Extraman Manipulator. Extraman Manipulators, designed for performing remote handling odd jobs, are capable of operating through a 1-in pipe which penetrates 3-inch cell walls; they can be extended for use.

TID-4100 (Suppl. 1)
Cape-28
Cape-30
Cape-33
Cape-37
Cape-42
Cape-47
Cape-61
3
4

(11) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1787
1. Forts.
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs and Specifications ....
(TID-4100(Suppl.1)(1957) getr. Zählg.)

Cape-33: Ball Joint Manipulator-Model 2. Assembly and detailed drawings are given for a ball joint manipulator to be used in a junior cave for low-level chemistry work. Cape-37: Ball Swivel Manipulator Tongs. Ball-swivel manipulator tongs for a general purpose handling device may be either hand-held or supported by a ball-swivel joint, mounted in a protective shield. The design uses detachable heads. The tongs consist of a pistol grip, trigger, and trigger release, and operating rod enclosed in a barrel. Cape-42: H.C. 6" Lead Cave Chain Drive Manipulator. Assembly and detail drawings are available for remotely controlled equipment for

TID-4100 (Suppl. 1)
Cape-28
Cape-30
Cape-33
Cape-37
Cape-42
Cape-47
Cape-61
3
4

(11) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1787
2. Forts.
Unclassified Engineering Materials List. A Catalog of Drawings, Photographs and Specifications ....
(TID-4100(Suppl.1)(1957) getr. Zählg.)

small chemistry boxes for easy transfer of centrifuge cones to various items of equipment which are set up on intersecting circles with the chain drive manipulator. Cape-47: Hanford Manipulator Model II. A complete set of drawings and a parts list for constructing and assembling the Hanford Manipulator Model II is given. Cape-61: Hot Lab Addition. Drawings are given for new high level shielded hot cells to be used primarily for examination and to conduct physical operations and tests on solid reactor materials of source strengths of several million curies of old fission product activity. The hot drain system for the cells are included in this package.

TID-4100 (Suppl. 1)
Cape-28
Cape-30
Cape-33
Cape-37
Cape-42
Cape-47
Cape-61
3
4

(11) RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1788
Engineering Materials List. A Catalog of Drawings ...
(TID-4100(1st Rev., Suppl.2)(1958) getr. Zählg.)

Cape-167: Metallographic Cell Extension. The extension is 9 ft. long, 5 ft 2 in. deep, its roof height is 7 ft. 6 in. and its floor level is 3 ft. 6 in. The unit is supported by steel columns which leave the underside of the cell accessible. Wall construction is 6 in. laminated steel shielding. The extension is equipped with openings for a periscope, manipulators, hardness testers, windows and doors. Cape-173: Master Slave Manipulator Model 7. This is a mechanical general purpose manipulator most suitable for junior caves and intermediate-level shielded enclosures. It enters the enclosure through a hole in the roof. There are seven independent motions.

TID-4100 (1st Rev., Suppl. 2)
Cape-167
Cape-173
Cape-177
Cape-184
Cape-186
Cape-198
Cape-200
4

(10) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1788
1. Forts.
Engineering Materials List. A Catalog of Drawings ...
(TID-4100(1st Rev., Suppl.2)(1958) getr. Zählg.)

Cape-177: Master Slave Manipulator Model 4. This manipulator has a telescoping range of about 34" and will move from side to side, back and forth and cover a volume of better than 30 cubic feet. Cape-184: Midi Mixer Settler. The pump-mix mixer settler has a capacity of approximately one liter/min of both phases. It provides information on capacity, settling characteristics, mixing speed, and other operating characteristics. Also included are drawings for the cell, cell ventilation and a shielded cask. Cape-186: Manipulator Cell. This cell is built to use 2 manipulators which enter through the roof. The cell is 60" x 43" shielded by 34" of concrete on the sides and 18" in the back.

TID-4100 (1st Rev., Suppl. 2)
Cape-167
Cape-173
Cape-177
Cape-184
Cape-186
Cape-198
Cape-200
4

(10) Forts. RL

United States Atomic Energy Commission, Oak Ridge, Tenn. 1788
2. Forts.
Engineering Materials List. A Catalog of Drawings ...
(TID-4100(1st Rev., Suppl.2)(1958) getr. Zählg.)

The $ZnBr_2$ window is 24" thick, 2' high and 3' wide. Cape-198: H.C. 2" Lead Shield, Nodel 6. The 2" lead movable shield or box is used in health chemistry. Castle manipulators, used with the box are also included. Cape-200: 40 Ton Electric Overhead Traveling Crane. This 40 ton crane may be used for charging and maintaining chemical equipment. It has a double box girder bridge, a steel shielded cab, a main trolley carrying a 40 ton main hoist and a 10 ton auxiliary hoist.

TID-4100 (1st Rev., Suppl. 2)
Cape-167
Cape-173
Cape-177
Cape-184
Cape-186
Cape-198
Cape-200
4

(10) RL

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Engineering Materials List. A Catalog of Drawings ...
(TID-4100(1st Rev., Suppl.3 (1959) getr. Zählg.)

Cape-301: Remote Controlled Quartz-Fiber Microbalance. The microbalance is designed for routine remote-control weighing of decimal microgram to milligram quantities of radioactive materials and nonradioactive materials requiring protection from environment or atmosphere. Cape-328: Multikilocurie Loading Cell. This cell is used in operations involving 10,000-curie cobalt 60 pellets and for fabrication of sources containing Cobalt 60. The cell walls are 3 ft. thick and the top is 2-1/2 in. thick made of barytes aggregate concrete. The cell is equipped with a viewing window of cerium-barium glass, manipulators and a 1-ton capacity air operated hoist on a traveling crane.

TID-4100 (1st Rev., Suppl. 3)
Cape-301
Cape-328
Cape-369
Cape-381
4

(9) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1789
Engineering Materials List. A Catalog of Drawings .... Forts.
(TID-4100(1st Rev., Suppl. 3 (1959) getr. Zählg.)

Cape-369: Falling Drop Densimeter and a Servo Pipette. This remotely operated densimeter measures the density of intensely radioactive liquids and consists of a fall-tube turret with thermostat, "lazy susan" screw-operated elevator, servo-controlled pipette, a timing clock and control units. Cape-381: Hot Cell and Storage Facility. This is a basic design study for the Hot Cell and Storage Facility. The cell is designed for a maximum curie level, limited to 100,000 curies of 1 Mev. gamma. Remote control equipment consists of Argonne M/S Manipulators Model 8 (see Cape-66), Lee Associates Manipulators, 3 Ton Hoist, 20 Ton Bridge Crane.
(9)

TID-4100 (1st Rev., Suppl. 3)
Cape-301
Cape-328
Cape-369
Cape-381
4
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings ....
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.)

Cape-219: Ball Socket Manipulator-6" Ball. This manipulator is made of stainless steel with a lead shield and ring, a neoprene gasket, and a graphite bearing. Cape-327: Periscope for Hot Cell Microscopy. This extended periscope is of good optical quality and definition, with sufficient field size to be used with a hardness-tester microscope in a hot cell for examination of irradiated metallurgical specimens. The section of the periscope passing
(19) Forts.

TID-4100 (1st Rev., Suppl. 4)
Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419
3/4
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings .... 1. Forts.
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

through the cell wall is about 57 in. long and the section within the cell is about 19 in. high. Cape-336: Remote Cutoff Wheel, Model 3. The cutoff wheel was designed to facilitate the removal of components from a cell maintenance or repair of apparatus. A specimen to be cut is loaded into a vise, and the cover carrying the cutting wheel and vise is closed. Cape-372: Auxiliary Plug-In Fingers for Master-Slave Jaws. The slim fingers facilitate the handling of small oddly shaped parts by the Argonne Master Slave Manipulator tongs. The duralumin fingers fit into duralumin fixtures bolted on to the jaws of the manipulator.
(19) Forts.

TID-4100 (1st Rev., Suppl. 4)
Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings .... 2. Forts.
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

Cape-373: Expendable Plastic Cubicle and Manipulator Sleeve. The plastic sleeve is used to protect mechanical parts of the slave end of a manipulator from contamination and is made of 0.004 in. thick vinyl chloride acetate film. Cape-393: Hot Lab Periscope for Open Top Cells. The periscope is used to view the interior of a front-wall-shielded open top cell. It rides on a carriage mounted on top of the front shielding wall and can travel the length of the cell. Cape-397: Shielded Manipulator Dry Box. The box is 3 ft. by 3 ft. long of 3/16 in. stainless steel. The sloping front is a safety plate-glass window which may be covered by a 4 in. lead door for gamma protection.
(19) Forts.

TID-4100 (1st Rev., Suppl. 4)
Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings .... 3. Forts.
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

Lead glass windows permit visibility during shielded operations. Cape-398: Hot Cell Access System. The system provides a method of quickly transferring radioactive samples into and out of small hot cells without the use of a radiation lock. Cape-406: Beaker Handling Device. The manipulator is an aluminum tube 3 to 10 ft. long with a spring-loaded expandable steel band at one end. Tension on the band is controlled by a lever on the handle. A different manipulator is used for each size beaker.
(19) Forts.

TID-4100 (1st Rev., Suppl. 4)
Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings .... 4. Forts.
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

Cape-410: General Purpose Hood. The hood is well suited to alpha activity work. In high level experiments a glove-port panel replaces the sliding window. The hood, 48 in. wide, 36 in. deep and 59-1/2 in. high is on a 36 in. high base. The interior has strippable paint. Cape-411: Remotely Controlled Lathe. This is a standard lathe modified by remote controls and mounted on its end in a hot cell to save space and ease chip collection. Cape-416: Remotely Controlled Micropipetter. The pipetter is used in analytical laboratory sampling and is oper-
(19) Forts.

TID-4100 (1st Rev., Suppl. 4)
Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1790
Engineering Materials List. A Catalog of Drawings .... 5. Forts.
(TID-4100(1st Rev., Suppl. 4)(1959) getr. Zählg.) 3/4

ated by hand or by flexible cable extension with a rotating ring stand. The body is aluminum and the fittings are aluminum or stainless steel. Cape-419: Model B Pipetter. The pipetter is a device designed to pipe aliquots of highly radioactive samples. Samples are delivered by driving the plunger into the chamber in precise increments, and expelling sample solution as desired.
(19)

TID-4100 (1st Rev., Suppl. 4)
Cape-219
Cape-327
Cape-336
Cape-372
Cape-373
Cape-393
Cape-397
Cape-398
Cape-406
Cape-410
Cape-411
Cape-416
Cape-419
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1791
Engineering Materials List
(TID-4100(1st Rev., Suppl. 10)(1961) getr. Zählg.)

Cape-515: High-Level-Chemistry-Development-Facility Building. The building is 54 ft. 6-1/2 in. long by 53 ft. 8 in. wide. It contains an operating area, a cell area 34 ft. long and 23 ft. 6 in. wide containing 3 in-line cells 6 ft. by 10 ft. by 10 ft. high. Each cell has a transfer opening, a viewing window 3 ft. 6 in. by 2 ft. 3/8 in. by 4 ft. thick, and cell walls are of 4 ft. of concrete. Each cell is equipped with a M/S manipulator and a general access door. Cape-583: Five Foot General Purpose Tongs, No. 2. The general purpose tong is used throughout the laboratory quite satisfactorily. It consists of a 5 ft. long 74 in. diameter stainless steel tube, a stainless squeeze type handle and a jaw of stainless steel that opens to 3-1/8 in.
(10) Forts.

TID-4100 (1st Rev., Suppl. 10)
Cape-515
Cape-583
Cape-640
Cape-643
Cape-654
4
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1791 Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 10)(1961) getr. Zählg.)

The jaw is activated from the handle by a 1/16 in. diameter aircraft cable. Cape-640: Universal Handling Tool. The tool is used in the handling of fuel, control rods, shims and sources of a compatible and specific design. Cape-643: Dismantling Equipment. A standard band-saw was modified to be used in a hot cell. It is remotely operated, mounted on wheels for movability and was modified for dismantling a pump-loop used to study molten salts. Cape-654: Junior Cave Crane and Manipulator. The manipulator was designed to be used in a junior cave. It is mounted on an existing rectilinear crane used in a junior cave.

TID-4100 (1st Rev., Suppl. 10)
Cape-515
Cape-583
Cape-640
Cape-643
Cape-654

4

(10) RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1792
Engineering Materials List
(TID-4100(1st Rev., Suppl. 14)(1961) getr. Zählg.)

Cape-767: Mixer-Settler Unit. The apparatus of steel is 21-1/2 x 9-3/4 x 8-1/8 in. with 1/16 in. fluorethene windows. It has 11 flow directors, flow baffles, and impellers; 5 dividers and 33 baffles. Cape-779: Fuel Fabrication Facility, 350. The facility is housed in a building 245 ft long and 72 ft wide and is divided into three ventilation areas; the administration area; the technical area; and the fabrication area. The fabrication area is used for all work performed directly on radioactive materials or clad fuel elements containing radioactive materials.

TID-4100 (1st Rev., Suppl. 14)
Cape-767
Cape-779
Cape-798
Cape-804
Cape-831

4

(10) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1792 1. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 14)(1961) getr. Zählg.)

Cape-798: JB-Line Glove Port. The JB-Line Glove Port is a mechanism which allows rapid changing of the type of gloves used for glove boxes or cabinets where it is essential to prevent air flow from the cabinet to the portion of the room occupied by personnel. Cape-804: Equipment Additions for Multicurie Fission Products Pilot Plant. Remotely controlled equipment additions used in the Multicurie Fission Products Pilot Plant include a Pellet Press for Cell 12; a Sampler Station for Cell 19; a Conductivity Calorimeter for Cell 12, and a Calorimeter for Cell 14.

TID-4100 (1st Rev., Suppl. 14)
Cape-767
Cape-779
Cape-798
Cape-804
Cape-831

4

(10) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1792 2. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 14)(1961) getr. Zählg.)

Cape-831: Manipulator Cell. The manipulator cell is a slight modification of the Multikilocurie Loading Cell. The cell walls are 3 ft thick, of high density concrete blocks and the top is 2-1/2 ft thick. The cell is lined with stainless steel. The window consists of 7 sections.

TID-4100 (1st Rev., Suppl. 14)
Cape-767
Cape-779
Cape-798
Cape-804
Cape-831

4

(10) RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1793
Engineering Materials List
(TID-4100(1st Rev., Suppl. 17)(1963) getr. Zählg.)

Cape-872: Transfer Mechanism for High-Level Radiochemistry Cell. The mechanism is used to move highly radioactive substances from one cell to another in the High Level Radiochemistry Facility. The transfer device extends into the cells so that objects can be raised or lowered vertically into or out of the transfer unit. Cape-921: Metallographic Equipment Used in HRLEL. The new High Radiation Level Examination Laboratory (HRLEL) employs only remote control equipment. A cut-off machine, used successfully in high radiation, and a vibratory polisher specimen holder used with the Syntron Polisher. The vibratory polisher is a modified Syntron polisher that is used in metallography.

TID-4100 (1st Rev., Suppl. 17)
Cape-872
Cape-921
Cape-922
Cape-988
Cape-989

4

(10) NSA-17(1963)-34070 Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1793 1. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 17)(1963) getr. Zählg.)

Cape-922: Modified Ball and Socket Coupling. This modified ball and socket coupling is used in hot cell manipulators. Cape-988: Decontamination Facility for ANP. The decontamination facility consists of a multicurie cell room, containing a hot cell with outside dimensions of 15 ft x 21 ft and having 5 ft thick concrete walls, decontamination room, remote analytical facility, rest rooms, change rooms, chemical cleaning room, tool crib, welding shop, metal working shop, and inspection room. The main cell block building is 83 ft x 88 ft.

TID-4100 (1st Rev., Suppl. 17)
Cape-872
Cape-921
Cape-922
Cape-988
Cape-989

4

(10) NSA-17(1963)-34070 Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1793 2 Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 17)(1963) getr. Zählg.)

Cape-989: Solid State Laboratory, Building 3025. This laboratory is contained in a two-story steel-framed reinforced-concrete structure 58 ft x 106 ft. Partitions and doors are made of hollow metal. On the first floor are laboratories, offices, working areas, and cells. There are laboratories and offices on the ground floor.

TID-4100 (1st Rev., Suppl. 17)
Cape-872
Cape-921
Cape-922
Cape-988
Cape-989

4

(10) NSA-17(1963)-34070 RL

Duthie, R.E.C., Sachs, F.L. (Ed.) — 1794
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

Cape-636: Standard Hood (LASL). The standard hood is 85-3/8 in. high, 48 in. wide and 32-1/2 in. deep, and is constructed of sheet metal. It has one door 39-3/4 in. wide and 35-1/2 in. high and is made of safety glass 1/4 in. thick. The balance control damper (see Cape-641) is used with this hood. Cape-800: Neutron Facility (UCRL). The neutron facility consists of a chemistry box 65 in. long x 48 in. x 48 in. made of 11 gage cold rolled, mild steel, with a water window. There are a polyethylene lined storage well, transfer box and carrier, a magnetic lift capable of lifting

Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986

TID-4100 (1st Rev., Suppl. 18)

3
4
5

(18) NSA-18(1964)-367 Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

1794
1. Forts.

500 lb, an overhead crane, and a manipulator device capable of raising and lowering 65 lb. Cape-861: Plastic Glove Box (SRL). The box is useful in housing short-term experiments with radioisotopes to contain the emitted β and low energy γ radiation, or limited amounts of α activity. The box is 46-7/8 in. x 34-1/4 in. x 20-1/8 in. It has two ports 8-11/16 in. in dia. The box ist constructed of fire-resistant, self-extinguishing, polyester resin that is reinforced with glass fibers. Cape-885: High Intensity Food Irradiator Facility (HIFI)(CWC). The facility is used to treat food and other materials with gamma radiation, using a multimega curie Co^{60} source. The radiation cell is 32 ft 8 in. long, 22 ft

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986

(18) NSA-18(1964)-367 Forts. 3 4 5 RL

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18 (1963) getr. Zählg.) 3 4 5

1794
2. Forts.

wide, and 11 ft high; and has an access corridor 7 ft wide. The shielding walls consist of 6 ft of compacted sand between 8 in. thick walls. The roof of the cell has a 5-1/2 in. concrete slab which is covered with 7 ft of compacted sand. Cape-886: Thorex Facility Building (ORNL). The concrete building consists of a basement, first floor, and attic with dimensions of 214 ft 8 in. long and 33 ft wide. A concrete platform, 174 ft long and 15 ft wide, has a small room opening onto it from the building. This room is 22 ft 6 in. wide x 12 ft 6 in. Cape-906: Remote Metallograph (HAPO). This remotized, Bausch and Lomb, research metallograph

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986

(18) NSA-18(1964)-367 Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18 (1963) getr. Zählg.) 3 4 5

1794
3. Forts.

is installed in a cast-iron blister attached to the side of a cast-iron cell in the radio-metallurgical laboratory. The blister is made of 10-1/2 in. thick cast iron of 7.0 density. The blister is 32 in. long x 39 in. high; the part containing the metallograph is 18 in. wide. A sample conveyor and manipulator serve the metallograph and are controlled mechanically outside the cell. Cape-912: Bag Passout Sealer for Water-Shielded Cave Facility (UCRL). The remotely operated, plastic-bag passout sealer is used in removing isotopic fractions for storage in the rear or for removing radioactive waste for placement in the waste storage containers.

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986

(18) NSA-18(1964)-367 Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.) 3 4 5

1794
4. Forts.

The unit is accessible by both the primary inclosure master-slaves and the service area master-slaves. Cape-924: Shielded Personnel Monitoring Station (HAPO). This shielded monitoring station is used for whole body counting. The station is located in a small, concrete block house 40 ft x 40 ft 6 in. The cell is 9 ft x 10 ft with 10-1/4 in. steel walls having a stainless steel facing. The door is the same construction and moves on rollers to open. Cape-930: Hot Canyon Crane (SRL). The 221-F 411, 50-ton capacity, remotely controlled crane is used for installing, removing, and maintaining canyon process equipment. There is a specially shielded cab which houses the operating controls.

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

(18) NSA-18(1964)-367 Forts.

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

1794
5. Forts.

Cape-951: Glove Box-Introduction Port (BNL). 3 4 5 The port used for introducing materials into a glove box is a door made in two sections. The inner section is 1/2 in. thick and 10-1/4 in. in dia. The outside of the door is 9-7/8 in. in dia. and 1/2 in. thick. Light teflon-covered "O" rings separate the two parts of the door. A teflon washer is used at the knob. Cape-986: Metallography Cell and Storage Facility (KAPL). The metallography cell is constructed of concrete 2 ft 4 in. thick. The outside dimensions are 28 ft 9 in. long, 9 ft 8 in. wide, and 16 ft high. The cell has a 6 in. thick steel door 6 ft 11 in. wide and 12 ft 1-1/2 in. high which operates on a worm-type mechanism.

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

(18) NSA-18(1964)-367 Forts.

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.) 3 4 5

1794
6. Forts.

On a bridge in the cell is mounted an electromechanical manipulator. The cell is also equipped with a 2-ton electric hoist.

(18) NSA-18(1964)-367

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 19 (1963) getr. Zählg.)

1795

Cape-1014: Facility and Equipment for the HRLEL. The High Radiation Level Examination Laboratory (HRLEL) is located in a two-story brick building with a partial basement. Thirteen main cells are located on the first floor in three straight-line banks arranged in the form of a "U". The operating cells are 6 ft wide, 10 ft deep, and 14 ft high. The two corner cells are somewhat wider. The 13 cells contain 15 oil-filled lead-glass windows with a pair of master slave manipulators at each window. Cape-1019: High Radiation Level Cells and Equipment. This collection of engineering materials describe the remote control equipment and cave layouts used in the High Radiation Level Cells at the Savannah River Laboratory.

TID-4100 (1st Rev., Suppl. 19)
Cape-1014
Cape-1019
Cape-1024
4

(8) NSA-18(1964)-376 Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.)
Engineering Materials List
(TID-4100(1st Rev., Suppl. 19 (1963) getr. Zählg.)

1795
Forts.

The equipment used in Cell 1 includes a Tinius Olsen tester and a bulk density balance. Cell 2 contains a boroscope and a monocular periscope. A cutting machine and a furnace are located in Cell 3; and a hoist is located in Cell 4. Cells 5 and 9 are used for metallography. Etchers, polishers, and a periscope are used in Cell 6. Cape-1024: Plutonium Research Gloveboxes. The boxes are constructed of aluminum extrusions, are modular in design, and are flexible for application with many types of research equipment. The boxes, if properly assembled, are suitable for use with high purity inert gas atmospheres. There are 8 standard sizes.

TID-4100 (1st Rev., Suppl. 19
Cape-1014
Cape-1019
Cape-1024
4

(8) NSA-18(1964)-376 RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1796
Engineering Materials List
(TID-4100 (Suppl. 20)(1964) getr. Zählg.)

Cape-631: Remote Analytical Facility. The building is constructed of reinforced concrete, is 88 ft x 83 ft, and is divided into three parallel areas: analytical, decontamination, and multicurie cell. The analytical area contains both remote and conventional laboratories. The remote laboratory contains 32 Berkeley type boxes which are arranged in two lines. Also included are manipulators, dollies, carriers, conveyors, tongs, and cabinets. Cape-951: Glove Box - Introduction Port. The port used for introducing materials into a glove box is a door made in two sections. The inner section is 1/2 in. thick and 10 1/4 in. in dia. The outside of the door is 9 7/8 in. in dia. and 1/2 in thick.

TID-4100 (Suppl. 20)
Cape-631
Cape-951
Cape-1038
Cape-1052
Cape-1062

4

(10) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1796 1. Forts.
Engineering Materials List
(TID-4100(Suppl. 20)(1964) getr. Zählg.)

Light teflon-covered "O" rings separate the two parts of the door. A teflon washer is used at the knob. Cape-1038: Emission Spectrograph Facility - Glove Box. The box, which is located on a stand 38 in. high, is 59 in. long, 35 1/2 in. deep, and 31 in. high. It has 2 glove ports, 3 access ports, 2 viewing windows on the front, and an access door on the side. The filter housing and blower system used with the box are included. Cape-1052: Mixer Settler, 16 Stage. The in-line, 16 stage, mixer settler is a second modification of a mixer settler that was designed in Belgium. It is a laboratory scale instrument that is used when the flow rates are low. This modification retains the submerged weir between each settler and the downstream mixer.

TID-4100 (Suppl. 20)
Cape-631
Cape-951
Cape-1038
Cape-1052
Cape-1062

4

(10) Forts. RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1796 2. Forts.
Engineering Materials List
(TID-4100(Suppl. 20)(1964) getr. Zählg.)

The weir balances the static head in the settler with an equal head on the downstream side, thus maintaining the aqueous-organic interface independent of mixer speed. Cape-1062: Plutonium Fabrication Pilot Plant Equipment. This equipment is used in plutonium chemistry and consists of a precipitator drum filter, calciner, fluorinator, and glove box.

TID-4100 (Suppl. 20)
Cape-631
Cape-951
Cape-1038
Cape-1052
Cape-1062

(10)

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RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1797
Engineering Materials List
(TID-4100(Suppl. 21)(1964) getr. Zählg.)

Cape-558: Alpha Probe. The probe is used to guard against alpha contamination in a laboratory. Modified versions of the probe are used in alpha-hand and -shoe counters, floor monitors, and air filter monitors. It is an air proportional-type probe with 20 sq. in. of active area. It is insensitive to beta and gamma radiations and has a very low fast-neutron response (0.003 %). Cape-1067: Mechanical Manipulator for Vacuum System. The mechanical manipulator is used with a vacuum chamber for electron beam welding. The manipulator consists of an aluminum pistol grip 4-7/8 in. long and 5-3/4 in. high, and a 22-1/2 in. long steel rod housing 5/8 in. in dia. (10) Forts.

TID-4100 (Suppl. 21)
Cape-558
Cape-1067
Cape-1069

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Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1797 Forts.
Engineering Materials List
(TID-4100(Suppl. 21)(1964) getr. Zählg.)

Cape-1069: Density Balance with Hood. The remotely controlled, hot laboratory equipment consists of a standard and a specially designed, density measuring apparatus. The critical parts of the weighing apparatus are enclosed in a hood to prevent air currents from affecting the weighing operation. The lower part of the hood is 20 in. x 21 in. x 50 in. high. The Mettler balance is enclosed in a hood 20 in. high x 16 in. x 17 in. which rests on top of the other hood. Metal frames and lucite or metal panels are used. The apparatus is used in an alpha-gamma cave.

TID-4100 (Suppl. 21)
Cape-558
Cape-1067
Cape-1069

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(10) RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Cape-1050: Isotopes Production Plant. The conceptual design for the isotopes production plant consists of a circular process building 140 ft. in dia. and 69 ft high with an attached single-story service building 100 ft by 120 ft. The process building contains a circular, concrete-shielded structure 103 ft in dia. which is divided into 11 manipulator cells and eight process vaults. The eight wet chemistry cells are located below grade level. The cell floors are lined with stainless steel, and the walls and cover blocks are coated with radiation resistant paint. Each of the manipulator cells is 16 ft high. These cells are accessible by crane from the top and through doors in the back of the cells.

TID-4100 (Suppl. 22)
Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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(14) Forts. RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798 1. Forts.
Engineering Materials List
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Cape-1059: Vacuum Cleaner with Cyclone Separator. This vacuum cleaner is used to pick up radioactive material. Particulates are removed from the airstream with a small cyclone which is followed by an 8 in. square x 5-7/8 in. high efficiency filter. The vacuum cleaner employs an Electrolux motor and fan. Cape-1078: Miniature Centrifugal Contactor. The 16-stage contactor is suitable for remote operation with highly radioactive materials. The housing is of stainless steel and the stages are arranged in a circular configuration which allows a central gear drive for all of the bowls and a gear train drive for all of the mixers.

TID-4100 (Suppl. 22)
Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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(14) Forts. RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798 2. Forts.
Engineering Materials List
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Individual bowls and mixers are replaced by lifting out a single assembly. Cape-1089: Fallout Monitor/ Q-2256/. This monitor is used in the Fallout Monitor System which is designed to measure fallout of radioactive particles that originate from a nuclear incident, failure of air-cleaning components, or to give warning when a present tolerance level has been reached. Cape-1099: Monocular Periscope Stage. The stage of the monocular periscope used in Cell No. 9 of the High Level Cells is described. The oval stage plate has a long axis of 6-6/8 in., a short axis of 4-6/8 in., and is fabricated of 1/2 in. stainless steel.

TID-4100 (Suppl. 22)
Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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(14) Forts. RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D.(Ed.) 1798
Engineering Materials List 3.Forts.
(TID-4100(Suppl.22)(1964) getr. Zählg.)

It is attached to a shaft 10-1/8 in. long which is mounted on a low tripod 1-3/4 in. high. Cape-1125: Extrusion Press, 280 Ton. The extrusion press is used in the fabrication of aluminum-plutonium spike enrichment fuel elements for the Plutonium Recycle Test Reactor (PRTR). The 280 ton press is enclosed in a glove box.

(14)

TID-4100
(Suppl.22)
Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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RL

Fassbender, H. (Hrsg.) 1799
Einführung in die Meßtechnik der Kernstrahlung und die Anwendung der Radioisotope. 2. Aufl.
Stuttgart: Thieme 1962. XVIII, 420 S., 240 Fig., 26 Tab.

In Kapitel E wird über die Einrichtung und über Hilfsmittel für Isotopenlaboratorien (Bauweise von Isotopenlaboratorien, Raumeinteilung- und Anordnung, Ausstattung der Räume, Wände und Fußböden, Be- und Entlüftung, Abzüge, Handschuhkästen) berichtet.

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Fig.:
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RL

Jaeger, Thomas 1800
Grundzüge der Strahlenschutztechnik für Bauingenieure, Verfahrenstechniker, Gesundheitsingenieure, Physiker
Berlin, Göttingen, Heidelberg: Springer 1960. XV, 392 S., 224 Fig.

In Kapitel 13 wird über den Entwurf von Radioisotopen-Laboratorien berichtet (Anordnung der Räume, Ventilation, Abzüge, Handschuhkästen, heiße Zellen, fernbediente Geräte und Maschinen, Manipulatoren, Sichtvorrichtungen). Zahlreiche Abbildungen sind vorhanden. Die Kostenaufstellung eines heißen Laboratoriums beträgt $ 268 000.

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Fig.:
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RL

5 Schutz- und Dekontaminationsvorrichtungen

(Schutzkleidung, Schutzanstriche, Bodenbeläge, Duschanlagen, Strahlenschutzgeräte usw.)

Lead Development Association, London **1387**
Lead for Radiation Shielding. No.2:Design and Construction of Lead Shielded Containers
London: Lead Development Association 1963, 18 S., 7 Fig.

The following notes on the design and construction of lead shielded containers are intended for the guidance of designer so that they can take into account the problems of manufacture in preparing designs, and thus facilitate the use of techniques that best overcome these problems.

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(4) RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1395** 2. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.)

Cape-628: Dry Box Equipment. Dry box equipment includes a pneumatic airlock door, an edge filter, and a centrifuge housing. The pneumatic door is a guillotine type, air-cylinder-actuated door that is used where space does not permit the use of a hinged door.

TID-4100 (1st Rev., Suppl. 9)
Cape-456
Cape-482
Cape-534
Cape-556
Cape-568
Cape-603
Cape-628
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(15) NSA-1961-4087 RL

Pomarola, J., Risselin, A., Feliers, P. **1392**
Contrôle de la contamination de l'air par le plutonium dans les laboratoires
(CEA-(R)2739 (1965) 18 S., 14 Fig., 2 Tab.)

Immediate detection of atmospheric contamination by plutonium is necessary for warning of operators. A precise estimate of the level of this contamination is also necessary in order to give the Medical Section proper information. Experiments have been carried out at CEN-FAR using atmospheric contamination by plutonium monitors. This paper deals successively with: important problems of monitoring, the carrying out of the experiments and the results yielded.

CEA-(R)2739
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Fig.:
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(6) RL

Faust, L.G., Unruh, C.M. **1404**
Radiological Design Criteria for the Fuel Recycle Pilot Plant
(HW-68954(Rev.2)(1962) 14 S.)

Radiological design criteria for the Fuel Recycle Plant have been formalized to assist design engineers in the design of the proposed facility. These criteria were developed to assure, by the design of the facility, adequate control of physical conditions relating to: 1) chronic and acute radiation exposures to personal assigned to the facility; 2) radioactive contamination; and 3) solid, liquid, and gaseous radioactive wastes.

HW-68954 (Rev.2)
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(5) RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1395**
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.)

Cape-456: Bag Sealer. To keep contamination at a low level, plastic bags are used in hot cells and gloved boxes. This bag sealer is an apparatus for sealing the plastic bags. Included in the package is an outlet ring for a gloved box used to remove the sealed plastic bag from the box. Cape-482: Metal Glove Box. The box has two glove ports, each 6 1/6 in. in diameter, and a safety-glass window in a metal frame 18 in. by 36 7/8 in. with fluorescent lighting at the top. Cape-534: Cenham Hoods. The Chemical Engineering Division hoods are built in modules. This module is 42 in. high, 42 in. long, and 42 in. deep. The fronts and backs have 4 glove ports each.

TID-4100 (1st Rev., Suppl. 9)
Cape-456
Cape-482
Cape-534
Cape-556
Cape-568
Cape-603
Cape-628
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(15 NSA-1961-4087 2 Forts. RL

Maier, A. **1407**
Belüfteter Strahlenschutzhandschuh
(D.A.S.1,093,949 (1960) 2 S., 4 Fig.)

Aufgabe der Erfindung ist eine wirksame künstliche Belüftungseinrichtung für Strahlenschutzhandschuhe unter Berücksichtigung üblicher Herstellungsweise und Vermeidung von storenden Schlauchen oder Kabeln. Gemäß der Erfindung ist der künstlich belüftete Strahlenschutzhandschuh mit einem besonderen, auf seiner Außenseite mit an seinen Fingerspitzen ins Innere eingefuhrten Luftschlauchen versehenen Innenhandschuh aus Weichgummi oder ahnlichen Stoffen gefuttert.

D.A.S. 1,093,949
5
Fig.:
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(4) RL

Duthie, R.E.C., Sachs, F.L. (eds.) **1395** 1. Forts.
Supplemental Insert Sheets for Engineering Materials List
(TID-4100 (1st Rev., Suppl. 9)(1960) 56 Bl.

Cape-556: Syntron Polisher. The polisher is used in a hot cell with a vibrator to polish metal samples for metallographic examination. Cape-568: Glove Type Hoods. The hood is used to safely handle highly toxic or reactive materials. The hood contains an inert or treated atmosphere under regulated pressures. Equipment is operated manually through gauntlet gloves secured and sealed to the hood sides. Cape-603: Automatic Alpha Hand Counter, Model HC-2. The automatic, personnel-operated α particle hand meter is a qualitative instrument indicating that hands are hot or cold.

TID-4100 (1st Rev., Suppl. 9)
Cape-456
Cape-482
Cape-534
Cape-556
Cape-568
Cape-603
Cape-628
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(15) NSA-1961-4087 Forts. RL

Bondarenko, I.P., Budarova, N.V. **1421**
(Russ.) Grundlagen der Dosimetrie und des Strahlenschutzes.
Moskva: Gos.izd."Vyssaja skola" 1962. 197 S., 145 Fig., 14 Tab.)

Es wird unter anderem über die Einrichtung und Ausstattung von Laboratorien mit radioaktiven Stoffen berichtet. Zahlreiche Abbildungen zeigen Spezialzangen, Manipulatoren, Pipetten, Abzüge, Handschuhkästen, spezielle Labortische, Schutzkleidung, Handschuhe usw.

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Fig.:
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(6) RL

Komarskiy, A.N. 1444
Coating of Building Structures in Radioactive Locations - USSR -
(JPRS-8849 (1961) 16 S., 4 Fig.)

This article considers problems of coatings of walls, floors, and ceilings of rooms of nuclear installations. It illuminates and summarizes the experience of using various types of coatings for radioactive rooms in the USSR, and makes recommendations as to their use. Data is quoted on the cost of various materials used for the coatings.

JPRS-8849
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Fig.:
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(5) NSA-1962-433 RL

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A two-chambered hot cell has been designed, built, and used. The hot cell is suitable for radioactive material testing, hot chemistry or handling of radioactive sources. The access door to each chamber has a zinc bromide window and a pair of ANL Model 8 manipulators mounted on it. A 2-ton traveling bridge crane serves both sides of the cell. A Jordan Remote Area Monitoring System Model I was installed in the cell when it was built.

WADC-TR-57-498
AD-142157
PB-131619
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Tab.: 2 3 4 5
Fig.: 2 3 4 5

(12) NSA-12(1958)-5748 Forts. RL

Atkins, M.C., Wolfsberg, K., Lorentz, W.N., Smith, D.R. 1460 Forts.
Design and Use of a 23,000 Curie Cobalt-60 Facility
(WADC-TR-57-498 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(AD-142157 (1957) VIII, 93 S., 12 Tab., 41 Fig.)
(PB-131619 (1957) VIII, 93 S., 12 Tab., 41 Fig.)

A filtered exhaust system was provided to prevent contamination of areas outside the cell. A CO_2 fire extinguisher system is installed with two nozzles in each chamber of the cell.

WADC-TR-57-498
AD-142157
PB-131619
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Tab.: 2 3 4 5
Fig.: 2 3 4 5

(12) NSA-12 (1958)-5748 RL

Corbin, L.T., Winsbro, W.R., Lamb, C.E., Kelley, M.T. 1462
Design and Construction of ORNL High-Radiation-Level Analytical Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.3-10, 5 Fig.)

The High-Radiation-Level Analytical Laboratory is designed and built for use in the chemical analysis of highly radioactive materials. The in-line hot-cell bank has separate cells for unloading, storing, performing analyses (six cells), and nondestructive testing. Supporting areas include laboratories and rooms for assemblying equipment, decontaminating equipment, and changing clothes. The salient features are an intercell conveyor, transfer drawer, maintenance cart, cask-transfer cart and interchangeable work pans. All areas in which radioactive operations are performed and which are adjacent to these operating areas are equipped for the safe handling and confinement of radioactive materials.

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Fig.:
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(9) RL

Brebant, C., Dick, H., Junca, A., Portal, A., Wallet, P. 1464
LECA - Irradiated Fuel Study Laboratory
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.17-32, 13 Fig.)

The building containing the laboratory is a two story building with a basement. Total cost, including installed cell equipment (windows, manipulators, conveyor, transfer devices) was $3,200,000. The laboratory and its particular features are described. The entire building is ventilated and air conditioned.
(11)

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Fig.:
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Peterson, P.J., Carlson, D.C., Walker, R.W. 1482
A Recirculating Wet Vacuum Cleaning and Scrubbing System for Decontamination
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.281-84, 2 Fig.)

A re-circulating wet vacuum cleaning and scrubbing system has been devised for decontamination of the interior of alpha sealed boxes. The specific application is to remotely reduce the beta-gamma activity in the shielded glove boxes within the DP West Plutonium Hot Cells at Los Alamos to a tolerable level for direct contact work on experimental apparatus.

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Fig.:
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(5) RL

Hughes, J.P., Franck, T.E., Schmitz, F.J. 1483
Fixed Automatic and Manual System to Control Fires
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.285-94, 7 Fig., 3 Tab.)

A method of extinguishing fires in glove boxes and hoods with carbon dioxide either automatically or manually before absolute filters could be clogged presents a safety feature for the chemist in Plutonium research laboratories. The automatic carbon dioxide release is electrically controlled through a rate-compensated electric heat detector that reacts to a temperature of 160°F.

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Fig.:
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Tab.:
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(5) RL

Filer, E.W., Leighton, S.A. 1484
Post-Irradiation Metallographic Laboratory at GE-NMPO
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.295-310, 18 Fig., 2 Tab.)

The construction of the cell and equipment used in preparing irradiated materials for metallographic evaluation are discussed. The inside wall of the cell is lined with 3/4 inch steel boiler plate covered with a 1/16 inch sheet of stainless steel to facilitate cleaning and decontamination. The cell is serviced by a pair of Model No.7 Master Slave Manipulators. Most of the equipment used throughout the cell is controlled from the panel located under the large viewing window. The radiation level in the room is monitored by 3 units. Fastened on the wall in back of the operator is an Eberline radiation monitor (model RM-1A).

4
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Fig.:
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(5) RL

Faust, L.G., Bradley, J.G., Boyd, C.L. 1493
Criteria for Safe Handling of Irradiated Plutonium in Beta-Gamma Shielded Cells
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.437-45, 3 Fig., 1 Tab.)

Control of alpha contamination by beta-gamma moni- 5
toring in controlled mixtures of the two types of
contaminants has been successfully established within
the Radiometallurgy Laboratory. General airborne
contamination in the laboratory is monitored by five
continuous beta-gamma air monitors positioned through-
out the work area. These monitors are set to alarm
at 1×10^{-9} µc/cm^3.

(5) RL

Rigaut, H., Dieval, M. 1501
Measurement Assembly for High Gamma Flux
(Proceedings of the 11th Conference on Hot Laboratories and Equipment, New York, November 18-21, 1963 (1963) S.463-67, 2 Fig.)

The equipment described in this paper has been de- 4
signed and constructed to permit high gamma flux 5
survey and measurement. This instrument is an Fig.:
essential component of the high activity cells 4
where remote handling, transformation and examination 5
of irradiated fuels or highly active radioisotopes
are performed. The instrument can also be used in
irradiation facilities and other nuclear installa-
tions such as reactors and accelerators.

(5) RL

Shepherd, D.M. 1525
Radioactive Plant Maintenance
(*Nuclear Safety*, Vol.4, No.2 (1962) S.73-79, 1 Tab.)

In a nuclear plant, particularly a radiochemical 5
plant, a choice of maintenance philosophy ranging Tab.:
from completely remote to direct maintenance must 5
be made. Some factors that influence this choice are
feasibility of decontamination, economics of provid-
ing spare equipment, importance of downtime, and
protection of personnel and equipment. These and
other factors have been examined, and a comparative
tabulation of direct maintenance plants and experiences
with various types of maintenance has been made to
guide design decisions.

(3) NSA-17-13734 RL

Lawrence, E.O. 1527
Hazards Control. Quarterly Report No.7 (October-December 1961)
(UCRL-6818 (1961) IV, 21 S., 9 Fig.)

In Building 171 (Metallurgy Laboratory) exhaust UCRL-6818
air passes through two high-efficiency filter systems 5
prior to discharge from the building. The first such
filter is at each gloved enclosure, while the second
is in the manifold system located in the fan loft. In
addition, exhaust air from laboratory areas and fume
hoods is filtered twice by similar, though physically
separate, systems. To check the effectiveness of the
filters, routine continuous stack monitoring is re-
quired with capability of remote audio alarm at a
central control panel.

(4) NSA-16-20875 Forts. RL

Lawrence, E.O. 1527 Forts.
Hazards Control. Quarterly Report No.7 (October-December 1961)
(UCRL-6818 (1961) IV, 21 S., 9 Fig.)

Because of the large air flow, only an aliquot can be UCRL-6818
sampled by the stack monitor. Therefore, the de-
tection system must be highly sensitive. To demon- 5
strate this application, the monitor was connected
to the hood exhaust of the gloved-box system down-
stream from the final high-efficiency filter.

(4) NSA-16-20875 RL

Hazards Control. Quarterly Report No.8 (January-March 1962) 1528
(UCRL-6936 (1962) IV, 45 S., 18 Fig., 2 Tab.)

Building 171 Gloved Box Systems. Enclosures UCRL-6936
in this building are constructed of extruded aluminum 4
frames with acrylic plastic (Plexiglas 5009) window 5
panels. Eight-inch-diameter glove ports are mounted Fig.:
in the windows. Ports are fitted with Charleston 4
30-mil neoprene gauntlet gloves. Each port is equipped 5
with an aluminum cover plate which is secured over Tab.:
the glove when the box is not in used. Argon is used 4
as the inert atmosphere. Box exhaust is filtered by 5
two high-efficiency filters in parallel. This report
discusses techniques employed for determining leak
rates in Bldg. 171 (Metallurgical Lab.) where special
glove boxes are available for plutonium investigations.

(5) NSA-16-30682 RL

Whitfield, W.J. 1530
A New Approach to Cleanroom Design
(SC-4673(RR) (1962) 28 S., 19 Fig.)

This is a report on an experimental cleanroom SC-4673(RR)
which eliminates the need for strict personnel control, 5
special clothing, and special operational procedures. Fig.:
Tests to date have shown that cleanliness levels have 5
been achieved which are several orders of magnitude
better than cleanrooms of conventional design. General
design features, and the results of operational tests,
are described. The high clean-down characteristics
enable the room to be operated as a portable clean-
room at a high degree of cleanliness. The unit can
also be moved as an assembly, or be disassembled
if needed.

(4) NSA-16-20874 RL

Ferguson, D.E. (Comp.) 1532
Transuranium Quarterly Progress Report for Period Ending August 31, 1962
(CRNL-3375 (1963) V, 54 S., 18 Fig., 14 Tab.)

The process-test facility will be located in cells 3 CRNL-3375
and 4 of Building 4507. Cell 4 will contain solvent 4
extraction process equipment. The head-end equip- 5
ment, consisting of a dissolver and the accompanying Tab.:
gas-handling equipment will be located in cell 3. The 5
cell walls proper were coated with epoxy glass-fiber
lining in preparation for the installation of piping and
other process equipment. The equipment-removal
cubicle, makeup-area equipment, and some cell proc-
ess equipment are being built. Thirty-one protective
coatings on steel and concrete were tested for their
tendency to fix surface contamination. The Amercoat
66 epoxy system, not shown on the table, seems to be
the most acceptable coating, so far.

(5) NSA-17-12183 RL

Macfarlane, C.J., Beal, R.J. 1535
Special Equipment for Decontamination and Control of Radiation Hazards at Chalk River
(AECL-1465 (1962) 24 S., 8 Fig.)
(CRRIS-1071 (1962) 24 S., 8 Fig.)

This account describes some items of decontamination and monitoring equipment developed by the Radiation Hazards Control Branch at Chalk River, the reasons for their construction and the shape or form of the items. Operational performance is also discussed (Mobile Air Exhaust Units, Mobile Air Sampler, Mobile Change Room Trailer, Shielded Settling Box and Shielded High Efficiency Filter, the Steam-Detergent Decontamination Gun, Mobile, Remote-Controlled, Radiation Monitor, Inflatable Tent). (auth)

AECL-1465
CRRIS-1071
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Fig.:
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(7) NSA-16-24009 RL

Koschany, G. 1553
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S.565-580, 71 Fig., 16 Tab.)

Der vorliegende Beitrag befaßt sich primär mit den speziellen Problemen beim Bau von Laboratorien und Instituten, in denen mit Kernenergie gearbeitet wird und erwähnt die sonstige technische Einrichtung nur, soweit sie von grundsätzlicher Bedeutung und in diesem Zusammenhang interessant ist. Es sei hier auf die entsprechende Standardliteratur hingewiesen. Die Raumgruppierung unter dem Aspekt der Radioaktivität erfordert zunächst deren Einordnung in ein System der Strahlungsstärken, etwa mit folgenden Einheiten:

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Fig.:
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(6) Forts. RL

Koschany, G. 1553 Forts.
Kerntechnik - Bautechnik. E. Isotopenlaboratorien
(Deutsche Bauzeitschrift, 8 (1960) S.565-580, 71 Fig., 16 Tab.)

Bereich bis zu 10 μC, Bereich bis zu 100 mC, Bereich mehr als 100 mC ("heiße Zonen"). Der inaktive Teil des Labors sollte durch Schleusen und angegliederte Reinigungs- und Umkleideräume von der aktiven Zone getrennt sein. Über die Auswahl der Materialien für Fußböden, Wände, Decken sowie über Fenster, Türen, Lüftung und Feuerlöschvorrichtungen wird berichtet.

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Fig.:
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(6) RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Les caractéristiques essentielles de ce bâtiment sont les suivantes: Il comporte 4 tranches à peu près semblables d'environ 40 m x 50 m (alors que le projet initial en prévoyait 6), 2 tranches étant disposées côte à côte, les 2 autres étant symétriques des précédentes par rapport au grand côté des halls. L'ensemble mesure ainsi 80 m x 100 m. Dans chaque tranche, 4 laboratoires parallèles (14 m x 7,8 m) sont compris entre le couloir "personnel" et le couloir "matériel", un couloir transversal permet en plus une communication directe entre ces deux couloirs sans obliger à traverser les laboratoires. L'air arrive par un diffuseur au centre du plafond et par des bouches au-dessus de la porte d'entrée.

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Fig.:
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Forts.

(7) NSA-17-23390 RL

Trouvé, S. 1555 Forts.
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Chaque hall est divisé en 2 parties: l'une (7 m x 39 m) de hauteur voisine de celle des laboratoires (4 m); l'autre (11 m x 39 m) de grande hauteur (8,50 m) avec un pont roulant de 5 t. Le coût total de ce bâtiment, sans les aménagements intérieurs spécialisés se monte environ à 20 millions.

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Fig.:
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(7) NSA-17-23390 RL

Langlet, G. 1561
Utilisation des appareils de protection des voies respiratoires en milieu radioactif
(Bulletin d'informations scientifiques et techniques, 1963, No.72/73, S.35-39, 3 Fig.)

Divers appareils de protection respiratoire ont été essayés à l'échelle industrielle sur le Centre de Marcoule. Cette expérience de quelques années permet de dégager des résultats pratiques et des solutions éprouvées. Habituellement, les opérations dangereuses se déroulent dans des enceintes étanches, en dépression et ventilées. Cependant, nombreuses sont les manipulations où cette protection, quand elle est réalisable, ne constitue qu'un appoint. Il faut donc mettre à la disposition du personnel des appareils individuels de protection respiratoire qui sont du type filtrant ou isolant.

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Fig.:
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(3) Forts. RL

Langlet, G. 1561 Forts.
Utilisation des appareils de protection des voies respiratoires en milieu radioactif
(Bulletin d'informations scientifiques et techniques, 1963, No.72/73, S.35-39, 3 Fig.)

Le choix de l'emploi de l'un ou l'autre est décidé en fonction de la nature du risque radioactif et du niveau de contamination des atmosphères de travail.

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Fig.:
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(3) RL

Cottignies, S. 1562
Le matériel électronique et la protection contre les radiations
(Bulletin d'informations scientifiques et techniques, 1963, No.72/73, S.41-46, 6 Fig.)

La complexité des problèmes posés par la surveillance des risques radioactifs se répercute sur l'électronique qui doit satisfaire des exigences de détection, de sensibilité ou de précision dans les mesures, toujours plus impératives. Malgré cela, l'appareillage mis à la disposition du personnel de radioprotection doit être robuste, fidèle, facile à mettre en oeuvre et les résultats doivent être aisément exploitables. Les progrès techniques, en particulier, l'utilisation des transistors, la naissance des détecteurs à jonctions, etc... permettront peu à peu de satisfaire la presque totalité des besoins des utilisateurs.

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Fig.:
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(3) RL

Hyatt, E.C. 1564
Air Purifying Respirators for Protection Against Airborne Radioactive Contaminants
(Health Physics, 9 (1963) S.425-32, 6 Fig., 2 Tab.)

Respiratory protective devices for protection against airborne radioactive contaminants have been in use for approximately 20 years but have not been tested and approved by any government agency. The U.S. Bureau of Mines proposed approval program and current activities for such devices are discussed.

5 Fig.: 5

(3) RL

Johnson, J.E. 1565
Disassembly of a High Level Plutonium Glove Box System
(Health Physics, 9 (1963) S.433-41, 9 Fig., 2 Tab.)

Multi-gram quantities of plutonium and uranium had been handled in the sixteen interconnected glove boxes that comprised the glove box train. All sixteen boxes were separated along with all systems located externally of the train, which they served. The process of complete dismantlement required 8 weeks. Approximately 300 ft^3 of high level alpha dry active waste removed during this period along with hundreds of feet of both contaminated and non-contaminated pipe and tubing and all pumps, gauges and other regulatory devices. There were no incidents of either internal or external radiation exposure during this period, and only one incident of an uncontrolled release of high level alpha contamination.

4 5 Fig.: 3 4

(4) RL

Radioisotopie. Nachrichten aus den USA 1570
(Nucleus. Deutscher Atomdienst, 9, No.24 (1963) S.273-74)

In den zweieinhalb Jahren, in denen die Nuklear-Abteilung der Martin Company Brennelemente aus Radioisotopen herstellt und erprobt, hat sich noch kein einziger Strahlenunfall ereignet. Die Sicherheitsvorkehrungen sind außerordentlich streng. Jeder Wissenschaftler und Techniker, der eine sogenannte heiße Zelle betritt, trägt einen kompletten Schutzanzug mit Atemmaske, was die Strahlenexponierung auf ein Minimum beschränkt. Jede der fünf heißen Zellen ist rings von dicken Betonwänden eingeschlossen. Das "heiße" Material wird nur mit ferngesteuerten Geräten transportiert und behandelt. Dicke Bleiglasfenster (Glasdurchmesser 90 Zentimeter) erlauben die kontinuierliche Beobachtung der Vorgänge.

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(3) RL

Hollands, G. 1584
Radiation Protection Garment
(U.S.Pat.3,052,799 (1959/1962) 2 S., 3 Fig.)

This invention is directed to an improved apron structure which takes maximum advantage of such lead impregnated plastic sheeting and permits a high degree of flexibility so that the wearer may carry out his normal duties with maximum comfort and minimum impediment of motion.

U.S.Pat. 3,052,799
5 Fig.: 5

(4) NSA-16(1962)-30541 RL

Leguillon, C.W. 1592
X-Ray Protective Shields
(U.S.Pat.3,045,121 (1959/1962) 5 S., 11 Fig.)

An X-ray shield consisting essentially of a relatively thick inner plastic barrier portion comprising a plastic having finely divided particles of metallic lead uniformly dispersed therethrough, the metallic lead particles each being coated with protective films capable of excluding air from the surfaces of the metallic lead particles prior to and while dispersed in the plastic barrier portion and thus to prevent oxidation of the metallic lead particles, and a relatively thin high tensile skin strength plastic lead-free layer integral with each

U.S.Pat. 3,045,121
5 Fig.: 5

(4) NSA-16(1962)-27183 Forts. RL

Leguillon, C.W. 1592 Forts.
X-Ray Protective Shields
(U.S.Pat.3,045,121 (1959/1962) 5 S., 11 Fig.)

side of the said barrier portion and of a composition substantially of higher tensile strength and more highly resistant to ozone-cracking and to flex-cracking due to impingement of X-rays thereagainst and to flexing of the X-ray shield than is the plastic composition of said barrier portion.

U.S.Pat. 3,045,121
5 Fig.: 5

(4) NSA-16(1962)-27183 RL

Landis & Gyr A.G., Zug, Switzerland 1610
Device for Supervising the Concentration of Radioactive Substances Contained in a Medium
(Brit.Pat.899,971 (1962)) Brit.Pat. 899,971
(Helv.Pat.63300 (1958/62) 3 S., 2 Fig.)

The present invention relates to a device for the continuous complete monitoring of the concentration of radioactive substances having a long half-life, present in media, particularly in the air, primarily for the purpose of providing a timely warning of biologically-dangerous concentrations of radioactivity.

Helv.Pat. 63300
5 Fig.: 5

(5) NSA-16(1962)-20694 RL

Johnson, J.E. 1622
Disassembly of a High Level Plutonium Glove Box System
(TID-16203 (1962) 25 S., 9 Fig., 4 Tab.)

Dismantling operations of the Plutonium Metallurgy Research Laboratory, first put into operation seven years ago at Argonne National Laboratory, began on September 16, 1961. Multi-gram quantities of plutonium and uranium had been handled in the sixteen interconnected glove boxes that comprised the glove box train. All sixteen boxes were separated along with all systems located externally to the train which they served. The process of complete dismantlement required eight weeks.

TID-16203
4 5 Fig.: 4

(5) NSA-17(1963)-10866 Forts. RL

Johnson, J.E. 1622
Disassembly of a High Level Plutonium Glove Box System Forts.
(TID-16203 (1962) 25 S., 9 Fig., 4 Tab.)

Approximately 300 ft^3 of high level alpha dry active waste was removed during this period along with hundreds of feet of both contaminated and non-contaminated pipe and tubing and all pumps, gauges, and other regulatory devices. There were no incidents of either internal or external radiation exposure during this period and only one incident of a gross spread of alpha contamination.

TID-16203 4 5 Fig.: 4

(5) NSA-17(1963)-10866 RL

Rankin, M.C. 1632
A Radionuclide Cell Exhaust Monitoring System
(HW-71352 (1961) 7 S., 10 Fig., 1 Tab.)

An alpha and beta exhaust monitor was developed to sample and monitor filtered exhaust gases for particulate radionuclides.

HW-71352 5 Fig.: 5

(4) NSA-16(1962)-17819 RL

Swanton, W.F., Hyman, M.L. 1625
Liquid Radioactive Waste Disposal Facility. A Final Engineering Report
(NP-11496 (1962) VII, 40 S., 11 Fig., 10 Bl. Tab.)
(AD-273977)

The facility is a self-contained, transportable, semi-automatic assembly of monitoring, feed, and residue tanks, pumps, control panel, and ancillary equipment mounted on a skid. The site for the facility should be at least 20 ft x 16 ft in size and essentially level. It should be capable of supporting 200 lb/sq ft of live loads or 6000-pound concentrated loads under the leveling lugs. Head-room over the area should be 13 ft with additional room over the evaporator, E-1, for removal and installation of the rotor and drive assembly.

NP-11496 AD-273977 4 5 Fig.: 4 5 Tab.: 4 5

(7) NSA-16(1962)-18705 RL

Leuze, R.E. 1636
Evaluation of the Effectiveness of Building 3508 Alpha Air Monitoring
(CRNL-TM-555 (1963) 13 S., 1 Fig., 4 Tab.)

Each of the four laboratories in Building 3508 is equipped with a slightly modified version of the ORNL continuous Alpha Air Monitor. These machines simultaneously filter 3 cfm of air and count the collected alpha activity at about 20 % overall efficiency.

CRNL-TM-555 5 Fig.: 5 Tab.: 5

(4) NSA-17(1963)-23550 RL

Swanton, W.F., Hyman, M.L. 1625
Liquid Radioactive Waste Disposal Facility. A Final Engineering Report Forts.
(NP-11496 (1962) VII, 40 S., 11 Fig., 10 Bl. Tab.)
(AD-273977)

Total head-room for this operation is 12 ft plus that required for a 1-ton hoist and hook above, or about 14 ft. The unit can be moved short distances by a 4-ton crane or two fork trucks.

NP-11496 AD-273977 4 5 Fig.: 4 5 Tab.: 4 5

(7) NSA-16(1962)-18705 RL

Craft, R.C. 1644
Control of Contamination in High Level Caves at the Savannah River Laboratory
(TID-16181 (1962) 10 S., 2 Fig.)

Methods of controlling contamination in High Level Caves at Savannah River Laboratory are presented. A brief summary of recent operating experiences, including cell decontamination procedures, is presented.

TID-16181 4 5 Fig.: 2 5

(5) NSA-17(1963)-23556 RL

Smith, S.E., Hall, F.J., Holmes, W.E. 1626
Safety Aspects of the Design of Filtered Ventilation Systems
(TID-7677: 8th AEC Air Cleaning Conference, Oak Ridge, Tenn., Oct.22-25, 1963 (1963) S.56-72, 6 Fig.)

A number of safety aspects of the design of filtered ventilation systems for radioactive and toxic buildings have been considered. These include theoretical and experimental assessments of the heat release from fires of various kinds in workrooms, fume cupboards, glove boxes, and extract systems, the use of spark and flame arrestors, the ignitability of dust deposits in extract systems and filters, the cooling of hot gases in exhaust ducts. As a result of this work, it is possible to formulate principles which should be followed in the layout and design of such systems, in the future; existing systems have been found not to require any serious modification apart from installation of glass paper filters.

TID-7677 3 5 Fig.: 2 3 4

(7) RL

Taube, M. 1645
Plutonium. - Oxford: Pergamon Pr. 1964. VI, 258 S., 108 Fig., 49 Tab.
Übers. von (Nowa technika. Nc 16 (1958) 200 S.)

Work with quantities of more than 1 µg of plutonium should be carried out only with rubber gloves, e.g. surgeon's gloves without other precautions. Operations involving plutonium in amounts higher than 160 µg should be carried out in such protective devices as glove-boxes or radiochemical fume cupboards. The air-pressure in glove-boxes during work should be maintained at a level of 15 to 35 mm of water lower than the outside pressure. The air-velocity at the fume-cupboards' inlet should reach at least 35 m per min during work. The plutonium laboratory staff must wear protective clothing (surgeon's smocks, overalls, special protective footwear).

4 5 Fig.: 4 Tab.: 5

NSA-15(1961)-680 (4) RL

Lindell, B., Reizenstein, P. 1651
A Swedish Building Material for Low-Radioactivity Laboratories
(Arkiv för Fysik, 26, Heft 1 (1964) S.65-74, 4 Fig., 7 Tab.)

The increasing use of measurements of low levels of radioactivity both in the medical field and in the field of radiation protection has made it desirable to find more convenient building materials to provide both shielding from the environmental radiation and low contents of radioactivity in the material itself.

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Tab.:
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(5) RL

Howell, L.N. 1655
Safety in Glove-Box Design and Operation
(Nuclear Safety, 5, No. 1 (1963) S. 87-94)

The safety aspects of glove-box operations are significant and are commanding attention from an increasing number of people. In particular, more effort is being expended on studying the prevention and control of fires and explosions in glove boxes. A program covering test and research on new explosion protection systems for glove-box applications was recently initiated by the USAEC Chicago Operations Office.

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(4) NSA-18(1964)-380 RL

Dunster, H.J. 1661
The Designer and Radiation Protection
(Nuclear Engineering, 1 (1956) S.144-48, 5 Fig.)

When designing equipment and processes for the handling of radioactive materials consideration must be given to safety from direct radiation and contamination, concomitant with flexibility of operation and feasibility of maintenance. The designer must work in collaboration with specialists and understand the various problems that are involved. (auth)

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Fig.:
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(4) RL

Curtis, W.K. 1667
A Portable Shower Cabinet
(AERE-R 4084 (1964) II, 8 S., 3 Fig.)

This paper describes a Portable Shower Cabinet for use in areas where a toxic hazard exists. The cabinet shell is made from glass fibre reinforced polyester resin (Glass-Resin) and consists of two compartments. The spray operates in one of these and is known as the 'shower compartment'; the other, 'the dry compartment', is kept comparatively dry and clean so that monitoring and milder cleaning can be carried out. This dry compartment is also used by the attendant who assists the pressurized suit operator on his way in and out of the cabinet. Forts.

AERE-R 4084
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Fig.:
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(4) NSA-18(1964)-23808 RL

Curtis, W.K. 1667 (Forts.)
A Portable Shower Cabinet
(AERE-R 4084 (1964) II, 8 S., 3 Fig.)

Access to the dry compartment is by an opening in the side of the cabinet, whilst access to the shower compartment is by an opening in the end of the cabinet. The cabinet moves on castors and consequently it can be manoeuvred into position very quickly for such occasions as a site emergency when several of these units could form a battery of decontamination facilities.

AERE-R 4084
5
Fig.:
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(4) NSA-18(1964)-23808 RL

Feliers, P., Pomarola, J., Risselin, A. 1683
Protection du personnel contre la contamination atmosphérique par le plutonium, dans les laboratoires
(CEA-2311 (1963) 17 S., 3 Tab.)

Various problems about measurement of atmospheric contamination by plutonium in laboratories are considered. In particular are studied sampling methods, continuous measurement for alarm, criteria used for fixation of the concentrations to be measured, sensitivity of apparatus and effects of natural atmospheric contamination. The means actually available for measurement of contamination and their limits of use are briefly analyzed.

CEA-2311
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(6) NSA-18(1964)-1944 RL

Viswanathan Pillai, T.N., Kamath, P.R., Somasundaram, S. 1690
Handling Hazards of Natural Thorium
(A.E.E.T./HP/SM-5 (1959) 27 S., 2 Fig., 6 Tab.)

The factory should have a built in ventilation system to keep the air activity (particulate as well as thoron) inside the buildings far below the recommended maximum permissible levels. Suitable filters should be incorporated in the ventilation system to prevent the escape of excessive amounts of activity to neighbouring populated areas. All workers should be supplied with protective clothing consisting of coveralls, overshoes and linen caps to prevent the contamination of the body as well as of personal clothing. These should be washed from time to time in an 'active laundry'. In testing and control laboratories, all processes should be carried out in fumehoods fitted with exit filters.

AEET/HP/SM-5
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(7) RL

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S.45-53, 5 Fig.)

The five in-line hot cells are equipped for metallographic preparation and examination, physical and mechanical testing, and machine-shop operations. The supporting areas include a radiochemistry laboratory, facilities for decontamination, isotope storage, liquid radioactive waste disposal, and miscellaneous supporting laboratories and shops. The special features of the laboratory include transfer ports, electrical patch panels, access openings, intercell transfer gates, isolation cubicles, a decontamination room, and an isotope storage area.

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Fig.:
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(7) Forts. RL

Watson, H.E., Steele, L.E. 1696
The U.S. Naval Research Laboratory High Level Radiation Laboratory Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 45-53, 5 Fig.)

The ventilation system of the entire laboratory is 2
equipped to provide fresh air continuously without 3
recirculation of the air inside the building. Gamma- 4
detection area monitors are strategically positioned 5
throughout the laboratory. In addition, gamma-de- Fig.:
tection alarms are situated at critical points on the 2
second floor, above and beside the hot cells. A fire 4
detection, alarm, and extinguishing system is being planned for the hot cells.

(7) RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723
Installation d'un laboratoire pour la manipulation de substances radio-actives
(Bulletin technique de la Suisse Romande, (1964) No. 5, 6 S., 1 Fig., 2 Tab. (Sonderdruck))

Le laboratoire se divise en quatre zones qui permet- 2
tent de mieux échelonner les mesures de radiopro- 3
tection: I. Secrétariat, consigne et vestiaire extérieur 4
II. Locaux destinés à l'exploitation normale (distri- 5
bution normale). III. Locaux prévus pour l'exploi- Fig.:
tation spéciale (synthèses radiochimiques). IV. Lo- 2
caux pour la manipulation de très hautes radioactivités (où la manipulation d'activités excédant celles de la classe B pourraient être exceptionnellement autorisées). Dans chacune des zones, la ventilation s'opère des locaux les moins contaminés (vestiaires, laboratoires de mesure, de préparation ou de décontamination)

(9) Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723
Installation d'un laboratoire pour la manipulation de substances radio-actives 1. Forts.
(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

aux salles de manipulation, et plus particulière- 2
ment aux cellules de manipulation elles-mêmes 3
(hottes ou boîtes à gants). Les installations de 4
radioprotection fixes sont disposées comme des 5
hottes de laboratoire. Les manipulateurs à rotule Fig.:
ont été commandés à la Société française F.C.R.; 2
la rotule est enchâssée dans une brique occupant la place d'une brique normale. La longueur des tiges de manipulateurs varie: 40 cm, 60 cm, 80 cm, 1,20 m suivant les fonctions. Les sols existants sont protégés par un revêtement plastique synthétique sans joints à base de chlorure Forts. RL

Lerch, A., Lerch, G., Lerch, P., Gostely, J.-J. 1723
Installation d'un laboratoire pour la manipulation de substances radio-actives 2. Forts.
(Bulletin technique de la Suisse Romande (1964) No. 5, 1 Fig., 2 Tab. (Sonderdruck))

de polyvinyle. Toutes les portes sont munies d'un 2
ferme-porte automatique; les poignées sont prolon- 3
gées et orientées de telle sorte qu'elles puissent 4
être manoeuvrées à l'aide des coudes. Les boîtes 5
à gants qui occupent le laboratoire 8 servent à ma- Fig.:
nipuler les substances radioactives pulvérulentes 2
ou volatiles. Elles sont construites en résine synthétique dure et résistante, par la firme Saint-Gobain Nucléaire à Courbevoie, en France.

(9) RL

Hunzinger, W. 1727
Hazard Assessment and Safety Control at Eurochemic
(Eurochemic News Bulletin, 1964, No 12, S. 21-28)

This paper discusses the potential major nuclear 2
hazards concomitant with the Company's reprocess- 5
ing plant, examines the safeguards and methods of control applied to overcome them. Complex installations known as containments protect the workers and the neighbouring population from internal exposure. There are at least two containments surrounding the unsealed radioactive material throughout the plant. Each containment is as airtight as practicable and is ventilated in such a way as to provide a decreasing air pressure from an outer to an inner containment. When repair or maintenance work has to be carried out in the intervention areas the men themselves can be equipped with an additional "containment", such as pressurized plastic suits. (4) RL

Nowak, W., Hausdorf, S. 1732
Das Isotopenlaboratorium.
Leipzig: VEB Deutscher Verl. f. Grundstoffindustrie 1961. 108 S., 32 Fig., 7 Tab.

Die vorliegende Broschüre unterrichtet über einige 2
wichtige, mit dem Bau, der Einrichtung und der Tä- 3
tigkeit im Isotopenlaboratorium zusammenhängende 4
Fragen. Es werden folgende Laboratorien unter- 5
schieden: Forschungslaboratorien, Industrielabora- Fig.:
torien, Unterrichtslaboratorien und fahrbare Labo- 2
ratorien. Verschiedene Kapitel befassen sich mit den 3
Merkmalen solcher Laboratorien, ihrer Einrichtung, 4
Be- und Entlüftung, ihrer Grundrißgestalung und dem 5
Raumprogramm. Der Strahlenschutz im Isotopenlaboratorium behandelt bauliche Strahlenschutzmaßnahmen sowie apparative Maßnahmen zur Kontaminationsüberwachung.

(7) RL

Guirlet, J., Jain, C., Lavie, J.M., Lucas, G. 1734
Blindages de protection pour les éléments combustibles irradiés - évaluation rapide
(CEA-2288 (1963) 73 S., zahlr. Fig. u. Tab.)
(AED-Conf. 1962-102-70, 73 S., zahlr. Fig. u. Tab.)
Engl. Übers.: (AED-Conf. 1962-102-69, getr. Zählg., zahlr. Fig. u. Tab.)

Il est pensé qu'avec la réalisation des tableaux, CEA-2288
graphiques et abaques présentés, l'objectif fixé AED-Conf.
a été atteint: évaluation rapide des blindages né- 1962-102-70
cessaires à la manutention des combustibles irra-
diés, sous réserve, évidemment, de connaître AED-Conf.
l'histoire du combustible et ses conditions de 1962-102-69
traitement. On espère que le responsable des 5
études de protection d'un projet de machine de Fig.:
déchargement, d'installations de traitements de 5
Tab
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(9) NSA-18(1964)-11360 Forts. RL

Guirlet, J., Jain, C., Lavie, J.M., Lucas, G. 1734
Blindages de protection pour les éléments combustibles irradiés - évaluation rapide Forts.
(CEA-2288 (1963) 73 S., zahlr. Fig. u. Tab.)
(AED-Conf. 1962-102-70, 73 S., zahlr. Fig. u. Tab.)
Engl. Übers.: (AED-Conf. 1962-102-69, getr. Zählg., zahlr. Fig. u. Tab.)

combustibles irradiés ou de cellules chaudes, dis- CEA-2288
posera ainsi d'un outil de travail souple et efficace AED-Conf.
lui permettant de faire rapidement une première 1962-102-70
approche qui dans bien des cas sera une approxi- AED-Conf.
mation suffisante. 1962-102-69

(9) NSA-18(1964)-11360
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Fig.:
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Tab.:
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RL

Lanier, S.F. (Comp.) 1736
Fire and Explosion Protection of Glove-Box Facilities. A Literature Search
(TID-3578 (1964) III, 52 S.)

A total of 379 references are cited on the safety design of facilities handling radioactive materials. Included are references on glove boxes, fire hazards and control, explosion hazards and control, laboratory design, ventilation systems, and filter systems.

TID-3578
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(7) NSA-18(1964)-39414 RL

Simon, A. 1737
Disassembly and Decontamination Apparatus Especially for Calutrons
(U.S.Pat.3,143,119 (1961/1964) 5 Bl., 4 Fig.)
(Br.fr.236,880 (1961/1962))

The invention applies to the operations involved in handling a highly radioactive vessel, especially with a view to carrying out the disassembly as well as the decontamination of a calutron vessel. Since there is no apparatus which carries out all these operations, such operations usually have to be carried out directly in an active medium, the operators being protected by frogsuits; alternatively, the contaminated parts to be manipulated are isolated by protective covers of vinyl. Forts.

U.S.Pat. 3,143,119
Br.fr. 236,880
4
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Fig.: 4

(6) NSA-18(1964)-37317 RL

Simon, A. 1737 Forts.
Disassembly and Decontamination Apparatus Especially for Calutrons
(U.S.Pat.3,143,119 (1961/1964) 5 Bl., 4 Fig.)
(Br.fr.236,880 (1961/1962))

These methods entail a large number of manipulations, and safety is not absolutely guaranteed. The present invention has for its object a disassembly and decontamination apparatus which overcomes the above-mentioned disadvantages.

U.S.Pat. 3,143,119
Br.fr. 236,880
4
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Fig.: 4

(6) NSA-18(1964)-37317 RL

Building 3019 Emergency Manual 1742
(ORNL-TM-797 (1964) getr. Zählg., zahlr. Fig. u. Tab.)

The emergency plan for Building 3019, the Radiochemical Processing Pilot Plant, is described as well as the duties of all personal in the event of an emergency involving either radioactivity or "normal" industrial hazards. The operation of the plan is illustrated by two test cases, a fire and a criticality accident. Details of the building containment, protective system, and emergency instrumentation are included in the report.

ORNL-TM-797
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Fig.: 5
Tab.: 5

(4) NSA-18(1964)-37444 RL

Winsbro, W.R., Burch, W.D., Ryon, A.D. 1765
Safety Requirements for the Design of Radiochemical Processing Facilities
(CF-58-10-112 (1958) 14 S.)

Design safety requirements applicable to the selection of a radiochemical processing building site and applicable to the layout and general arrangement of operating, control, administrative, and access areas which surround the process containment areas within the process building are presented. Emergency exits shall be provided but shall be designed to prevent the entrance or exit of personnel except during emergencies.

CF-58-10-112
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(8) RL

Mackey, T.S. 1767
TRU Glove Box Fire Test Results
(ORNL-TM-923 (1964) 9 S., 2 Fig.)

The transuranium glove box will be very similar to the one presently in use in the 3508 building. Fire tests were performed. The dimensions of the box are 36 in. long, 27 in. in depth, 30 in. in height, with a top width of 16 in. The ventilation system is described. The air discharged from the glove box through the Fiberglas roughing filter, then through the absolute filter into the manifold which was held at a negative pressure. The fire extinguishing system consisted of a Fenwall thermoswitch which, when activated, opened the solenoid valve 18 which permitted carbon dioxide gas to enter the glove box.

ORNL-TM-923
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Fig.: 3
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(6) NSA-18(1964)-35766 Forts. RL

Mackey, T.S. 1767 Forts.
TRU Glove Box Fire Test Results
(ORNL-TM-923 (1964) 9 S., 2 Fig.)

The glove box fire tests demonstrated that two hazards are encountered as a result of a fire. The first is the possibility of containment loss due to the burn through of the rubber gloves and the second is the explosion hazard which follows a fire as a result of the increased evaporation rate of the solvent due to the heat buildup in the glove box floor.

ORNL-TM-923
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Fig.: 3
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(6) NSA-18(1964)-35766 RL

Seagren, H.E. 1771
Some Developments in Engineering, Fabrication, and Field Support of Laboratory Programs. Report 3: April 1963-Sept. 1963
(ORNL-TM-793 (1964) VI, 40 S., 28 Fig.)

A survey of the ORNL area was made to select an appropriate location for an emergency medical and decontamination facility. It is estimated that the modifications and equipment necessary to establish such a facility would cost approximately $ 5,000.

ORNL-TM-793
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(4) NSA-18(1964)-17977 RL

Lakey, L.T., Bower, J.R. (Ed.) 1773
ICPP Waste Calcining Facility Safety Analysis Report
(IDO-14620 (1963) getr. Zählg., zahlr. Fig. u. Tab.)

The process building is a single unit 110 feet long and 70 feet wide. Radiation shielding is provided by the thick reinforced-concrete walls of the "hot" process cells. The building has six levels or floors which provide access to all rooms and cells. Heating and ventilation air is supplied through a branch duct from the main heating and ventilation duct system. Ventilation systems, laboratories and cells are described. The fire alarm system is a manual system. The alarm can be actuated at any of four pull-lever fire boxes located throughout the facility. There are several portable fire extinguishers which are strategically located throughout the building.

IDO-14620
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4
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Fig.:
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(8) RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1775
Development of Plutonium Bearing Fuel Materials. Progress Report for January 1 Through March 31, 1960
(NUMEC-P-20 (1960) 17 S., 20 Fig., 2 Tab.)

Major effect has been directed towards glove-box and equipment setup (NUMEC Plutonium Facility). All exhaust fans, filter housings, ventilation ducts and manifolds for the plant have been installed. Three glove boxes have been installed to the plant exhaust manifold. Hot laboratory details are given. The cell exterior has been sand finished and painted. The interior walls were sand finished, ground smooth with a carborundum stone, sealed with Rustoleum Seal-Cote, and painted with two coats of Rustoleum gloss enamel.

NUMEC-P-20
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Fig.:
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Forts.

(6) RL

Nuclear Materials and Equipment Corporation, Apollo, Pa. 1775 Forts.
Development of Plutonium Bearing Fuel Materials. Progress Report for January 1 Through March 31, 1960
(NUMEC-P-20 (1960) 17 S., 20 Fig., 2 Tab.)

Each cell window consists of a cylindrical, stepped carbon steel tank with welded flanges on the ends having "O" ring grooves and tapped blind holes for seal of the glass cover plates and support of the cover plate flanges, respectively.

NUMEC-P-20
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Fig.:
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(6) RL

Rodier, J., Jouannaud, C., Mazaury, E. 1779
Marcoule Spent Fuel Processing Plant. Elements of Safety after Six Years' Operation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/83 (1964) 14 S., 5 Fig., 2 Tab.)

Under normal circumstances, access to any given zone is solely from the "cooler" zone, under due control, and after donning protective clothing as laid down in regulations. Before entering zones containing a permanent contamination hazard, operators put on a special canvas overall covering their normal working clothes. Experiences has in fact shown that it is much easier to provide this protection, and then "strip" those leaving the contaminated zone, than to enforce lengthy, complicated, and steadily less efficient monitoring upon exit from hazard areas.

A/Conf.28/P/83
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(6) Forts. RL

Rodier, J., Jouannaud, C., Mazaury, E. 1779 Forts.
Marcoule Spent Fuel Processing Plant. Elements of Safety after Six Years' Operation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/83 (1964) 14 S., 5 Fig., 2 Tab.)

Well designed ventilation is the indispensable complement to "zoning". Whatever the rate of air renewal, the efficiency of ventilation depends essentially on the maintenance of permanent pressure differentials between the various zones. Our experience has been that ventilation problems are often simply a matter of doors, and of the individuals that forget that they are made to be closed.

A/Conf.28/P/83
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(6) RL

Tadmor, J., Galron, H. 1780
Guide for the Hazards Evaluation of a Chemo-Nuclear Installation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/508 (1964) 19 S.)

We present in this paper an outline and discussion of the particular points which we consider should be taken into account in planning the safety precaution of a chemo-nuclear establishment and which should be considered in a report evaluating the hazards in such an installation. Description of design of the building, thickness and materials of construction of the walls, roof and floor. Position and dimensions of doors and windows (indicate double doors with airlocks) and the degree to which they are leakproof, direction of opening, and mate-

A/Conf.28/P/508
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(7) Forts. RL

Tadmor, J., Galron, H. 1780 Forts.
Guide for the Hazards Evaluation of a Chemo-Nuclear Installation
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/508 (1964) 19 S.)

rials of construction. Interlock and bypass provisions for airlocks. Emergency escape doors. Detailed description of each of the rooms of the building; size, thickness of the walls, materials of construction, paintwork, degree of resistance to fire and to radioactive contamination. Indication of method of introduction and removal of materials into and from the various facilities (including description of change of gloves in the glove boxes). General description of the ventilation system, including joints and welds in the ventilation ducts and their tightness to leaks. Number of air changes per unit time in the different facilities.

A/Conf.28/P/508
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(7) RL

Lister, B.A.J. 1782
Plutonium Properties, Hazards and General Methods of Control
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan March 1964 (1964) S. 1.1-1.7, 8 Fig., 9 Tab.)

The type of laboratory required for plutonium work will depend on the amount of plutonium which it is intended to handle. We can for convenience think of three grades of laboratory: Class 1 Laboratory, Class 2 Laboratory, Class 3 Laboratory. It may be suggested that for normal chemical or metallurgical operations a Class 3 laboratory is suitable for handling up to 10 μc of plutonium and a Class 2 laboratory up to 1 mc. If greater than millicurie amounts are handled regularly the facilities should be designed to the highest standards. Exposed surfaces within the

AERE-L-151
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Fig.:
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Forts.

(5) RL

Lister, B.A.J. 1782 Forts.
Plutonium Properties, Hazards and General Methods of Control
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan March 1964 (1964) S.1.1-1.7, 8 Fig., 9 Tab.)

laboratory should be of smooth nonpermeable finish and projections and ledges where dust might collect should be avoided. Similarly, sharp edges which might cause wounds should also be avoided. There should be suitable facilities for monitoring of personnel and for storing the necessary protective clothing for routine and emergency use. Monitoring of air and surfaces should be carried out regularly. The decision on whether respirators should be worn is highly dependant on circumstances and should be made by the local health physicist. In extreme cases completely sealed clothing may be necessary. (5) RL

AERE-L-151
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Fig.:
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Lister, B.A.J. 1783
Plutonium Containment
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Ledures given During a Visit to Japan, March 1964 (1964) S.2/3.1-2/3.13, 23 Fig., 1 Tab.)

In glove box design, four points are of importance; i) good containment during normal operation to prevent plutonium from entering the operating area; ii) comfortable and straightforward working conditions including good lighting. Early boxes had wooden frames but, because of the fire hazard and the difficulty of decontaminating wooden surfaces, wood is now replaced by steel or fibre-glass. For the viewing panels no more generally suitable organic material has been found than Perspex.
(6) Forts. RL

AERE-L 151
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4
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Fig.:
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Lister, B.A.J. 1783 Forts.
Plutonium Containment
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.2/3.1-2/3.13, 23 Fig., 1 Tab.)

Usually complete box sides are made of Perspex, but where a serious fire hazard exists, consideration should be given to the use of small viewing panels. Description of fume cupboards and types of glove boxes and fillings, gloves and glove changing, pressurized suits as well as fire and explosion hazards is given.
(6) RL

AERE-L 151
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Fig.:
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Lister, B.A.J. 1784
Plutonium Monitoring - Air Sampling
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.4.1-4.10, 26 Fig., 1 Tab.)

In a large building installed air samplers can with advantage be connected to a central pumping system. We find that it is an advantage to fit them with a flexible arm so that the collector can be placed in the most convenient and suitable position. The type of filter medium adopted again depends on the application. The cellulose fibre type has relatively low resistance to air flow but the particles penetrate into the thickness of the paper thereby resulting in some loss of counting efficiency. A number of instruments are currently being developed at Harwell Forts.(5) RL

AERE-L-151
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Fig.:
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Lister, B.A.J. 1784 Forts.
Plutonium Monitoring - Air Sampling
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.4.1-4.10, 26 Fig., 1 Tab.)

for continuous plutonium monitoring. One type is set to measure total alpha activity and gives an alarm and indication when an exceptional release of activity occurs. Samples were collected from three types of area: 1) Pressurized suit access area, 2) Powder metallurgy glove box areas, 3) General purpose glove box areas in which both metallurgical and chemical operations are carried out.
(5) RL

AERE-L-151
3
5
Fig.:
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Lister, B.A.J. 1785
Criticality Control in Plutonium Areas
(AERE-L 151: Lister, B.A.J.: Health Physics Aspects of Plutonium Handling. A Series of Lectures given During a Visit to Japan, March 1964 (1964) S.9.1-9.10, 13 Fig., 1 Tab.)

The provision of alarm instrumentation must be considered in any area where is sufficient material to cause a criticality incident, even though the administrative controls may be thought to be adequate. Such an alarm system should be designed to protect not only the operating staff but all persons inside and outside the building who might be affected. The main warning system adopted in our Radiochemical Building consists of 12 ion chambers to detect gamma radiation, a control and supervisory unit situated in the health physics office, an automatic alarm generator and 29 loudspeakers. The alarm signal given is a warning sound which, anywhere on the site, means urgent evacuation. (4) RL

AERE-L 151
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Fig.:
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Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

Cape-636: Standard Hood (LASL). The standard hood is 85-3/8 in. high, 48 in. wide and 32-1/2 in. deep, and is constructed of sheet metal. It has one door 39-3/4 in. wide and 35-1/2 in. high and is made of safety glass 1/4 in. thick. The balance control damper (see Cape-641) is used with this hood. Cape-800: Neutron Facility (UCRL). The neutron facility consists of a chemistry box 65 in. long x 48 in. x 48 in. made of 11 gage cold rolled, mild steel, with a water window. There are a polyethylene lined storage well, transfer box and carrier, a magnetic lift capable of lifting
(18) NSA-18(1964)-367 Forts. RL

Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986

TID-4100 (1st Rev., Suppl. 18)
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Duthie, R.E.C., Sachs, F.L. (Ed.) 1794 1. Forts.
Engineering Materials List
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.)

500 lb, an overhead crane, and a manipulator device capable of raising and lowering 65 lb. Cape-861: Plastic Glove Box (SRL). The box is useful in housing short-term experiments with radioisotopes to contain the emitted ß and low energy γ radiation, or limited amounts of α activity. The box is 46-7/8 in. x 34-1/4 in. x 20-1/8 in. It has two ports 8-11/16 in. in dia. The box ist constructed of fire-resistant, self-extinguishing, polyester resin that is reinforced with glass fibers. Cape-885: High Intensity Food Irradiator Facility (HIFI)(CWC). The facility is used to treat food and other materials with gamma radiation, using a multimega curie Co^{60} source. The radiation cell is 32 ft 8 in. long, 22 ft
(18) NSA-18(1964)-367 Forts. RL

TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
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Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 2. Forts.
(TID-4100(1st Rev., Suppl. 18 (1963) getr. Zählg.) 3

wide, and 11 ft high; and has an access corridor 7 ft wide. The shielding walls consist of 6 ft of compacted sand between 8 in. thick walls. The roof of the cell has a 5-1/2 in. concrete slab which is covered with 7 ft of compacted sand. Cape-886: Thorex Facility Building (ORNL). The concrete building consists of a basement, first floor, and attic with dimensions of 214 ft 8 in. long and 33 ft wide. A concrete platform, 174 ft long and 15 ft wide, has a small room opening onto it from the building. This room is 22 ft 6 in. wide x 12 ft 6 in. Cape-906: Remote Metallograph (HAPO). This remotized, Bausch and Lomb, research metallograph
(18) NSA-18(1964)-367 Forts.

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TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 3. Forts.
(TID-4100(1st Rev., Suppl. 18 (1963) getr. Zählg.) 3

is installed in a cast-iron blister attached to the side of a cast-iron cell in the radio-metallurgical laboratory. The blister is made of 10-1/2 in. thick cast iron of 7.0 density. The blister is 32 in. long x 39 in. high; the part containing the metallograph is 18 in. wide. A sample conveyor and manipulator serve the metallograph and are controlled mechanically outside the cell. Cape-912: Bag Passout Sealer for Water-Shielded Cave Facility (UCRL). The remotely operated, plastic-bag passout sealer is used in removing isotopic fractions for storage in the rear or for removing radioactive waste for placement in the waste storage containers.
(18) NSA-18(1964)-367 Forts.

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TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 4. Forts.
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.) 3

The unit is accessible by both the primary inclosure master-slaves and the service area master-slaves. Cape-924: Shielded Personnel Monitoring Station (HAPO). This shielded monitoring station is used for whole body counting. The station is located in a small, concrete block house 40 ft x 40 ft 6 in. The cell is 9 ft x 10 ft with 10-1/4 in. steel walls having a stainless steel facing. The door is the same construction and moves on rollers to open. Cape-930: Hot Canyon Crane (SRL). The 221-F 411, 50-ton capacity, remotely controlled crane is used for installing, removing, and maintaining canyon process equipment. There is a specially shielded cab which houses the operating controls.
(18) NSA-18(1964)-367 Forts.

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TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 5. Forts.
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.) 3

Cape-951: Glove Box-Introduction Port (BNL). The port used for introducing materials into a glove box is a door made in two sections. The inner section is 1/2 in. thick and 10-1/4 in. in dia. The outside of the door is 9-7/8 in. in dia. and 1/2 in. thick. Light teflon-covered "Q" rings separate the two parts of the door. A teflon washer is used at the knob. Cape-986: Metallography Cell and Storage Facility (KAPL). The metallography cell is constructed of concrete 2 ft 4 in. thick. The outside dimensions are 28 ft 9 in. long, 9 ft 8 in. wide, and 16 ft high. The cell has a 6 in. thick steel door 6 ft 11 in. wide and 12 ft 1-1/2 in. high which operates on a worm-type mechanism.
(18) NSA-18(1964)-367 Forts.

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TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

Duthie, R.E.C., Sachs, F.L. (Ed.) 1794
Engineering Materials List 6. Forts.
(TID-4100(1st Rev., Suppl. 18)(1963) getr. Zählg.) 3

On a bridge in the cell is mounted an electromechanical manipulator. The cell is also equipped with a 2-ton electric hoist.
(18) NSA-18(1964)-367

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TID-4100 (1st Rev., Suppl. 18)
Cape-636
Cape-800
Cape-861
Cape-885
Cape-886
Cape-906
Cape-912
Cape-924
Cape-930
Cape-951
Cape-986
RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1797
Engineering Materials List
(TID-4100(Suppl. 21)(1964) getr. Zählg.)

Cape-558: Alpha Probe. The probe is used to guard against alpha contamination in a laboratory. Modified versions of the probe are used in alpha-hand and -shoe counters, floor monitors, and air filter monitors. It is an air proportional-type probe with 20 sq.in. of active area. It is insensitive to beta and gamma radiations and has a very low fast-neutron response (0.003 %). Cape-1067: Mechanical Manipulator for Vacuum System. The mechanical manipulator is used with a vacuum chamber for electron beam welding. The manipulator consists of an aluminum pistol grip 4-7/8 in. long and 5-3/4 in. high, and a 22-1/2 in. long steel rod housing 5/8 in. in dia. (10) Forts.

TID-4100 (Suppl. 21)
Cape-558
Cape-1067
Cape-1069
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RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1797
Engineering Materials List Forts.
(TID-4100(Suppl. 21)(1964) getr. Zählg.)

Cape-1069: Density Balance with Hood. The remotely controlled, hot laboratory equipment consists of a standard and a specially designed, density measuring apparatus. The critical parts of the weighing apparatus are enclosed in a hood to prevent air currents from affecting the weighing operation. The lower part of the hood is 20 in. x 21 in. x 50 in. high. The Mettler balance is enclosed in a hood 20 in. high x 16 in. x 17 in. which rests on top of the other hood. Metal frames and lucite or metal panels are used. The apparatus is used in an alpha-gamma cave.
(10)

TID-4100 (Suppl. 21)
Cape-558
Cape-1067
Cape-1069
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RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List
(TID-4100(Suppl. 22)(1964) getr. Zählg.)

Cape-1050: Isotopes Production Plant. The conceptual design for the isotopes production plant consists of a circular process building 140 ft. in dia. and 69 ft high with an attached single-story service building 100 ft by 120 ft. The process building contains a circular, concrete-shielded structure 103 ft in dia. which is divided into 11 manipulator cells and eight process vaults. The eight wet chemistry cells are located below grade level. The cell floors are lined with stainless steel, and the walls and cover blocks are coated with radiation resistant paint. Each of the manipulator cells is 16 ft high. These cells are accessible by crane from the top and through doors in the back of the cells.
(14) Forts.

TID-4100 (Suppl. 22)
Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125
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RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D. (Ed.) 1798
Engineering Materials List 1.Forts.
(TID-4100(Suppl.22)(1964) getr. Zählg.)

Cape-1059: Vacuum Cleaner with Cyclone Separator. This vacuum cleaner is used to pick up radioactive material. Particulates are removed from the air-stream with a small cyclone which is followed by an 8 in. square x 5-7/8 in. high efficiency filter. The vacuum cleaner employs an Electrolux motor and fan. Cape-1078: Miniature Centrifugal Contactor. The 16-stage contactor is suitable for remote operation with highly radioactive materials. The housing is of stainless steel and the stages are arranged in a circular configuration which allows a central gear drive for all of the bowls and a gear train drive for all of the mixers.

TID-4100
(Suppl.22)

Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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(14) Forts. RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D.(Ed.) 1798
Engineering Materials List 2.Forts.
(TID-4100(Suppl.22)(1964) getr. Zählg.)

Individual bowls and mixers are replaced by lifting out a single assembly. Cape-1089: Fallout Monitor/ Q-2256/. This monitor is used in the Fallout Monitor System which is designed to measure fallout of radioactive particles that originate from a nuclear incident, failure of air-cleaning components, or to give warning when a present tolerance level has been reached. Cape-1099: Monocular Periscope Stage. The stage of the monocular periscope used in Cell No. 9 of the High Level Cells is described. The oval stage plate has a long axis of 6-6/8 in., a short axis of 4-6/8 in., and is fabricated of 1/2 in. stainless steel.

TID-4100
(Suppl.22)

Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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(14) Forts. RL

Duthie, R.E.C., Sachs, F.L., Donald, B.D.(Ed.) 1798
Engineering Materials List 3.Forts.
(TID-4100(Suppl.22)(1964) getr. Zählg.)

It is attached to a shaft 10-1/8 in. long which is mounted on a low tripod 1-3/4 in. high. Cape-1125: Extrusion Press, 280 Ton. The extrusion press is used in the fabrication of aluminum-plutonium spike enrichment fuel elements for the Plutonium Recycle Test Reactor (PRTR). The 280 ton press is enclosed in a glove box.

(14)

TID-4100
(Suppl.22)

Cape-1050
Cape-1059
Cape-1078
Cape-1089
Cape-1099
Cape-1125

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RL

6 KOSTENFRAGEN

Hanthorn, H.E. **1381**
Calculated Costs of Fabrication of Plutonium-Enriched Fuel Elements
(HW-74304 (1962) VI, 125 S., 12 Fig., 35 Tab.)

In part 3b and c plant layouts and conceptual machine design descriptions are discussed. HW-74304
In part 4 are presented construction cost study estimates for the fuel element fabrication plants described in parts 2 and 3.

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Fig.: 2

(6)

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Regnaud, F. **1384**
L'analyse du plutonium
(Chimie analytique, 46 (1964) S. 133-37, 3 Fig.)

Si le plutonium est un élément dangereux à manipuler, l'analyse n'en est pas moins effectuée dans des conditions de sécurité satisfaisantes. Ce résultat n'est obtenu qu'au moyen d'installations coûteuses et compliquées qu'on peut diviser en trois catégories, suivant la nature et la quantité des échantillons traités: - La sorbonne ventilée, ou la boîte semi-étanche, pour les solutions peu actives mettant en oeuvre des quantités le plus souvent de l'ordre du microgramme. - La boîte à gants pour les échantillons de plutonium plus conséquents. L'enceinte α γ est constituée d'une boîte à gants ou d'une chaîne de boîtes à gants Forts.

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Fig.: 4

(4)

RL

Regnaud, F. **1384 Forts.**
L'analyse du plutonium
(Chimie analytique, 46 (1964) S. 133-37, 3 Fig.)

entourée d'une protection, de plomb le plus souvent, pour éviter l'irradiation par les émetteurs γ. Les manipulations sont effectuées par l'intermédiaire de télémanipulateurs ou de pinces articulées sur rotules. Une boîte à gants vaut de 3000 à 4000 francs et elle ne peut servir qu'à une opération assez restreinte. Une enceinte α γ, d'une surface de travail utile de 4 m^2, avec une protection de plomb de 5 cm, coûte 250 à 300 000 francs.

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Fig.: 4

(4)

RL

Sethna, H.N., Srinivasan, N. **1386**
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

A Purex type process has been chosen for its flexibility as well as the advantages it offers in the matter of concentration of the fission product raffinates. The Plant has a co-decontamination cycle, a partition cycle and two separate parallel cycles for the purification of uranium and plutonium. For the extraction cycles, 30 % TBP is used as solvent. Initially 1.0 M, 2.0 M, and 0.01 M have been chosen as the concentration of nitric acid in the feed, scrub and strip respectively, with sodium nitrite in the feed solution to stabilise the valencies of uranium and plutonium. Ferrous sulphamate is used as a reducing agent for the partitioning of plutonium from uranium. (8) NSA-18(1964)-37283 Forts. RL

A/Conf.28/P/786
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Fig.: 2
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Sethna, H.N., Srinivasan, N. **1386 1. Forts.**
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

The plutonium separated from the bulk of the uranium is purified by an anion exchange process, for which Dowex-1 with 4 % cross linkage is used with loading and washing in 7.2 nitric acid medium and elution with 0.35 M nitric acid. The radioactive part of the Plant in the Main Process Buildings is housed in eight cells with a total volume of about 3600 cubic metres. The walls and the roof of the cells and the stagings are lined with stainless steel in three out of the eight cells, the rest are protected by acid resistant paint. The floors of all cells are lined with stainless steel with 30 cm of skirting.

A/Conf.28/P/786
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Fig.: 2
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(8) NSA-18(1964)-37283 Forts. RL

Sethna, H.N., Srinivasan, N. **1386 2. Forts.**
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 20 S., 10 Fig., 1 Tab.)

On one side of the cells are the access corridor, the service corridor, the operating gallery and the transmitter and tank space. The entrance doors to all the cells are situated at the access corridor (ground floor) level. The control laboratory has a lead shielded cell for work with highly active samples and other associated fumehoods and glove boxes for medium level and low level analytical work and for plutonium handling.

A/Conf.28/P/786
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6
Fig.: 2
4

(8) NSA-18(1964)-37283 Forts. RL

Sethna, H.N., Srinivasan, N. **1386 3. Forts.**
Fuel Reprocessing Plant at Trombay
(Third United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Aug. 1964. A/Conf.28/P/786 (1964) 2o S., 10 Fig., 1 Tab.)

For the active laboratories and the plutonium laboratory the conditioned air is rendered dust-free with absolute filters and is exhausted through fumehoods to maintain the minimum velocity of the air required across the face of the fumehoods. While final cost figures are likely to be available after some time, approximate indications are given.

A/Conf.28/P/786
2
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4
6
Fig.: 2
4

(8) NSA-18(1964)-37283

RL

Kuminskiy, A.N. **1444**
Coatings of Building Structures in Radioactive Locations - USSR -
(JPRS-8849 (1961) 16 S., 4 Fig.)

This article considers problems of coatings of walls, floors, and ceilings of rooms of nuclear installations. It illuminates and summarizes the experience of using various types of coatings for radioactive rooms in the USSR, and makes recommendations as to their use. Data is quoted on the cost of various materials used for the coatings.

JPRS-8849
5
6
Fig.: 5

(5) NSA-1962-433 RL

Moore, P.F., Allen, J.D. 1463
Los Alamos Radiochemistry Hot Cells
(Proceedings of the 11th Conference on Hot
Laboratories and Equipment, New York, November
18-21, 1963 (1963) S.11-16, 2 Fig.)

A major expansion of the hot cell facilities at the 2
Los Alamos Radiochemistry Building in 1962-63 in- 3
cluded adding a new wing on the building; increasing 4
the number of cells from three to sixteen. Rapid trans- 6
fer of materials was provided for by the use of over- Fig.:
head monorail hoists and by a small railroad train 2
passing through all cells. Building size and cost 4
were held down by designing for light-duty manipulators
and by simplification or elimination of some of the
usual secondary systems. Over-all cost of the project
was about one million dollars. The windows were to
provide shielding for 100 curies in the chemistry
cells and 1000 curies in the dispensary cell.

(7) RL

Brebant, C., Dick, H., Junca, A., Portal, A., 1464
Wallet, P.
LECA - Irradiated Fuel Study Laboratory
(Proceedings of the 11th Conference on Hot
Laboratories and Equipment, New York, November
18-21, 1963 (1963) S.17-32, 13 Fig.)

The building containing the laboratory is a two 2
story building with a basement. Total cost, in- 3
cluding installed cell equipment (windows, 4
manipulators, conveyor, transfer devices) was 5
$3,200,000. The laboratory and its particular 6
features are described. The entire building is Fig.:
ventilated and air conditioned. 2
(11) 4
5

RL

Faugeras, P., Boudry, J.-C., Lefort, G., Lheureux, C., 1468
Stratakis, J.
CARMEN Chemistry Facility for Reprocessing Irradiated
Fuels in Gas-Tight Shielded Enclosures
(Proceedings of the 11th Conference on Hot
Laboratories and Equipment, New York, November
18-21, 1963 (1963) S.89-111, 15 Fig.)

The "CARMEN" series of cells is an α β γ facility now 4
in operation at Fontenay-aux-Roses. The line has four 6
independent cells placed along a single row and which Fig.:
are interconnected through α γ locks equipped with 4
conveyors. Each cell is made of a gastight, stainless
steel glove box, entirely surrounded with 15 cm of self
supporting steel shielding. Each cell is provided on
the front side, with a viewing window and two Model 7
Manipulators. Each cell is connected to the glove box
exhaust system of the building through absolute filters,
model Schneider-Poelman. The outside air is exhausted
through similar filters. The cost of the facility (with-
out taxes) are listed. (8) RL

Youngquist, C.H., Lind, D.J., Mack, G.A., 1481
Mohr, W.C., Van Loon, J.A.
Transport System in Argonne Chemistry Cave
(Proceedings of the 11th Conference on Hot
Laboratories and Equipment, New York, November
18-21, 1963 (1963) S.267-79, 7 Fig., 2 Tab.)

The Argonne Chemistry Cave is laid out with a rail 4
system that connects the individual cells with the 6
central radiation lock corridor as well as a loading Fig.:
dock. A 20 ton capacity rail car carries large ship- 4
ping casks from the loading dock to the interior of
the cave for unloading. A radio controlled flat car
traverses the narrow gauge rail system throughout the
cave and obeys up to eight commands sent from a small
radio transmitter. A remotely operated elevator whose
tracks line up with rails in the floor carries the flat
car between the two cave floors and a storage area on
the third floor. Cost of two manipulator vehicles,
complete with two consoles, two control units and
an ample supply of cable was under $40,000.
(8) RL

First Report on the Activities of the Eurochemic 1507
Company 1959-1961
Paris: Organisation for Economic Co-Operation and
Development, European Nuclear Energy Agency (1962)
380 S., 121 Fig., 32 Tab.
(NP-12804)

The main process building will consist of 31 process NP-12804
cells with adjacent access areas and two rows of
service corridors on six different floor levels. Addi- 2
tional installations will include an analytical laboratory 3
(adjoining the main process building), a fission product 4
storage building, final product storage, an effluent 6
station for the concentration of medium and low active Fig.:
liquid waste streams, and inactive storage unit. A re- 2
search laboratory, consisting of a "cold" wing, "hot" 3
laboratories, "hot" cells and an engineering hall has 4

(7) NSA-17-25357 Forts. RL

First Report on the Activities of the Eurochemic 1507
Company 1959-1961 Forts.
Paris: Organisation for Economic Co-Operation and
Development, European Nuclear Energy Agency (1962)
380 S., 121 Fig., 32 Tab.
(NP-12804)

been designed by a team of architects from NP-12804
Switzerland, Denmark and Spain. It will be located
in the vicinity of the Eurochemic re-processing 2
building. The total investment has been estimated 3
to be $ 24 million, including site development. 4
6

(7) NSA-17-25357 Fig.:
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3
4

RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility
Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel
Cycle Symposium, Gatlinburg, Tenn., December 5-7,
1962 (o.J.) S.333-350, 9 Fig.) TID-7650

To accomplish the objectives, four operating cells (Book I)
and two service cells will be required. The first
floor plan of the building is shown. The four operating 2
cells are arranged in a line with one of the service 3
cells, which is to be used for decontamination and 4
as a radiation lock, teeing off from the line at the 6
point where the two large central cells join. Another Fig.:
service cell, to be used for storage of contaminated 2
equipment, is located at the basement level and joins 3
the Decontamination Cell via a hatch in the Decon- 4
tamination Cell floor.

(8) NSA-17-28462 2. Forts. RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility 1. Forts.
Conceptual Design
(TID-7650(Book I): Proceedings of the Thorium Fuel
Cycle Symposium, Gatlinburg, Tenn., December 5-7,
1962 (o.J.) S.333-350, 9 Fig.)

All operating cells will have a common roof line; TID-7650
however, the floor level will vary to provide dif- (Book I)
ferent inside cell heights. The lifeline of the cell
complex is the transportation system. This consists 2
of a pair of overhead bridge cranes which can travel 3
over essentially all the area in the Glove Maintenance 4
Room, Decontamination, Contaminated Fabrication, 6
Mechanical Processing, and Chemical Cells. The Fig.:
window will consist of two major assemblies: a seal 2
glass removable from inside the cell, and a shield- 3
ing window removable from the non-radioactive side. 4

(8) NSA-17-28462 Forts. RL

Irvine, A.R., Lotts, A.L. 1541
The Thorium Fuel Cycle Development Facility Conceptual Design 2. Forts.
(TID-7650(Book I): Proceedings of the Thorium Fuel Cycle Symposium, Gatlinburg, Tenn., December 5-7, 1962 (o.J.) S.333-350, 9 Fig.)

The window will be a composite unit consisting of TID-7650
approximately 6 in. of glass and 60 in. of zinc (Book I)
bromide solution. The cost of this facility is
estimated to be $\$ 6 \times 10^6$ exclusive of process 2
equipment but inclusive of manipulators, remote 3
cranes, viewing windows, design, and inspection. 4
6
(8) NSA-17-28462 Fig.:
2
3
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Stewart, D.C. 1554
A Large-Scale Facility for Chemical Research With Intensely Radioactive Materials
(Progress in Nuclear Energy. Ser. 9: Analytical Chemistry, 3, P.7 (1962) S.238-65, 6 Fig., 4 Tab.)

The facility to be described in this chapter, the 2
Chemistry Division's new hot laboratory at Argonne 3
National Laboratory, is unique in several features. 4
The new hot laboratory is attached to the rear of the 6
Argonne Chemistry Building along an existing access Fig.:
driveway. A complicated ventilation system is proba- 2
bly the primary (and usually the most expensive) 4
engineering feature distinguishing radiochemical from 6
ordinary laboratory design. The main air supply is brought in at the service floor level where it is pre-filtered, tempered, and conditioned. This supply is used for the offices, corridors, laboratories, shops, and cave areas. The remaining regions of the building
(6) Forts. RL

Stewart, D.C. 1554
A Large-Scale Facility for Chemical Research With Intensely Radioactive Materials Forts.
(Progress in Nuclear Energy. Ser. 9: Analytical Chemistry, 3, P.7 (1962) S.238-65, 6 Fig., 4 Tab.)

are ventilated separately. Essentially all of the glove 2
boxes and radiochemistry hoods as well as the associ- 3
ated duct-work are fabricated of glass-reinforced poly- 4
ester resin. Dimensions and details of the cave cells 6
are included. The three megacurie and the two large Fig.:
kilocurie cells are all similar in design. The primary 2
face of each has two working positions, with a third 4
window on the side wall away from the shielding door 6
and a fourth window in the back wall. All of the viewing windows are simple tanks cast directly in the wall. These tanks are filled with concentrated zinc bromide solution. Costs for the building, hoods, glove boxes and shielding windows are shown.
(6) RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Les caractéristiques essentielles de ce bâtiment sont 2
les suivantes: Il comporte 4 tranches à peu près sembla- 3
bles d'environ 40 m x 50 m (alors que le projet initial 4
en prévoyait 6), 2 tranches étant disposées côte à côte, 5
les 2 autres étant symétriques des précédentes par rap- 6
port au grand côté des halls. L'ensemble mesure ainsi Fig.:
80 m x 100 m. Dans chaque tranche, 4 laboratoires 2
parallèles (14 m x 7,8 m) sont compris entre le couloir 4
"personnel" et le couloir "matériel", un couloir transversal permet en plus une communication directe entre ces deux couloirs sans obliger à traverser les laboratoires. L'air arrive par un diffuseur au centre du pla- Forts.
fond et par des bouches au-dessus de la porte d'entrée.
(7) NSA-17-23390 RL

Trouvé, S. 1555
Les laboratoires de radiochimie du Centre d'Etudes Nucléaires de Fontenay-aux-Roses Forts.
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.3-15, 23 Fig.)

Chaque hall est divisé en 2 parties: l'une (7 m x 39 m) 2
de hauteur voisine de celle des laboratoires (4 m); 3
l'autre (11 m x 39 m) de grande hauteur (8,50 m) 4
avec un pont roulant de 5 t. Le coût total de ce 5
bâtiment, sans les aménagements intérieurs spé- 6
cialisés se monte environ à 20 millions. Fig.:
(7) NSA-17-23390 2
4
RL

Lheureux, C., Lefort, G. 1558
"Carmen". Chaîne de sorbonnes de radiochimie alpha, bêta, gamma
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.29-36, 7 Fig.)

Cet ensemble comprend quatre sorbonnes indépendantes, 4
accouplées par des sas α γ situés entre chaque cellule. 6
Les introductions et les sorties de matériel ont été Fig.:
groupées dans la première enceinte. Chaque poste de 4
travail constitue une véritable boîte à gants étanche, complètement protégée par un blindage de 15 cm d'acier. Toutes les ouvertures, y compris les sas, ont une protection γ mobile et un système d'étanchéité α, généralement constitué par une manche de chlorure de polyvinyle. Les opérations chimiques sont réalisées: -
(5) NSA-17-23392 Forts. RL

Lheureux, C., Lefort, G. 1558
"Carmen". Chaîne de sorbonnes de radiochimie alpha, bêta, gamma Forts.
(Bulletin d'informations scientifiques et techniques, 1963, No.68, S.29-36, 7 Fig.)

soit directement au moyen de manipulateurs Argonne 7; - 4
soit par l'intermédiaire d'accessoires motorisés. Une 6
description des cellules est donnée. Le prix de re- Fig.:
vient hors taxes de cette installation monte à 4
1000 000 F.
(5) NSA-17-23392 RL

Alfredson, P.G., Cairns, R.C. 1578
Cost Estimation for Nuclear Reprocessing Plants. A Comparison of Methods
(AAEC/TM-134 (1962) 12 S., 1 Tab.)

A comparison of methods of capital cost esti- AAEC/TM-134
mation used for nuclear reprocessing plants 6
shows that, because of the special nature and Tab.:
complexity of such plants, cost estimation methods 6
for conventional chemical plants involving the use of cost factors are not applicable and will give low estimates. Cost factors which are available from other countries where reprocessing plants are installed should be used with caution since these factors apply only for the particular design philosophy used and pertain to industrial conditions which are different in this country.
(5) NSA-16(1962)-31671 RL

Lane, W.B., Nuckolls, M.J. 1656
Argon Improves $ZnBr_2$ Shielding Windows
(Nucleonics, 22, No.2 (1964) S.88-89, 1 Fig.)

A window was constructed as shown in the figure from materials described in the table. All welded parts were stress-relieved after welding. Welds were ground smooth and free of pits, flux and cracks. The thicknesses of both spacers were determined by the contractor to allow sufficient gasket squeeze to withstand a hydrostatic test of 5 psi. This was accomplished by allowing 0.040 in. for gasket compression. The cost of the completed window, exclusive of zinc bromide, was under $1,000. No difficulties were reported during construction and delivery was made in less than 30 days.

3 / 6 / Tab.: 3

(5) NSA-18(1964)-11363 RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L. 1662
Transuranium Processing Facility Design
(Nuclear Science and Engineering, 17 (1963) S.479-85, 6 Fig.)

The facility will consist of nine heavily shielded process cells and eight laboratories. The toxicity of the heavier transuranium elements justifies a refined building containment and ventilation system. The building is scheduled for full-scale operation by December, 1965, at an estimated cost of $8.7 million. The nine shielded process cells are arranged in line. Removable top plugs provide access to the cells. The entire building will operate at a normal pressure of 0.3 in. water gauge below atmospheric pressure at all times to ensure against escape of any airborne contaminants. Normally occupied personnel areas are supplied with a once-through air flow system. A preliminary cost estimate of the TRU Facility, including process equipment, is given.

2 / 3 / 4 / 6 / Fig.: 2 / 4

(8) RL

Peterson, S., Wymer, R.G. 1688
Radiochemical Processing Plants
(Peterson, S., Wymer, R.G.: Chemistry in Nuclear Technology. Reading, Mass.: Addison-Wesley 1963, S.260-79, 3 Fig., 2 Tab.)

The major part of the radiochemical plant is the processing area. In a typical plant the processing area consists of one or two long shielded canyons or one or two rows of shielded cells. Between the two cell banks or canyons (or along one side if there is only one processing area) are the operating gallery, pipe tunnels with connections between the different parts of the processing area, cold processing areas for preparation of nonradioactive chemicals which enter the process, and process sampling facilities. An analytical laboratory must be located near the processing area, and some

2 / 6 / Fig.: 2 / Tab.: 6

(5) Forts. RL

Peterson, S., Wymer, R.G. 1688
Radiochemical Processing Plants Forts.
(Peterson, S., Wymer, R.G.: Chemistry in Nuclear Technology. Reading, Mass.: Addison-Wesley 1963, S.260-79, 3 Fig., 2 Tab.)

arrangement must be provided for the shielded transfer of samples from the processing area to this laboratory. A radiochemical plant of typical design is the Idaho Chemical Processing Plant, of which the plan view is shown. The laboratory must be equipped to handle samples remotely, preferably in hot cells with master-slave manipulators. Radiochemical plants are maintained principally by two procedures, direct maintenance and remote maintenance. A proposed third method, underwater maintenance, calls for flooding the processing area and performing repairs with long-handled tools through a mobile, transparent shield of water. The distribution of costs in the Idaho Chemical Processing Plant is given. (5)

2 / 6 / Fig.: 2 / Tab.: 6

RL

Saling, J.H., Lusk, E.C., Gates, J.E. 1691
A Nine-Station Alpha-Gamma Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov.30-Dec.3, 1964 (1964) S.3-8, 3 Fig.)

A total of nine operating stations is available in a cell 60 feet long by 4.5 feet deep by 11 feet high. A general view of the front of the cells is shown. Shielding is provided by 6.75 inches of lead cast in place between 1-inch-thick steel plates. Each operating station consists of a movable wall section containing a lead glass window, a set of Model-8 manipulators, and a dry box in which the radioactive materials are handled. Filtered air is exhausted from the boxes directly into a plenum system connected to the presently operating beta-gamma cell exhaust system. Construction costs for the Alpha-Gamma Facility will total $250,000.

4 / 6 / Fig.: 4

(6) RL

Boehme, G., Gottlob, P. 1692
Design and Equipment of the Alpha-Gamma Hot-Cell Facility at the Karlsruhe Nuclear Research Center
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov.30-Dec.3, 1964 (1964) S.9-13, 4 Fig.)

Five gastight hot cells are provided for examination of reactor experiments and irradiated fuel elements. The cells are equipped for handling alpha-gamma active material. This equipment has been designed to permit remote insertion and removal as well as maintenance, disassembly, repair, and reassembly by remote control. The manipulators are of a novel design offering some advantages over conventional models. Remote viewing equipment consists of dry, high-density lead glass windows and special periscopes.

3 / 4 / 6 / Fig.: 2 / 4

(6) Forts. RL

Boehme, G., Gottlob, P. 1692
Design and Equipment of the Alpha-Gamma Hot-Cell Facility at the Karlsruhe Nuclear Research Center Forts.
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov.30-Dec.3, 1964 (1964) S.9-13, 4 Fig.)

The cells may be operated for some years under gastight conditions without any personnel entering them. The over-all cost of the five hot cells with a total of eleven working stations, including equipment, amounts to some $1.5 million.

3 / 4 / 6 / Fig.: 2 / 4

(6) RL

Lefort, G., Paquis, R. 1693
A New Type of Chemistry Cell for High Specific Activity at Fontenay-aux-Roses
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov.30-Dec.3, 1964 (1964) S.15-24, 8 Fig.)

An alpha, beta, gamma cell is described which was recently built at Fontenay-aux-Roses. It will serve for the recovery of highly active irradiated fuel elements. The gamma shielding is 10-inches thick. The alpha cell is subdivided into three sections; (two working cells measuring 165-inches by 50-inches by 45-inches and one interconnecting central cell measuring 78-inches by 39-inches by 41-inches)

3 / 4 / 6 / Fig.: 4

(6) Forts. RL

Lefort, G., Paquis, R. 1693
A New Type of Chemistry Cell for High Specific Forts.
Activity at Fontenay-aux-Roses
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 15-24, 8 Fig.)

Altogether there are seven working places. The most 3
important details of the cell construction and the 4
auxiliary equipment are described. Although the 6
main building is properly ventilated, absolute filters Fig.:
are also provided at the intake and exhaust of the cell. 4
The costs of the installation are $700, 000.

(6) RL

Jefferson, R. M. 1694
50-Kilocurie Gamma Irradiation Facility
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 25-29, 2 Fig.)

The facility consists essentially of two hot cells above 2
a pool. Through the use of self-contained handling 3
equipment, sources may be readily introduced and 4
removed from these cells. Provisions are included for 6
visual, physical, and electrical access as well as con- Fig.:
trol to provide the necessary safety. Several problems 2
encountered in the operation of this facility are also discussed. Overall cost of the building, excluding land and site improvements but including utilities, was $431, 420. The cell ventilation system is described.

(6) RL

Dascenzo, R. W., Hammill, K. H., Merker, L. G. 1697
The Fuels Recycle Pilot Plant
(Proceedings of the 12th Conference on Remote Systems Technology, San Francisco, Calif., Nov. 30-Dec. 3, 1964 (1964) S. 55-64, 3 Fig., 3 Tab.)

The building is divided into four primary functional 2
areas: (1) radiochemical engineering cells, (2) shielded 3
metallurgical cells, (3) low level canyon, and (4) cold 4
canyon. The basic requirement of the ventilation 6
system is to maintain an established negative pressure Fig.:
in the cells and building structure. This is accom- 2
plished by pulling air through the building by the Tab.:
exhaust fans. The cost of constructing the FRPP 2
is $5, 560, 000. 4

(8) RL

Jaeger, Thomas 1800
Grundzüge der Strahlenschutztechnik für Bauingenieure, Verfahrenstechniker, Gesundheitsingenieure, Physiker
Berlin, Göttingen, Heidelberg: Springer 1960. XV, 392 S., 224 Fig.

In Kapitel 13 wird über den Entwurf von Radioisoto- 3
pen-Laboratorien berichtet (Anordnung der Räume, 4
Ventilation, Abzüge, Handschuhkästen, heiße Zellen, 6
fernbediente Geräte und Maschinen, Manipulatoren, Fig.:
Sichtvorrichtungen). Zahlreiche Abbildungen sind 2
vorhanden. Die Kostenaufstellung eines heißen 3
Laboratoriums beträgt $ 268 000. 4

(5) RL