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KERNFORSCHUNGSZENTRUM

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KFK 176

Literaturabteilung

Laboratorien für Arbeiten mit radioaktiven Stoffen
Bibliographie über Planung, Bau, Einrichtung und Ausrüstung
Teil II

G. Brossmann

KERNREAKTOR
BAU- UND BETRIEBS-GESELLSCHAFT M. B. H.
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Vorwort

In Teil I der Literaturzusammenstellung über Bau, Planung, Einrichtung und Ausrüstung von Laboratorien für Arbeiten mit radioaktiven Stoffen, die als KFK 69 veröffentlicht wurde, sind 800 seit 1955 erschienene Veröffentlichungen sowie ca. 150 umfassendere Abhandlungen aus den Jahren 1947 bis 1955 enthalten. Im vorliegenden Teil II dieser Literaturzusammenstellung sind weitere 420 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).

Die vorliegende Literaturzusammenstellung wird laufend weitergeführt und durch nachfolgende Berichte vervollständigt.

Bei der Fertigstellung der Druckvorlagen leistete Herr Dr. Buriks während einiger Monate wertvolle Hilfe.

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

Kernforschungszentrum Karlsruhe,
im Oktober 1963 Literaturabteilung

Inhaltsverzeichnis

0 BÜCHER

Coffinberry, A.S., Miner, W.N. (ed.) 1101
The Metal Plutonium 1105
Chicago: University of Chicago Pr. 1961. 0

S. 36 - 62: Coffinberry (1101)
S. 133 -151: Lee, Mardon (1105)

Ritter, H.-J. 1106
Strahlenschutz für Jedermann: Handbuch
für Unterricht und Einsatz im Strahlenschutz. 0
2., verb. Aufl. -
Mainz & Heidelberg: Hüthig & Dreyer. 1961. 199 S.
(Schriften des Deutschen Roten Kreuzes)

Flagg, J.F. (ed.) 1132
Chemical Processing of Reactor Fuels
New York (usw.): Academic Pr. 1961. 0

S. 271-303: Davis, Jennings (1132)

Kern, W. 1138
Ein Elektrofilter für die Abscheidung radio-
aktiver Aerosole 0
Bonn 1958. 101 S.
Bonn, Math.-naturwiss. Diss. v. 27.6.1958

Grison, E., Lord, W.B.H., Fowler, R.D. (ed.) 1173
Plutonium 1960 1174
London: Cleaver-Hume Press 1961. 1176

S. 186- 91: Kerjean (1173) 1177
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S. 499-512: Horton, Ward (1177)
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Lochanin, G.N., Sinicyn, V.J., Štan', A.S. 1200
(Russ.) Zaščitnoe oborudovanie i prisposob-
lenija dlja raboty s radioaktivnymi 0
veščestvami
Moskva: "Gosatomizdat" 1961. 129 S.
(Schutzgeräte und ihre Anwendungen für die
Arbeit mit radioaktiven Substanzen.)

Kaufmann, A.R. (ed.) 1237
Nuclear Reactor Fuel Elements 0
New York: Interscience Publ. 1962.

S. 92 -145: Aronin (1237)

1 Zusammenfassende Abhandlungen und Bibliographien

Duthie, R.E.C., Sachs, F.L. (ed.) 956
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev.,Suppl.7)(1960) 39 Bl.)

Descriptions of engineering materials including computers, critical assemblies, engineering and hot laboratory equipment, instruments, metallurgical equipment, reactors, radiation sources, and shielded containers are presented.

TID-4100 (1st Rev.) (Suppl.7)

1 / 4

(6) NSA-1960-13813 RL

Duthie, R.E.C., Sachs, F.L. (ed.) 957
Engineering Materials List. Cumulative Index Through Suppl. 7
(TID-4100(1st Rev.) Index (1960) 109 S.)

The materials covered include computers, critical assemblies, hot laboratory equipment, radiation instruments etc.

TID-4100 (1st Rev.)

1 / 4

(6) NSA-1960-20290

RL

Duthie, R.E.C., Sachs, F.L. (ed.) 958
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl.8)(1960) 62 Bl.)

Descriptions of engineering equipment including computers, critical assemblies, hot laboratory equipment instruments, metallurgical equipment and progresses, nuclear radiation instruments, nuclear reactors and facilities, particle accelerators, plant design and processes (chemical), radiation source units, and shielded containers are presented.

TID-4100 (1st Rev., Suppl.8)

1 / 4

(6) NSA-1960-22687 RL

Raleigh, H.D., Scott, R.L. 1102
Nuclear Instrumentation. A Literature Search
(TID-3550(Rev.1) (1961) III, 149 S.)

Included are 1,728 references on the design, construction and application of instruments for radioactive environments (Hot Cell, Radiation Detection Instruments, Remote-Control Equipment).

TID-3550(Rev.1)

1 / 4 5

(7) NSA-1961-22459

RL

Rowlands, R.P. 1123
A Catalogue of Available Whole Body Protective Clothing
(AHSB(RP)R.9 (1961) 70 S., 14 Fig.)

A brief general description, together with illustrations, is given for each of the whole body pressurized or unpressurized impermeable suits in regular use within the Authority. The Catalogue sets out to provide a record of the equipment available and in regular use within the Authority for whole body protection. Attention has been focused on the suits themselves without undue reference to ancillary and installed equipment which may also be required when the suits are in use. Brief descriptive details of the design and fabricating materials of each suit are given together with an outline of its uses.

AHSB(RP)R.9

1 / 5

Fig.: 5

(5) RL

Lochapin, G.N., Sinicyn, V.J., Štan', A.S. 1200
Schutzgeräte und ihre Anwendungen für die Arbeit mit radioaktiven Substanzen (Russ.)
Moskva: "Gosatomizdat" 1961. 129 S., 91 Fig., 10 Tab.

Dieser Katalog enthält Beschreibungen, Abbildungen und Tabellen von Geräten und Einrichtungen, die in der Sowjetunion für Arbeiten mit radioaktiven Substanzen verwendet werden. Die Geräte sind unterteilt in: Behälter, Tresore, Schirme, Abschirmklötze, Karren, Abzüge, Kammern, Distanz-Instrumente und Manipulatoren, medizinische Instrumente, sanitär-hygienische Einrichtung, Laboratoriumsmöbel, Geräte zum Sammeln und Entfernen radioaktiver Abfälle, Sichtfenster, Filtermaterial, Kunststoffmaterial zur Auskleidung der Laboreinrichtungen, Schutzkleidung.

1 / 3 4 5

(7) RL

Foskett, A.C. 1239
Techniques for Handling Radioactive Materials A Bibliography
(AERE-BIB-122 (1959) 34 S.)

Die Bibliographie enthält 187 Literaturstellen über Laboratorien im Allgemeinen, Arbeitskästen, Ausrüstungen, Pipetten, Fernbedienung, Manipulatoren, Sehvorrichtungen usw.

AERE-BIB-122

1 / 3 4

(6) RL

Foskett, A.C., Randall, C.H. 1240
Techniques for Handling Radioactive Materials. A Bibliography
(AERE-BIB-122(Suppl.1)(1962) 30 S.)

126 references of the following sections are given: Laboratories, glove boxes, equipment, remote handling, manipulators, remote control, remote viewing etc.

AERE-BIB-122 (Suppl.1)

1 / 3 4

(7)

RL

Ridgeway, C.L. 1257
Remote-Handling Equipment Catalog
(TID-12752 (1961) V, 60 S., 54 Fig.)

This document is a reference catalog of remote-handling equipment at the Idaho Test Station. Each item is illustrated to show shape and primary dimensions. In addition, each illustration includes pertinent facts such as the assembly drawing number, weight, primary materials, and load or load capacity.

TID-12752
1/4
Fig.: 4

(5) NSA-1961-18168 RL

Barton, C.J. 1259
A Review of Glove Box Construction and Experimentation
(ORNL-3070 (1961) 112 S., 11 Fig.)

The literature on construction and operation of glove boxes for work with toxic inorganic materials not requiring biological shielding is reviewed as a contribution to this re-examination, with special emphasis on methods and equipment for working safely with plutonium and other α-active materials. Methods for the detection and measurement of α-active materials and of impurities in controlled atmospheres, window materials, protective coatings, glove materials and design, filters and scrubbers, exhaust systems, laboratory design, etc. are discussed.

ORNL-3070
1/3
4
5
Fig.: 4

(7) NSA-1961-22394 RL

2 Baupläne und Beschreibungen von Gebäuden und Laboratorien

Reardon, W.A., Clayton, E.D., Brown, C.L., Masterson, R.H., Powell, T.I., Richey, C.R., Smith, R.B., Healy, I.W. 951

Hazards Summary Report for the Hanford Plutonium Critical Mass Laboratory

(HW-66266 (1960) 124 S., 16 Fig., 13 Tab.)

The facility has essentially three architectural units: 1) The reactor-assembly room, 2) the service building closely attached to the reactor room, and 3) the control and office building. All the interior surfaces of the concrete, including the floor, are coated with a fiber glass reinforced resin surface (Amercoat No. 74). The first of three rooms in the service building, adjacent to the reactor room, is the mixing room. The most prominent fixture in the room is the mixing hood which provides containment for operations involving the plutonium. (13)

HW-66266
2/3
4
Fig.:
2
4
RL
Forts.

Reardon, W.A., Clayton, E.D., Brown, C.L., Masterson, R.H., Powell, T.I., Richey, C.R., Smith, R.B., Healy, I.W. 951 Forts.

Hazards Summary Report for the Hanford Plutonium Critical Mass Laboratory

(HW-66266 (1960) 124 S., 16 Fig., 13 Tab.)

The mixing room is served by the main exhaust system. Air from the mixing hood and the fume hood is drawn out after first passing through a common filter box containing a fire resistant absolute filter of the same type used in the reactor room.

(13)

HW-66266
2/3
4
Fig.:
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4
RL

Berkeley Nuclear Laboratories 959

(Nuclear Engineering, 6, No.62 (1961) S.281-82, 4 Fig.)

In plan form the Berkeley Laboratories resemble the letter "E". Radioactive materials are handled in the shielded area and the laboratory wing on the north side. The total floor area of the laboratories is about 100,000 sq. ft. There are a number of special features about the shielded area and the laboratory wing. Normally, access to them is through the change rooms in which members of the staff change into protective clothing and ultimately ensure that they are free from contamination before leaving. All protective clothing is washed in the laundry which is adjacent to the change rooms. An air-conditioning system supplies warm fresh air to the buildings and extracts it through filters which remove any possible radioactivity before discharge into the atmosphere through a 75-ft chimney. (5)

2/3
4
Fig.:
2
RL

Gaschermann, A. 960

Bauliche Planung und Aufbau von Isotopen-Laboratorien

(Kerntechnik, 3 (1961) S.204-08, 1 Fig.)

Es wird über die bauliche Planung, die Installation, den Innenausbau, die Beheizung und Beleuchtung, über Strahlenschutzbeton, Einrichtung, Be- und Entlüftung von Isotopenlaboratorien berichtet.

(6)

2/3
4
5
Fig.:
2
RL

Aldebert, F. 966

Ein neues Radiochemisches Labor am Ohm-Polytechnikum in Nürnberg

(Atompraxis, 7 (1961) S.238-39, 3 Fig.)

Die Hauptarbeitsräume des von außen recht ansehnlichen Baues sind ein Meßraum, ein niederaktives Labor und ein mittelaktives Labor. Daneben sind ein Abfalldepot, eine Tresoranlage, eine Bibliothek vorhanden und weitere Nebenräume wie Garderoben, Chemikalienlager usw. Etwa 50 % des Gesamtraumes entfallen auf derartige Nebenräume, die entweder arbeitstechnisch nicht entbehrt werden können oder aus Sicherheitsgründen vorhanden sein müssen. Eine Abwasserabklinganlage in einem Außenbunker vervollständigt das Bild des in sich geschlossenen und in bezug auf die relative Lage der Räume zueinander gut geplanten Labors.

(3)

2
Fig.:
2
RL

Woodall, A.J., Wilson, C.G., Jones, A.L., Thomas, D.K. 967

Design and Management of a Nuclear Science Laboratory

(Nature, 182 (1958) S.367-69, 1 Fig.)

A substantial central wall divides the building longitudinally into physics and chemistry sections. The rooms are separately ventilated into the roof void above the light-alloy false ceiling, which is stiffened by overhead girders and rests on the partition walls. All exposed wall surfaces are smooth and coated with hard glossy paint, light in colour, so that splashes are easily visible. The concrete floor is completely covered with waxed polished linoleum and the joints sealed. The laboratory furniture is normal, but bench tops are protected by stout water-proof waxed paper which can easily be removed after contamination. (8) NSA-1958-13782

2/3
5
Fig.:
2
RL

Harwell's New High-Activity Handling Building "459" 969

(Nuclear Engineering, 3 (1958) S.121-22, 5 Fig.)

The building is roughly "T"-shaped, the crossbar of the T containing what might be termed the "service" departments, such as changing rooms, stores, offices, messroom and workshop, while the leg of the T forms the actual "operations" portion of the building. The five high-activity cells are planned on an 8-ft module. The line of cells is equipped with a 1 1/2-ton remote-controlled overhead travelling crane, a 5-ton self-propelled bogie and a power-operated manipulator. Each cell has a zinc bromide window, 5 ft x 3 ft and 5 ft 6 in. thick, backed up by high-density glass. Each cell is equipped with a pair of master-slave manipulators. Frogmen wearing thick rubber suits and helmets are supervised from a control room that has a window giving a view of the entire maintenance area.

(6) NSA-1958-6497

2/3
4
5
Fig.:
2
4
5
RL

MackIntosh, A.D. 976

The Radiochemical Laboratory - An Architectural Approach to its Design

(Nucleonics, 5, No.5 (1949) S.48-61, 7 Fig.)

(AECU-210 (1949))

How various levels of radioactivity affect planning of labs and offices serves to introduce a proposal for a modular system that offers flexibility in layout. Shielding, waste-disposal facilities, hoods, finishes, heating, and ventilation are touched upon.

(7)

AECU-210
2/3
4
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Fig.:
2
RL

Weinberg, D.J. 981
Design of Nuclear Laboratories
(Nuclear Engineering and Science Conference at Chicago, Ill., March 17-21, 1958, Preprint 148, Sess. 19, 22 S.)

Nuclear laboratories require special care in their design to insure adequate personnel protection and efficient use. The facility must be easily decontaminated in case of a spill, special precautions must be taken to prevent spread of contamination, and there must be adequate biological radiation shielding to protect personnel. Building plans, special anti-contamination measures, floor covering, walls, floors, air flow and air conditioning systems are discussed.

2/3
5

(5) NSA-1958-13023 RL

Rachinskiy, V.V., Platonov, F.P 984
Radioisotope Laboratory of Timiryazev Academy - USSR -
(JPRS-2737 (1960) 20 S., 12 Fig.)

The Radioisotope Laboratory has been planned in the following way: radiometric and lecture room; photographic room; distillation room; radiochemical room; forced-growth room; repair shop; radiochemical rooms; isotope storage; weighing rooms; teachers' room; washroom; dressing room; shower room. The three radiochemical rooms are equipped with special workbenches with hot and cold water, gas, compressed air and vacuum outlets. The movable front windows of the exhaust hoods are equipped with built-in gloves with long sleeves. This allows work to be conducted in hoods with closed windows. There are also special removable plexiglass boxes for grinding radioactive materials.

JPRS-2737
2/4
Fig.:
2
4

(6) RL

Dubois, F. 985
Bétons lourds à base de barytine et de minerais de fer
(Bulletin d'informations scientifiques et techniques, 1960, No.36, S.2-24, 21 Fig., 4 Tab.)

Two important applications are described in this article: baryte concrete for the cells of the laboratory of study of irradiated fuels and concrete with iron scraps for the protection at the proton synchrotron Saturne.

2/4

(4) NSA-1960-12318 RL

Porembski, T.T. 995
Air Cleaning at the Knolls Atomic Power Laboratory
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.140-50, 4 Fig.)

This report deals with the description of the newly designed activated carbon and stack system which will handle the radioactive iodine vapor and will be operated in conjunction with the existing systems in the Radioactive Materials Laboratory. Air is supplied to the building with two central plant air units on a once-thru basis. Both units are equipped with 2" thick fibre glass filters and together the units have a capacity of approximately 12000 cfm. Air is discharged from duct openings high up under the roof in order to avoid air turbulence at the occupancy levels. Air is exhausted from the work areas with several individual exhaust systems each of which is equipped with a fibre glass prefilter followed by a CWS filter. (5) NSA-1961-6267 RL

TID-7593
2/3
Fig.:
2
3

Wilson, H.W., Watt, D.E., Ramsden, D. 1016
A Low-Background Laboratory
(International Journal of Applied Radiation and Isotopes, 10 (1961) S.158-66, 6 Fig., 3 Tab.)

Consideration of the design, cost and construction of a low-background laboratory for the measurement of low specific activity samples leads to the choice of demineralized water as the main shielding material. Background figures and spectra obtained for a range of proportional and scintillation counters in the completed laboratory, show that the shielding is slightly better than 12 in. of steel. It is deducted from energy and intensity measurements that the gamma-ray peaks occurring in the background spectrum arise mainly from ThC" present in the counter construction materials. The cell was built at a total cost of some £ 20,000. This cost includes all services and air conditioning.

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

(7) RL

Wilson, A.R.W. 1018
Activity Levels in Relation to Laboratory Design and Practice
(Martin, J.H.(ed.): Radiation Biology. Proceedings of the 2nd Australasian Conference on Radiation Biology, ... Melbourne, 15-18 Dec. 1958, S.147-51)

All of the laboratories in the radiochemical building fall within the classification (I) of Dunster, being provided with readily decontaminable surfaces, adequate fume hoods and forced ventilation giving approximately 20 room changes an hour. Following British practice, areas within the radio-chemical building are classified as red, blue or white. The blue and red contamination areas are located in the active section of the building and access to them is by way of a change room. Measures against spread of contamination in these latter areas include regular monitoring of all laboratory

2/5

(4) Forts.

RL

Wilson, A.R.W. 1018
Activity Levels in Relation to Laboratory Design and Practice Forts.
(Martin, J.H.(ed.): Radiation Biology. Proceedings of the 2nd Australasian Conference on Radiation Biology, ... Melbourne, 15-18 Dec. 1958, S.147-51)

surfaces, systematic cleaning procedures, clothing and shoe changes for persons entering and leaving the area, showering, prohibition of smoking and eating, and the monitoring of hands for contamination.

2/5

(4) RL

Lamb, C.E. 1025
The High-Radiation-Level Analytical Facility at the Oak Ridge National Laboratory
(Talanta, 6 (1960) S.20-7, 26 Fig.)

This facility is used for the analysis of radioactivity greater than 1 r/hr at contact; the samples are received from the Power Reactor Fuel Reprocessing Pilot Plant as well as from many other sources. It consists of a sample-storage cell, seven work cells, a "cold" preparation area, a decontamination area, a receiving dock and an office. Barytes concrete, in addition to concrete of normal composition, is used in the cell walls to meet different shielding requirements. Zinc bromide solutions are used for shielding in the work-cell windows, and high-density lead glass is used for shielding in the storage-cell window.

2/4
Fig.:
2
4
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(4) NSA-1961-8734 Forts. RL

Lamb, C.E. 1025 Forts.
The High-Radiation-Level Analytical Facility at the Oak Ridge National Laboratory
(Talanta, 6 (1960) S.20-7, 26 Fig.)

The facility is provided with Master Slave Manipulators, analytical instruments designed for use by remote control, and special equipment for transporting samples, for continuously monitoring air-borne and background radioactivity, for disposing of solid and liquid wastes, and for carrying out decontamination procedures.

2/4, Fig.: 2, 4, 5

(4) NSA-1961-8734 RL

Cooper, J.H. 1027
The High-Alpha-Radiation Analytical Facility of the Oak Ridge National Laboratory
(Talanta, 6 (1960) S.154-58, 7 Fig., 2 Tab.)

At the present time, the facilities of the high-alpha analytical laboratory consist of hoods with a high flow of air and one glove box for handling dry alpha active materials. A schematic diagram of the analytical laboratory and equipment is shown in Fig.5. Typical hoods and glove boxes are shown in Figs.6 and 7.

2/4, Fig.: 2, 4

(4) NSA-1961-8748 RL

Pietri, C.E., Baglio, J.A. 1028
The Determination of Plutonium Based on National Bureau of Standards Potassium Dichromate
(Talanta, 6 (1960) S.159-66, 6 Fig., 4 Tab.)

A description of the design and operation of the New Brunswick Laboratory's plutonium analytical facility is presented. The potentiometric titration of high-purity Pu is discussed. A new laboratory, using gloved boxes of improved design, has been built to study the chemistry of Pu, develop methods of analysis, and prepare Pu compounds suitable for standards. The laboratory is equipped for spectrographic, wet-chemical, instrumental, and low-level radiochemical analyses.

2/4, Fig.: 2, 4

(5) NSA-1961-8749
Zeitschr. f. analyt. Chem., 182 (1961) S.50
RL

Barendregt, T.J. 1031
Aspects of the Eurochemic Reprocessing Facility
(Nuclear Power, 6, No.61 (1961) S.59-64, 6 Fig.)

The plant will contain a large reception and storage hall, an active cell-block, with access, maintenance and control corridors on the southern side. On this side the analytical laboratory for process-analysis is connected to the main building. The active cell-block consists essentially of four parts, the head-end, the extraction and concentration, the rework and solvent recovery and the final purification area (Fig.6). This cell-block has a length of 240 ft, a width of 55 ft and a height of 60 ft. The head-end part will have two dissolver cells, an off-gas treatment located above the dissolver cells, a storage and a make-up cell.

2, Fig.: 2

(3) RL

Olsen, A.R. 1038
A New Postirradiation Examination Laboratory at the Oak Ridge National Laboratory
(Proceedings of the 91h Conf. on Hot Lab. and Equipment, Chicago 1961, S.3-14,7 Fig.)

The building arrangement, cell construction, and special features, designed to permit operations with complete containment and with essentially no personnel entry, are described. The remote installation and removal of equipment, storage of contaminated equipment, remote decontamination, and remote maintenance features of the facility are expected to provide safer operation, increased cell utilization, and decreased operating costs.

2/3, 4, Fig.: 2, 4

(5) RL

Berreth, J.R., Schuman, R.P. 1040
A Chemistry Hot Cell for Handling Alpha-Gamma Activities
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.22-26, 6 Fig.)

The cave, see Fig. 2, is located near the center of the 27'4" by 29'4" hot cell laboratory. It is designed to accommodate two isolation boxes and has inside dimensions of 5' deep, 8'8" long, and 6'8" high. Steel reinforced high density (> 3.5) magnetite concrete is used for shielding. All interior surfaces of the cave are painted with two coats of white Phenoline 305, and will be further protected by an additional strippable coating. Illumination of the cave is with fluorescent lights placed above the viewing windows. The cave itself is maintained at a negative pressure with respect to the room and vented through the absolute filters of the building hood system.

2/3, 4, Fig.: 2, 4

(6) Forts. RL

Berreth, J.R., Schuman, R.P. 1040 Forts.
A Chemistry Hot Cell for Handling Alpha-Gamma Activities
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.22-26, 6 Fig.)

Central Research Laboratory Model 7 master-slave manipulators were chosen for the cave in order to simplify the problems of isolation box design and booting.

2/3, 4, Fig.: 2, 4

(6) RL

Vandenbulck, C.F. 1042
Radioactive Materials Laboratory Union Carbide Nuclear Company
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.35-43, 7 Fig.)

The hot laboratory is a concrete and steel structure, 139 feet long by 57 feet wide by 37 feet high, and it is adjacent to the reactor building (Fig. 2). The hot lab and reactor buildings are connected by two air lock personnel passages and a canal (12 feet water depth) which provides direct connection of the reactor pool and cell No. 1. Five individual hot cells, constructed with 4' thick walls of high density (magnetite) concrete, are located in the central portion of the building. Cell 1 is 16' long by 15' high, and contains equipment for remote cutting machining, welding, and similar operations. There are 2 Corning radiation shield windows in cell 1 and one in each small cell.

2/3, 4, Fig.: 2, 4

(5) Forts. RL

Vandenbulck, C.F. 1042 Forts.
Radioactive Materials Laboratory Union Carbide Nuclear Company
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.35-43, 7 Fig.)

Provision was made for installation of a pair of master slave manipulators at each window position and at present there are available 4 pair of AMF Model 8 units and 1 pair of AMF Heavy Duty Model 8 units. The ventilation system is designed to provide a minimum of 20 volume changes per hour in the hot cells and a face velocity of 100 feet per minute at each of the three hoods in the Radiochemistry Laboratory.

2 3 4 Fig.: 2 4

(5) RL

Oldrieve, R.E. 1043
NASA Plum Brook Reactor Hot Laboratory Facility
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.44-55, 7 Fig., 1 Tab.)

This paper presents a description of the National Aeronautics and Space Administration's high level gamma hot laboratory building and of the hot cell equipment for examination and analysis of materials test specimens. The building houses 100,000 cubic feet of multikilocurie shielded volume including a 40x74 foot hot handling bay and seven hot cells. Emphasis has been placed on the following: (1) elimination of transfer casks for experiment test rigs, (2) interchangeability of equipment within the hot cells, (3) a "cold" operating area achieved by design and practice, (4) large hot storage areas capable of handling complete test rigs, and (5) electromechanical control of all equipment not readily operated by master-slave manipulators.

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

(5) RL

Shuck, A.B. 1044
The Plutonium Fuel Fabrication Facility at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.58-63, 4 Fig.)

A laboratory and pilot plant for the development of a variety of plutonium reactor fuel elements is described. This facility is housed in a building designed to control contamination hazards both within and outside the building. Processes and equipment are enclosed in gas-tight gloveboxes. Equipment is arranged departmentally, rather than in production lines, to achieve maximum process flexibility. Oxidation and fire hazards are controlled by use of a helium atmosphere. Normally, glovebox ventilation is by relatively low volume flow. A high volume purge exhaust system is connected to each enclosure by means of an automatically controlled valve.

2 3 4 Fig.: 2 4

(5) Forts. RL

Shuck, A.B. 1044 Forts.
The Plutonium Fuel Fabrication Facility at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.58-63, 4 Fig.)

The process enclosures, or gloveboxes, consist of modular frames fabricated from the aluminum alloy extrusions shown in Fig. 3. Plastic windows, aluminum alloy floors, ends, service panels and equipment are gasketed to these frames. Access to the enclosures for operation or maintenance is by means of arm length, synthetic rubber gloves which are sealed to molded phenolic gloveports gasketed into the windows.

2 3 4 Fig.: 2 4

(5) RL

Kuhl, O.A. 1066
A High Intensity Radiation Development Laboratory at Brookhaven National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.253-58, 3 Fig.)

This facility will house offices, laboratories, and a hot cell and canal complex. The cell complex, designed to remotely handle 1,000,000 curies of cobalt-60, comprises a Work Preparation Cell, an Experimental Irradiation Cell, and a connecting canal with two bays. The Work Preparation Cell with its associated special equipment will provide the means for decanning, sorting, encapsulating, testing, and assembling sources for use in the Experimental Irradiation Cell. The Experimental Irradiation Cell is basically designed to perform large-scale batch and continuous irradiations. A conveyor system will provide for moving material in and out of the cell and properly passing it through various irradiation systems.

2 4 Fig.: 2 4

(4) RL

Eldred, V.W., Saddington, K. 1068
The Post-Irradiation Examination Facilities at Windscale Works, U.K.A.E.A.
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.264-88, 14 Fig.)

The new facility (Figs. 12 and 13) consist essentially of 12 distinct parallel caves, most of them 34 1/2 feet long, 8 1/2 feet wide and 10 feet high internally, arranged in pairs back-to-back, connected at one end by a transport corridor 264 feet long, 8 feet wide and 14 1/2 feet high. The caves at each end are somewhat smaller than the others and used respectively for storage (Cave 1) and decontamination (Cave 12). The operating face of each cave is perpendicular to the transport corridor and is fitted with 5 zinc bromide windows. Although provision is made for Argonne master-slave manipulators over each window, these will not normally be necessary since the standard operations

2 4 Fig.: 2 4

(5) Forts. RL

Eldred, V.W., Saddington, K. 1068 Forts.
The Post-Irradiation Examination Facilities at Windscale Works, U.K.A.E.A.
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.264-88, 14 Fig.)

of each machine are selected as required on a control panel at the window concerned. A workshop has been provided for the repair and maintenance of machines after partial decontamination and removal from the caves.

2 4 Fig.: 2 4

(5) RL

Duvaux, Y., Mas, R., Junca, A., Dick, H. 1070
Laboratory for Plutonium Fuel Element Fabrication at Cadarache
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.307-14, 7 Fig.)

The building includes two working areas, East, with two parallel lines of 6 laboratories each; West, a large hall. A traffic corridor serves on the one hand the 12 laboratories, and on the other hand the hall, as well as workshops, stores, decontamination room, checked entrance and exit of material. The whole building is ventilated and air-conditioned. At the entrance and exit, the air passes through absolute filters. Four showers, accessible from the outside only, are provided for possible decontamination of the personnel who could have left the laboratory in case of accident without passing by the change-room showers again.

2 5 Fig.: 2 4

(7) Forts. RL

Duvaux, Y., Mas, R., Junca, A., Dick, H. 1070
Laboratory for Plutonium Fuel Element Fabrication at Cadarache Forts.
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.307-14, 7 Fig.)

All services can be cut from lockers outside the 2
laboratories, located in the material corridor. 5
In case of contaminating accident in one of the Fig.:
laboratories, it is possible to proceed to de- 2
contamination operations in frog-suits. A general 4
alarm network to inform the central control station of a very serious accident, such that the personnel must leave the laboratory. This signal can be transmitted by pressing one of the 35 buttons installed in different places in the laboratory.

(7) RL

Bazire, R., Duhamel, F. 1079
Progrès récents dans la conception et l'équipement des laboratoires de haute activité
(Health Physics in Nuclear Installations. La Physique de Santé dans les installations nucléaires. Symposium org. at the Danish Atomic Centre of Risø, 25-28 May 1959, S.201-17)
(CEA-1503 (1960) 17 S.)

Es wird über die Anlage, Einrichtung und Aus- CEA-1503
rüstung verschiedener Laboratorien für Arbeiten mit
radioaktiven Stoffen in Frankreich berichtet. Be- 2
schrieben werden: Das Laboratorium von hoher Akti- 3
vität in Saclay, das Laboratorium zur Untersuchung 4
von bestrahlten Brennelementen in Saclay, das Labora- 5
torium zur Herstellung von Radioisotopen, das heiße Laboratorium von Grenoble, die α-, β-, γ-Laboratorien von Fontenay-aux-Roses, ein bewegliches Laboratorium, α-Zellen von großem Ausmaß, Schutzvorrichtungen, Fernbedienungen und Transportmittel.

(8) NSA-1960-16753 RL

Fisher, C. 1083
Laboratoire spécialisé dans la production des radioéléments
(Bulletin d'informations scientifiques et techniques, No.51 (1961) S.17-21, 3 Fig.)

Les locaux, traversés par le couloir actif central, 2
sont composés de quatre éléments. Chaque élément a 3
une longueur de 25 m et comporte six laboratoires Fig.:
de 4,50 m x 7 m répartis de part et d'autre du 2
couloir actif. Leur faisant face ont été disposées des pièces de 3 m x 3 m environ qui pourront servir de bureaux ou de salles de mesures physiques. Les couloirs actifs de chaque élément débouchent sur le couloir actif central auquel on ne peut accéder qu'en traversant un vestiaire et une salle de décontamination. L'accès à ce couloir, libre normalement, peut être interdit ou limité en cas de contamination accidentelle. Seule la zone du couloir actif est ventilée et maintenue en dépression par rapport au reste du bâtiment. Le taux de renouvellement de l'air dans les couloirs actifs est fixé à 20 fois par heure. (4) RL

Ficke, K.H. 1085
Grundsätzliche Fragen bei der Einrichtung von Isotopenlaboratorien
(Wissenschaftl. Referate u. Berichte der 2. Tagg. der ... der Strahlenschutzärzte ... 1956 (1957) S.84-92, 5 Fig.)
(Schriftenreihe des Bundesministers f. Atomfragen. I. Strahlenschutz. H.1, S.84-92, 5 Fig.)

Es wird über die Einrichtung in Isotopenlaboratorien 2
für medizinische Zwecke berichtet. Drei verschiedene Fig.:
Arbeitsareale mit unterschiedlichen Gefahrenstufen 2
sind streng voneinander abzugrenzen: 1) Tresor- oder Aufbewahrungsräume, 2) sog. "aktives" Laboratorium, 3) Meßraum. Es ist zweckmäßig, daß Fußboden, Wände und Tischplatten eine glatte Oberfläche besitzen, die leicht zu säubern ist. Bei Verwendung von offenen Isotopen sowie bei der biologischen und chemischen Aufarbeitung von aktiven Proben ist ein Abzug zu benutzen, der möglichst eine Filtereinlage im Abzugskanal besitzen soll, um das Entweichen radioaktiver

(3) NSA-1960-1960 Forts. RL

Ficke, K.H. 1085
Grundsätzliche Fragen bei der Einrichtung von Isotopenlaboratorien Forts.
(Wissenschaftl. Referate u. Berichte der 2. Tagg. der ... der Strahlenschutzärzte ... 1956 (1957) S.84-92, 5 Fig.)
(Schriftenreihe des Bundesministers f. Atomfragen. I. Strahlenschutz. H.1, S.84-92, 5 Fig.)

Aerosole zu verhindern. Auf Einzelheiten über die 2
Einrichtung von Arbeitsplätzen wird nicht einge- Fig.:
gangen. Die Anlage der geplanten Isotopenabtei- 2
lung im Neubau des Städt. Krankenhauses Moabit (Berlin) wird diskutiert. Der Grundriß ist abgebildet.

(3) NSA-1960-1960 RL

Rachinskii, V.V., Platonov, F.P. 1086
The Radioisotope Laboratory of the Timiryazev Academy
(Izvestiya Timiryazevskoi sel'skokhozyaistvennoi akademii, 1959, 6, S.239-250)
Engl.Übers.: (LLU Translations Beulletin, 2 (1960) S.545-67, 12 Fig.)

There are three radiochemical rooms. All preparatory 2
and analytical work with radioactive materials is 4
carried out in these rooms. They are fitted with 5
special laboratory benches with hot and cold water, Fig.:
gas, compressed air and a vacuum line laid on. Each 2
work place at the radiochemical bench is equipped 4
with a set of appliances and protective fixtures for 5
work with radioactive substances. The radiochemical rooms are fitted with fume cupboards of special design. The front sash-windows of these cupboards contain devices for the fixing of long-sleeved gloves.

(6) Forts. RL

Rachinskii, V.V., Platonov, F.P. 1086
The Radioisotope Laboratory of the Timiryazev Academy Forts.
(Izvestiya Timiryazevskoi sel'skokhozyaistvennoi akademii, 1959, 6, S.239-250)
Engl.Übers.: (LLU Translations Bulletin, 2 (1960) S.545-67, 12 Fig.)

This makes work in the fume cupboards possible with 2
the windows shut. Various plexiglass devices are 4
widely used in work with radioactive substances: 5
protective plexiglass stands for filtering, boxes Fig.:
for pipettes, for compounds and plants, and for 2
flasks. 4

(6) 5

RL

Leščinskij, N.I. 1091
Fundamentals of the Organization of Laboratories for Work Involving the Use of Radioactive Isotopes
(AEC-tr-4139: Radioactive Methods of Control and Regulation of Industrial Processes (1959) S.24-34, 4 Fig.)
Übers.aus: (Radioaktionye metody kontrolya i regulirovaniya proisvodstvennykh protsessov. Riga 1959)

In planning laboratories and organizing work in- AEC-tr-4139
volving use of radioactive substances it is ne-
cessary, first of all, to ascertain the category, 2
class, and grade to which the laboratory belongs, 3
since they determine the planning of the labora- Fig.:
tory and the organization of work conducted in it. 2
The laboratory must be equipped with simple manipulators required for remote handling, with clamps, tongs, protective gloves, etc. Calibration of instruments, apparatus, and units is allowed only in a separate, specially equipped room. At all laboratories which utilize radioactive isotopes monitoring is mandatory.

(5) NSA-1961-15926 Forts. RL

Leščinskij, N.I. 1091 Forts.
Fundamentals of the Organization of Laboratories for Work Involving the Use of Radioactive Isotopes
(AEC-tr-4139: Radioactive Methods of Control and Regulation of Industrial Processes (1959) S.24-34, 4 Fig.)
Übers.aus: (Radioaktionye metody kontrolya i reguliro-vaniya proisvodstvennykh protsessov. Riga 1959)

All the rooms of the laboratory must have blower- and exhaust ventilation capable of effecting at least a five-fold renewal of the air per hour, and providing an air flow velocity of not less than 0.7 m/second in open hoods. Ventilation ducts and hoods must have special filters for the removal of aerosols.

AEC-tr-4139
2
3
Fig.:
2

(5) NSA-1961-15926 RL

Coffinberry, A.S. 1101
Later Plutonium Metallurgical Research at Los Alamos
(Coffinberry, A.S., Miner, W.N. (ed.): The Metal Plutonium. Chicago: University of Chicago Pr. 1961. Chapter 5, S.36-62, 15 Fig.)

The building consists primarily of five large "plutonium" wings interconnected by a narrow, windowless "spinal corridor" perpendicular to these wings. Although the entire CMR building is air-conditioned, only the five plutonium wings contain the elaborate and extensive ventilating equipment required to deal adequately with the health hazard of plutonium. Liquid wastes from the laboratories are drained into one of two large retention tanks located near the exhaust end of the basement area. The rate of air flow through each of the five plutonium wings is approximately 80,000 cubic feet per minute.

2
3
Fig.:
2
3
4

(4) RL

La fabrication du combustible de Rapsodie. Etat d'avancement des études et des équipements de fabrication. III, 3: Atelier de découpage des assemblages combustibles (A.D.A.C.) 1107
(Bulletin d'informations scientifiques et techniques, 1961, No.57, S.47-49, 3 Fig.)

Les opérations se font dans des cellules α β γ, c'est-à-dire entièrement étanches, et entourées de murs de béton de 1,20 m d'épaisseur (densité du béton: 3,3). Ces chiffres correspondent à une activité de l'ordre de 10^6 curie pour des gamma de 1 MeV. L'atelier comporte une petite zone froide, une salle pour une cellule-maquette, des salles de décontamination, de stockage de hottes et de châteaux de plomb, etc. (fig. 13). Il couvre une superficie au sol de 1200 m^2 environ. Le bâtiment comporte un sous-sol et un étage technique.

2
4
Fig.:
2
4

(4) RL

Tomlinson, R.E. 1109
Radiochemical Plant Containment at Hanford
(Nuclear Safety, 3 (1961) S.51-56, 2 Tab.)

This article discusses plant containment as it is currently applied to the radiochemical plants at Hanford. All cells have removable stepped concrete cover blocks, and processing equipment is remotely installed or removed through these top openings. Remotely operated cranes traverse the canyon high above the deck formed by the cover blocks. These cranes are equipped with hooks, pipe grabbers, and impact wrenches to perform the necessary manipulations. Periscopes and closed-circuit television provide the necessary visual contact. All manipulations are controlled from shielded cabs on the cranes. Typical pressures and rates of air change maintained in the operating buildings are listed in Tables IV-1 and IV-2, respectively.

2
3
4
Tab.:
3

(5) RL

Eldred, V.W., Saddington, K. 1114
The Post-Irradiation Examination Facilities at the Windscale Works of the U.K. Atomic Energy Authority
(DPR-Inf-265 (1962) III, 23 S., 10 Fig.)

The paper describes the facilities and the techniques developed over a number of years at Windscale. These consist primarily of a pilot-scale fuel examination and breakdown cave capable of handling 1000 elements per year, together with the associated metallographic lines for the examination of the fuel and can specimens cut from the fuel elements. The experience gained in the operation of these facilities is described in relation to its influence on the design philosophy underlying the construction of the full-scale cave and line facilities now in operation for the examination of up to 3000 standard and experimental fuel elements per year arising from the United Kingdom Civil Power Programme.

DPR-Inf-265
2
4
Fig.:
2
4

(6) RL

Appleton, G.I., Dunster, H.I. 1116
Recommended Practice in the Safe Handling of Plutonium in Laboratories and Plants
(AHSB(RP)R.6 (1961) 44 S., 2 Fig., 1 Tab.)

This report provides a brief introduction to the physical, chemical and toxic properties of plutonium, reviews the precautions to be taken in the design and operation of laboratories, plants and stores, and makes recommendations for safe practice. Criticality problems are discussed only in outline. Where available, fire resistant materials should be used for glove box construction. Transparent material must be incorporated to enable ample direct vision and this material, too, should be fire resistant and shatterproof. Special laundry arrangements should be provided for those establishments in which contact clothing may be contaminated with plutonium to levels in excess of the maximum permissible.

AHSB(RP)R.6
2
4
5

(7) Forts. RL

Appleton, G.I., Dunster, H.I. 1116 Forts.
Recommended Practice in the Safe Handling of Plutonium in Laboratories and Plants
(AHSB(RP)R.6 (1961) 44 S., 2 Fig., 1 Tab.)

Provision should be made in each changeroom for collecting contaminated clothing in suitable containers. Each glove box should be provided with a supply of suitable dry powder in a metal container and a means of transferring the powder in the event of a fire. In the event of a plutonium fire in the box, the scoop should be used to cover the burning material with the dry powder extinguisher - this application should be liberal.

AHSB(RP)R.6
2
4
5

(7) RL

Govaerts, J. 1127
Aménagement d'un laboratoire de radiochimie
(Govaerts, J.: Introduction à la chimie nucléaire. Paris: Dunod 1961. S.323-28, 3 Fig.)

Les schémas représentés montrent l'aménagement d'un laboratoire de radiochimie. L'idéal est de prévoir les laboratoires isolés et spécialement construits à cet effet. La solution idéale est de prévoir des cloisons amovibles qui peuvent être brûlées en cas de contamination. Un laboratoire chaud doit comprendre des chapelles bien ventilées pour empêcher les vapeurs radioactives de se répandre dans le laboratoire. Les manipulateurs spéciaux permettront le travail à distance. Les tables des laboratoires de chimie doivent être recouvertes d'acier inoxydable ou bien il faut placer tout équipement dans des cuvettes en acier inoxydable. Des planchers en bois non recouvert ou en béton sont à proscrire. Le recouvrement de linoléum ou de caoutchouc est pratique, car ceux-ci sont facilement remplaçables si la contamination est importante.

2
Fig.:
2
4

(3) RL

Snyder, W.A. 1131
Safety Review of Hanford Laboratories Pilot Plant
(HW-69587(Rev.) (1961) 15 S.)

Es wird über Schutz- und Sicherheitsvorkehrungen beim Arbeiten mit Plutonium und Spaltprodukten in verschiedenen Laboratorien in Hanford sowie über administrative Anordnungen bei der Ausführung von Versuchen berichtet. Die wesentlichen Merkmale bezüglich Anlage und Funktion der Laboratorien werden diskutiert.

HW-69587(Rev.)
2
5

(5) NSA-1962-3261 RL

Billiau, R., Blumenthal, B., Draulans, J., Vanden Bemden, E. 1133
The Design and Operation of the Plutonium Ceramics Laboratories at Mol
(BLG-64 = BN-6107-03 = R. 2013 (o.J. um 1962) II, 26 S., 9 Fig., 1 Tab.)

Das Laboratorium wurde für die Untersuchung von alpha-aktiven keramischen Materialien ausgerüstet. In den Arbeitskasten werden Uran- und Plutoniumoxyd-Preßkörper hergestellt und untersucht. Es wird über die grundsätzlichen Überlegungen bei der Laboratoriumseinrichtung berichtet. Die allgemeine Anlage und Beluftung des Laboratoriums, die leckdichten Arbeitskästen und ihr Druckregelsystem für wiederholte und einmalige Luftdurchfuhrung, die Filter, Handschuhbefestigungen usw. werden beschrieben. Sicherheitsregeln und Vorschriften für erste Hilfe bei Unfällen werden mitgeteilt.

BLG-64
BN-6107-03
R. 2013
2
3
4
5
Fig.:
2
4
Tab.:
4

(12) NSA-1962-11811 RL

Schwennesen, J.L. 1135
Operating Experience at Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S. 993-1021, 23 Fig.)

In a remote maintenance processing plant all process equipment, including reaction vessels, centrifuges, pumps, agitators, evaporators, etc., is assembled, connected and disconnected by manipulation from a traveling overhead crane. The Plants considered in this report are the Hot Semiworks located at the Hanford Atomic Products Operation near Richland, Washington; the Idaho Chemical Processing Plant (ICPP) located at the National Reactor Testing Station near Idaho Falls, Idaho; and the Metal Recovery Plant and the Thorex Pilot Plant both located at the Oak Ridge National Laboratory.

TID-7534
2
4
5
Fig.:
4
5

(6) Forts. RL

Schwennesen, J.L. 1135 Forts.
Operating Experience at Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S. 993-1021, 23 Fig.)

All of these plants employ Redox, Purex, or Thorex process solvent extraction technology or minor variation therefrom. All of the Plants discussed in this paper have various special design features to facilitate decontamination of equipment which were provided initially or as a result of experience in production activities.

TID-7534
2
4
5
Fig.:
4
5

(6) RL

Sadowski, G.S., Hungerford, T.W., Blanco, R.E., Culler, F.L. 1136
Radiation Exposure and Safety Experience in Radiochemical Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.1022-36, 11 Fig.)

To protect operating personnel from penetrating beta and gamma rays emitted by decaying fission products, the processing equipment in irradiated-fuel separations plants is installed behind heavy concrete shields or for small equipment, behind lead. Equipment is operated remotely using indicating and recording instruments to follow the operations. Sampling is one of the most serious personnel exposure operations in a radiochemical plant. Samples of the radioactive solutions are taken by means of automatic sampling devices which are heavily shielded, and the samples transported in heavily shielded containers to high level analytical cells. (8) RL

TID-7534
2
4

Heydorn, K., Singer, K.A., Wangel, J. 1141
Radioisotope Laboratory Design
(Risö-Report No.26 (1961) 25 S., 9 Fig., 4 Tab.) RISÖ-26

Radioisotope laboratories are often designed by architects and engineers without any idea of radioisotopes, in conjunction with scientists without any idea of laboratory design. The report describes the basic requirements arising from the presence of radioactive material, as well as the limitations imposed by practical and economical possibilities (planning of the laboratory, lay-out, construction of the building, laboratory furniture, sanitary installation, ventilation, air filters, fume hood, glove box, working clothes, cleaning).

2
3
4
5
Fig.:
2
3
4
5
Tab.:
5

(9) RL

Quarterly Progress Report January - February - March 1961 1143
(KR-7 (1961) 41 S., 35 Fig.)

After a longer planning period, the actual construction of the Metallurgical laboratory II started in March. The 3 hot-cells using heavy concrete as shielding, form the nucleus of the structure with the operating area, maintenance area, change rooms and control room, grouped around. Space is also reserved for offices, workshop, store rooms etc. in the building. The total floor area is 1991 m^2.

KR-7
2

(4) RL

Cook, R.M., Fisher, R.W. 1144
A System for Administering Air-Borne Contaminants by Inhalation
(IS-371 (1961) III, 110 S., 27 Fig., 9 Tab.)

An entire facility for subjecting animals to aerosols has been designed. This facility or system consisted of one large purchased inhalation unit and five smaller inhalation units. The large inhalation unit was capable of handling animal cages containing twenty rabbits and forty mice. The five smaller inhalation units were each capable of handling a twenty-five kilogram dog. These five smaller units were designed and constructed to the dictates of the veterinary personnel who would ultimately supervise the operation of the facility.

IS-371
2
Fig.:
2

(5) NSA-1962-11382 RL

Artaud, J. 1146
Le laboratoire central d'analyse et de contrôle
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.7-10, 3 Fig.)

Ce laboratoire (fig.1) est installé à Grenoble, dans un bâtiment spécialement conçu comme laboratoire d'analyses, c'est-à-dire avec des cellules relativement petites; d'une superficie totale bâtie de 2250 m^2, il comprend: - une zone froide (940 m^2 utiles) - une zone chaude (200 m^2 utiles) - les parties générales ou annexes (1110 m^2). 2 Fig.: 2

(3) RL

Fontaine, M. 1149
Le laboratoire de fabrication de l'usine d'extraction du plutonium
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.14-17, 5 Fig.)

Le bâtiment - 92 m de long, 16 m de large, 12 m de haut, en trois étages - abrite 1000 m^2 de cellules chaudes; la ventilation occupe plus de 2000 m^2, les couloirs, bureaux, vestiaires, salles de mesures physiques, ateliers, se partagent le reste. Près de 100 000 m^3 d'air sont véhiculés pour assurer 15 renouvellements horaires dans les cellules étanches et maintenir avec l'extérieur les gradients nécessaires de dépression. 4 cellules sont réservées aux agents du contrôle continu; 5 cellules aux analyses de bilan, contrôle de pureté, dont 2 en α, ß, γ, 3 en α pur; 2 cellules à l'analyse radiochimique (spectrométrie α, γ, analyse isotopique); 1 cellule inactive aux matières premières et préparations de tous les réactifs et solutions titrées, utilisés par le personnel des laboratoires. (4) RL 2 4 Fig.: 4

Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

An efficient, flexible, and relatively simple system of enclosures for the handling of multicurie amounts of alpha, gamma, and neutron-emitting isotopes has been developed by the Health Chemistry Department at Lawrence Radiation Laboratory, Berkeley. It has been in operation since April of 1961. This system consists basically of interlocking 4-ft water tanks that form the shielding around the leaktight primary enclosure in which operations are conducted by means of totally socked master-slave manipulators. This facility has been successfully used for procedures ranging from multicurie chemical separation to highly refined microtechniques. UCRL-9657 2 3 4 6 Fig.: 2 4

(9) NSA-1962-4407 Forts. RL

Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory Forts.
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

It has served equally well for metallurgical examinations and remote machining and welding procedures. The cost of this totally equipped facility was approximately $60,000. Viewing and ventilation systems are described. UCRL-9657 2 3 4 6

(9) NSA-1962-4407 Fig.: 2 4

RL

Blin 1167
Le laboratoire de contrôle du centre de production du Bouchet
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.11-13, 2 Fig.)

Le laboratoire ayant pour fonction essentielle de vérifier la marche de l'usine est amené à contrôler: - la qualité des produits entrant à l'usine comme matières premières, - les teneurs en uranium, thorium, impuretés des corps obtenus à chaque stade de la fabrication, depuis la mise en solution jusqu'à l'élaboration du métal. Le laboratoire comprend: 1° un laboratoire de chimie, chargé du contrôle courant et 2° un laboratoire physico-chimique (spectrographie et analyses spéciales). 2 4 Fig.: 4

(4) RL

Corpel, J., Vie, R. 1170
L'Analyse au département du plutonium:
I. Laboratoire α-γ de l'Atelier-Pilote de Marcoule
II. Laboratoire α-γ (C.E.N.-F.A.R.-Radiochimie)
III. Laboratoire de spectrographie d'émission de plutonium (C.E.N.-F.A.R.)
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.44-49, 5 Fig.)

Tous ces laboratoires sont construits selon la technique des laboratoires chauds. Ils sont équipés de boîtes à gants pour le travail sur le plutonium ou de chaînes αγ pour le travail sur les combustibles irradiés. Ces chaînes αγ sont constituées par des cellules étanches entourées de protection de fonte ou de plomb à travers lesquelles passent les appareils de manipulation. Les cellules d'analyse sont en lucoflex et la cellule-sas en acier inoxydable; des panneaux en plexiglas permettent, sur l'avant, 2 4 Fig.: 4

(5) Forts. RL

Corpel, J., Vie, R. 1170 Forts.
L'Analyse au département du plutonium:
I. Laboratoire α-γ de l'Atelier-Pilote de Marcoule
II. Laboratoire α-γ (C.E.N.-F.A.R.-Radiochimie)
III. Laboratoire de spectrographie d'émission de plutonium (C.E.N.-F.A.R.)
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.44-49, 5 Fig.)

l'éclairage et la vision, sur l'arrière, cinq ronds de gant et un rond de diamètre 400 mm sont destinés aux interventions manuelles et aux mouvements de matériel. Les manipulateurs sont des Hobson modèle 7. La vision est assurée par des hublots de verre de densités 6,2 et 3,3. 2 4 Fig.: 4

(5) RL

Kanevskij, S.L. 1189
Typical Designs of Buildings for the Organization of Radiological Departments for Diverse Purposes
[Russ.]
(Medizinskaja radiologija, 5, No.8 (1960) S.46-52, 5 Fig., 2 Tab.)

The article depicts the characteristics of principal typical designs of radiological departments with presentation of designing solutions, equipment and technico-economical indices. 2 Fig.: 2

(3) NSA-1961-1196 RL

Granil'ščikov, V.P., Parchomenko, G.M. 1191
The Designing of Laboratories and Radiation Safety
[Russ.]
(Medizinskaja radiologija, 5, No.12 (1960) S.47-56, 5 Fig.)

The authors commit to paper data pertinent to the importance of designing of laboratories for work with radioactive substances in the problem of securing radiation safety for research workers. Examples are given of zonal designing in accordance with the sanitary requirements.

2 4 Fig.: 2 4

(5) NSA-1961-13203 RL

Hazen, W.C. 1201
Remote Control Equipment for Plutonium Metal Production
(LA-1387(Del.)(1951) 224 S., 114 Fig., 2 Tab.)

This report describes the design and construction of remote control equipment for plutonium metal production installed at the Los Alamos Scientific Laboratory. The floor plan of the installation is shown.

LA-1387 (Del.) 2 4 Fig.: 2 4

(5) RL

Irvine, A.R., Lotts, A.L. 1204
Criteria for the Design of the Thorium Fuel Cycle Development Facility
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

Criteria for the conceptual design of the proposed Thorium Fuel Cycle Development Facility have been established and are presented. In addition, conceptual layouts of the building and equipment are included. The hot-cell structure consists of the Clean Fabrication Cell, the Contaminated Fabrication Cell, the Mechanical Processing Cell, the Chemical Cell, the Decontamination Cell, and the Hot-Equipment Storage Cell. The Glove Maintenance Room and the Airlock are appended to this structure. Each viewing window will consist of a steel liner embedded in the concrete structure of the cell with installed glass shielding of approximately 12 in. total thickness on the radioactive side and zinc bromide solution for the remaining wall thickness. Forts.

ORNL-TM-149 2 3 4 5 Fig.: 2 4 Tab.: 4

(8) NSA-1962-10103 RL

Irvine, A.R., Lotts, A.L. 1204 Forts.
Criteria for the Design of the Thorium Fuel Cycle Development Facility
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

One pair of CRL Model A master-slave manipulators or one pair of CRL Model D heavy-duty master-slave manipulators respectively will be provided for each viewing window of the various cells. Two 30-ton-capacity overhead traveling cranes are to cover almost the entire third-floor area. All interior spaces in the building will be served by fire protection facilities. The cells will have fire protection system of "metalex" cylinders placed at various locations in the cells.

ORNL-TM-149 2 3 4 5 Fig.: 2 4 Tab.: 4

(8) NSA-1962-10103 RL

Sakagishi, S. 1221
Précautions à prendre par les ingénieurs chimistes contre les dangers d'irradiation
(Japan Analyst, 9, 10 (1960) S.910-15)
(CEA-TR-X-499 (1961) S.27-53, 4 Tab.)

Les laboratoires de la classe C sont des lieux au seuil de radioactivité le plus bas. L'installation d'un tel laboratoire peut se faire comme pour celle d'un laboratoire moderne de chimie. Les laboratoires de la classe B sont des laboratoires où le seuil radioactif est la moyenne. On doit appliquer de la peinture lavable, dure et sans pores sur le plancher, le plafond et les murs pour faciliter le lavage du laboratoire de cette catégorie. En prévision de l'installation d'un écran contre les rayonnements gamma, il faut que le plancher ait une résistance de 800-1000 kg/m^2. Les blouses du personnel doivent être fabriquées en dérivés vinyliques, de sorte que la décontamination puisse se faire aisément. On prévoit également l'utilisation de gants protecteurs ainsi que de couvre-chaussures. Les laboratoires de la classe A sont dits "hot cells".

CEA-TR-X-499 2 5

(5) RL

Clayton, E.D. 1245
Minutes of Critical Mass Laboratory Program Meeting, Richland, Washington, Oct. 25-26, 1960
(HW-67240 (1960) 38 S.)

The facility has essentially three architectural units: the reactor-assembly room, the service building closely attached to the reactor room, and the control and office building. The first two are of concrete and steel construction and the latter of concrete block. Two reactor hoods are semi-permanently mounted in one half of the reactor room. The hoods are identical, each 8 feet square and 15 feet high. The frame of the hood including the floor, is made of welded stainless steel. The first of three rooms in the service building, adjacent to the reactor room, is the mixing room.

HW-67240 2 3

(5) NSA-1962-5855 Forts. RL

Clayton, E.D. 1245 Forts.
Minutes of Critical Mass Laboratory Program Meeting, Richland, Washington, Oct. 25-26, 1960
(HW-67240 (1960) 38 S.)

The most prominent fixture in the mixing room is the mixing hood which provides containment for operations involving the plutonium. The last room of the service building contains most of the auxiliary service and utility equipment for the facility.

HW-67240 2 3

(5) NSA-1962-5855 RL

A Description of SGR Test Installations Available at Atomics International 1248
(NAA-SR-MEMO-4411(Rev.)(1960) VIII, 43 S., 38 Fig.)

The radioactive-waste disposal facility is a centralized facility erected to handle radioactive wastes. Its two basic structures are the decontamination building and the vault building. Adjacent to the vault building is the decontamination building containing the packaging, change and decontamination rooms. The decontamination room is used to remove radioactive contamination from equipment and contains steam, sand, and acid equipment for this purpose.

NAA-SR-MEMO-4411 (Rev.) 2 5

(5) NSA-1961-4082 RL

Constant, R., Mekers, J. 1249
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Ce rapport a pour objet d'établir les règles de sécurité adoptées dans le service, dans le but de protéger le personnel contre le double danger de contamination et l'irradiation. Les laboratoires occupés par la section des radioisotopes sont situés dans deux bâtiments principaux. Cet ensemble peut être divisé en trois parties bien distinctes: zone froide, zone tiède, zone chaude. Deux sorties de secours sont prevues. L'installation du conditionnement d'air de l'aile droite du BRI est localisée dans la partie supérieure de l'aile isotopes. Un tableau reprenant la disposition des extincteurs dans l'aile est affiché à l'entrée des laboratoires.

BLG-68 2 3 4 5 Fig.: 2 3 4 Tab.: 3 4

(8) Forts. RL

Constant, R., Mekers, J. 1249 Forts.
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Les enceintes de travail employées dans la section pour la manipulation des produits radioactifs sont de trois types principaux: 1) Enceinte de manipulation pour émetteurs β^-; 2) Boîte gantée pour émetteurs β^- et β^--γ à faible activité; 3) Cellule de manipulation pour émetteurs β^--γ à forte activité.

BLG-68 2 3 4 5 Fig.: 2 3 4 Tab.: 3 4

(8) RL

The Analytical Laboratory 1254
(Eurochemic, News Bulletin, No.8 (Nov.1962) S.4-9, 3 Fig.)

The Laboratory Design distinguishes five main sections: 1) a transfer and storage laboratory, 2) a high-activity laboratory with shielded glove-boxes, 3) a high-activity laboratory with unshielded glove-boxes, 4) a low-activity laboratory, 5) an alpha laboratory. A design feature of laboratories 1, 2 and 3 will be the in-line installation of the 26 glove-boxes. An electrically-operated conveyor system running the length of the row will be used to transport samples from the transfer and storage laboratory to the shielded and unshielded boxes on its left and right respectively. The two high-activity laboratories will be separated from the low-activity and alpha laboratories by a corridor which will provide access to all these laboratories.

2 4 Fig.: 2

(4) RL

Olsen, A.R., McDonald, R.E. 1260
Postirradiation Examination Laboratory
(ORNL-2988: Metallurgy Division Annual Progress Report for Period Ending July 1, 1960 (1960) S.436-42, 3 Fig.)

The new hot-cell facility will be a two-story brick building, 122 x 105 ft, with a partial basement. The operation cell bench, which is U-shaped, is divided into three separate sections for ventilation control and further divided into 12 operational areas and one charging area to provide an internal working area of 920 ft². The second floor above the cell bench has provisions for the shielded storage of contaminated equipment, remote decontamination, and glove box maintenance. The cells will be completely sealed and in general will not be re-enterable once the facility is in full operation.

ORNL-2988 2

(5) NSA-1961-294 Forts. RL

Olsen, A.R., McDonald, R.E. 1260 Forts.
Postirradiation Examination Laboratory
(ORNL-2988: Metallurgy Division Annual Progress Report for Period Ending July 1, 1960 (1960) S.436-42, 3 Fig.)

Concurrent with the design of this facility there has been considerable effort expended in designing and developing remote experimental equipment for use in these new hot cells.

ORNL-2988 2

(5) NSA-1961-294 RL

Watcher, J. 1262
Final Safety Analysis Report of American Processing to be Performed by the Martin Company
(MND-P-2347 (1960) XIII, 63 S., 16 Fig., 4 Tab.)

The processing building is a rectangular, one story, windowless structure approximately 52 feet long and 27 feet, 4 inches wide with a ceiling height of 12 feet. A mechanical equipment room will be located in the northeast portion of the building with single entry from the exterior of the building. The processing area will contain the necessary equipment for direct performance of the processing and fabrication operations. These will include dry boxes, press, furnace, welding and decontamination equipment, and laboratory and mechanical work benches.

MND-P-2347 2 3 4 Fig.: 3 4 5

(6) Forts. RL

Watcher, J. 1262 Forts.
Final Safety Analysis Report of American Processing to be Performed by the Martin Company
(MND-P-2347 (1960) XIII, 63 S., 16 Fig., 4 Tab.)

The total processing system is enclosed in a series of six interconnected dry boxes. The boxes will be relatively airtight to ensure safe handling operations, with the exception of air intake and exhaust ducts. All dry boxes will be interconnected by stainless steel transfer chambers to be utilized for the transfer of equipment into and out of the dry box system.

MND-P-2347 2 3 4 Fig.: 3 4 5

(6) RL

Radioactive Materials Laboratory Safety Report, Martin Nuclear Facility, Quehanna Site 1263
(MND-2410 (1960) getr. Zählg., zahlr. Fig. u. Tab.)

The facility consists of five cells. Each of these cells is provided with manipulator ports for the use of Argonne Model 8 Manipulators. The shielding walls of the cells are constructed of ferrophosphorous concrete with a minimum weight of 280 pounds per cubic foot. The radiation shielding windows are of 3,6 density glass and were received as packaged, oil-filled units ready for insertion into previously installed steel frames. Access to the cells is through doors at the rear which open into the isolation rooms. The decontamination room is used mainly for decontaminating portable equipment and materials. The room contains two fume hoods. A radiochemistry laboratory, equipped to handle curie-level quantities of isotopes, opens off the service area. Details are discussed. Fire equipment is installed in and about the building. Automatic fire detectors and sprinkler systems are installed.

MND-2410 2 3 4 5 Fig.: 2 4

(7) NSA-1961-15895 RL

Hammil, K.H., Brown, J.E. 1267
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

The new laboratory is a $960,000 annex to a HW-SA-1748
large radiochemistry building. Three adjoin-
ing cells, through which materials can be trans- 2
ferred internally, are the heart of the installa- 3
tion. The largest of the three cells has a depth of 4
7 feet, a height of 15 feet, and a width of 15 feet. 5
Stainless steel was used to line the cell's walls Fig.:
and floors. Incased in the walls are 4 foot thick 2
viewing windows. These viewing windows, composed of 4
layers of oil between multiple plates of lead-glass,
provide the same shielding as the concrete walls.
Inserted into the cells above each window are a
pair of masterslave manipulators.

(8) NSA-1961-2647 Forts. RL

Hammil, K.H., Brown, J.E. 1267 Forts.
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

Illumination of 300 foot candles permits HW-SA-1748
adequate viewing through the dense viewing
windows. A decontamination room and a "set-up" 2
area are also located in the new facility's contam- 3
ination-control area. A highly efficient ventila- 4
tion system with built-in safety factors was in- 5
stalled in the facility. Fig.:
2
(8) NSA-1961-2647 4

RL

Babushkin, A.V., Voznesenskaya, I.V., Zhirov, N.G., 1273
Zatulovskii, V.I., Khmel'nitskii, Yu.-L.
The Cobalt Emitter Laboratory
(Trudy Vsesoyuznogo Nauchno-Tekhnicheskoi Konfe-
rentsii po Primeneniya Radioaktivnykh i Stabil'nykh
Izotopov ..., Moskov, Aprel 4-12, 1957 (1958).) AEC-tr-
Engl.Übers.:(AEC-tr-4544: Selected Articles from the 4544
Proceedings of the All-Union Scientific Conf. on the
Application of Radioactive and Stable Isotopes ...,
Moscow, April 4-12, 1957 (1958) S.25-28, 2 Fig.)

The laboratory occupies a separate one story build- 2
ing (with a general construction area of 170 m^2), Fig.:
which contains two booths for emitters with an 2
activity up to 800 gram-equivalents of radium and
another booth for an emitter with an activity of
10,000 to 16,000 gram-equivalents of radium. In
addition, the building contains an area for the
controls of the emitters and the equipment which
regulates temperature and pressure in the reaction
equipment, as well an area for the receipt of
sources and auxiliary rooms.
(8) RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., 1274
Culler, F.L.
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.3-10, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.296-7, 1 Fig.)

The TRU Facility will consist of nine heavily 2
shielded cells served by master-slave manipulators, 3
and eight laboratories, four on each of two floors. 4
The laboratory side of the building is separated 6
from the cell area by the cell operating gallery, Fig.:
which is regarded as a buffer zone of low con- 2
tamination potential. The nine shielded process cells 4
are arranged in line. Removable top plugs provide
access to the cells. The top and back of the cell
line is served by a bridge crane in a limited access
area of the building not normally occupied by oper-
ating personnel. (9) Forts. RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., 1274 Forts.
Culler, F.L.
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.3-10, 5 Fig. 1 Tab.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.296-7, 1 Fig.)

The front face of the cell is provided with windows, 2
master-slave manipulators, and plugged ports for 3
possible future installation of periscopes. The 4
building is scheduled for full-scale operation 6
by December 1965, at an estimated cost of $8,7 Fig.:
million. 2
(9) 4

RL

Wherritt, C.R., Franke, P., Field, R.E., Lyle, A.R. 1281
New Hot Laboratory Facilities at Los Alamos
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.55-62, 6 Fig.)
(Transactions of the American Nuclear Society, 5,
No.2 (1962) S.302-3, 3 Fig.)

The planned addition to the MAD Building at NRDS provides
four additional hot cells - two side by side in 2
two rows separated back to back by a service corri- 4.
dor and facing an operating gallery. Each cell has Fig.:
two oil-filled, lead glass windows, and provision 2
for one pair of Argonne Model 8 manipulators, and 4
one General Mills Model 100-150 bridge mounted,
manipulator unit. The High Level Chemistry Addition
is now under construction at Los Alamos to provide
additional capability for radiochemical analysis of
Rover fuel elements. There are twelve drybox cells
in two rows of six, separated by a cell corridor
and facing an operating gallery. (7) Forts. RL

Wherritt, C.R., Franke, P., Field, R.E., Lyle, A.R. 1281 Forts.
New Hot Laboratory Facilities at Los Alamos
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.55-62, 6 Fig.)
(Transactions of the American Nuclear Society, 5,
No.2 (1962) S.302-3, 3 Fig.)

The dispensary cell has a pair of AMF, heavy duty, 2
extended reach manipulators mounted over a lead 4
glass window. A bridge mounted device has been Fig.:
designed which is capable of moving along the 2
clean-up cell under remote control, repairing, 4
replacing or adjusting components by using a pair
of General Mills Model 150 manipulators, and a 1-ton
hoist.

(7) RL

Silverman, J., Agnihotri, C.B. 1282
University of Maryland Gamma Laboratory
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.63-68, 7 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.303-04)

A gamma irradiation facility has been constructed 2
at the University of Maryland. It consists of an 4
underground irradiation chamber, 15' x 4' x 7', con- 6
nected to the surface by a Z-shaped labyrinth and Fig.:
a stairway. Targets are placed in the chamber and 4
irradiated by 5,000 curie Co^{60} source that is
lowered from a lead shield located in the ceiling.
The concrete substructure is covered by a pre-
fabricated steel panel structure that houses
control and drive mechanisms, and laboratory
facilities. The entire cost of the installation
is $30,000.

(6) RL

Watson, C.D., West, G.A., Schaffer, W.F. 1348
Performance of Mechanical Equipment for Dejacketing Spent SRE Core 1 Fuel
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.219-32, 14 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S. 317-19, 1 Fig.)

The facility, formerly of solid wall construction, was converted to a direct viewing facility by core drilling cubes of concrete of about 5 tons each from the walls to permit installation of windows. The cell area, 25 by 10 by 15 ft high, is formed by 5-ft-thick concrete walls lined with stainless steel, with three zinc bromide-filled viewing windows, 5 ft thick, at appropriate intervals.

2/4 Fig.: 2 4

(6) Forts. RL

Watson, C.D., West, G.A., Schaffer, W.F. 1348 Forts.
Performance of Mechanical Equipment for Dejacketing Spent SRE Core 1 Fuel
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.219-32, 14 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.317-19, 1 Fig.)

To thwart leakage of radioactive gases and particulate matter from the processing cells into the building proper, (a) the cell was provided with a fail safe ventilation system, (8) (b) all manipulators were encased in leaktight plastic booting both inside and outside the operating face of the cell, and (c) the charging face of the cell and the top of the cell were enclosed by separate entry rooms.

2/4 Fig.: 2 4

(6) RL

Arakawa, T. 1353
Design of a Medium Level Radioisotope Tracer Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.610-18, 3 Fig., 2 Tab.)

AEC-tr-4482

The following is a summary description of the radioisotope laboratory in our research set-up. The structure was one-storied and made with reinforced concrete. Its dimensions were 77.76 m^2 in area, 3.5 m in height, and 2.5 m in height to the ceiling. The assignment of the rooms is given. The amount of ventilation is 2.706 m^3 per hour. The ventilation of the rooms and the inside of hoods was done by the single ventilator. The hoods are made of wood, lined with polished steel sheets. The insides of the hoods are painted with strippable paint and the outside of the hoods is painted with "kashu".

2/3 Fig.: 2 4 Tab.: 5

(5) Forts. RL

Arakawa, T. 1353 Forts.
Design of a Medium Level Radioisotope Tracer Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.610-18, 3 Fig., 2 Tab.)

AEC-tr-4482

Experimental benches in Fig.1, T_1 and T_3 are made of polished artificial stones, and T_2 is made of mortar which was polished and painted with strippable paint. A few movable tables made of steel and coated with melamine are provided for experiments at desired locations.

2/3 Fig.: 2 4 Tab.: 5

(5) RL

Hamada, T., Okano, M. 1354
Construction of Radioisotope Handling Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.619-27, 6 Fig.)

AEC-tr-4482

The laboratory is one-storied and consists of a control room, a dressing room, a shower room, a radioisotope handling room, a contaminated material disposal room, a storage area, a radioactive material storage area, a contaminated material storage area, a machine room, a power room, toilets and corridors. The air exhaust is located in the lower part of a wall in each unit, and the air exhaust ducts lead vertically to the ceiling where they converge in one place, and are finally connected to the ventilator on the roof. The discharge through the special drainage system provided to each unit is connected in the storage tank located in this room, and merge into the general drainage system through a "biruji" pump.

2/3 5 Fig.: 2 5

(7) Forts. RL

Hamada, T., Okano, M. 1354 Forts.
Construction of Radioisotope Handling Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.619-27, 6 Fig.)

AEC-tr-4482

The floor was covered with asphalt mortar. The walls and ceilings are covered with vinyl type paints. All the fixtures on the wall, ceiling, and floor are in most cases waterproofed. Sinks are lined with stainless steel or vinyl plates, as mentioned before, and the boundaries between the sinks and the walls are covered with polyethylene.

2/3 5 Fig.: 2 5

(7) RL

Sonoda, S., Shigeki, T., Matsumoto, A. 1355
Radioisotope Laboratory Facilities at Showa Electric Manufacturing Company
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.628-44, 10 Fig., 1 Tab.)

AEC-tr-4482

The building is a single-storey, made of reinforced concrete, and includes a tracer laboratory of 320 m^2, a γ-ray irradiation laboratory of 37 m^2, a green-house, and a cage room of 90 m^2. The ground plan of the tracer laboratory is shown in Fig.3. The part of the laboratory to the left of the center door is designated as the semi-control area. The check-point is set up at the entrance of the locker room, where monitors for hand and clothing are used for the final check at the time of employees' departure from the laboratory. Pocket dosimeters and film badges are handled and left for storage in this area. The inner area next to the center door is assigned for exchange of gowns and pants, and the first monitoring is done here. (7) Forts. RL

2/3 Fig.: 2 4 5 Tab.: 5

Sonoda, S., Shigeki, T., Matsumoto, A. 1355 Forts.
Radioisotope Laboratory Facilities at Showa Electric Manufacturing Company
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.628-44, 10 Fig., 1 Tab.)

AEC-tr-4482

Air-conditioning is provided. Air is exhausted only through the hoods. The windows and doors of each room are semi-pneumatic. The drainage consists of two separate systems. The drainage from the laboratories, dark room, and storage area, is collected and discharged into the liquid waste pool. The drainage from other rooms is discharged directly to the general sewage system.

2/3 Fig.: 2 4 5 Tab.: 5

(7) RL

Kitani, R., Terada, M. 1356
TOH-SHIBA Hot Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.654-65, 8 Fig.)

The ground plan of the hot laboratory is shown in Fig.1. The total ground area is about 46 tsubo, including the lot of raised ground. Two sides of the hot cell which face the operating room are provided with ordinary concrete shields of 1 m thickness. The dimensions of the hot cave are 2 m in width, 1,5 m in depth, and 4.5 m in height. A rectangular window with 100 x 50 cm dimension on the hot side and 43 x 25 dimension on the cold side is provided as well as a circular auxiliary window. The operation in the cell can be performed by direct observation through the rectangular window or by use of a periscope. The inside of the hot cell is lined with stainless steel plates for easy cleaning of the walls.

AEC-tr-4482
2
3
4
Fig.:
2
4

(7) Forts. RL

Kitani. R., Terada, M. 1356
TOH-SHIBA Hot Laboratory Forts.
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.654-65, 8 Fig.)

A Toh-Shiba Type UB manipulator, which is equivalent to Argonne type 8, is installed. In this instrument the motions of the master and the slave have a relationship of one-to-one correspondence, and each arm can raise a load weighing up to 5 kg. A 1/2-ton hoist of the hanging type, provided on the ceiling, plays the role of the third hand in the cell. The inside illumination of the hot cell is provided by three sets of sodium lamps. Air in the hot cell is exchanged 20 times per hour.

AEC-tr-4482
2
3
4
Fig.:
2
4

(7) RL

Ananthakrishnan, S. (comp.) 1361
Remote Handling Facilities at Chalk River
(AECL-1658 (1962) 29 S., 19 Fig., 1 Tab.)

The hot-cell installations for examining irradiated fuel materials are described. A pair of master-slave manipulators, mounted 10 feet from the floor at 28 in. centers are provided at each operating station, i.e. over each window position. The operating area for each cell block contains a fume hood and inactive work bench. Details of shielding windows used in the facilities are given in Table 1. The windows are constructed of plate glass and are either dry mounted, or oil-filled in the interspace between plates. The active face of the window is made up of 3.3 density cerium-stabilised glass in the high activity cells. The cell ventilation philosophy is a once through system where inlet air is obtained by leakage from the operating area through manipulator ports, cracks around doors, shielding plugs, etc. Both up-draft and down-craft systems are being employed. (6)

AECL-1658
2
3
4
Fig.:
2
4
Tab.:
3

RL

Clayton, E.D., Reardon, W.A. 1365
Plutonium Critical Mass Facilities and Experiments
(HW-71666: Clayton, E.D., Reardon, W.A.: Nuclear Safety and Criticality of Plutonium (1961) S.63-70, 4 Fig.)

The room, within which the critical assemblies are located, has internal dimensions of 35 x 35 feet and a ceiling height sloping from 20 to 21 feet. It is made entirely of ordinary concrete containing reinforcing steel bars. The walls on three sides facing the rest of the facility are 5-feet thick. The fourth wall is 3-feet thick, and the floor and ceiling are each 2-feet thick. Two hoods are semipermanently mounted in one half of the critical assembly room. Each provides containment for a critical assembly, two of which may thus be set up at one time. The hoods are identical, each being 8 feet square and 15 feet high. The most prominent fixture in the mixing room is the mixing hood which provides containment for operations involving the plutonium. (6) RL

HW-71666
2
3
Fig.:
2

3 Eingebaute Vorrichtungen

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

Manipulatoren und Krane siehe 4

Reardon, W.A., Clayton, E.D., Brown, C.L., Masterson, R.H., Powell, T.I., Richey, C.R., Smith, R.B., Healy, I.W. 951
Hazards Summary Report for the Hanford Plutonium Critical Mass Laboratory
(HW-66266 (1960) 124 S., 16 Fig., 13 Tab.)

The facility has essentially three architectural units: 1) The reactor-assembly room, 2) the service building closely attached to the reactor room, and 3) the control and office building. All the interior surfaces of the concrete, including the floor, are coated with a fiber glass reinforced resin surface (Amercoat No. 74). The first of three rooms in the service building, adjacent to the reactor room, is the mixing room. The most prominent fixture in the room is the mixing hood which provides containment for operations involving the plutonium. (13)

HW-66266
2
3
4
Fig.:
2
4
RL
Forts.

Berkeley Nuclear Laboratories 959
(Nuclear Engineering, 6, No.62 (1961) S.281-82, 4 Fig.)

In plan form the Berkeley Laboratories resemble the letter "E". Radioactive materials are handled in the shielded area and the laboratory wing on the north side. The total floor area of the laboratories is about 100,000 sq. ft. There are a number of special features about the shielded area and the laboratory wing. Normally, access to them is through the change rooms in which members of the staff change into protective clothing and ultimately ensure that they are free from contamination before leaving. All protective clothing is washed in the laundry which is adjacent to the change rooms. An air-conditioning system supplies warm fresh air to the buildings and extracts it through filters which remove any possible radioactivity before discharge into the atmosphere through a 75-ft chimney. (5)

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3
4
Fig.:
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RL

Reardon, W.A., Clayton, E.D., Brown, C.L., Masterson, R.H., Powell, T.I., Richey, C.R., Smith, R.B., Healy, I.W. 951 Forts.
Hazards Summary Report for the Hanford Plutonium Critical Mass Laboratory
(HW-66266 (1960) 124 S., 16 Fig., 13 Tab.)

The mixing room is served by the main exhaust system. Air from the mixing hood and the fume hood is drawn out after first passing through a common filter box containing a fire resistant absolute filter of the same type used in the reactor room.
('3)

HW-66266
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Fig.:
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RL

Gaschermann, A. 960
Bauliche Planung und Aufbau von Isotopen-Laboratorien
(Kerntechnik, 3 (1961) S.204-08, 1 Fig.)

Es wird über die bauliche Planung, die Installation, den Innenausbau, die Beheizung und Beleuchtung, über Strahlenschutzbeton, Einrichtung, Be- und Entlüftung von Isotopenlaboratorien berichtet.
(6)

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Fig.:
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RL

Trouve, S., Rapin, M., Mestre, E. 954
Un laboratoire chaud mobile
(CEA-1379 (1960) 21 S., 15 Fig.)

La cellule est constituée de plusieurs éléments metalliques qui sont faits de plaques d'acier de 2 mm raidies par des profilés en U. Ces éléments, dont le nombre varie en fonction des dimensions que l'on veut donner à la cellule, sont reliés entre eux à l'aide de serre-joints. L'étanchéité est assurée par des joints plats en caoutchouc. Chaque cellule dispose d'une unité standard de ventilation. La cellule est en dépression par rapport à l'atmosphère. L'air, préalablement chauffé et filtré, y entre donc sans le secours d'un ventilateur de soufflage. Les filtres sont du type à tiroir, et peuvent être changés de facon étanche à l'aide de sacs en chlorure de polyvinyle.
(8)

CEA-1379
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4
6
Fig.:
3
4
Forts.
RL

Woodall, A.J., Wilson, C.G., Jones, A.L., Thomas, D.K. 967
Design and Management of a Nuclear Science Laboratory
(Nature, 182 (1958) S.367-69, 1 Fig.)

A substantial central wall divides the building longitudinally into physics and chemistry sections. The rooms are separately ventilated into the roof void above the light-alloy false ceiling, which is stiffened by overhead girders and rests on the partition walls. All exposed wall surfaces are smooth and coated with hard glossy paint, light in colour, so that splashes are easily visible. The concrete floor is completely covered with waxed polished linoleum and the joints sealed. The laboratory furniture is normal, but bench tops are protected by stout water-proof waxed paper which can easily be removed after contamination. (8) NSA-1958-13782

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Fig.:
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RL

Trouve, S., Rapin, M., Mestre, E. 954 Forts.
Un laboratoire chaud mobile
(CEA-1379 (1960) 21 S., 15 Fig.)

Le coût de la fabrication d'une cellule, unité de ventilation comprise, s'élève à environ 40.000 NF ($8.000). La surface utile est comprise entre 20 et 30 m^2.
(8)

CEA-1379
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6
Fig.:
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RL

Harbert, G.M. 968
Heating and Ventilating at Harwell
(Nuclear Power, 1 (1956) S.75-8, 2 Fig.)

Verschiedene Verfahren zur Beheizung der Harwellschen Laboratorien werden erörtert. Die allgemeine Entwicklungsrichtung der mechanischen Ventilationseinrichtungen in radioaktiven Laboratorien wird besprochen; außerdem werden Merkmale einiger ungewöhnlicher Systeme erläutert, u.a. Verwendung von Glasleitungen sowie von hintereinandergeschalteten Axial-Ventilatoren, wodurch ein hoher Druckwert erreicht wird; die Nutzungsdauer der hochwertigen Filter, deren Aktivität das Wegschaffungsproblem mit sich bringt, wird infolgedessen verlängert.
(3) NSA-1956-10055

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Fig.:
3
RL

Harwell's New High-Activity Handling Building "459" 969
(Nuclear Engineering, 3 (1958) S.121-22, 5 Fig.)

The building is roughly "T"-shaped, the crossbar of the T containing what might be termed the "service" departments, such as changing rooms, stores, offices, messroom and workshop, while the leg of the T forms the actual "operations" portion of the building. The five high-activity cells are planned on an 8-ft module. The line of cells is equipped with a 1 1/2-ton remote-controlled overhead travelling crane, a 5-ton self-propelled bogie and a power-operated manipulator. Each cell has a zinc bromide window, 5 ft x 3 ft and 5 ft 6 in. thick, backed up by high-density glass. Each cell is equipped with a pair of master-slave manipulators. Frogmen wearing thick rubber suits and helmets are supervised from a control room that has a window giving a view of the entire maintenance area.

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Fig.:
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(6) NSA-1958-6497 RL

Core Test Facility 971
(LAMS-2875: Quarterly Status Report on LAMPRE Program for Period Ending Febr. 20, 1963 (1963) S.8-13)

Specifications for the 10 hot-cell windows have been completed and mailed to possible bidders. Specifications for bridge-mounted hoists, and Model A manipulators are being written.

LAMS-2875
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(5) RL

MackIntosh, A.D. 976
The Radiochemical Laboratory - An Architectural Approach to its Design
(Nucleonics, 5, No.5 (1949) S.48-61, 7 Fig.)
(AECU-210 (1949))

How various levels of radioactivity affect planning of labs and offices serves to introduce a proposal for a modular system that offers flexibility in layout. Shielding, waste-disposal facilities, hoods, finishes, heating, and ventilation are touched upon.

AECU-210
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Fig.:
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(7) RL

Weinberg, D.J. 981
Design of Nuclear Laboratories
(Nuclear Engineering and Science Conference at Chicago, Ill., March 17-21, 1958, Preprint 148, Sess. 19, 22 S.)

Nuclear laboratories require special care in their design to insure adequate personnel protection and efficient use. The facility must be easily decontaminated in case of a spill, special precautions must be taken to prevent spread of contamination, and there must be adequate biological radiation shielding to protect personnel. Building plans, special anti-contamination measures, floor covering, walls, floors, air flow and air conditioning systems are discussed.

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(5) NSA-1958-13023 RL

Cheever, C.L. 992
ANL Air Cleaning Resume
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.100-02)

High efficiency filters, in conjunction with prefilters, carry the major portion of the exhaust air cleaning load at the Laboratory. Generally, there are about six individually mounted filters per exhaust plenum. Most have fiberglass media and aluminum separators, although filters with asbestos media and some with asbestos separators are used for special requirements. Filters with paper separators have not been entirely replaced, but they are fading fast as all replacements are with the non-combustible separators. Recently, some filters with honeycomb construction have been purchased.

TID-7593
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(4) NSA-1961-6258 RL

Croley, J.J. 993
A Summary of Air Cleaning Activities at the Savannah River Plant
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.114-17)

In summary, current air cleaning practices at SRP utilize a variety of techniques directed at securing a maximum decontamination factor for radioactive gases and particulate matter. The most commonly used device is the high-efficiency package filter. All "critical" locations where a potential fire hazard exists employ fireproof type filters. Other filter installations utilize the fire-retardant, high-efficiency type filter as an economic factor, until the current inventory of these filters is exhausted.

TID-7593
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(4) NSA-1961-6261 RL

Hall, F.J., Smith, S.E. 994
Air Cleaning Practice at U.K.A.E.A., Aldermaston
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.127-30)

Room ventilation requirements range from 5-20 air changes per hour for active and toxic laboratories, to 10 air changes per hour for semi-active areas such as change-rooms and stores. Air is usually supplied to these areas via a filtered plenum system which promotes cleanliness within the building and relieves the dust load on the extract filters. High efficiency filters are installed on this H.P.E. extract, and also on the inert gas exit lines to confine contamination to the glove box installation.

TID-7593
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Forts.

(5) NSA-1961-6264 RL

Hall, F.J., Smith, S.E. 994
Air Cleaning Practice at U.K.A.E.A., Aldermaston Forts.
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.127-30)

All main filters and fans are housed in a separate ventilated filter room within the building served, which, where high activity is involved, is a "purple" area, i.e., in which any operation such as filter changing must be carried out in "frog" suits with air line supply.

TID-7593
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(5) NSA-1961-6264 RL

995

Porembski, T.T.
Air Cleaning at the Knolls Atomic Power Laboratory
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.140-50, 4 Fig.)

This report deals with the description of the newly designed activated carbon and stack system which will handle the radioactive iodine vapor and will be operated in conjunction with the existing systems in the Radioactive Materials Laboratory. Air is supplied to the building with two central plant air units on a once-thru basis. Both units are equipped with 2" thick fibre glass filters and together the units have a capacity of approximately 12000 cfm. Air is discharged from duct openings high up under the roof in order to avoid air turbulence at the occupancy levels. Air is exhausted from the work areas with several individual exhaust systems each of which is equipped with a fibre glass prefilter followed by a CWS filter. (5) NSA-1961-6267 RL

TID-7593
2
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Fig.:
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996

Fuller, A.B.
Additional Off-Gas Facility
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.151-6, 2 Fig.)

The information contained in this article relays some considerations in the engineering design of additional radioactive off-gas cleaning and handling facilities at Oak Ridge National Laboratory. Present off-gas equipment provides a gas handling capacity of 2000 cfm with cleaning provided by a Cottrell electric precipitator followed by absolute filters with the effluent being released from a 250-foot brick stack along with other gaseous wastes.

(4) NSA-1961-6266

TID-7593
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Fig.:
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997

Thaxter, M.D.
Condition of Commercial High-Efficiency Filters Upon Receipt or Installation
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.157-60, 4 Fig.)

AEC-type high-efficiency filters have recently been received with media breaks. A survey under AEC auspices at other sites shows that our experience is not unique. Several features make it difficult to evaluate filters visually: (a) less than 10% of the media of these filters is visible; (b) some of the high-efficiency filters now being offered are assembled in such manner that visual examination is impossible; (c) even if all the media could be inspected by eye, the efficiency specification of 99.96% is far more rigorous than can be perceived by eye. (4) NSA-1961-6269 RL

TID-7593
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Fig.:
3

998

Richardson, W.J., Palmer, J.H.
The Installation, Handling and Storage of High Efficiency Filters
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.182-98, 18 Fig.)

The filter unit should be carefully removed from the carton, being careful not to drop the filter. If it is necessary to lay the filter with the back or face down when removed from the carton, care should be taken to be sure that bolts, nuts, stones, or uneven floor surfaces will not damage the media or separators. Remember - the filter is extremely susceptible to damage. Inspect the filter for cracks in the media and separators, and for separation from the frame. The filters should be stored where they will not be exposed to dampness, excessive heat or cold, or rapidly changing temperatures. (5) NSA-1961-6271 RL

TID-7593
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Fig.:
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Jordan, H.S., Welty, C.G.
A Venturi Scrubber Installation for the Removal of Fission Products from Air
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.219-27, 5 Fig., 3 Tab.)
(American Industrial Hygiene Association Journal, 20 (Aug. 1959) S.332-6)

A local exhaust collection system and a venturi scrubber installation for the cleaning of exhaust air contaminated with acid mists and mixed fission products are described in detail. The features of the collection system that are designed to offset the hazard of perchloric acid condensing in the collection system are stressed, and the feasibility of a venturi scrubber with a caustic solution for the removal of iodine vapors as a scrubbing medium is demonstrated. The efficiency of the scrubbing unit for removing acid mist, total fission products, and iodine vapor tested 90% or better.

(5) NSA-1959-19085 RL

TID-7593
3
Fig.:
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1000

Piccot, A.R.
Ventilation Systems at Atomics International
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.228-35)

A brief summary of ventilation systems employed on reactors, hot cells and critical facilities designed and/or operated by Atomics International is presented. Similarly, of the two hot cells described, one operates with a comparatively large volume air flow, the other with a very low ventilation rate. Of the two remaining facilities considered, the Organic Moderated Reactor Critical Facility employs a somewhat unique dual ventilation system to avoid filter plugging by non-radioactive organic condensate.

(5) NSA-1961-6273 RL

TID-7593
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1001

Young, J.A.
High-Efficiency, High-Velocity Electrostatic Precipitators
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.238-43, 7 Fig.)

Laboratory studies of electrostatic precipitation were initiated at NRL in 1949. The objective of this work was to determine if the aerosol removal efficiencies of standard, commercial, ventilation-type precipitators could be improved. It was hoped that efficiency-wise, they could be made competitive with paper filters while still retaining their great advantage of low air resistance.

(4) NSA-1961-6275 RL

TID-7593
3
Fig.:
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1002

Silverman, L.
Control of Radioactive Air Pollution
(Blatz, H.(Ed.): Radiation Hygiene Handbook. - New York: McGraw-Hill (1959) S.22-1 - 22-45, 25 Fig., 9 Tab.)

Es werden die Schutzmaßnahmen zur Verhinderung der Luftkontamination durch radioaktive Substanzen ausführlich geschildert. Die Überschriften der wichtigsten Unterabschnitte lauten: Quellen der Luftkontamination, Kontrollmethoden. Abzüge für die Bearbeitung (Process Hood), besondere Laboratoriumsabzüge, Glove-Boxes, allgemeine Ventilation, allgemeine Richtlinie zur Reinigung radioaktiver Gase und Aerosole, Art der Ausrüstung zur Entfernung radioaktiver Teilchen (Trockenfilter, Naßfilter), Reinigung der Gase von Leistungsreaktoren.

(4) CEA-Bib.-6-188 RL

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Fig.:
3
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Tab.:
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Olsen, A.R. 1038
A New Postirradiation Examination Laboratory at the Oak Ridge National Laboratory
(Proceedings of the 91h Conf. on Hot Lab. and Equipment, Chicago 1961, S.3-14,7 Fig.)

The building arrangement, cell construction, and special features, designed to permit operations with complete containment and with essentially no personnel entry, are described. The remote installation and removal of equipment, storage of contaminated equipment, remote decontamination, and remote maintenance features of the facility are expected to provide safer operation, increased cell utilization, and decreased operating costs.

2 3/4 Fig.: 2 4

(5) RL

Berreth, J.R., Schuman, R.P. 1040
A Chemistry Hot Cell for Handling Alpha-Gamma Activities
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.22-26, 6 Fig.)

The cave, see Fig. 2, is located near the center of the 27'4" by 29'4" hot cell laboratory. It is designed to accommodate two isolation boxes and has inside dimensions of 5' deep, 8'8" long, and 6'8" high. Steel reinforced high density (> 3.5) magnetite concrete is used for shielding. All interior surfaces of the cave are painted with two coats of white Phenoline 305, and will be further protected by an additional strippable coating. Illumination of the cave is with fluorescent lights placed above the viewing windows. The cave itself is maintained at a negative pressure with respect to the room and vented through the absolute filters of the building hood system.

2 3/4 Fig.: 2 4

(6) Forts. RL

Berreth, J.R., Schuman, R.P. 1040 Forts.
A Chemistry Hot Cell for Handling Alpha-Gamma Activities
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.22-26, 6 Fig.)

Central Research Laboratory Model 7 master-slave manipulators were chosen for the cave in order to simplify the problems of isolation box design and booting.

2 3/4 Fig.: 2 4

(6) RL

Vandenbulck, C.F. 1042
Radioactive Materials Laboratory Union Carbide Nuclear Company
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.35-43, 7 Fig.)

The hot laboratory is a concrete and steel structure, 139 feet long by 57 feet wide by 37 feet high, and it is adjacent to the reactor building (Fig. 2). The hot lab and reactor buildings are connected by two air lock personnel passages and a canal (12 feet water depth) which provides direct connection of the reactor pool and cell No. 1. Five individual hot cells, constructed with 4' thick walls of high density (magnetite) concrete, are located in the central portion of the building. Cell 1 is 16' long by 15' high, and contains equipment for remote cutting machining, welding, and similar operations. There are 2 Corning radiation shield windows in cell 1 and one in each small cell.

2 3/4 Fig.: 2 4

(5) Forts. RL

Vandenbulck, C.F. 1042 Forts
Radioactive Materials Laboratory Union Carbide Nuclear Company
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.35-43, 7 Fig.)

Provision was made for installation of a pair of master slave manipulators at each window position and at present there are available 4 pair of AMF Model 8 units and 1 pair of AMF Heavy Duty Model 8 units. The ventilation system is designed to provide a minimum of 20 volume changes per hour in the hot cells and a face velocity of 100 feet per minute at each of the three hoods in the Radiochemistry Laboratory.

2 3/4 Fig.: 2 4

(5) RL

Oldrieve, R.E. 1043
NASA Plum Brook Reactor Hot Laboratory Facility
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.44-55, 7 Fig., 1 Tab.)

This paper presents a description of the National Aeronautics and Space Administration's high level gamma hot laboratory building and of the hot cell equipment for examination and analysis of materials test specimens. The building houses 100,000 cubic feet of multikilocurie shielded volume including a 40x74 foot hot handling bay and seven hot cells. Emphasis has been placed on the following: (1) elimination of transfer casks for experiment test rigs, (2) interchangeability of equipment within the hot cells, (3) a "cold" operating area achieved by design and practice, (4) large hot storage areas capable of handling complete test rigs, and (5) electromechanical control of all equipment not readily operated by master-slave manipulators.

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

(5) RL

Shuck, A.B. 1044
The Plutonium Fuel Fabrication Facility at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.58-63, 4 Fig.)

A laboratory and pilot plant for the development of a variety of plutonium reactor fuel elements is described. This facility is housed in a building designed to control contamination hazards both within and outside the building. Processes and equipment are enclosed in gas-tight gloveboxes. Equipment is arranged departmentally, rather than in production lines, to achieve maximum process flexibility. Oxidation and fire hazards are controlled by use of a helium atmosphere. Normally, glovebox ventilation is by relatively low volume flow. A high volume purge exhaust system is connected to each enclosure by means of an automatically controlled valve.

2 3/4 Fig.: 2 4

(5) Forts. RL

Shuck, A.B. 1044 Forts.
The Plutonium Fuel Fabrication Facility at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.58-63, 4 Fig.)

The process enclosures, or gloveboxes, consist of modular frames fabricated from the aluminum alloy extrusions shown in Fig. 3. Plastic windows, aluminum alloy floors, ends, service panels and equipment are gasketed to these frames. Access to the enclosures for operation or maintenance is by means of arm length, synthetic rubber gloves which are sealed to molded phenolic gloveports gasketed into the windows.

2 3/4 Fig.: 2 4

(5) RL

Mayfield, R.M., Tope, W.G. **1063**

Design and Operation of a 15,000 Cubic Foot Helium Recirculating and Purification System

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.233-38, 4 Fig.)

The ANL Plutonium Fuel Fabrication Facility Recirculating and Purification System is described. The helium atmosphere is continuously recirculated at low pressure by a seven-stage turboblower. Purification is accomplished by passing compressed gas through a Molecular Sieve-drying tower to remove moisture and an activated carbon tower to remove oxygen and other impurities. A parallel arrangement permits continuous operation and regeneration of either tower as required. 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 100 ppm water.

3 Fig.: 3

(4) RL

Hardtke, F.C. **1075**

Neutron Shielding Calculations for Current Window Designs

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.351-62, 4 Fig., 6 Tab.)

Several 49-inch thick window designs have been compared to heavy concrete in their neutron and gamma ray shielding effectiveness. Computations for two common designs, glass-$ZnBr_2$ and glass-oil, give biological dose rates for fission neutron sources within an order of magnitude higher than that of magnetite concrete. Slightly better neutron shielding is afforded by the glass-oil design, which also is better suited for the thermal neutron and gamma ray flux reduction resulting from the addition of boron to the window. Both designs maintain an adequately high average density for satisfactory gamma ray attenuation. One problem, not yet fully evaluated, is the neutron activation of bromine in the glass-$ZnBr_2$ design. (3) RL

3 Fig.: 3 Tab.: 3

Youngquist, C.H., Rentschler, L.M. 1076

Zinc Bromide Windows for Neutron and Gamma Ray Shielding

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.363-75, 7 Fig., 5 Tab.)

The new chemistry cave complex at Argonne National Laboratory will have a total of forty zinc bromide windows. The window tanks will be of cast malleable iron built into the cells as an integral part of the concrete walls. A fission source of 10^{12} neutrons per second and a 10^6 curie 1 Mev gamma source govern the shielding requirements. Zinc bromide windows meet these needs ans suffer least from radiation exposure effects. Where gamma activity is a maximum, composite windows are used with a slab of 3.3 density glass attenuating the gamma rays to the point where they are tolerable to the zinc bromide solution.

3 Fig.: 2 3 Tab.: 3

(4) RL

Mazza, J.S., McGary, T.E. 1077

A New Approach to the Problem of Cloudy Radiation Shielding Windows

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.376-82, 7 Fig.)

The radiation induced clouding of oil in shielding windows is caused mainly by oxidation of the oil as shown by the presence of peroxides and acids in irradiated oil samples. These oxidation products attack the metallic lead present in the window to form lead salts which later separate as a cloudy sludge. Tricresylphosphate plasticizer used in Koroseal 116 gasket leaches into the oil and intensifies this reaction. A gasket containing a different plasticizer has eliminated this intensified reaction. Elimination of air spaces within the shielding window and the use of degassed oil will aid in minimizing the oxidation and subsequent clouding of windows.

3

(4) RL

Ferguson, K.R., Czernik, D.E., Safranski, L.M. 1078

Gastight Seal and Installation Technique for a Kilocurie Gamma Shielding Window

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.383-87, 1 Fig., 2 Tab.)

A shielding window has been designed for use in a sealed kilocurie research cave containing a high-purity atmosphere. The window opening is sealed independently by both the window and the gas seal plate. The gas seals are formed by neoprene gaskets which retain sufficient resilience after a gamma exposure of 10^7 r. The space between the window and the gas seal plate is pressurized with the same type of gas as that within the cave. Hence, a little leakage does not effect the purity of the cave atmosphere. Repairs can be made on either the window or the gas seal plate without large effects on the cave atmosphere.

3 Fig.: 3

(5) Forts. RL

Ferguson, K.R., Czernik, D.E., Safranski, L.M. 1078 Forts.

Gastight Seal and Installation Technique for a Kilocurie Gamma Shielding Window

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.383-87, 1 Fig., 2 Tab.)

The window and its auxiliary parts are installed after heavy cave construction has been completed. Special low strength mortar is used for shielding between the window and liner to facilitate the removal of the window.

3 Fig.: 3

(5) RL

Bazire, R., Duhamel, F. 1079

Progrès récents dans la conception et l'équipement des laboratoires de haute activité

(Health Physics in Nuclear Installations. La Physique de Santé dans les installations nucléaires. Symposium org. at the Danish Atomic Centre of Risø, 25-28 May 1959, S.201-17)

(CEA-1503 (1960) 17 S.)

Es wird über die Anlage, Einrichtung und Ausrüstung verschiedener Laboratorien für Arbeiten mit radioaktiven Stoffen in Frankreich berichtet. Beschrieben werden: Das Laboratorium von hoher Aktivität in Saclay, das Laboratorium zur Untersuchung von bestrahlten Brennelementen in Saclay, das Laboratorium zur Herstellung von Radioisotopen, das heiße Laboratorium von Grenoble, die α-, β-, γ-Laboratorien von Fontenay-aux-Roses, ein bewegliches Laboratorium, α-Zellen von großem Ausmaß, Schutzvorrichtungen, Fernbedienungen und Transportmittel.

CEA-1503 2 3 4 5

(8) NSA-1960-16753 RL

Jahn, W. 1080

Radioaktive Strahlung und Glas

(Umschau, 58 (1958) S.522-24, 4 Fig.)

Unter der Einwirkung radioaktiver Strahlung, vor allem der durchdringenden γ-Strahlung, verfärben sich Gläser mehr oder weniger je nach ihrer chemischen Zusammensetzung und der Strahlendosis. Über die Entstehung und Verhütung dieser Verfärbung, über Strahlendosimetrie mit Gläsern, strahlenresistente Spezialglaser und Schutzfenster für die Atomtechnik berichtet der folgende Aufsatz. Schutzfenster für "heiße Zellen" mit größeren Aktivitäten bestehen aus mehreren Einzelscheiben, die 15 bis 25 cm dick sind. Sehr große Aktivitäten (10 000 Curie und mehr) erfordern Schutzfenster, die nicht selten eine Dicke von einem Meter überschreiten. Nach Möglichkeit (bei Betonwänden) wird die Glasart auf das Wandmaterial abgestimmt, so daß Wandung und Beobachtungsfenster von gleicher Dicke sind. (3)

3 Fig.: 3

RL

Lochanin, G.N., Siničyn, V.I. 1081
New Leak-Tight Glove Boxes for Handling Alpha- and Beta-Emitting Materials
(Atomnaja Energija, 9 (1960) S.344-47, 5 Fig.)
Engl.Ubers.in: (Soviet Journal of Atomic Energy, 9 (1961) S.883-887, 5 Fig.)

The dimensions of this glove box model are: height 2320 mm, length with one transfer chamber 1270 mm, width 875 mm. All leads coupled into the glove box enclosure are sealed (with acid-resistant soft rubber packing) and held fast with adhesive. The frameless body of the glove box is welded with stainless steel up to 3 mm thick; the glove-box tables are also welded stainless, to 10 mm thickness. The outer surface of the box is given a prime coating after cleaning from grime and scale, and is then finished with a cream-colored acid-proof enamel. The inner surface of the box frame has a smooth streamlined surface.

3
4
Fig.:
4

(5) Forts. RL

Lochanin, G.N., Siničyn, V.I. 1081 Forts.
New Leak-Tight Glove Boxes for Handling Alpha- and Beta-Emitting Materials
(Atomnaja Energija, 9 (1960) S.344-47, 5 Fig.)
Engl.Ubers.in: (Soviet Journal of Atomic Energy, 9 (1961) S.883-887, 5 Fig.)

The leak-tight volume of the box comprises 0.4 m^3. The support base for the 1KNZh box is welded carbon steel. A rectangular viewing window is built into the front of the glove box to facilitate observation of the work. A special ventilation arrangement is provided in all rooms where radioactive materials are handled in the open, to protect the air environment of occupied rooms and the atmosphere from contamination by radioactive aerosols.

3
4
Fig.:
4

(5) RL

Mestre, E. 1082
Le contrôle de la contamination atmosphérique dans les laboratoires ou ateliers
(Bulletin d'informations scientifiques et techniques, No.43 (1960) S.32-43, 15 Fig.)

Afin de connaître la concentration d'aérosols radioactifs ou toxiques dans l'air, les agents chargés du contrôle des radiations disposent d'un certain nombre d'appareils. L'appareil de prélèvement du type "8 heures" est placé dans tous les laboratoires et ateliers où le travail est susceptible de produire une contamination atmosphérique par libération dans l'air d'aérosols. L'agent chargé du contrôle des radiations dans les laboratoires ou ateliers relève tous les soirs les filtres. L'appareil de prélèvement instantané est utilisé auprès des installations en fonctionnement ou encore d'une opération présentant un caractère exceptionnel. Forts.

3
5
Fig.:
3
5

(4) NSA-1961-9250 RL

Mestre, E. 1082 1.Forts.
Le contrôle de la contamination atmosphérique dans les laboratoires ou ateliers
(Bulletin d'informations scientifiques et techniques, No.43 (1960) S.32-43, 15 Fig.)

L'embout porte-filtre est placé aussi près que possible de la tête de l'opérateur. Le volume d'air que l'on fait passer à travers le filtre de papier est d'environ 1 m^3. Il existe deux types d'appareils de prélèvement de poussières atmosphériques basés sur le principe de l'impacteur: - l'impacteur annulaire, - l'impacteur en cascade. L'appareil "Impacteur annulaire" est utilisé au même titre qu'un prélèvement instantané. L'impacteur en cascade, comme l'impacteur annulaire, utilise le principe de la force centrifuge pour collecter des poussières sur des surfaces planes. 2. Forts.

3
5
Fig.:
3
5

(4) NSA-1961-9250 RL

Mestre, E. 1082 2.Forts.
Le contrôle de la contamination atmosphérique dans les laboratoires ou ateliers
(Bulletin d'informations scientifiques et techniques, No.43 (1960) S.32-43, 15 Fig.)

Le contrôle de la pollution de l'atmosphère est effectué soit par piégeage du gaz, c'est le cas par exemple pour ^{131}I, soit par comptage de la radioactivité de l'air par circulation à travers une chambre d'ionisation, c'est le cas de ^{3}H.

3
5
Fig.:
3
5

(4) NSA-1961-9250 RL

Fisher, C. 1083
Laboratoire spécialisé dans la production des radioéléments
(Bulletin d'informations scientifiques et techniques, No.51 (1961) S.17-21, 3 Fig.)

Les locaux, traversés par le couloir actif central, sont composés de quatre éléments. Chaque élément a une longueur de 25 m et comporte six laboratoires de 4,50 m x 7 m répartis de part et d'autre du couloir actif. Leur faisant face ont été disposées des pièces de 3 m x 3 m environ qui pourront servir de bureaux ou de salles de mesures physiques. Les couloirs actifs de chaque élément débouchent sur le couloir actif central auquel on ne peut accéder qu'en traversant un vestiaire et une salle de décontamination. L'accès à ce couloir, libre normalement, peut être interdit ou limité en cas de contamination accidentelle. Seule la zone du couloir actif est ventilée et maintenue en dépression par rapport au reste du bâtiment. Le taux de renouvellement de l'air dans les couloirs actifs est fixé à 20 fois par heure. (4) RL

2
3
Fig.:
2

Taketani, K. 1090
The Design of Special Hoods for Machining Natural Uranium Metal. Studies on Uranium Fuel Element.Pt.4
(AEC-tr-4464 (1961) 14 S., 6 Fig., 1 Tab.)
Ubers.aus: (Nihon-Genshiryoku-Gakkai Shi, 1(1959) S.370-5)

This paper reports the consideration, which the author gave in designing the hoods for machines, and the experiences he gained in the course of using these hoods. The materials for the hood are 2 mm thick 18-8 stainless steel and 3 mm thick acrilite plate. Dimensions of the hood is 600 x 1,200 x 600 mm for lathe, 650 x 650 x 650 mm for drilling machine, 1,100 x 2,880 x 1,100 mm for 10 HP grinding cutter, 1,000 x 1,100 x 700 mm for 5 HP grinding cutter, and 650 x 1,000 x 800 mm for hacksaw.

AEC-tr-4464
3
4
Fig.:
2
4
Tab.:
3

(5) Forts. RL

Taketani, K. 1090 Forts.
The Design of Special Hoods for Machining Natural Uranium Metal. Studies on Uranium Fuel Element.Pt.4
(AEC-tr-4464 (1961) 14 S., 6 Fig., 1 Tab.)
Ubers.aus: (Nihon-Genshiryoku-Gakkai Shi, 1(1959) S.370-5)

Plates 1 and 2 show the external views of the lathe hood and the drilling machine hood respectively. Stainless steel was used for the hood frame, the bottom part and the coolant pan. Acrilite resin was used for the front, rear, side and ceiling of the hood, the chip trap and the air adjusting port.

AEC-tr-4464
3
4
Fig.:
2
4
Tab.:
3

(5) RL

Leščinskij, N.I. 1091
Fundamentals of the Organization of Laboratories for Work Involving the Use of Radioactive Isotopes
(AEC-tr-4139: Radioactive Methods of Control and Regulation of Industrial Processes (1959) S.24-34,4 Fig.)
Übers.aus: (Radioaktionye metody kontrolya i regulirovaniya proisvodstvennykh protsessov. Riga 1959)

In planning laboratories and organizing work involving use of radioactive substances it is necessary, first of all, to ascertain the category, class, and grade to which the laboratory belongs, since they determine the planning of the laboratory and the organization of work conducted in it. The laboratory must be equipped with simple manipulators required for remote handling, with clamps, tongs, protective gloves, etc. Calibration of instruments, apparatus, and units is allowed only in a separate, specially equipped room. At all laboratories which utilize radioactive isotopes monitoring is mandatory.

AEC-tr-4139
2
3
Fig.:
2

(5) NSA-1961-15926 Forts. RL

Leščinskij, N.I. 1091 Forts.
Fundamentals of the Organization of Laboratories for Work Involving the Use of Radioactive Isotopes
(AEC-tr-4139: Radioactive Methods of Control and Regulation of Industrial Processes (1959) S.24-34, 4 Fig.)
Übers.aus: (Radioaktionye metody kontrolya i regulirovaniya proisvodstvennykh protsessov. Riga 1959)

All the rooms of the laboratory must have blower- and exhaust ventilation capable of effecting at least a five-fold renewal of the air per hour, and providing an air flow velocity of not less than 0.7 m/second in open hoods. Ventilation ducts and hoods must have special filters for the removal of aerosols.

AEC-tr-4139
2
3
Fig.:
2

(5) NSA-1961-15926 RL

Coffinberry, A.S. 1101
Later Plutonium Metallurgical Research at Los Alamos
(Coffinberry, A.S., Miner, W.N. (ed.): The Metal Plutonium. Chicago: University of Chicago Pr. 1961. Chapter 5, S.36-62, 15 Fig.)

The building consists primarily of five large "plutonium" wings interconnected by a narrow, windowless "spinal corridor" perpendicular to these wings. Although the entire CMR building is air-conditioned, only the five plutonium wings contain the elaborate and extensive ventilating equipment required to deal adequately with the health hazard of plutonium. Liquid wastes from the laboratories are drained into one of two large retention tanks located near the exhaust end of the basement area. The rate of air flow through each of the five plutonium wings is approximately 80,000 cubic feet per minute.

2
3
Fig.:
2
3
4

(4) RL

Low-Level Radioactivity Laboratory Established 1104
(National Bureau of Standards, Technical News Bulletin, 45 (1961) S.81-2, 2 Fig.)

The bureau has recently completed a new laboratory for the measurement of very low levels of radioactivity - down to 10^{-12} curie. An existing room in the Radioactivity Section has been extensively renovate and modified to furnish a low-level radiochemistry laboratory and a source preparation room. An airlock has been built at the entrance to this room, and air-filtration and air-conditioning arrangements are used to provide a clean, dust-free atmosphere. The counting room is adjacent to the source preparation room and is connected by a small wall air-lock through which samples may be passed.

3
Fig.:
3

(3) RL

Tomlinson, R.E. 1109
Radiochemical Plant Containment at Hanford
(Nuclear Safety, 3 (1961) S.51-56, 2 Tab.)

This article discusses plant containment as it is currently applied to the radiochemical plants at Hanford. All cells have removable stepped concrete cover blocks, and processing equipment is remotely installed or removed through these top openings. Remotely operated cranes traverse the canyon high above the deck formed by the cover blocks. These cranes are equipped with hooks, pipe grabbers, and impact wrenches to perform the necessary manipulations. Periscopes and closed-circuit television provide the necessary visual contact. All manipulations are controlled from shielded cabs on the cranes. Typical pressures and rates of air change maintained in the operating buildings are listed in Tables IV-1 and IV-2, respectively.

2
3
4
Tab.:
3

(5) RL

Brubaker, R., Hummel, H.H., MacArthy, A., Smaardyk, A., Kittel, J.H. 1115
Fast Fuel Test Reactor-FFTR
Conceptual Design Study
(ANL-6194 (1960) 101 S., 24 Fig., 23 Tab.)

One of the significant features of the FFTR is the fuel-transfer cell which is located directly above the reactor and contains shielded windows (see Fig. 11) through which the handling of the spent fuel can be visually followed. The viewing may be done with the aid of mirrors and/or binoculars. Commercially available manipulators are used within the shielded cell and these are operated from the outside of the cell. The inside surface of the shielded cell is covered with a welded and sealed steel surface which serves as a hermetically sealed membrane. Argon gas of high purity is circulated within the fuel-transfer cell and its pressure will be maintained slightly below atmospheric.

ANL-6194
3
4
Fig.:
4

(9) RL

Faugeras, P., Couture, J., Lefort, G. 1119
Etude concernant la réalisation d'un ensemble de cellules destinées à des traitements de combustibles irradiés à l'échelle semi-industrielle
(CEA-1980 (1961) 17 S., 14 Fig.)

La cellule est constituée par un caisson de tôle de 4 m x 3 m et de 5 m de hauteur. Les tôles de 2 mm d'épaisseur qui constituent l'étanchéité α sont soudées entre elles et maintenues extérieurement par des profilés, sans aucune liaison avec la protection γ. Dans notre cellule prototype nous avons expérimenté une fenêtre fournie par la Société Saint-Gobain, comportant 3 dalles de verre de 100 mm d'épaisseur, de densité 6,2, placées entre deux dalles de densité 3,3 de 250 mm d'épaisseur. Dans la cellule prototype, l'eclairage était situé dans le haut de la cellule.

CEA-1980
3
4
6
Fig.:
4

(8) Forts. RJ

Faugeras, P., Couture, J., Lefort, G. 1119 Forts.
Etude concernant la réalisation d'un ensemble de cellules destinées à des traitements de combustibles irradiés à l'échelle semi-industrielle
(CEA-1980 (1961) 17 S., 14 Fig.)

Le but des essais de ventilation était double: - Essai d'étanchéité des joints. Vérification des pertes de charge sur les filtres en papier amiante. Sur une dépense totale de 700 000 NF, dont 30 p. 100 pour les éléments de structure et 70 p. 100 pour les éléments fonctionnels, plus de 60 p. 100 de l'appareillage sera réutilisé après démontage (télémanipulator, hublots, vannes, etc...).

CEA-1980
3
4
6
Fig.:
4

(8) RL

Development of Viewing Systems 1120
(ANL-6433: Reactor Development Program Progress Report. Sept. 1961 (1961) S.44-45)

A shielding window has been designed for use in a sealed kilocurie research cave containing a high-purity atmosphere. The window opening is sealed independently by both the window and the gas seal plate. The gas seals are formed by neoprene gaskets which still retain sufficient resilience to be effective after a gamma exposure of 10^7 r. The space between the window and the gas seal plate is pressurized with the same type of gas as that within the cave.

ANL-6433
3

(4) RL

Culler, F.L., Frederick, E.J. 1124
Development Facilities and Aids for Radiochemical Reprocessing
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.807-30, 11 Fig., 3 Tab.)

The information is divided into three general categories for presentation, which are: 1) Cells suitable for high-level analytical and radiochemical work. 2) Selected analytical and process equipment for remote control operation. 3) High level development cell design. Construction cost analysis of the Hot Analytical Facility constructed 1955 and equipment cost for the Analytical Facility are presented.

TID-7534
3
4
6
Fig.:
2
4
Tab.:
6

(7) RL

Billiau, R., Blumenthal, B., Draulans, J., Vanden Bemden, E. 1133
The Design and Operation of the Plutonium Ceramics Laboratories at Mol
(BLG-64 = BN-6107-03 = R. 2013 (o.J. um 1962) II, 26 S., 9 Fig., 1 Tab.)

Das Laboratorium wurde für die Untersuchung von alpha-aktiven keramischen Materialien ausgerüstet. In den Arbeitskästen werden Uran- und Plutoniumoxyd-Preßkörper hergestellt und untersucht. Es wird über die grundsätzlichen Überlegungen bei der Laboratoriumseinrichtung berichtet. Die allgemeine Anlage und Belüftung des Laboratoriums, die leckdichten Arbeitskästen und ihr Druckregelsystem für wiederholte und einmalige Luftdurchführung, die Filter, Handschuhbefestigungen usw. werden beschrieben. Sicherheitsregeln und Vorschriften für erste Hilfe bei Unfällen werden mitgeteilt.

BLG-64
BN-6107-03
R. 2013
2
3
4
5
Fig.:
2
4
Tab.:
4

(12) NSA-1962-11811 RL

Kern, W. 1138
Ein Elektrofilter für die Abscheidung radioaktiver Aerosole. Bonn 1958. 101 S., 44 Fig.
Bonn, Math.-naturw. Diss. v. 27.6.1958

Es wird die Theorie eines Elektro-Plattensatzfilters für die Abscheidung radioaktiver Aerosole dargestellt und mit den anderen gebräuchlichen Filterverfahren verglichen. Bau und Betrieb eines solchen Filters werden beschrieben.

3
Fig.:
3

(3) RL

Perry, K.E.G. 1140
Air Sampling Units
(AERE-M-772 (1960) 4 S., 5 Fig.)

A new design of Air Sampling Unit has been developed for collecting the particulate contamination in air on a filter paper. Initially the requirement was for a unit to operate from 50 V A.C. but similar equipments have been designed to operate from 240 V A.C. and 12 V D.C. The A.C. operated designs are suitable for continuous operation. Also described is a new design of filter paper retainer that can be used with these units and also with existing units.

AERE-M-772
3
Fig.:
3

(4) NSA-1961-7501 RL

Heydorn, K., Singer, K.A., Wangel, J. 1141
Radioisotope Laboratory Design
(Risö-Report No.26 (1961) 25 S., 9 Fig., 4 Tab.) RISÖ-26

Radioisotope laboratories are often designed by architects and engineers without any idea of radioisotopes, in conjunction with scientists without any idea of laboratory design. The report describes the basic requirements arising from the presence of radioactive material, as well as the limitations imposed by practical and economical possibilities (planning of the laboratory, lay-out, construction of the building, laboratory furniture, sanitary installation, ventilation, air filters, fume hood, glove box, working clothes, cleaning).

2
3
4
5
Fig.:
2
3
4
5
Tab.:
5

(9) RL

Smith, S.E., White, P.A.S. 1154
Design of Radioactive Filtration Systems
(Nuclear Engineering, 7, No.73 (1962) S.239-44, 9 Fig.)

The removal of activity from air or coolant gases calls for specialized equipment. This article describes the different fibrous filters commercially available; outlines the information required when designing a filtration plant and reports on a typical installation.

3
Fig.:
3

(4) RL

Wood, A.J., Fudge, A.J. 1160
A Concrete Cell for the Analysis of Multi-Curie Active Materials
(AERE-R-3976 (1962) 9 S., 12 Fig.)

A concrete cell has been adapted for the purpose of the analysis of material with up to 1000 MeV curies of β, γ activity, with associated high levels of α activity. Details are given of the construction of the cell and of the installed equipment together with descriptions of the technique and apparatus used for the analysis of irradiated nuclear fuel specimens. The cell consists of an area 10' x 6' surrounded by 2' 6" thick high density concrete walls. Service plugs are situated at regular intervals along the operating face. A pair of Model 8 Master-Slave manipulators, manufactured by Savage and Parsons to the design of the Argonne National Laboratory, have been modified by the Remote Handling Group at Harwell to include PVC gaiters and a special α seal. (6) Forts.

AERE-R-3976
3
4
Fig.:
4

RL

Wood, A.J., Fudge, A.J. 1160
A Concrete Cell for the Analysis of Multi-Curie Active Materials Forts.
(AERE-R-3976 (1962) 9 S., 12 Fig.)

The cell air is changed five times per hour, air being filtered as it is drawn into the cell and being extracted into a bank of ten filter boxes packed with glass fibre paper before being discharged into the main building filtration system.

AERE-R-3976
3/4
Fig.: 4

(6) RL

Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

An efficient, flexible, and relatively simple system of enclosures for the handling of multicurie amounts of alpha, gamma, and neutron-emitting isotopes has been developed by the Health Chemistry Department at Lawrence Radiation Laboratory, Berkeley. It has been in operation since April of 1961. This system consists basically of interlocking 4-ft water tanks that form the shielding around the leaktight primary enclosure in which operations are conducted by means of totally socked master-slave manipulators. This facility has been successfully used for procedures ranging from multicurie chemical separation to highly refined microtechniques.

UCRL-9657
2
3/4
6
Fig.: 2
4

(9) NSA-1962-4407 Forts. RL

Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory Forts.
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

It has served equally well for metallurgical examinations and remote machining and welding procedures. The cost of this totally equipped facility was approximately $60,000. Viewing and ventilation systems are described.

UCRL-9657
2
3/4
6
Fig.: 2
4

(9) NSA-1962-4407 RL

Miller, J.M., Muckenthaler, F.J. 1164
Design of a Window for a Hot Cell
(ORNL-3193: Neutron Physics Division. Annual Progress Report for Period Ending Sept.1, 1961 (1961) S.318-19, 1 Tab.)

The proposed sign of the hot cell window envisages the use of various thicknesses of three types of glass separated by thicknesses of oil. The glasses to be used are a nonbrowning glass of density 3.7 g/cm^3, a lead-silicate glass of density 3.3 g/cm^3, and a lead-silicate glass of density 6.2 g/cm^3. In the second phase of the present study, ordinary plate glass and lead slabs were laminated to mock up the removal cross sections of the various high-density glasses and combined in various configurations with water to obtain the optimum arrangement for the most effective attenuation of both neutrons and (prompt and capture) gamma rays. Final analysis of this data has not been completed. Based upon the experimental data obtained, a 4.5-ft-thick window has been designed.

ORNL-3193
3
Fig.: 3

(5) NSA-1962-3884 RL

Lochanin, G.N., Sinicyn, V.J., Štan', A.S. 1200
Schutzgeräte und ihre Anwendungen für die Arbeit mit radioaktiven Substanzen (Russ.)
Moskva: "Gosatomizdat" 1961. 129 S., 91 Fig., 10 Tab.

Dieser Katalog enthält Beschreibungen, Abbildungen und Tabellen von Geräten und Einrichtungen, die in der Sowjetunion für Arbeiten mit radioaktiven Substanzen verwendet werden. Die Geräte sind unterteilt in: Behälter, Tresore, Schirme, Abschirmklötze, Karren, Abzüge, Kammern, Distanz-Instrumente und Manipulatoren, medizinische Instrumente, sanitär-hygienische Einrichtung, Laboratoriumsmöbel, Geräte zum Sammeln und Entfernen radioaktiver Abfälle, Sichtfenster, Filtermaterial, Kunststoffmaterial zur Auskleidung der Laboreinrichtungen, Schutzkleidung.

1
3/4
5

(7) RL

Irvine, A.R., Lotts, A.L. 1204
Criteria for the Design of the Thorium Fuel Cycle Development Facility
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

Criteria for the conceptual design of the proposed Thorium Fuel Cycle Development Facility have been established and are presented. In addition, conceptual layouts of the building and equipment are included. The hot-cell structure consists of the Clean Fabrication Cell, the Contaminated Fabrication Cell, the Mechanical Processing Cell, the Chemical Cell, the Decontamination Cell, and the Hot-Equipment Storage Cell. The Glove Maintenance Room and the Airlock are appended to this structure. Each viewing window will consist of a steel liner embedded in the concrete structure of the cell with installed glass shielding of approximately 12 in. total thickness on the radioactive side and zinc bromide solution for the remaining wall thickness.

ORNL-TM-149
2
3/4
5
Fig.: 2
4
Tab.: 4

(8) NSA-1962-10103 Forts. RL

Irvine, A.R., Lotts, A.L. 1204
Criteria for the Design of the Thorium Fuel Cycle Development Facility Forts.
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

One pair of CRL Model A master-slave manipulators or one pair of CRL Model D heavy-duty master-slave manipulators respectively will be provided for each viewing window of the various cells. Two 30-ton-capacity overhead traveling cranes are to cover almost the entire third-floor area. All interior spaces in the building will be served by fire protection facilities. The cells will have fire protection system of "metalex" cylinders placed at various locations in the cells.

ORNL-TM-149
2
3/4
5
Fig.: 2
4
Tab.: 4

(8) NSA-1962-10103 RL

Schott & Genossen 1207
Jenaer Glaswerk Schott & Genossen, Mainz (Strahlenschutz)
(Atom-Informationen, 1962, No.123)

Ein Strahlenschutzfenster, das vom Jenaer Glaswerk Schott & Gen. in Mainz für den Schwimmbad-Forschungsreaktor in Saluggia (Italien) angefertigt wurde, schützt die Forscher speziell gegen Gamma-Strahlen, die von den im Reaktor verwendeten Brennstäben ausgehen. Die Stäbe werden in der "heißen Zelle" untersucht und aufgearbeitet. 5 Scheiben von je 20 cm Dicke sind hintereinander angeordnet. Da die Lichtreflexion an den einzelnen Scheibenoberflächen die Durchsicht vermindern würde , hat man in die Zwischenräume eine Öl-Immersion eingefüllt. Das Fenster hat eine Öffnung von 90 x 96 cm, bildet also bei 112 cm Dicke beinahe einen regelmäßigen Kubus.

3

(3) Forts. RL

Schott & Genossen 1207
Jenaer Glaswerk Schott & Genossen, Mainz Forts.
(Strahlenschutz)
(Atom-Informationen, 1962, No.123)

Dieser Glasschichten-Block wurde in einen geschweiß- 3
ten Stahlrahmen eingebaut. Damit an den Stellen, die nicht mit Glasmasse ausgefüllt sind, keine Strahlung durchdringt, wurden außerdem alle Leerräume innerhalb des Rahmens mit Schwerbeton und Blei ausgegossen. Das Fenster wiegt 6,5 t, wovon allein 3 t auf Kosten der Glasscheiben gehen.

(3) RL

Marter, W.L. 1208
Radiation and Contamination Control Improvements for a Plutonium Processing Plant
(Health Physics, 8 (1962) S.435-38, 5 Fig.)

3 / 5 / Fig.: 2 3

Process cabinets, in which metallic reductions are performed, have highly contaminated atmospheres. These cabinets are individually supplied with filtered air which is exhausted through individual filters on each cabinet. All air and cabinet filters are of the high-efficiency fire-resistant type. The interior of the plant was designed to simplify decontamination. All piping and conduit is contained in smooth plaster walls, buried in concrete, or located above false ceilings. An oil-modified phenolic protective coating on all walls permits ready decontamination without resorting to harsh or corrosive chemicals. All rooms have air samplers recessed in small cabinets in the walls. All process and maintenance areas are provided with a supply of clean, dry air for use in air masks or plastic suits. (4) RL

Facchini, A., Terrani, S. 1209
L'impianto di celle caldo del CESNEF
(Energia nucleare, 8 (1961) S.701-6, 3 Fig., 1 Tab.)

3 / 4 / Fig.: 4 / Tab.: 5

Das Innere der Zelle besteht aus einem Blechkasten aus Kohlenstoff-Stahl von 5 mm Dicke, der mit einem Lackanstrich von Amercoat 55 versehen ist und einen einzigen Block mit Kanälen für die verschiedenen Öffnungen bildet (Fenster, mechanische Manipulatoren etc.). Die für die Vorderwand gewählte Geometrie (Gesamtstärke 90 cm - Schirm aus Barytbeton 230 g/cm^3) ermöglicht die Verwendung von Fenstern geringer Dichte (etwa 2,5 - 2,6 g/cm^3). Dabei liegt die Stärke der Fenster bei gleichem Abschirmeffekt innerhalb der Wandstärke; außerdem erzielt man einen beträchtlichen wirtschaftlichen Vorteil gegenüber der Verwendung von Fenstern hoher Dichte. Die schon fertiggestellte Zelle ist mit zwei "Savage and Parsons" Modellen SP.8 versehen. Es können damit Lasten bis zu 9 kg gehoben werden.

(5) NSA-1962-4260 RL

Garber, H.J., Puechl, K.H. 1215
Project and Facility Administration
(NUMEC-P-30: Development of Plutonium Bearing Fuel Materials. Progress Report for Period April 1 through June 30, 1960 (1960) S.3-5, 3 Fig.)

NUMEC-P-30 / 3 / 4 / Fig.: 4

The major effort has been directed towards assembly of glove boxes and installation and checking out of equipment. Fourteen glove boxes are now installed and connected to the ventilation system. As examples, Fig. 1.2 shows the furnaces and controls for the "drying-calcining-reduction" box. Testing of the ventilation system has demonstrated a need for further working of the plant absolute filter housings to achieve absolute tightness.

(6) RL

Oppenheimer, E.D., Lazarus, S. 1219
Philosophy of Design for the NDA Plutonium Facility
(NDA-MEMO-2145-3 (1960) VII, 21 S., 2 Fig.)

NDA-MEMO-2145-3 / 3 / 5 / Fig.: 2 3

The purpose of this report is to state the basic points of design philosophy which will be followed as a guide in the design of a facility for handling, analyzing, cladding, and performing other operations on plutonium carbide. Toxicity, resulting from the alpha activity of plutonium, requires that the material be isolated from personnel by continuously containing it within leaktight containers or glove boxes. The pressure within, the contained volume will be kept below the surrounding atmospheric pressure at all regions of the system by an amount that will insure that in-leakage flow velocity will be sufficient to prevent escape of contamination in quantities exceeding tolerance levels. (6) NSA-1961-23592 Forts. RL

Oppenheimer, E.D., Lazarus, S. 1219
Philosophy of Design for the NDA Plutonium Facility Forts.
(NDA-MEMO-2145-3 (1960) VII, 21 S., 2 Fig.)

NDA-MEMO-2145-3 / 3 / 5 / Fig.: 2 3

All the normally clothed parts of the body and the head of personnel should be covered. Normally unclothed parts such as face, neck, eyes and hands will be covered and respirators worn when the contamination hazard is sufficiently great. Skin decontamination equipment for personnel, such as showers, shall be provided. In the operating area and storage areas, all ceiling, wall, and floor surfaces will be smooth and sealed and will be washable.

(6) NSA-1961-23592 RL

Faust, L.G., Unruh, C.M. 1222
Radiological Design Criteria for the Fuel Recycle Pilot Plant
(HW-68954(Rev.1)(1961) 14 S.)

HW-68954 (Rev.1) / 3 / 5

Automatic dose rate alarms shall be provided at routinely occupied work locations and the detectors shall be placed such that they will detect the dose rate to personnel at their work location. These alarms should be adjustable to alarm at any point between 5 mr/hr and 100 mr/hr. Work locations where air-borne contamination ranges from one to twenty MPC can be entered with an assault mask. Concentrations above twenty MPC require fresh air or independent air supply masks for entry. An air flow from clean areas to contaminated areas helps to prevent the spread of contamination to clean areas. Air locks provide a proven means for maintaining air balance and contamination control. A pressure differential of minus 1:4 to minus 1 inch of water assures a reasonable flow of air from the room to the hoods or cells.
(6) NSA-1962-10098 RL

Moulthrop, H.A. 1228
An Efficient Method for Radiation and Ventilation Control of Contamination Enclosures. Process Technology Information Report
(HW-53004(Del.)(1957) 13 S., 3 Fig.)

HW-53004 (Del.) / 3 / 4 / Fig.: 3

The past and current design philosophy of making process equipment enclosures for "contact" radiation processes as small as possible has resulted in several notable advantages. These include greater potential for localized shielding, simplified contact maintenance and increased adaptability of the equipment to remote operation. This development stage of building small equipment within compactly filled hoods can thus be regarded as an essential step in involving an optimum facility.

(5) NSA-1961-29308 Forts. RL

Moulthrop, H.A. 1228 Forts.
An Efficient Method for Radiation and Ventilation Control of Contamination Enclosures. Process Technology Information Report
(HW-53004(Del.)(1957) 13 S., 3 Fig.)

It is proposed as an alternate for the present "high-density" equipment layouts within a relatively large and shielded hood that consideration be given to the design philosophy based on small "high-density", well shielded equipment units within a spacious, "low-density", easily accessible, unshielded contamination enclosure. Double filtration under present design philosophy is provided to insure against the escape of radioactive contaminants during periods in which one set of the filters is being changed.

HW-53004 (Del.) 3 4 Fig.: 3

(5) NSA-1961-29308 RL

Aronin, L.R. 1237
Plutonium and its Alloys.4-2.3 Facilities for Handling Plutonium
(Kaufmann, A.R.(ed.): Nuclear Reactor Fuel Elements. New York: Interscience Publ. 1962. S.92-145, 33 Fig., 13 Tab.)

Buildings may be zoned into cold or hot areas to control spread of contamination. Building heating and ventilation should be designed to minimize the spread of air-borne particles within the structure. Primarily, work on plutonium at all sites is carried out with equipment in suitable glove-box systems. Glove boxes can be of the free-standing or isolated type, or they can be interconnected in trains. Good design requires that interior surfaces have smooth contours to facilitate cleanliness and that the physical dimensions and the arrangement of glove ports be such that all portions of the interior can be reached. Boxes are connected to a filtered exhaust system and maintained at a negative pressure of 1/2 - 1 in. H_2O, which assures that any leakage will be into the glove box. (4) RL

3 4 Fig.: 4

Morand, R.F., Gehring, R.R. 1232
Remote Handling. Comprehensive Technical Report, General Electric Direct-Air-Cycle, Aircraft Nuclear Propulsion Program
(APEX-911 (1961) 68 S., 48 Fig.)

Direct viewing through a shielded window is the most widely used method for visual control of remotely controlled devices in a hot cell. However, certain conditions arise in which better visibility is required than direct viewing provides. Studies of closed-circuit television, periscopes, mirrors, shielded windows are discussed. An important part of the remote handling effort was the work done in developing power tool and torque wrench techniques. At first, standard commercial wrenches were modified for remote use. Later, special torque control wrenches were developed for specific power plant use. Furthermore manipulator-development, remote handling vehicles, and Hot Laboratory Accessories are discussed.

APEX-911 3 4 Fig.: 4

(6) NSA-1962-7624 RL

Foskett, A.C. 1239
Techniques for Handling Radioactive Materials A Bibliography
(AERE-BIB-122 (1959) 34 S.)

Die Bibliographie enthält 187 Literaturstellen über Laboratorien im Allgemeinen, Arbeitskasten, Ausrüstungen, Pipetten, Fernbedienung, Manipulatoren, Sehvorrichtungen usw.

AERE-BIB-122 1 3 4

(6) RL

Garden, N.B. (ed.) 1233
Report on Glove Boxes and Containment Enclosures
(TID-16020 (1962)II, 142 S., zahlr.Fig. u. Tab.)

This report has been prepared by an ad hoc Committee, established by memorandum from the General Manager dated August 27, 1959, for the purpose of establishing guide lines for the design of efficient, safe, and economical glove boxes. Comprehensive discussions of glove box materials and components, safety and fire prevention methods, health physics problems, operational considerations, and brief descriptions of AEC installations, are included.

TID-16020 3 4 Tab.: 3 4 5

(5) RL

Foskett, A.C., Randall, C.H. 1240
Techniques for Handling Radioactive Materials. A Bibliography
(AERE-BIB-122(Suppl.1)(1962) 30 S.)

126 references of the following sections are given: Laboratories, glove boxes, equipment, remote handling, manipulators, remote control, remote viewing etc.

AERE-BIB-122 (Suppl.1) 1 3 4

(7) RL

Kessie, R., Gerding, T. 1235
Plutonium Particulate Filtration from Exhaust Systems
(ANL-6543: Chemical Engineering Division, Summary Report, Jan.-March 1962 (1962) S.122-28, 6 Fig., 1 Tab.)

The exhaust ventilation air from a facility handling Plutoniumhexafluoride should be filtered to prevent the discharge of plutonium particles into the atmosphere should an accidental release of plutonium occur within the facility. A program was initiated to determine the efficiencies of filter material which might be used to handle the exhaust ventilation air from this type of facility.

3 4 Fig.: 3 Tab.: 3

(5) RL

Clayton, E.D. 1245
Minutes of Critical Mass Laboratory Program Meeting, Richland, Washington, Oct. 25-26, 1960
(HW-67240 (1960) 38 S.)

The facility has essentially three architectural units: the reactor-assembly room, the service building closely attached to the reactor room, and the control and office building. The first two are of concrete and steel construction and the latter of concrete block. Two reactor hoods are semi-permanently mounted in one half of the reactor room. The hoods are identical, each 8 feet square and 15 feet high. The frame of the hood including the floor, is made of welded stainless steel. The first of three rooms in the service building, adjacent to the reactor room, is the mixing room.

HW-67240 2 3

(5) NSA-1962-5855 Forts. RL

Clayton, E.D. 1245
Minutes of Critical Mass Laboratory Program Meeting, Forts.
Richland, Washington, Oct. 25-26, 1960
(HW-67240 (1960) 38 S.)

The most prominent fixture in the mixing room is the mixing hood which provides containment for operations involving the plutonium. The last room of the service building contains most of the auxiliary service and utility equipment for the facility.

HW-67240
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(5) NSA-1962-5855 RL

Perona, J.J., Dunn, W.E., Johnson, H.F. 1247
Calculated Transient Pressures Due to Impulse and Ramp Perturbations to Ventilating Systems in Buildings 3019, 3026, 3508 and 4507
(ORNL-3086 (1961) 62 S., 34 Fig., 6 Tab.)

The cell ventilating systems in the various buildings and the glove box ventilating system in building No.3508 were studied. Cell A is the main process cell in which mechanical decladding and chopping operations can be performed. A modulated air flow enters the cell from the maintenance facility through a duct containing four 24 by 24 by 11,5-in. absolute filters in parallel. These filters were installed to remove any air-borne activity, which would otherwise be blown back into the secondary containment area if the flow pattern should reverse as a result of a pressure surge. Normal air exhaust from the cell is through a roughing filter, absolute filter, perforated plate orifice, and manual damper valve.

ORNL-3086
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Fig.:
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(6) NSA-1961-26396 RL

Constant, R., Mekers, J. 1249
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Ce rapport a pour objet d'établir les règles de sécurité adoptées dans le service, dans le but de protéger le personnel contre le double danger de contamination et l'irradiation. Les laboratoires occupés par la section des radioisotopes sont situés dans deux bâtiments principaux. Cet ensemble peut être divisé en trois parties bien distinctes: zone froide, zone tiède, zone chaude. Deux sorties de secours sont prevues. L'installation du conditionnement d'air de l'aile droite du BRI est localisée dans la partie supérieure de l'aile isotopes. Un tableau reprenant la disposition des extincteurs dans l'aile est affiché à l'entrée des laboratoires.

BLG-68
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Fig.:
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Tab.:
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(8) Forts. RL

Constant, R., Mekers, J. 1249
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol Forts.
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Les enceintes de travail employées dans la section pour la manipulation des produits radioactifs sont de trois types principaux:
1) Enceinte de manipulation pour émetteurs β^-;
2) Boîte gantée pour émetteurs β^- et β^--γ à faible activité; 3) Cellule de manipulation pour émetteurs β^--γ à forte activité.

BLG-68
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Fig.:
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Tab.:
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(8) RL

Garber, H.J., Atkins, R.J., Puechl, K.H. 1251
Project and Facility Administration
(NUMEC-P-40: Development of Plutonium Bearing Fuel Materials. Progress Report for Period July 1 - Sept. 30, 1960 (1961) S.5-7, 1 Fig.)

Twenty-two boxes are connected to the box ventilation system and transport tunnel. The emphasis is now centered on installation of equipment set-ups and checkout of operations with inert materials prior to final sealing the boxes. With the redesigned facility ventilation system, no unfiltered air will be released from the facility.

NUMEC-P-40
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4
Fig.:
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(7) RL

Barton, C.J. 1259
A Review of Glove Box Construction and Experimentation
(ORNL-3070 (1961) 112 S., 11 Fig.)

The literature on construction and operation of glove boxes for work with toxic inorganic materials not requiring biological shielding is reviewed as a contribution to this re-examination, with special emphasis on methods and equipment for working safely with plutonium and other α-active materials. Methods for the detection and measurement of α-active materials and of impurities in controlled atmospheres, window materials, protective coatings, glove materials and design, filters and scrubbers, exhaust systems, laboratory design, etc. are discussed.

ORNL-3070
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Fig.:
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(7) NSA-1961-22394 RL

Watcher, J. 1262
Final Safety Analysis Report of American Processing to be Performed by the Martin Company
(MND-P-2347 (1960) XIII, 63 S., 16 Fig., 4 Tab.)

The processing building is a rectangular, one story, windowless structure approximately 52 feet long and 27 feet, 4 inches wide with a ceiling height of 12 feet. A mechanical equipment room will be located in the northeast portion of the building with single entry from the exterior of the building. The processing area will contain the necessary equipment for direct performance of the processing and fabrication operations. These will include dry boxes, press, furnace, welding and decontamination equipment, and laboratory and mechanical work benches.

MND-P-2347
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Fig.:
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(6) Forts. RL

Watcher, J. 1262
Final Safety Analysis Report of American Processing to be Performed by the Martin Company Forts.
(MND-P-2347 (1960) XIII, 63 S., 16 Fig., 4 Tab.)

The total processing system is enclosed in a series of six interconnected dry boxes. The boxes will be relatively airtight to ensure safe handling operations, with the exception of air intake and exhaust ducts. All dry boxes will be interconnected by stainless steel transfer chambers to be utilized for the transfer of equipment into and out of the dry box system.

MND-P-2347
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3
4
Fig.:
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4
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(6) RL

Radioactive Materials Laboratory Safety Report, 1263
Martin Nuclear Facility, Quehanna Site
(MND-2410 (1960) getr. Zählg., zahlr. Fig. u. Tab.)

The facility consists of five cells. Each of these MND-2410
cells is provided with manipulator ports for the use 2
of Argonne Model 8 Manipulators. The shielding walls 3
of the cells are constructed of ferrophosphorous 4
concrete with a minimum weight of 280 pounds per 5
cubic foot. The radiation shielding windows are of Fig.:
3,6 density glass and were received as packaged, oil- 2
filled units ready for insertion into previously in- 4
stalled steel frames. Access to the cells is through
doors at the rear which open into the isolation rooms.
The decontamination room is used mainly for decontaminating portable equipment and materials. The room contains two fume hoods. A radiochemistry laboratory, equipped to handle curie-level quantities of isotopes, opens off the service area. Details are discussed. Fire equipment is installed in and about the building. Automatic fire detectors and sprinkler systems are installed.
(7) NSA-1961-15895 RL

Hammil, K.H., Brown, J.E. 1267
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

The new laboratory is a $960,000 annex to a HW-SA-1748
large radiochemistry building. Three adjoin- 2
ing cells, through which materials can be trans- 3
ferred internally, are the heart of the installa- 4
tion. The largest of the three cells has a depth of 5
7 feet, a height of 15 feet, and a width of 15 feet. Fig.:
Stainless steel was used to line the cell's walls 2
and floors. Incased in the walls are 4 foot thick 4
viewing windows. These viewing windows, composed of layers of oil between multiple plates of lead-glass, provide the same shielding as the concrete walls. Inserted into the cells above each window are a pair of masterslave manipulators.
(8) NSA-1961-2647 Forts. RI

Hammil, K.H., Brown, J.E. 1267 Forts.
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

Illumination of 300 foot candles permits HW-SA-1748
adequate viewing through the dense viewing
windows. A decontamination room and a "set-up" 2
area are also located in the new facility's contam- 3
ination-control area. A highly efficient ventila- 4
tion system with built-in safety factors was in- 5
stalled in the facility. Fig.:
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(8) NSA-1961-2647 4
RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., 1274
Culler, F.L.
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.3-10, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.296-7, 1 Fig.)

The TRU Facility will consist of nine heavily 2
shielded cells served by master-slave manipulators, 3
and eight laboratories, four on each of two floors. 4
The laboratory side of the building is separated 6
from the cell area by the cell operating gallery, Fig.:
which is regarded as a buffer zone of low con- 2
tamination potential. The nine shielded process cells 4
are arranged in line. Removable top plugs provide access to the cells. The top and back of the cell line is served by a bridge crane in a limited access area of the building not normally occupied by operating personnel. (9) Forts. RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., 1274 Forts.
Culler, F.L.
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.3-10, 5 Fig. 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.296-7, 1 Fig.)

The front face of the cell is provided with windows, 2
master-slave manipulators, and plugged ports for 3
possible future installation of periscopes. The 4
building is scheduled for full-scale operation 6
by December 1965, at an estimated cost of $8,7 Fig.:
million. 2
(9) 4
RL

Nichols, J.P., Arnold, E.D., Trubey, D.K. 1275
Evaluation of Shielding and Hazards in the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.11-18, 4 Fig., 3 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.297)

The shielding and containment criteria for the 3
Transuranium Facility obtained by calculations 4
and experiments are given. The shield evaluation 5
studies (for cell walls, cell windows, and fission source carriers) utilized experiments at the ORNL Lid Tank Shielding Facility and IBM-7090 computer calculations for determination of neutron transport, neutron activation, and gamma penetration. These studies also included an evaluation of the effects of credible accidents occurring in the facility.
(7) RL

Youngquist, C.H., Mohr, W.C., Vachta, S.J. 1278
Contamination Control in Argonne Chemistry Cave
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.39-44, 2 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.299-300, 2 Fig.)

A new chemistry cave at Argonne is designed for 3
the use of in-cell containment boxes. Inlet air 4
to the boxes will be through a series of three Fig.:
inlet filters taking air from a clean area through 3
progressively more suspect areas and ending in the 4
containment box. Air is exhausted from the box through three high efficiency filters in series, which have an overall decontamination factor of 10^{10}. A transfer tunnel that utilizes the favorable geometry of two intersecting thick shielding walls permits removal of material from the cell directly into a gloved box for the preparation of assay samples.
(6) RL

Miles, L.E., Howe, P.W., Parsons, T.C. 1279
A 4-Inch Portable Neutron Shield for a Radiochemistry Enclosure
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.45-48, 3 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.300, 1 Fig.)

The paper describes a simple portable neutron shield 3
enclosure with tong manipulators for surrounding a 4
radiochemistry box-type enclosure. The shield Fig.:
allows the chemist to work with safety with 4
neutron emitters having a flux density equivalent to a point source of 5.56×10^6 neutrons/sec. Except for minor adjustments, the radiochemistry enclosure can be completely equipped and quickly slid into the shield enclosure ready for work. Two types of windows have been provided. One consists of a 6-in.-thick tank which fits the opening in the shield front. (6) Forts. RL

Miles, L.E., Howe, P.W., Parsons, T.C. 1279 Forts.
A 4-Inch Portable Neutron Shield for a Radiochemistry Enclosure
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.45-48, 3 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.300, 1 Fig.)

The other can replace it when it is necessary to use the glove ports in the sloping front window of the Berkeley box. 3 4 Fig.: 4

(6) RL

Hunt, C.L., Linn, F.C. 1292
The Beetle, a Mobile Shielded Cab with Manipulators
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.167-84, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.312-13, 1 Fig.)

A manned, self-propelled, lead shielded, 85-ton vehicle with manipulators, has been built that is designed to operate in radiation environments. The intended operation and development of this vehicle is described. The man is provided with the capabilities to perform useful work. Notable features include: 12 inches of lead shielding; five two-foot thick leaded windows; 550-horsepower main engine; 110-horsepower auxiliary power package; filtered air conditioning; two high capacity manipulators; emergency and safety systems; communications equipment; 25-foot vertical movement and 360° rotation of the cab. (5) Forts. 3 4 Fig.: 3 4 RL

Turner, E.C. 1286
Maintenance Cell for Hallam Nuclear Power Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.111-20, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.306-7)

The Hallam Nuclear Power Facility (HNPF) maintenance cell is located beneath the reactor room floor near the reactor fuel storage area. The cell provides facilities for the assembly, disassembly, inspection and maintenance of radioactive reactor core components and the HNPF fuel handling machine internal mechanisms. The maintenance cell is shielded and equipped to maintain a controlled nitrogen or air atmosphere as required by cell operations. Radioactive component access is provided to the cell through ports in the cell roof. 3 4 Fig.: 4

(4) Forts. RL

Hunt, C.L., Linn, F.C. 1292 Forts.
The Beetle, a Mobile Shielded Cab with Manipulators
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.167-84, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.312-13, 1 Fig.)

One large window directly in front of the operator, and two smaller windows at each side -- a total of 5 windows -- provide for direct vision. A dual-head periscope is mounted on top of the hatch to permit vertical viewing from 80 degrees above horizontal to 80 degrees below, and horizontal viewing of 180 degrees from stop to stop. A 600-line, 3-camera, closed-circuit television systems is incorporated in the vehicle. 3 4 Fig.: 3 4

(5) RL

Turner, E.C. 1286 Forts.
Maintenance Cell for Hallam Nuclear Power Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.111-20, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.306-7)

Equipment access is provided through a tunnel from the plant decontamination area. Principal components of the cell ventilation system are a low volume exhaust subsystem and a high volume exhaust subsystem. 3 4 Fig.: 4

(4) RL

Saulino, F.A., Andersen, J.C., Taylor, K.M. 1301
Research Facility for the Synthesis and Fabrication of Refractory Plutonium Materials
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.277-86, 7 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.325-26, 1 Fig.)

This paper describes a facility for studying the synthesis and fabrication of refractory plutonium materials. The outstanding features of the facility are its compactness, reliability, low operating cost and the unusually high purity of the atmosphere in the helium glove boxes (2-3 ppm oxygen and less than 1 ppm water vapor). The high purity helium atmosphere results from the leak tightness of the system and the highly effective zirconium-titanium alloy getter system. In addition to the usual health and safety precautions, possible trouble areas are continuously monitored by an extensive alarm system. 3 4 5 Fig.: 2 4

(7) RL

McGary, T.E., Mazza, J.S. 1289
A Procedure for Cleaning Clouded Oil-Filled Radiation Shielding Windows
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.149-52)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.310-11)

A procedure for the cleaning of clouded, oil filled radiation shielding windows has been developed. This procedure, which is a filling and draining technique, has been successfully field tested. A severely clouded window was restored nearly to the original state of clarity as judged by visual observation. The technique uses glacial acetic acid to dissolve the cloudy sludge from the window interior. An inert atmosphere within the window must be used during cleaning to prevent component damage. A solvent rinse must precede and follow the acid cleaning to permit cleaning and minimize reclouding. 3 5

(5)

Rush, D. 1306
United Nuclear Corporation Plutonium Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.313-20, 4 Fig., 2 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962)S.328-29, 1 Fig.)

The Plutonium Facility has ten glove boxes and two hoods for the preparation of plutonium fuel elements and samples, and for out-of-pile examination for weight, dimension, density, microscopic structure, thermal expansion at high temperature, melting point, vapor pressure and quantitative chemical composition. In all but the chemistry boxes and hoods, the box atmosphere is either nitrogen or helium, with careful control over oxygen and water vapor content, and maintained at less than ambient pressure. The Facility is engaged in a mixed-carbide fuel development 3 4 Fig.: 2 4 Tab.: 4

(4) Forts. RL

Rush, D. 1306 Forts.

United Nuclear Corporation Plutonium Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.313-20, 4 Fig., 2 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.328-29, 1 Fig.)

program and during more than a year of operation there has been no detectable alpha contamination outside the boxes.

(4)

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Fig.: 2 4
Tab.: 4
RL

Hamada, T., Okano, M. 1354 Forts.

Construction of Radioisotope Handling Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.619-27, 6 Fig.)

AEC-tr-4482

The floor was covered with asphalt mortar. The walls and ceilings are covered with vinyl type paints. All the fixtures on the wall, ceiling, and floor are in most cases waterproofed. Sinks are lined with stainless steel or vinyl plates, as mentioned before, and the boundaries between the sinks and the walls are covered with polyethylene.

(7)

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Fig.: 2 5
RL

Arakawa, T. 1353

Design of a Medium Level Radioisotope Tracer Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.610-18, 3 Fig., 2 Tab.)

AEC-tr-4482

The following is a summary description of the radioisotope laboratory in our research set-up. The structure was one-storied and made with reinforced concrete. Its dimensions were 77.76 m^2 in area, 3.5 m in height, and 2.5 m in height to the ceiling. The assignment of the rooms is given. The amount of ventilation is 2.706 m^3 per hour. The ventilation of the rooms and the inside of hoods was done by the single ventilator. The hoods are made of wood, lined with polished steel sheets. The insides of the hoods are painted with strippable paint and the outside of the hoods is painted with "kashu".

(5) Forts.

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Fig.: 2 4
Tab.: 5
RL

Sonoda, S., Shigeki, T., Matsumoto, A. 1355

Radioisotope Laboratory Facilities at Showa Electric Manufacturing Company
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.628-44, 10 Fig., 1 Tab.)

AEC-tr 4482

The building is a single-storey, made of reinforced concrete, and includes a tracer laboratory of 320 m^2, a γ-ray irradiation laboratory of 37 m^2, a green-house, and a cage room of 90 m^2. The ground plan of the tracer laboratory is shown in Fig.3. The part of the laboratory to the left of the center door is designated as the semi-control area. The check-point is set up at the entrance of the locker room, where monitors for hand and clothing are used for the final check at the time of employees' departure from the laboratory. Pocket dosimeters and film badges are handled and left for storage in this area. The inner area next to the center door is assigned for exchange of gowns and pants, and the first monitoring is done here. (7) Forts.

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Fig.: 2 4 5
Tab.: 5
RL

Arakawa, T. 1353 Forts.

Design of a Medium Level Radioisotope Tracer Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.610-18, 3 Fig., 2 Tab.)

AEC-tr-4482

Experimental benches in Fig.1, T_1 and T_3 are made of polished artificial stones, and T_2 is made of mortar which was polished and painted with strippable paint. A few movable tables made of steel and coated with melamine are provided for experiments at desired locations.

(5)

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Fig.: 2 4
Tab.: 5
RL

Sonoda, S., Shigeki, T., Matsumoto, A. 1355 Forts.

Radioisotope Laboratory Facilities at Showa Electric Manufacturing Company
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.628-44, 10 Fig., 1 Tab.)

AEC-tr-4482

Air-conditioning is provided. Air is exhausted only through the hoods. The windows and doors of each room are semi-pneumatic. The drainage consists of two separate systems. The drainage from the laboratories, dark room, and storage area, is collected and discharged into the liquid waste pool. The drainage from other rooms is discharged directly to the general sewage system.

(7)

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Fig.: 2 4 5
Tab.: 5
RL

Hamada, T., Okano, M. 1354

Construction of Radioisotope Handling Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.619-27, 6 Fig.)

AEC-tr-4482

The laboratory is one-storied and consists of a control room, a dressing room, a shower room, a radioisotope handling room, a contaminated material disposal room, a storage area, a radioactive material storage area, a contaminated material storage area, a machine room, a power room, toilets and corridors. The air exhaust is located in the lower part of a wall in each unit, and the air exhaust ducts lead vertically to the ceiling where they converge in one place, and are finally connected to the ventilator on the roof. The discharge through the special drainage system provided to each unit is connected in the storage tank located in this room, and merge into the general drainage system through a "biruji" pump.

(7) Forts.

2
3
5
Fig.: 2 5
RL

Kitani, R., Terada, M. 1356

TOH-SHIBA Hot Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.654-65, 8 Fig.)

AEC-tr-4482

The ground plan of the hot laboratory is shown in Fig.1. The total ground area is about 46 tsubo, including the lot of raised ground. Two sides of the hot cell which face the operating room are provided with ordinary concrete shields of 1 m thickness. The dimensions of the hot cave are 2 m in width, 1,5 m in depth, and 4.5 m in height. A rectangular window with 100 x 50 cm dimension on the hot side and 43 x 25 dimension on the cold side is provided as well as a circular auxiliary window. The operation in the cell can be performed by direct observation through the rectangular window or by use of a periscope. The inside of the hot cell is lined with stainless steel plates for easy cleaning of the walls.

(7) Forts.

2
3
4
Fig.: 2 4
RL

Kitani, R., Terada, M. 1356 Forts.
TOH-SHIBA Hot Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.654-65, 8 Fig.)

A Toh-Shiba Type UB manipulator, which is equivalent to Argonne type 8, is installed. In this instrument the motions of the master and the slave have a relationship of one-to-one correspondence, and each arm can raise a load weighing up to 5 kg. A 1/2-ton hoist of the hanging type, provided on the ceiling, plays the role of the third hand in the cell. The inside illumination of the hot cell is provided by three sets of sodium lamps. Air in the hot cell is exchanged 20 times per hour.

AEC-tr-4482
2
3
4
Fig.:
2
4

(7) RL

Clayton, E.D., Reardon, W.A. 1365
Plutonium Critical Mass Facilities and Experiments
(HW-71666: Clayton, E.D., Reardon, W.A.: Nuclear Safety and Criticality of Plutonium (1961) S.63-70, 4 Fig.)

The room, within which the critical assemblies are located, has internal dimensions of 35 x 35 feet and a ceiling height sloping from 20 to 21 feet. It is made entirely of ordinary concrete containing reinforcing steel bars. The walls on three sides facing the rest of the facility are 5-feet thick. The fourth wall is 3-feet thick, and the floor and ceiling are each 2-feet thick. Two hoods are semipermanently mounted in one half of the critical assembly room. Each provides containment for a critical assembly, two of which may thus be set up at one time. The hoods are identical, each being 8 feet square and 15 feet high. The most prominent fixture in the mixing room is the mixing hood which provides containment for operations involving the plutonium. (6) RL

HW-71666
2
3
Fig.:
2

Fujii, S. 1358
Performance Test of a High Efficiency Air Filter System
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S. 713-21, 8 Fig.)

In order to be able to test the performance of air filtering devices with the use of paper or glass-wool, we constructed experimental devices for the determination of performance of filtering materials such as filter papers, and devices for the performance test of unit filters built with such filtering materials. The present report is concerned with the results of our study of the testing methods as well as the results of the performance tests of domestic filtering materials and unit filters.

AEC-tr-4482
3
Fig.:
3

(4) RL

Development of Viewing Systems 1367
(ANL-6619: Reactor Development Program Progress Report Sept.1962 (1962) S.40)

Studies on the electrical properties of glass have been continued along two general lines, namely, to achieve a better understanding of the radiation induced coloration of glass, and the phenomenon of radiation induced voltage build-up which has resulted in the dielectric break-down and fracture of glass in a few shielding windows. The overall objective is to achieve a practical shielding glass with improved resistance to radiation induced coloration and breakage.

ANL-6619
3

(3) RL

Yobikawa, G. 1359
Study of Filter Paper (5) - Study of Air Filter Paper
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.722-36, 5 Fig., 3 Tab.)

The study of air filter paper for the prevention of radiation hazard is only one and half years old. The present project was started by the proposal of the Protective Equipment Association and the suggestion of Mr. T. Inoue. The performance to be tested includes the following factors: composition, thickness, weight, flow rate, resistance, efficiency, and life.

AEC-tr-4482
3
Fig.:
3

(4) RL

Beukelaer, R.C. 1371
Rapport de mission. Visite aux cellules chaudes de Saclay - le 10 juin 1958
(NP-6956 (1958) 7 S.)

L'ensemble "cellules" est constitué par onze cellules alignées côte à côte. Quatre d'entre elles sont prévues pour une activité de 10.000 curies à 1 MeV, séparées des six cellules à basse activité (de 100 à 1.000 curies) par une cellule de stockage. Chaque cellule est munie d'une fenêtre en verre au plomb stabilisé au cérium de densité 3,3 pour les cellules de haute activité et de 2,7 pour les autres. Les fenêtres sont formées de plaques de 25 mm d'épaisseur. L'ensemble des cellules de forte activité est desservi par deux paires de manipulateurs Argonne n° 8 et d'un manipulateur hydraulique. L'ensemble des cellules de basse activité est desservi par une paire de manipulateurs type Argonne n° 8. Forts.

NP-6956
3
4

(5) NSA-1959-61 RL

Ananthakrishnan, S. (comp.) 1361
Remote Handling Facilities at Chalk River
(AECL-1658 (1962) 29 S., 19 Fig., 1 Tab.)

The hot-cell installations for examining irradiated fuel materials are described. A pair of master-slave manipulators, mounted 10 feet from the floor at 28 in. centers are provided at each operating station, i.e. over each window position. The operating area for each cell block contains a fume hood and inactive work bench. Details of shielding windows used in the facilities are given in Table 1. The windows are constructed of plate glass and are either dry mounted, or oil-filled in the interspace between plates. The active face of the window is made up of 3.3 density cerium-stabilised glass in the high activity cells. The cell ventilation philosophy is a once through system where inlet air is obtained by leakage from the operating area through manipulator ports, cracks around doors, shielding plugs, etc. Both up-draft and down-craft systems are being employed. (6) RL

AECL-1658
2
3
4
Fig.:
2
4
Tab.:
3

Beukelaer, R.C. 1371 Forts
Rapport de mission. Visite aux cellules chaudes de Saclay - le 10 juin 1958
(NP-6956 (1958) 7 S.)

Le manipulateur hydroélectrique construit par la compagnie S.O.M. Berthiot permet de desservir les 4 cellules de forte activité en roulant sur des rails. Sa capacité est de 500 kg verticalement, et de 30 kg dans toutes les autres directions. Les cellules sont ventilées sous dépression de 15 mm d'eau, et un débit de 800 à 1600 m3/h est assuré par cellule.

NP-6956
3
4

(5) NSA-1959-61 RL

Valentin, J.P. 1372
Réacteur BR-2 - Aile chaude - Description du complexe des cellules blindées
(NP-7157 (1958) 46, III S., 4 Fig., 2 Tab.)

La colonne de cellules blindées superposées est placée dans l'axe de la piscine du réacteur. Le blindage de ces cellules - 1.371 m de béton de densité 3.8 - a été calculé pour qu'un observateur placé à 2 m d'une source ponctuelle de 60.000 curies de 3 MeV reçoive une dose n'excédant pas 2.5 mR/h. L'ensemble de ces cellules est entouré de planchers de travail. Toutes les parois des cellules, sauf exception expressément notifiée, sont en béton lourd ayant une densité de 3,8. Des fenêtres mixtes en bromure de zinc et verre au plomb ou entièrement en verre au plomb seront installées dans les cellules supérieures.

NP-7157

3/4

(5) NSA-1959-5916 Forts. RL

Valentin, J.P. 1372 Forts.
Réacteur BR-2 - Aile chaude - Description du complexe des cellules blindées
(NP-7157 (1958) 46, III S., 4 Fig., 2 Tab.)

Les drains s'organisent en deux colonnes verticales assurant d'une part, le plus bref séjour des résidus dans les conduites et, d'autre part, les traversées de béton les plus courtes. Les cellules et tous les locaux et planchers de travail qui l'entourent sont ventilés par circulation forcée sans recyclage permettant, en service normal, respectivement 10 et 6 renouvellements par heure.

NP-7157

3/4

(5) NSA-1959-5916 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

Dispositif pour le prélèvement d'échantillons de liquides, en particulier de liquides radioactifs — 949
(CEA-X-275 (1960) 5 S., 1 Fig.)
(Brevet hollandais No.219,654 (1957) — CEA-X-275

Un dispositif réalisé selon l'invention comprend un bac muni d'un échappement d'air permettant de prélever des échantillons du liquide à examiner, un réservoir au-dessus de ce bac, un récipient à vide, un récipient auquel est adjoint une enceinte d'échantillonnage, un système à robinet d'arrêt, pouvant être placé dans plusieurs positions, une tuyauterie par laquelle la partie supérieure du réservoir peut être mise en communication avec le récipient à vide au moyen du système à robinet d'arrêt, deux conduites faisant communiquer la partie inférieure du réservoir avec le bac.

4
Fig.: 4

(4) RL

Goette, H. — 950
Strahlenschutz beim Umgang mit offenen radioaktiven Stoffen. T.1.2.
(Atompraxis, 6 (1960) S.99-107 u. S.148-54, 16 Fig., 6 Tab.)

Handschuhboxen eignen sich für den Umgang mit α- und weichen β-Strahlern, wie z.B. ^{35}S und ^{14}C. Diese Stoffe können in beliebigen Aktivitäten in ihnen verarbeitet werden, da die Reichweite dieser Strahlenarten nicht groß genug ist, um Schichten von mehr als 20 mg/cm^2 zu durchdringen. Sehr starke offene Präparate - insbesondere γ-Strahler über 10 Curie - werden in sogenannten "heißen Zellen" verarbeitet. Das sind Anordnungen, die aus drei starren Betonwänden von 1-1,5 m und einer beweglichen rückwärtigen Tür gleicher Abschirmung bestehen. Ferner wird über Geräte, die zur Handhabung von radioaktiven Stoffen dienen,

4
5
Fig.: 4

(4) RL Forts.

Goette, H. — 950 Forts.
Strahlenschutz beim Umgang mit offenen radioaktiven Stoffen. T.1.2.
(Atompraxis, 6 (1960) S.99-107 u. S.148-54, 16 Fig., 6 Tab.)

über die organisatorischen Maßnahmen, die sich für den Umgang mit offenen radioaktiven Stoffen als notwendig erweisen sowie über die Methoden der Dekontaminationsüberwachung und Schutzmaßnahmen berichtet.

4
5
Fig.: 4

(4) RL

Reardon, W.A., Clayton, E.D., Brown, C.L., Masterson, R.H., Powell, T.I., Richey, C.R., Smith, R.B., Healy, I.W. — 951
Hazards Summary Report for the Hanford Plutonium Critical Mass Laboratory
(HW-66266 (1960) 124 S., 16 Fig., 13 Tab.)

The facility has essentially three architectural units: 1) The reactor-assembly room, 2) the service building closely attached to the reactor room, and 3) the control and office building. All the interior surfaces of the concrete, including the floor, are coated with a fiber glass reinforced resin surface (Amercoat No. 74). The first of three rooms in the service building, adjacent to the reactor room, is the mixing room. The most prominent fixture in the room is the mixing hood which provides containment for operations involving the plutonium. (13)

HW-66266
2
3
4
Fig.: 2
4

RL
Forts.

Reardon, W.A., Clayton, E.D., Brown, C.L., Masterson, R.H., Powell, T.I., Richey, C.R., Smith, R.B., Healy, I.W. — 951 Forts.
Hazards Summary Report for the Hanford Plutonium Critical Mass Laboratory
(HW-66266 (1960) 124 S., 16 Fig., 13 Tab.)

The mixing room is served by the main exhaust system. Air from the mixing hood and the fume hood is drawn out after first passing through a common filter box containing a fire resistant absolute filter of the same type used in the reactor room.

(13)

HW-66266
2
3
4
Fig.: 2
4

RL

Notley, M.J., French, P.M. — 952
Apparatus for Determining the Mechanical Properties of Alpha-Active Materials
(AERE-M-796 (1960) 4 S., 6 Fig.)

Apparatus for determining the hardness and tensile properties of plutonium alloys at temperatures up to 1000°C is described. The two boxes, containing the two types of hot hardness measuring apparatus are connected by means of P.V.C. tunnels to a third box. This eliminates the potential hazard of posting specimens in and out of boxes and also speeds up the transfer operation. The purpose of this third box is as a general workshop and polishing box for hardness specimens.

AERE-M-796
4
Fig.: 4

(5) RL

Fudge, A.J., Banham, M.F. — 953
The Design and Construction of a Lead Shielded Cubicle for the Analysis of βγ Active Materials
(AERE-R-3165 (1960) III, 10 S., 14 Fig.)

The modifications to four semi-shielded fume cupboards and a centrifuge alcove for the analysis of βγ active materials in a typical laboratory, of building 220, is described. Three fume cupboards are used as the working area on highly active (up to 5 Mev curies) samples. One fume cupboard is fitted with a sliding access door and also used as a decontamination bay. An electrically driven crane fitted with a manual lift has been incorporated into the design so that sources, apparatus and reagents can be taken in and out of the working area. The apparatus necessary to carry out a number of standard analytical techniques is also described.

AERE-R-3165
4
Fig.: 4

RL

(5) NSA-1960-21804

Trouve, S., Rapin, M., Mestre, E. — 954
Un laboratoire chaud mobile
(CEA-1379 (1960) 21 S., 15 Fig.)

La cellule est constituée de plusieurs éléments metalliques qui sont faits de plaques d'acier de 2 mm raidies par des profilés en U. Ces éléments, dont le nombre varie en fonction des dimensions que l'on veut donner à la cellule, sont reliés entre eux à l'aide de serre-joints. L'étanchéité est assurée par des joints plats en caoutchouc. Chaque cellule dispose d'une unité standard de ventilation. La cellule est en dépression par rapport à l'atmosphère. L'air, préalablement chauffé et filtré, y entre donc sans le secours d'un ventilateur de soufflage. Les filtres sont du type à tiroir, et peuvent être changés de facon étanche à l'aide de sacs en chlorure de polyvinyle.

CEA-1379
3
4
6
Fig.: 3
4

Forts.

(6) RL

Trouve, S., Rapin, M., Mestre, E. 954 Forts.
Un laboratoire chaud mobile
(CEA-1379 (1960) 21 S., 15 Fig.)

Le coût de la fabrication d'une cellule, unité de ventilation comprise, s'élève à environ 40.000 NF ($8.000). La surface utile est comprise entre 20 et 30 m^2.

CEA-1379 3 4 6 Fig.: 3 4

(8)

RL

Danno, A., Hotta, H., Tsuchihashi, G., u.a. 955
Strahlungsmessung an der 10-Kilo-Curie-Zelle (des Japan Atomic Energy Research Institute) (Japan)
(JAERI-1011 (1960) 42 S., 38 Fig., 4 Tab.)

In the preliminary test using 500-c cobalt-60 source, several weak points such as the manipulator through-tube and the shielding around the storage well were detected. To reduce the radiation leakage, an additional lead shielding plug of 18 cm in thickness was inserted in a through-tube, and an iron shield box of 5 cm in thickness was attached around the tube at the hotside. For the storage cell, lead blocks of 10 cm in thickness were placed over the floor.

JAERI-1011 4 Fig.: 2

(6) NSA-1961-4164 RL

Duthie, R.E.C., Sachs, F.L. (ed.) 956
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev.,Suppl.7)(1960) 39 Bl.)

Descriptions of engineering materials including computers, critical assemblies, engineering and hot laboratory equipment, instruments, metallurgical equipment, reactors, radiation sources, and shielded containers are presented.

TID-4100 (1st Rev.) (Suppl.7) 1 4

(6) NSA-1960-13813 RL

Duthie, R.E.C., Sachs, F.L. (ed.) 957
Engineering Materials List. Cumulative Index Through Suppl. 7
(TID-4100(1st Rev.) Index (1960) 109 S.)

The materials covered include computers, critical assemblies, hot laboratory equipment, radiation instruments etc.

TID-4100 (1st Rev.) 1 4

(6) NSA-1960-20290

RL

Duthie, R.E.C., Sachs, F.L. (ed.) 958
Supplemental Insert Sheets for Engineering Materials List
(TID-4100(1st Rev., Suppl.8)(1960) 62 Bl.)

Descriptions of engineering equipment including computers, critical assemblies, hot laboratory equipment instruments, metallurgical equipment and progresses, nuclear radiation instruments, nuclear reactors and facilities, particle accelerators, plant design and processes (chemical), radiation source units, and shielded containers are presented.

TID-4100 (1st Rev., Suppl.8) 1 4

(6) NSA-1960-22687 RL

Berkeley Nuclear Laboratories 959
(Nuclear Engineering, 6, No.62 (1961) S.281-82, 4 Fig.)

In plan form the Berkeley Laboratories resemble the letter "E". Radioactive materials are handled in the shielded area and the laboratory wing on the north side. The total floor area of the laboratories is about 100,000 sq. ft. There are a number of special features about the shielded area and the laboratory wing. Normally, access to them is through the change rooms in which members of the staff change into protective clothing and ultimately ensure that they are free from contamination before leaving. All protective clothing is washed in the laundry which is adjacent to the change rooms. An air-conditioning system supplies warm fresh air to the buildings and extracts it through filters which remove any possible radioactivity before discharge into the atmosphere through a 75-ft chimney. (5)

2 3 4 Fig.: 2

RL

Gaschermann, A. 960
Bauliche Planung und Aufbau von Isotopen-Laboratorien
(Kerntechnik, 3 (1961) S.204-08, 1 Fig.)

Es wird über die bauliche Planung, die Installation, den Innenausbau, die Beheizung und Beleuchtung, über Strahlenschutzbeton, Einrichtung, Be- und Entlüftung von Isotopenlaboratorien berichtet.

2 3 4 5 Fig.: 2

(6)

RL

Gutmann, W. 961
Manipulator mit akustischer Greifkraft - Differenz-Kontrolle
(Kerntechnik, 3 (1961) S.213-14, 2 Fig.)

Es wird eine Vorrichtung zur Wahrnehmung der Greifkraft für Fernbedienungseinrichtungen zur Handhabung radioaktiver Gegenstände oder Substanzen beschrieben, die einem Paar zueinander abhängig beweglicher Klemmglieder in der Weise vermittelt wird, daß für einen gegebenen Zeitabschnitt ein Bezugton mit einer verhältnismäßig konstanten Tonhöhe und für einen anderen Zeitabschnitt ein Ton mit einer Tonhöhe erzeugt und wahrgenommen wird, die sich entsprechend der von den Klemmgliedern auf einen zwischen ihnen gehaltenen Gegenstand ausgeübten Kraft ändert.

4 Fig.: 4

(3)

RL

Lehr, A., Scheplitz, H.-G., Thümmler, F., Ondracek, G. 962
Mikroskopieranlage für heiße Zellen
(Kernenergie, 3 (1960) S.941-50, 13 Fig., 1 Tab.)

Es wird über eine Mikroskopieranlage, die in ihrer Konstruktion auf die Anwendung in heißen und warmen Zellen angelegt ist, berichtet. Die Konstruktion und Arbeitsweise des Mikroskops werden ausführlich beschrieben und an Hand zahlreicher Abbildungen erläutert.

4 Fig.: 4

(6) RL

Savouyaud, J. 964
Manipulation et manutention des substances radioactives
(Bulletin d'informations scientifiques et techniques, 1960, No.43, S.24-31, 23 Fig.)

La paroi placée entre l'opérateur et les produits à traiter ou a transporter conditionne la nature et la quantité de produits radioactifs manipulables. De son épaisseur et de ses dimensions vont dépendre les organes de manipulation et de vision. Eau, plexiglass, verres, béton, béton lourd, fer, plomb et uranium sont les matériaux les plus utilisés. En laboratoire, nous trouverons surtout: - des enceintes en plexiglass (boîtes à gants, boîtes à pinces, enceintes d'étanchéité, etc.), - des enceintes en plomb, qui, pour de faibles volumes, sont les plus intéressantes, - quelques enceintes en fonte ou en acier.

4 Fig.: 2 4

(3)

Ellis, R.E. 965
Reduction of Radiation Hazards in the Use of Radium and Similar Sources. II: The Construction of a Remote Handling Room for Radioactive Sources
(British Journal of Radiology, 34, No.403 (1961) S.415-20, 7 Fig., 1 Tab.)

The basic plan consists of a long working bench of 1 ft. thick concrete, 14 ft. long, with a 2 in. lead barrier up to 5 ft. 3 in. from the ground. At four positions, 4 ft. thick 6 x 6 in. lead glass blocks have been inserted to form working positions. The bench is 2 ft. 6 in. from the ground so that the operator should be seated. A remote manipulator runs on an overhead trolley along the length of the bench. The bench top was sealed with Tretoplast[2] which is a strippable P.V.C. coating sprayed on. Table 1 shows the approximate cost of the main items in the room. This makes a total of nearly £ 9,000, of which a third is for the safe and manipulator which could always be used elsewhere.

4 6 Fig.: 2 4 Tab.: 6

(4) RL

Harwell's New High-Activity Handling Building "459" 969
(Nuclear Engineering, 3 (1958) S.121-22, 5 Fig.)

The building is roughly "T"-shaped, the crossbar of the T containing what might be termed the "service" departments, such as changing rooms, stores, offices, messroom and workshop, while the leg of the T forms the actual "operations" portion of the building. The five high-activity cells are planned on an 8-ft module. The line of cells is equipped with a 1 1/2-ton remote-controlled overhead travelling crane, a 5-ton self-propelled bogie and a power-operated manipulator. Each cell has a zinc bromide window, 5 ft x 3 ft and 5 ft 6 in. thick, backed up by high-density glass. Each cell is equipped with a pair of master-slave manipulators. Frogmen wearing thick rubber suits and helmets are supervised from a control room that has a window giving a view of the entire maintenance area.

2 3 4 5 Fig.: 2 4 5

(6) NSA-1958-6497 RL

Full Remote Control of Hot Cells Planned 970
(Nuclear Power, 2 (1957) S.144-45, 5 Fig.)

Known as the SP Model 8, the manipulator is designed to perform delicate handling operations with highly active materials in hot cells or dry boxes, and is claimed to be capable of performing all the operations normally requiring human hands. Made of light alloy and stainless steel, the manipulator is said to have 500 moving parts, including 200 ft of stainless steel tape. As research advances, the size of hot cells is likely to increase and it may be possible for the operator to see into every corner of the cell. For such situations and to give a detailed close-up view of the experiment, Marconi's have developed, at the request of the AERE, a stereoscopic television unit for experimental purposes.

4 Fig.: 4

(3) RL

Core Test Facility 971
(LAMS-2875: Quarterly Status Report on LAMPRE Program for Period Ending Febr. 20, 1963 (1963) S.8-13)

Specifications for the 10 hot-cell windows have been completed and mailed to possible bidders. Specifications for bridge-mounted hoists, and Model A manipulators are being written.

LAMS-2875 3 4

(5) RL

Welsher, R.A.G. 972
Remote Handling. 4. Shielding Systems
(Nuclear Engineering, 2 (1957) S.427-30, 8 Fig.)

Gegen Beta- und Gamma-Strahlen ist Schutz mittels schwererer Abschirmung notwendig, und es gibt da eine Reihe von Materialien zur Auswahl. Bleiziegel bilden einen einfach anzuwendenden Schutz für die kleinere Art von Zellen, obwohl sie bei einem Schirm von über 1 m Höhe besondere Abstutzung erfordern. Beton ist mit Erfolg benutzt worden, sowohl in Form von monolithischen Konstruktionen als auch in Gestalt von gegossenen Beton-Ziegeln oder Blöcken. Gußeiserne Ziegel sind auch schon verwendet worden. Eine verhältnismäßig neue Entwicklung stellt eine Wand dar, die aus Stahlzellen aufgebaut ist, die jede mit losem Material wie Sand, Spänen usw. gefüllt werden kann.

4 Fig.: 4

(3) RL

Marsh, J.A. 973
A Versatile Heavy-Duty Power Manipulator
(Nuclear Engineering, 3 (1958) S.207-09, 3 Fig.)

British-manufactured power-operated manipulators for exceptionally heavy duty are already in operation at the Windscale and Dounreay establishments of the U.K.A.E.A. In this article, the author describes the philosophy of design, and outlines their capabilities.

4 Fig.: 4

(3) NSA-1958-9050 RL

Bennet,A.E. 974

Automatic Sample Separator for Radioactive Liquids
(Nucleonics,1o,No.2 (1952)S.14-18,7 Fig.)
(AERE-EL/R-688) AERE-EL/R-688

An ion-exchanger column can be used to separate fission products with each product producing a corresponding peak in observed activity. The device described here uses a three-in-one countingrate circuit that detects these peaks with uniform accuracy over a wide range to control funneling each fission product into a separate container. The fact that the apparatus is completely automatic is of great importance,for it thus is capable of freeing the laboratory staff ffom the routine of separations. 4 Fig.: 4

(4) NSA-1951-5587 RL

Campbell,M.H. 975

Remote,Phase-Separation Bulb for Radioactive Sample Analyses
(Nucleonics,18,No.6 (1960) S.118-19,3 Fig.)

A phase-separation bulb remotely operated with a modified hypodermic syringe has been designed for organic extraction of highly radioactive aqueous samples. The closed system minimizes contamination spread and can be operated from outside a radiation shield. Another advantage is that,with this inexpensive apparatus,one person can handle as many as six "hot" samples ih a day. 4 Fig.: 4

(3) RL

MackIntosh, A.D. 976

The Radiochemical Laboratory - An Architectural Approach to its Design
(Nucleonics, 5, No.5 (1949) S.48-61, 7 Fig.)
(AECU-210 (1949)) AECU-210

How various levels of radioactivity affect planning of labs and offices serves to introduce a proposal for a modular system that offers flexibility in layout. Shielding, waste-disposal facilities, hoods, finishes, heating, and ventilation are touched upon. 2 3 4 5 Fig.: 2

(7) RL

Douis, M., Guillon, A., Laurent, H., Sauvagnac, R. 977

Installation de chimie analytique pour produits radioactifs
(CEA-1125 (1959) 6 S., 5 Fig.)

The report deals with a shielded enclosure, hermetic, for analytical examination and handling of radioactive products. Remote handling for the following is provided: pipette absorption - weighing - centrifuging - dessication - volumetrics - pH measurement - potentiometrics - colorimetrics - polarographics. The above list is not restrictive: the enclosure is designed for the rapid installation of other equipment. Powerfully ventilated and screened to 400 mcuries long life fission product levels by 5 cm of lead, the enclosure is fully safe to the stated level. CEA-1125 4 Fig.: 4

(7) NSA-1961-5017 RL

Flint, I.C. 979

A New Concept for Remote Manipulation and Handling
(American Nuclear Society, Winter Meeting, Washington, D.C., November 4-6, 1959, 8 S.,1 Fig.)

A fully-mobile remote handling device must consist of a chassis suitable for moving about in an uninhabitable area, with suitable "hands" and "arms" mounted upon it. An operator's control console, safely located outside the uninhabitable area, is the second basic unit. Either cable or radio links may be used to join the operator to the mobile equipment; the control circuitry to be described is adaptable to either cable or radio. Operator vision is accomplished by closed-circuit TV systems. Manipulation is accomplished by electrical or electro-hydraulic control systems with which the operator can perform manipulations within the capability of the individual machine. Finally, hearing can be accomplished by a simple intercom system. 4 Fig.: 4

(3) RL

Unger,W.E. 980

Auxiliary Equipment for Radiochemical Processing
(Nuclear Engineering and Science Conference at Chicago,Ill.,March 17-21,1958 Preprint 26,Sess.34, 69 S.,Zahlr.Fig.u.Tab.)

Described are examples of both specially-designed items and the adaptation of commercial equipment,including valves,filters,centrifuges,s mplers,and carrier-chargers. 4 Fig.: 4

(3) NSA -1958-10446 RL

Mills, L.E. 982

Zircaloy Welding Techniques Developed for Plutonium Recycle Program UO_2 Fuel Element Fabrication
(Welding Journal, 40 (1961) S.141-51, 14 Fig., 1 Tab.)

This paper discusses metal joining applications used to fabricate the uranium dioxide elements for the first PRTR loading. The arc-weld joint is performed by the tungsten arc inert-gas process within a closed chamber. The chamber is backfilled to atmospheric pressure, and the operator manipulates equipment by using long rubber gloves which extend into the chamber. A viewing window is provided to monitor the operation, with a welding glass moved into position when the arc is initiated. 4 Fig.: 4

(3) NSA-1961-9392 RL

Rachinskiy, V.V., Platonov, F.P 984

Radioisotope Laboratory of Timiryazev Academy - USSR -
(JPRS-2737 (1960) 20 S., 12 Fig.)

The Radioisotope Laboratory has been planned in the following way: radiometric and lecture room; photographic room; distillation room; radiochemical room; forced-growth room; repair shop; radiochemical rooms; isotope storage; weighing rooms; teachers' room; washroom; dressing room; shower room. The three radiochemical rooms are equipped with special workbenches with hot and cold water, gas, compressed air and vacuum outlets. The movable front windows of the exhaust hoods are equipped with built-in gloves with long sleeves. This allows work to be conducted in hoods with closed windows. There are also special removable plexiglass boxes for grinding radioactive materials. JPRS-2737 2 4 Fig.: 2 4

(6) RL

Dubois, F. 985
Bétons lourds à base de barytine et de minerais de fer
(Bulletin d'informations scientifiques et techniques, 1960, No.36, S.2-24, 21 Fig., 4 Tab.)

Two important applications are described in this article: baryte concrete for the cells of the laboratory of study of irradiated fuels and concrete with iron scraps for the protection at the proton synchrotron Saturne. 2 4

(4) NSA-1960-12318 RL

Weber, M. 986
[Tschechisch] Radiochemická pracoviště pro práci s vysokými aktivitami (Radiochemical Facilities for High Activities)
(Jaderna energie, 5 (1959) S.184-89, 9 Fig.)

This paper brings a survey of the progress achieved in the design and construction of apparatus for remote control and of the prospects of further development of the radiochemical facilities for high activity materials, as it had been rendered by the communications and reflected by exhibits at the Second international conference about peaceful uses of atomic energy in Geneva 1958. 4 Fig.: 4

(3) NSA-1959-17582 RL

Hanson, C., Smith, M.J.S. 988
Tentative Designs for Two Geometrically Eversafe Mixer Settlers for High Volumetric Throughputs
(TRG-Report 22 (R)(1961) 10 S., 6 Fig., 3 Tab.)

The first tentative design described here has the stages on top of each other in a vertical slab configuration. This overcomes the lack of driving force but introduces difficulties of construction and stability. The second, a horizontal design, uses a marine propeller to maintain a large difference in surface level between the mixer and settling compartments. In this way unlimited driving force and complete hydraulic stage independence is achieved. The liquors flow from the settling compartments over weirs which eliminate back-mixing. The unit is simple, flexible and provides ideal settling conditions. Small models of each of these designs have been run successfully. It is recommended that the second be developed. TRG-Report 22 (R) 4 Fig.: 4

(5) RL

Metallography for the High Radiation Level Examination Laboratory 989
(ORNL-2988: Metallurgy Division Annual Progress Report for Period Ending July 1, 1960 (1960) S.348-60, 9 Fig.) ORNL-2988

The Metallurgy Group is responsible for equipping and operating four of the cells in the High Radiation Level Examination Laboratory. The functions of the four cells are: cell 4: cutting, nickel plating, mounting, and grinding operations; cell 5: metallographic polishing only; cell 6: chemical, electrolytic, and vacuum cathodic etching; cell 7: metallographic examination equipment and functions of the various cells are discussed. 4 Fig.: 4

(4) RL

Charlton, J.C. 990
A Versatile Apparatus for the Heating and Evaporation of Liquids in Shielded Box Systems
(RCC-R-119 (1961) 4 S., 10 Fig.)

The apparatus consists of a vapour bath in which a 40 ml. centrifuge tube can be heated, together with a device for the removal of vapour from the centrifuge tube in a stream of air. Evaporation is rapid and trouble-free. The equipment can readily be handled remotely and is small enough to be "bagged-out" of the box. RCC-R-119 4 Fig.: 4

(4) RL

Moss, J.H., Kitt, G.P., Brown, P.E. 991
The Small Scale Remote Handling of Curie Levels of Beta, Gamma Active Solutions
(AERE-C/R-2622 (1958) III, 15 S., 13 Fig.)
(Nuclear Power, 4, June (1959) S.120-21, 1 Fig. gekürzt

Three adjacent fume cupboards were used and in each a lead brick wall was built to protect the whole front and some side faces, the depth of each shielded space being about 2'6". The centre cupboard was used for highest activity work and had no frontal access but was connected at the rear to the other two cupboards which were used for analysis, and for miscellaneous specialized apparatus. The lead walls, normally 4" thick except in the analytical cupboard where 2" shielding sufficed, contained as standard items (2) ball joint units with 1/2" shafted 3 foot tongs (4 per cupboard), 2" bung port units for access (4" bung port units are much heavier and were not found necessary) and 6x6" lead glass window units for viewing. Large tilting mirrors over the top of each cupboard were also used for viewing. (6) AERE-C/R-2622 4 Fig.: 4 RL

Piccot, A.R. 1000
Ventilation Systems at Atomics International
(TID-7593: 6th AEC Air Cleaning Conference, July 7-9, 1959 (1960) S.228-35)

A brief summary of ventilation systems employed on reactors, hot cells and critical facilities designed and/or operated by Atomics International is presented. Similarly, of the two hot cells described, one operates with a comparatively large volume air flow, the other with a very low ventilation rate. Of the two remaining facilities considered, the Organic Moderated Reactor Critical Facility employs a somewhat unique dual ventilation system to avoid filter plugging by non-radioactive organic condensate. TID-7593 3 4

(5) NSA-1961-6273 RL

Waterbury, G.R., Douglass, R.M., Metz, C.F. 1002
Thermogravimetric Behavior of Plutonium Metal, Nitrate, Sulfate and Oxalate
(Analytical Chemistry, 33 (1961) S.1018-23, 4 Fig., 1 Tab.)

A thermobalance for analysis of plutonium samples is described. The furnace and elevator assembly is enclosed in a large stainless steel glove box, and the balance is in a second glove box attached to the top of the furnace box and connected to it through high-pass paper filters. The balance rests on approximately 300 pounds of lead brick which act as a heat shield and a vibration damper. A 36-inch length of platinum-rhodium alloy chain suspends a 20-ml. crucible of the same alloy from the bottom of the left pan of the balance. 4 Fig.: 4

(5) RL

Morgan, F., Sizeland, M.L. 1003
Fission Product Separation by Ion-Exchange
(AERE-C/R-2277 (1957) 17 S., 9 Fig., 4 Tab.)

A remote control apparatus has been built and operated for the separation and concentration of the major long-lived fission products by ion exchange: operating details and desirable improvements are given. Factors governing the ion exchange separation of the rare earths are discussed and illustrated.

AERE-C/R-2277
4
Fig.:
4

(5) RL

Nuclear, Space, Underseas, Industrial. - 1004
Minneapolis, Minn.: General Mills 1961., 21 S., 53 Fig.

In einem Katalog werden Angaben über Konstruktion und technische Daten zahlreicher Modelle von Manipulatoren der General Mills Inc. gegeben. Die einzelnen Manipulatoren sind abgebildet und Konstruktionszeichnungen werden erläutert.

4
Fig.:
4

(3) RL

Data Sheet, Nuclear, Space, Underseas, Industrial.- 1005
Minneapolis, Minn.: General Mills 1961. 1 Faltbl., 3 Fig.

The basic system consists of three major assemblies, 1) the vehicle chassis with its frame, tracks and drives, 2) the telescoping mast mounted on the chassis, and 3) the Model 150 mechanical Arm attached to the mast.

4
Fig.:
4

(3) RL

Mechanical Arm. Vehicular Systems. - 1006
Minneapolis, Minn.: General Mills 1960., 18 S., 49 Fig.

In einem Prospekt werden zahlreiche Modelle für fahrbare Manipulatoren beschrieben. Zahlreiche Abbildungen sind vorhanden.

4
Fig.:
4

(3) RL

Jelatis, D.G., Chesley, F.G. 1009
Remote Control Manipulator
(Can.Patent 612.374 (1957/1961) 10 S., 7 Fig.)

This invention relates to a lateral rotation device, or, more particularly, to means for introducing or providing relative rotation of the slave arm end of a remote control manipulator with respect to the master arm end. The manipulator is of the type illustrated and described in United States Patent No. 2,771,199, issued on November 20, 1956, to Demetrius G. Jelatis, one of the instant co-inventors.

Can.Pat. 612.374
4
Fig.:
4

(5) RL

Robot with a Memory 1010
(Nucleonics, 19, No.4 (1961) S.143, 1 Fig.)

Unimate, a robot that can take over repetitive jobs now performed by men, may prove useful in hot cells and around reactors. The Unimate remembers 200 sequential commands and directs its arm to act according to the stored information in its brain. By simply being led through the motions of a job once, Unimate learns a task on the job. It then repeats the operation continuously until a new routine is taught to it.

4
Fig.:
4

(3) RL

Jakovlev, G.N., Dedov, V.B. 1012
Development of Remote Handling Methods in the Radiochemical Laboratories of the Academy of Sciences USSR
(Soviet Journal of Atomic Energy, Suppl. 5(1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.14-21, 10 Fig.)

This principle of diversification was developed in the design of automatic chemical apparatuses, where the whole technological process is broken down into a series of elementary operations, accomplished with different assemblies of mechanisms. Electrical manipulators, simple holders attached to arms, usually with not more than three movements, transfer the samples along the technical line. Some operations are achieved with manipulators with two movements. All the work in the chemical processing is accomplished with special accessory mechanisms.

4
Fig.:
4

(4) Forts. RL

Jakovlev, G.N., Dedov, V.B. 1012 Forts.
Development of Remote Handling Methods in the Radiochemical Laboratories of the Academy of Sciences USSR
(Soviet Journal of Atomic Energy, Suppl. 5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.14-21, 10 Fig.)

This sort of setup makes wide use of mobile platforms, tables and discs with collections of instruments and equipment. This type of constructional solution makes it possible to automate the whole technological process easily and this will be discussed below.

4
Fig.:
4

(4) RL

Samokhvalov, N.V. **1013**

Shielding and Manipulative Devices for Work with Radioactive Isotopes
(Soviet Journal of Atomic Energy, Suppl. 5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.22-66, 36 Fig.)

The author has developed a series of interrelated, complementary methods and also pneumatic-hydraulic and electromechanical devices for remote manipulation of radioactive materials in preparative chemical work in shielded, evacuated cupboards. In work under open conditions protection is achieved by distance from the radiation source and the use of screens, particularly, large-sized cellular shielding observation blocks with combined water-glass shielding, which considerably improve the conditions for observation of objects and the lighting inside the chamber. Hand manipulative transfer-holders are used for semi-remote work with radioactive emitters of certain qualitative and quantitative characteristics.

4 / 5 Fig.: 4 / 5

(4) Forts. RL

Samokhvalov, N.V. **1013** Forts.

Shielding and Manipulative Devices for Work with Radioactive Isotopes
(Soviet Journal of Atomic Energy, Suppl. 5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.22-66, 36 Fig.)

The holding devices described are used in the chemical and other technological processing of harmful materials under laboratory and production conditions. Wet cleaning rooms in which radioactive substances are used and processed (laboratories, vivariums for experimental animals, wash and shower rooms, etc.) is of extreme importance. Multisolution stationary decontaminators are designed for deactivating the hands of operators and small articles of laboratory and production use contaminated with radioactive and other highly toxic materials.

4 / 5 Fig.: 4 / 5

(4) RL

Betzler, K.-E. **1015**

Die technischen Einrichtungen im heißen Labor des Forschungsreaktors München
(Kerntechnik, 3 (1961) S.304-07, 4 Fig.)

Es werden die Transportwege der bestrahlten Proben mit allen Handhabungen und Sicherungseinrichtungen vom Reaktor zum Arbeitsplatz in der heißen Zelle bzw. zum Tresor, durch Abbildungen unterstützt, dargestellt. In der Wand der heißen Zelle zum Bedienungsraum sind rechts und links vom Fenster zwei Durchreichen. Die Schiebeschleusen dienen zum Transport von Proben von einem strahlengesicherten Raum in einen anderen. Es sind zwei solche Schiebeschleusen eingebaut. Die eine verbindet den Tresor mit der Zelle, die andere stellt die Verbindung her zwischen dem Tresor und den Digestorien.

4 Fig.: 4

(3) RL

Wilson, H.W., Watt, D.E., Ramsden, D. **1016**

A Low-Background Laboratory
(International Journal of Applied Radiation and Isotopes, 10 (1961) S.158-66, 6 Fig., 3 Tab.)

Consideration of the design, cost and construction of a low-background laboratory for the measurement of low specific activity samples leads to the choice of demineralized water as the main shielding material. Background figures and spectra obtained for a range of proportional and scintillation counters in the completed laboratory, show that the shielding is slightly better than 12 in. of steel. It is deducted from energy and intensity measurements that the gamma-ray peaks occurring in the background spectrum arise mainly from ThC" present in the counter construction materials. The cell was built at a total cost of some £ 20,000. This cost includes all services and air conditioning.

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

(7) RL

Fradin, J. **1017**

Atelier pilote pour la séparation du césium-137
(Energie nucléaire, 3 (1961) S.275-76)

L'atelier pilote créé à cet effet, et traitant environ 100 curies de Cs-137 par opération, a 10 m de longueur, 1,5 m de largeur et 2 m de hauteur; il est divisé en compartiments correspondant aux différentes phases de la séparation. La face avant de l'appareil se prolonge jusqu'au plafond de l'atelier, délimitant ainsi une zone étanche inactive pour le personnel et contenant les différents appareils de commande et de contrôle. L'appareil est divisé en 6 compartiments protégés les uns par rapport aux autres par des dalles de plomb et revêtus intérieurement de tôles d'acier inoxydable soudées. Des enceintes de plomb pour les prises d'échantillons sont disposées sur chaque compartiment.

4

(3) RL

Snyder, M.D. **1019**

Apparatus for Remote Chemical Operations
(DP-162 (1956) 27 S., 17 Fig.)

A system was developed for processing materials exhibiting multicurie levels of radiation. Apparatus was built at low cost using interchangeable glass components and master slave manipulators. The design of the apparatus permits extensive modifications to be made with ease. All design criteria were met. A variety of operations were carried out including precipitation, filtration, solvent extraction and ion exchange. For example, irradiated slugs of uranium were dissolved and processed to yield decontaminated plutonium. Six of these operations were performed in one month with no measurable contamination of the cell or significant exposure of personnel.

DP-162 / 4 Fig.: 4

NSA-1956-9196 RL
Chem.Ab.-1956 16[illegible]

(4)

Blomgren, R.A., Hart, E.J., Markheim, L.S. **1021**

Radioactive Cobalt Laboratory for Chemical Research
(Review of Scientific Instruments, 24 (1953) S.298-303, 4 Fig., 1 Tab.)
(AECU-2178; UAC-611 (1952))

The essential features of two Co-60 γ-ray irradiation chambers designed primarily for chemical studies are described. The "multisource chamber" holding up to a maximum of five separate Co-60 sources in a movable shield mounted on top of the chamber, is designed basically for studies on the effect of dosage rate. Up to a total of 100 curies of cobalt activity may be housed in this chamber. The "double cavity irradiation chamber" is provided with a single 400 curie Co-60 source which may be lowered into either of two irradiation cavities. One of the cavities is a thermostated well that may be maintained at constant temperatures in the range from -30°C to 130°C. Two intermittent γ-ray devices are also described.

AECU-2178 / UAC-611 / 4 Fig.: 4 Tab.: 4

(7) NSA-1952-5578 RL

Bleecher, H. **1022**

Valve for Glass Blowing on Contaminated Apparatus
(Review of Scientific Instruments, 31 (1960) S.997, 1 Fig.)

The simple pressure controller shown in Fig.1 provides a convenient method of glass blowing on any gas-handling system without the necessity of decontamination. The apparatus is brought to atmospheric pressure by admitting an inert gas, e.g., nitrogen or argon, from a cylinder regulated to a pressure of 2 psi through the valve as shown. Control of inert gas pressure inside the apparatus under repair is excellent between 0 and 2 psi for the valve dimensions shown, a very adequate range for glass blowing. As is obvious, the hazards of inhaling toxic gases or vapors are completely eliminated.

4 Fig.: 4

(3) NSA-1961-4137 RL

Nurnberg, H.L., Domagala, R.F., Levinson, D.W. 1023
Apparatus for Preparing Metal Powders Under Protective Atmospheres
(Review of Scientific Instruments, 27 (1956) S.728-29, 2 Fig.)

An apparatus originally conceived for directly preparing capillaries of powders of reactive alloys for x-ray study inspired the present device. The unit is simply a hermetically sealed chamber which is provided with a drive mechanism at the top, specimen and sight ports at the sides, and a funnel at the bottom. The drive mechanism is used to rapidly rotate a rotary cutter. Particles of any desired size are produced by a suitable choice of cutter and screen. The unit is extremely effective in its original role but has been used to prepare small quantities of powders of reactive alloys for other purposes, and is a versatile research tool.

4 Fig.: 4

(5) NSA-1957-1459 RL

Nussbaum, A.I. 1024
Remote Controlled Mill for Rolling Plutonium Alloys
(Metal Progress, 78, No.2 (1960) S.116, 1 Fig.)

Es wird über die Konstruktion und Funktion einer fernbedienten Walzenmühle zur Bearbeitung von Pu-Al-Legierungen berichtet. Die Maschine befindet sich in einem völlig geschlossenen Abzug mit Argonatmosphäre. Gummihandschuhe sind zum Arbeiten an den Türöffnungen befestigt. Die extremste Reichweite der Handschuhe beträgt etwa 61 cm. Die Maschine wird zum Walzen von Pu-Al-Elementen in zahlreichen Formen benutzt.

4 Fig.: 4

(3) NSA-1960-20589 RL

Lamb, C.E. 1025
The High-Radiation-Level Analytical Facility at the Oak Ridge National Laboratory
(Talanta, 6 (1960) S.20-7, 26 Fig.)

This facility is used for the analysis of radioactivity greater than 1 r/hr at contact; the samples are received from the Power Reactor Fuel Reprocessing Pilot Plant as well as from many other sources. It consists of a sample-storage cell, seven work cells, a "cold" preparation area, a decontamination area, a receiving dock and an office. Barytes concrete, in addition to concrete of normal composition, is used in the cell walls to meet different shielding requirements. Zinc bromide solutions are used for shielding in the work-cell windows, and high-density lead glass is used for shielding in the storage-cell window.

2 4 Fig.: 2 4 5

(4) NSA-1961-8734 Forts. RL

Lamb, C.E. 1025 Forts.
The High-Radiation-Level Analytical Facility at the Oak Ridge National Laboratory
(Talanta, 6 (1960) S.20-7, 26 Fig.)

The facility is provided with Master Slave Manipulators, analytical instruments designed for use by remote control, and special equipment for transporting samples, for continuously monitoring air-borne and background radioactivity, for disposing of solid and liquid wastes, and for carrying out decontamination procedures.

2 4 Fig.: 2 4 5

(4) NSA-1961-8734 RL

Metz, C.F., Waterbury, G.R. 1026
Analytical Laboratories for the Handling of Plutonium
(Talanta, 6 (1960) S.149-53, 20 Fig.)

These boxes are fabricated of stainless steel, with windows of Lucite or safety glass. All metal exposed on the inside is painted with a strippable plastic-base paint. Glove ports are located at a convenient height to permit easy use of rubber gloves. Doors between boxes are of an unusual design, vertically operated by compressed air. Provisions are included for the operation of equipment such as centrifuges and pH meters within the boxes, yet permitting their removal in an uncontaminated condition. Ventilation is provided through filters for all gloved boxes. The descriptive material is adequately illustrated by 20 photographs.

4 Fig.: 4

(4) NSA-1961-8747 RL

Cooper, J.H. 1027
The High-Alpha-Radiation Analytical Facility of the Oak Ridge National Laboratory
(Talanta, 6 (1960) S.154-58, 7 Fig., 2 Tab.)

At the present time, the facilities of the high-alpha analytical laboratory consist of hoods with a high flow of air and one glove box for handling dry alpha active materials. A schematic diagram of the analytical laboratory and equipment is shown in Fig.5. Typical hoods and glove boxes are shown in Figs.6 and 7.

2 4 Fig.: 2 4

(4) NSA-1961-8748 RL

Pietri, C.E., Baglio, J.A. 1028
The Determination of Plutonium Based on National Bureau of Standards Potassium Dichromate
(Talanta, 6 (1960) S.159-66, 6 Fig., 4 Tab.)

A description of the design and operation of the New Brunswick Laboratory's plutonium analytical facility is presented. The potentiometric titration of high-purity Pu is discussed. A new laboratory, using gloved boxes of improved design, has been built to study the chemistry of Pu, develop methods of analysis, and prepare Pu compounds suitable for standards. The laboratory is equipped for spectrographic, wet-chemical, instrumental, and low-level radiochemical analyses.

2 4 Fig.: 2 4

(5) NSA-1961-8749
Zeitschr. f. analyt. Chem., 182 (1961) S.50
RL

Suvorov, L. 1029
Ein kleines "heißes" Laboratorium (Russ.)
(Atomnaja Energija, 4 (1958) S.304-05, 2 Fig.)
Deutsche Übers. s.:(Kernenergie, 2 (1959) S.103-05, 2 Fig.)

Das hier beschriebene "heiße" Laboratorium für radiochemische Zwecke kann von jedem Forschungsinstitut gebaut werden, das über eine mechanische Werkstatt verfügt. Der Hauptteil dieses Laboratoriums für Arbeiten mit Präparaten bis zu 100 c besteht aus einer Spezialbox mit drei getrennten Kammern. Den unteren Teil der Box bildet ein Betonfundament, auf das als Vorderwand der Box und als Trennwände zwischen den Kammern 100-200 mm starke Gußeisenplatten (Formguß) montiert sind. Oberteil und Seitenwände sind in Schwerbeton ausgeführt. Boden und unterer Teil der Wände aller drei Kammern sind mit nichtrostendem Stahl verkleidet. (3) NSA-1958-10441 RL

4 Fig.: 4

Manipulator Development in the USA 1032
(Nuclear Power, 6, No.61 (1961) S.87, 2 Fig.)

In addition to the primary manipulators, ANL model 8 4
master slaves, a mobile manipulator has been designed Fig.:
to serve a series of cells. This consists of a com- 4
mercially available hinged arm polar unit and a manipulator positioner, the two mounted on the radio controlled mule. Carrying capacity of the manipulator, with its arm fully extended in a horizontal position is 25 lb; the maximum size of objects to be carried is 4 in². The manipulator positioner will lift up to 100 lb suspended by means of a hook below the shoulder pivot point of the manipulator. A smaller mobile unit in use at the Esso Research Centre for handling high energy solid rocket propellant ingredients, described by J.A. Brown and W.A. Koelsch, also works under remote control through a 60 ft trailing cable linked to a simple transistor power unit.

(3) RL

Platinum-Lined Furnaces for Plutonium Production. 1033
New Equipment to be Installed at Windscale
(Platinum Metals Review, 5, No.3 (1961) S.92,1 Fig.)

These furnaces are of the horizontal front-loading 4
type, and are operated on a batch production line, Fig.:
the charges being brought to the furnaces in their 4
platinum-lined trays by a totally encased conveyor belt. When a tray reaches the furnace the door is first raised and then the tray automatically fed into the muffle. After several hours' treatment the furnace is force-cooled, the door removed and the tray dropped back on to the conveyor belt. A new tray is then fed into the furnace. The high level of radio-activity exhibited by the charge, and eventually by the equipment, necessitates the whole operation being conducted inside glove-box compartments. A detailed view of a platinum-lined muffle and door is shown here.

(3) RL

Bochkarev, V.V., Kulish, E.E., Tupitsyn, I.F. 1034
Some Technical and Technological Aspects of the Production of Isotopes and Labeled Compounds in the USSR
(Soviet Journal of Atomic Energy, Suppl.5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.1-13, 14 Fig.)

The exhausted boxes and cupboards used in prepara- 4
tive laboratories are equipped with manipulators or Fig.:
gloves, sealed, fitted with aerosol and gas filters 4
and supplied with water, gas, vacuum, electric mains and communications for a drain and the removal of waste. Complex master-slave manipulators are used comparatively little in preparative work, mainly in shielded cupboards of the general type. The whole great extension of techniques in Soviet preparative laboratories has been achieved with simple manipulators, designed for a definite range of operations.

(5) NSA-1959-21158 Forts. RL

Bochkarev, V.V., Kulish, F.E., Tupitsyn, I.F. 1034 Forts.
Some Technical and Technological Aspects of the Production of Isotopes and Labeled Compounds in the USSR
(Soviet Journal of Atomic Energy, Suppl.5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.1-13, 14 Fig.)

They can be used for all the possible manipulative 4
purposes with objects measuring from several to Fig.:
hundreds of millimeters and weighing from fractions 4
of a gram to kilograms. The manipulation of small volumes of active liquids is achieved with hydromanipulators, samplers and automatic burettes and pipettes with remote control.

(5) NSA-1959-21158 RL

Plail, O.S. 1035
Irradiation Techniques for Fissile Materials - 5
(Nuclear Power, 6, No.61 (1961) S.82-86, 10 Fig.)

Firstly, all boxes have been changed from βγ to 4
αβγ working. This resulted in a very much cleaner Fig.:
operation and has not significantly increased 4
operational troubles. Secondly there has been a gradual change from the principle of fixed equipment in the boxes to that of having everything possibly removable and of such a size that it can be posted in and out of the box for maintenance purposes. The culmination of these changes has led to the installation of new concrete cells for αβγ work utilizing master slave manipulators.

(3) Forts. RL

Plail, O.S. 1035 Forts.
Irradiation Techniques for Fissile Materials - 5
(Nuclear Power, 6, No.61 (1961) S.82-86, 10 Fig.)

They consist of units joined together and con- 4
structed in such a fashion that the whole cell Fig.:
has a very low leak rate. The back of the cell 4
is sealed by a large steel door which seals onto a rubber flange this giving a considerable degree of leak tightness.

(3) RL

Silverman, L. 1037
Control of Radioactive Air Pollution
(Blatz, H.(Ed.): Radiation Hygiene Handbook. - New York: McGraw-Hill (1959) S.22-1 - 22-45, 25 Fig., 9 Tab.)

Es werden die Schutzmaßnahmen zur Verhinderung der 3
Luftkontamination durch radioaktive Substanzen 4
ausführlich geschildert. Die Überschriften der Fig.:
wichtigsten Unterabschnitte lauten: Quellen der 3
Luftkontamination, Kontrollmethoden. Abzüge für 4
die Bearbeitung (Process Hood), besondere Labo- Tab.:
ratoriumsabzüge, Glove-Boxes, allgemeine Venti- 3
lation, allgemeine Richtlinie zur Reinigung radioaktiver Gase und Aerosole, Art der Ausrüstung zur Entfernung radioaktiver Teilchen (Trockenfilter, Naßfilter), Reinigung der Gase von Leistungsreaktoren.

(4) CEA-Bib.-6-188 RL

Olsen, A.R. 1038
A New Postirradiation Examination Laboratory at the Oak Ridge National Laboratory
(Proceedings of the 91h Conf. on Hot Lab. and Equipment, Chicago 1961, S.3-14,7 Fig.)

The building arrangement, cell construction, and 2
special features, designed to permit operations 3
with complete containment and with essentially 4
no personnel entry, are described. The remote in- Fig.:
stallation and removal of equipment, storage of 2
contaminated equipment, remote decontamination, 4
and remote maintenance features of the facility are expected to provide safer operation, increased cell utilization, and decreased operating costs.

(5) RL

Coops, M.C., Hanson, C.L. 1039
Livermore Alpha-Gamma-Neutron Chemistry Cell
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.15-21, 8 Fig.)

A special-purpose cell has been constructed for the 4
processing of highly alpha-active, neutron-emitting Fig.:
isotopes. This cell utilizes aqueous shielding, in- 4
ternally-mounted polar-type manipulators, and air-
tight vinyl booting throughout the radioactivity
processing enclosures. The active material is con-
fined to readily-disposable, lightweight boxes in-
side the biological shielding. Transfer and storage
facilities are provided for the safe and easy removal
of highly alpha-active materials to other enclosures.

(4) RL

Berreth, J.R., Schuman, R.P. 1040
A Chemistry Hot Cell for Handling Alpha-Gamma
Activities
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.22-26, 6 Fig.)

The cave, see Fig. 2, is located near the center 2
of the 27'4" by 29'4" hot cell laboratory. It is 3
designed to accommodate two isolation boxes and 4
has inside dimensions of 5' deep, 8'8" long, and Fig.:
6'8" high. Steel reinforced high density (> 3.5) 2
magnetite concrete is used for shielding. All in- 4
terior surfaces of the cave are painted with two
coats of white Phenoline 305, and will be further
protected by an additional strippable coating. Il-
lumination of the cave is with fluorescent lights
placed above the viewing windows. The cave itself
is maintained at a negative pressure with respect
to the room and vented through the absolute filters
of the building hood system.

(6) Forts. RL

Berreth, J.R., Schuman, R.P. 1040 Forts.
A Chemistry Hot Cell for Handling Alpha-Gamma
Activities
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.22-26, 6 Fig.)

Central Research Laboratory Model 7 master-slave 2
manipulators were chosen for the cave in order 3
to simplify the problems of isolation box design 4
and booting. Fig.:

(6) 2
4

RL

Klima, B.B. 1041
Transuranium Development Facility
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.27-34, 7 Fig.)

Facilities for process development were provided 4
by modifying four existing cells to provide pri- Fig.:
mary and secondary cell containment, and the trans- 4
uranium development facility is being installed
in one of these cells. The schematic arrangement
of the major pieces of equipment in the facility is
shown in Fig. 1. The cell has a 4-ft-thick front
wall and 4-ft-thick walls at the two sides made from
barytes concrete. The rear door and back wall are
5-1/2-ft-thick regular concrete and the top is 5 ft
thick made from the same material. There is a non-
browning lead glass plate window of density 3.3 g/cc
in the front face.

(3) Forts. RL

Klima, B.B. 1041 Forts.
Transuranium Development Facility
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.27-34, 7 Fig.)

Above the cell is mounted a glove box through which 4
all materials, samples, and equipment are trans- Fig.:
ferred in and out of the system. A transfer box 4
is used to move these materials between the glove
and alpha boxes. The alpha box is serviced with
two heavy-duty model 8 manipulators on which the
fingers are separable from the slave hand.

(3) RL

Vandenbulck, C.F. 1042
Radioactive Materials Laboratory Union Carbide
Nuclear Company
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.35-43, 7 Fig.)

The hot laboratory is a concrete and steel structure, 2
139 feet long by 57 feet wide by 37 feet high, and it 3
is adjacent to the reactor building (Fig. 2). The 4
hot lab and reactor buildings are connected by two Fig.:
air lock personnel passages and a canal (12 feet 2
water depth) which provides direct connection of 4
the reactor pool and cell No. 1. Five individual
hot cells, constructed with 4' thick walls of high
density (magnetite) concrete, are located in the
central portion of the building. Cell 1 is 16' long
by 15' high, and contains equipment for remote cut-
ting machining, welding, and similar operations.
There are 2 Corning radiation shield windows in
cell 1 and one in each small cell.

(5) Forts. RL

Vandenbulck, C.F. 1042 Forts.
Radioactive Materials Laboratory Union Carbide
Nuclear Company
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.35-43, 7 Fig.) 2

Provision was made for installation of a pair of 3
master slave manipulators at each window position 4
and at present there are available 4 pair of AMF Fig.:
Model 8 units and 1 pair of AMF Heavy Duty Model 8 2
units. The ventilation system is designed to pro- 4
vide a minimum of 20 volume changes per hour in
the hot cells and a face velocity of 100 feet per
minute at each of the three hoods in the Radio-
chemistry Laboratory.

(5) RL

Oldrieve, R.E. 1043
NASA Plum Brook Reactor Hot Laboratory Facility
(Proceedings of the 9th Conf. on Hot Lab. and
Equipment, Chicago 1961, S.44-55, 7 Fig., 1 Tab.)

This paper presents a description of the National 2
Aeronautics and Space Administration's high level 3
gamma hot laboratory building and of the hot cell 4
equipment for examination and analysis of materials Fig.:
test specimens. The building houses 100,000 cubic 2
feet of multikilocurie shielded volume including 4
a 40x74 foot hot handling bay and seven hot cells. Tab.:
Emphasis has been placed on the following: (1) elim- 4
ination of transfer casks for experiment test rigs,
(2) interchangeability of equipment within the hot
cells, (3) a "cold" operating area achieved by de-
sign and practice, (4) large hot storage areas
capable of handling complete test rigs, and (5)
electromechanical control of all equipment not
readily operated by master-slave manipulators.

(5) RL

Shuck, A.B. 1044
The Plutonium Fuel Fabrication Facility at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.58-63, 4 Fig.)

A laboratory and pilot plant for the development of 2
a variety of plutonium reactor fuel elements is de- 3
scribed. This facility is housed in a building de- 4
signed to control contamination hazards both within Fig.:
and outside the building. Processes and equipment 2
are enclosed in gas-tight gloveboxes. Equipment is 4
arranged departmentally, rather than in production lines, to achieve maximum process flexibility. Oxidation and fire hazards are controlled by use of a helium atmosphere. Normally, glovebox ventilation is by relatively low volume flow. A high volume purge exhaust system is connected to each enclosure by means of an automatically controlled valve.

(5) Forts. RL

Shuck, A.B. 1044 Forts.
The Plutonium Fuel Fabrication Facility at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.58-63, 4 Fig.)

The process enclosures, or gloveboxes, consist 2
of modular frames fabricated from the aluminum 3
alloy extrusions shown in Fig. 3. Plastic windows, 4
aluminum alloy floors, ends, service panels and Fig.:
equipment are gasketed to these frames. Access 2
to the enclosures for operation or maintenance 4
is by means of arm length, synthetic rubber gloves which are sealed to molded phenolic gloveports gasketed into the windows.

(5) RL

Kelman, L.R., Armstrong, J.L., Livernash, W.H., Rhude, H.V. 1045
Gloveboxes for Plutonium Metallurgy Research at Argonne National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.64-70, 4 Fig.)

Free standing gloveboxes with stringent require- 4
ments for tightness and flexibility were developed Fig.:
to enclose plutonium research equipment. Various 3
styles of gloveboxes are made from aluminum ex- 4
trusions welded into a framework. Safety glass windows, aluminum panels and service flanges are O-ring gasketed to the framework. The gloveboxes can be used individually or easily connected into a line. Articles are posted in and out through vinyl pouches. Rubber gloves are clamped on plastic glove ports which are gasketed to the windows. The gloveboxes are normally used with 0.1 to 0.2 scfm of nitrogen flowing through them, but other atmospheres may be used. (6) RL

King, R.R. 1046
The Prevention and Control of Fires in Glove Boxes Containing Plutonium
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.71-77, 5 Fig.)

5
Numerous and varied fire hazards exist in glove 4
boxes containing plutonium. They range from oils, Fig.:
solvents, and paper products to pyrophoric metals. 4
The glove box itself (i.e., gloves, plastic bags, Plexiglas panels, exhaust filters) is vulnerable. A dry chemical type extinguisher discharged into the glove box through a quick-coupling will safely extinguish all but the metal and filter fire. Burning plutonium can be safely contained by smothering with MgO sand. No effective method has been devised to extinguish a filter fire but a wire mesh prefilter minimizes the hazard by acting as an oil mist eliminator and fire stop.

(3) RL

Hughes, J.P., Jastrab, A.G. 1047
Fiberglass Reinforced Plastic Gloveboxes for Plutonium Analytical Research
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.78-86, 6 Fig., 3 Tab.)

An economical fiberglass reinforced plastic glovebox 4
was designed for use in an analytical plutonium Fig.:
laboratory to eliminate chemical corrosion, de- 4
crease decontamination time, and increase flexibility of operation. Materials of construction were tested for chemical, fire, and heat resistance and decontamination efficiency. Coupling of boxes into a train and sealing gasketed windows in position, giving a helium-tight enclosure, was made with Thiokoladhesives. Boxes constructed during development stages have been in use for periods up to two years.

(4) RL

Desroche, M., Cherel, G. 1048
Gas-Tight Cell and Magnetic Remote Controlled Manipulator
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.87-90, 5 Fig.)

The following description relates to a gas-tight cell 4
equipped with a remote controlled magnetic manipu- Fig.:
lator, and shielded by 8 in. of cast iron. The de- 4
sign seems particularly economic, as compared with units of conventional construction. This type of cell is considered suitable for manipulations in inert atmospheres (argon, helium and nitrogen).

(4) RL

Evans, J.H., Venables, H.H. 1049
Remote Metallography in the Metallurgy Division at AERE
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.91-106, 18 Fig.)

A 100 Curie beta gamma metallography suite used for 4
remote metallography, has been in operation for 6
two years. Designed for ease of operation and Fig.:
maintenance it consists of a single, free stand- 4
ing lead cell with 9 inches of shielding; it contains two alpha boxes, one for preparation and one for viewing, separated by a 9 inch shielding wall but connected by a posting tunnel. The suite is operated with a reduced pressure of nitrogen and it is possible to isolate either box from the other for leak testing and to permit entry into the examination alpha box for major maintenance work. The inner walls of both alpha boxes are coated with an epoxy resin paint for protection against alkalis and weak acids; (5) Forts. RL

Evans, J.H., Venables, H.H. 1049 Forts.
Remote Metallography in the Metallurgy Division at AERE
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.91-106, 18 Fig.)

the preparation box is also sprayed with a strip- 4
pable film for acid protection and to speed up 6
decontamination when necessary. Several types of Fig.:
machine have been used for remote metallography, 4
the choice being largely governed by the size and design of the cell used. The cost of the 100 curie suite with all equipment was approximately £ 38,500.

(5) RL

Saunders, C.E. 1050
Extended Reach Manipulator
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.107-110, 4 Fig.)

This paper describes a new manipulator for general hot cell work that provides twice the stroke of present manipulators and three times the volume coverage. The paper covers the development of this mechanism and points up the affects it will have on overall hot cell design, both from an operational standpoint, as well as the engineering design of future cells.

4 Fig.: 4

(3) RL

Clark, J.W. 1051
The Mobot Mark II Remote Handling System
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.111-120, 10 Fig.)

A mobile general-purpose handling system has been built and operated. Intended primarily for use in regions completely inaccessible to personnel, the only communication between vehicle and operator is a three-conductor cable. The feasibility of such fully-remote systems has been conclusively demonstrated. The machine described is a first step in the development of equipment for operation in all hostile environments. An outline of the general theory of design for such systems is presented.

4 Fig.: 4

(3) RL

Goertz, R.C., Blomgren, R.A., Grimson, J.H., Forster, G.A., Thompson, W.M., Kline, W.H. 1052
The ANL Model 3 Master-Slave Electric Manipulator--Its Design and Use in a Cave
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.121-42, 13 Fig., 3 Tab.)

Four ANL Model 3 Master-Slave Electric Manipulators have been operating in the Chemical Engineering Senior Cave, Argonne National Laboratory, since mid-1960. These manipulators have a load capacity of 50 pounds for 15 minutes and 30 pounds continuously. Master and slave arms are connected only by electrical cables. The master and slave arm assemblies are mounted on bridge and rail systems. The slave support system, together with the seven master-slave motions of the manipulator, make it possible for the tongs to reach any point within the cave. The manipulators have performed well and demonstrate several advantages over mechanically connected master-slave manipulators. (8)

4 Fig.: 4 Tab.: 4

RL

Barabaschi, S., Cammarata, S., Mancini, C., Pulacci, A., Roncaglia, F. 1053
An Electronically Controlled Servomanipulator
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.143-53, 10 Fig.)

An Electronic Force-Reflecting Servomanipulator with a load capacity of 50 pounds has been constructed for nuclear industrial applications. The Slave arms are mounted on a remotely controlled trolley to perform as a General-Purpose Robot. The design features provide a high degree of handling dexterity and safe performance. However, a considerable effort is needed to increase the reliability, reduce the cost and improve the remote maintenance of the Servomanipulator.

4 Fig.: 4

(7) RL

Potts, C.W., Forster, G.A., Maschhoff, R.H. 1054
Transistorized Servo System for Master-Slave Electric Manipulators
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.154-60, 2 Fig.)

A transistorized, force-reflecting servo system has been developed for 50 pound capacity master-slave electric manipulators. This system has several improvements over similarly-used vacuum tube systems. The new system utilizes three phase synchro excitation in a 6 kc positional data system to reduce the number of leads in the cables. Demodulator-modulator circuits are used to get relatively noise-free performance. A fail-safe circuit is included to set the brakes on the slave drive unit if an electrical failure occurs. The operating time at full capacity is extended by automatically increasing the power to the fixed fields of the servo-motors only when required. The maximum amplifier output is 320 watts at 60 cycles. (5)

4 Fig.: 4

RL

MacDonald, R.E., MacCollum, B.W., Moore, G.A. 1055
Replication of Surfaces for Hot-Cell Application
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.166-72, 6 Fig.)

In summary, hot-cell techniques have been developed for producing both positive and negative replicas of metallographic specimens as small as 1/4 in. by 1/4 in. in size to a roughened surface of several square inches in area and which are applicable to internal and external surfaces. The replicas produced by these techniques can be routinely cleaned to probe readings < 20 mr/hr and to smear < 50 counts/min, thus, allowing cold laboratory macro- or microscopic examination of the surfaces at magnifications from 1 to 1000. These replicas are dimensionally accurate and can be used for evaluation of dimensional control.

4 Fig.: 4

(5) RL

Pokorny, G.J., Shuck, A.B. 1056
Semi-Remote Control of Two-High, Four-High Laboratory Rolling Mills
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.177-87, 11 Fig.)

The adaptation of laboratory rolling mills to semi-remote control is described. Two-high, four-high rolling mills were modified for inert atmosphere glovebox enclosure. Work tensioning pinch rolls, guides and push button operated manipulators were applied to these mills. Work tensioning required feed-back speed control to compensate for back slip and forward extrusion of the work. Interchangeable plate and bar chucking equipment was designed for the manipulators to provide maximum flexibility of mill application.

4 Fig.: 4

(4) RL

Chow, J.G.Y., Hare, J.R., Nielsen, A.F., Pallas, F.P. 1057
Procedure for Disassembling an Uranium-Bismuth Loop in the BNL Metallurgy Hot Cell
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.188-94, 7 Fig.)

The BNL metallurgy hot cell was constructed and equipped to handle alpha contaminated material and no extensive modifying of the cell was necessary. However, the contamination control area (isolation room) where the coffin was located during the disassembling operation was only partially shielded and temporary shielding was set up to protect the operating personnel. Figure 2 shows the general layout of the cutting cell and the isolation room. Figure 3 shows schematically the layout in the cutting cell for advancing and sawing the loop.

4 5 Fig.: 4 5

(7) Forts. RL

Chow, J.G.Y., Hare, J.R., Nielsen, A.F., Pallas, F.P. 1057 Forts.
Procedure for Disassembling an Uranium-Bismuth Loop in the BNL Metallurgy Hot Cell
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.188-94, 7 Fig.)

The initial pull was done with the cell 1-ton crane. Subsequent advancing was done with a special vise mounted on a sliding table. The vise can also be moved in a vertical direction to position the loop for cutting. Figure 4 shows an assembly drawing of this special vise. Manipulation in the cell was performed with a Lee Asociate arm mounted on a jib boom, a pair of model 8 manipulators and a bridge crane.

4 5 Fig.: 4 5

(7) RL

Blesch, R.A., Wehrle, R.B. 1059
Replaceable Gastight Utility Plug for a Shielded Facility
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.201-5, 6 Fig.)

A replaceable, gastight, plug has been developed for the Alpha-Gamma Metallurgy Cave at Argonne National Laboratory. This plug will be used in the ceiling and the walls of the cave. For convenience, only the vertical application will be described in detail.

4 Fig.: 4

(4) RL

Gruber, W.J., Watts, E.C. 1060
The Metallographic Facilities in the Radiometallurgy Laboratory at Hanford
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.206-12, 5 Fig.)

Metallographic facilities in the Radiometallurgy Laboratory include remotely operated grinder-polishers, vacuum cathodic etching, electrochemical etching, and a remote metallograph for the examination of irradiated reactor fuels and structural materials. The remotized metallographic facilities are consolidated into one shielded enclosure. The expediting of sample processing is enhanced because all phases of metallographic preparation and photography are at one location.

4 Fig.: 4

(4) RL

Doe, W.B. 1061
Expendable Abrasive Cutoff Machine
(Proceddings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.224-26, 1 Fig.)

An inexpensive abrasive cutoff machine for radioactive samples is being used which differs from conventional machines in that the cutoff wheel rotates at only 173 rpm. An enclosure for the wheel is unnecessary since coolant is not thrown off the wheel at this slow speed. A removable vise is used which can be brought up to a viewing window for accurate positioning of small or delicate samples. The water coolant and cuttings can be solidified with plaster of Paris for disposal as solid waste. Any required decontamination of the machine is relatively easy because of its small size and simplicity.

4 Fig.: 4

(3) RL

Shabel, B.S., Smith, S.C. 1062
A Comparator for Post-Irradiation Thermal Conductivity Measurements
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.227-32, 5 Fig.)

Equipment based on the Powell thermal comparator has been built for the measurement of the thermal conductivity of irradiated materials. It operates on the principle that the cooling rate of a heated object brought into contact with a cooler sample will be proportional to the thermal conductivity of the sample. The equipment was designed for remote handling using standard metallographic specimens.

4 Fig.: 4

(4) RL

Rizzo, F.X., Huszagh, D., Fallon, P., Quadrado, A. 1064
Precision Remote Plotting of Radiation Dose Distributions
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.239-43, 2 Fig.)

A semi-automatic apparatus has been developed to measure and remotely plot radiation levels in three-dimensional targets. This equipment has a wide range of proven uses in shielding, scattering, and dosimetry studies; experiments involving the measurement of vertical, horizontal, and depth-dose distributions.

4 Fig.: 4

(6) RL

Dascenzo, R.W. 1065
Pneumatically Placed Concrete Shielding
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.244-52, 5 Fig., 1 Tab.)

Hanford's High Level Radiochemistry Cell walls required 175 cubic yards of high density magnetite aggregate concrete with a unit weight of 220 lb. per cu. ft. and compressive strength of 3000 psi. From the experiences gained on this facility it can be demonstrated that the spraying of the pneumatically applied mortar will save from 15 to 20% of the per-cubic-yard cost over using pre-pack or pre-mix pour concrete instead of the 5% as shown in Tab. I. (3) The principal cost advantages realized by the Gunite method were from the lower cost of forms below that required for other types of placement and the magnetite fine sand, readily available at low cost.

4 5 Fig.: 4 Tab.: 5

(4) RL

Kuhl, O.A. 1066
A High Intensity Radiation Development Laboratory at Brookhaven National Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.253-58, 3 Fig.)

This facility will house offices, laboratories, and a hot cell and canal complex. The cell complex, designed to remotely handle 1,000,000 curies of cobalt-60, comprises a Work Preparation Cell, an Experimental Irradiation Cell, and a connecting canal with two bays. The Work Preparation Cell with its associated special equipment will provide the means for decanning, sorting, encapsulating, testing, and assembling sources for use in the Experimental Irradiation Cell. The Experimental Irradiation Cell is basically designed to perform large-scale batch and continuous irradiations. A conveyor system will provide for moving material in and out of the cell and properly passing it through various irradiation systems.

2 4 Fig.: 2 4

(4) RL

Huszagh, D.W., Nugent, G. 1067
Machines Developed for Use in the High Intensity Radiation Development Laboratory
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.259-63, 5 Fig.)

The special purpose machines used for preparing 4
cobalt 60 sources for service in the High Intensity Fig.:
Radiation Development Laboratory (1) are herein de- 4
scribed. These machines include a railway system, a remotely operated pipe cutter, a source monitor, a source encapsulator, a capsule leak detector, and a source extractor. The railway system is used for transporting materials and equipment into and between the hot cells. The remaining machines are used in sequence for the encapsulation of cobalt 60 sources into stainless steel sheaths. This is undertaken to prevent surface contamination in the later use of the sources.

(4) RL

Eldred, V.W., Saddington, K. 1068
The Post-Irradiation Examination Facilities at Windscale Works, U.K.A.E.A.
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.264-88, 14 Fig.)

The new facility (Figs. 12 and 13) consist essential- 2
ly of 12 distinct parallel caves, most of them 34 1/2 4
feet long, 8 1/2 feet wide and 10 feet high internal- Fig.:
ly, arranged in pairs back-to-back, connected at one 2
end by a transport corridor 264 feet long, 8 feet 4
wide and 14 1/2 feet high. The caves at each end are somewhat smaller than the others and used respectively for storage (Cave 1) and decontamination (Cave 12). The operating face of each cave is perpendicular to the transport corridor and is fitted with 5 zinc bromide windows. Although provision is made for Argonne master-slave manipulators over each window, these will not normally be necessary since the standard operations

(5) Forts. RL

Eldred, V.W., Saddington, K. 1068
The Post-Irradiation Examination Facilities at Windscale Works, U.K.A.E.A. Forts.
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.264-88, 14 Fig.)

of each machine are selected as required on a control 2
panel at the window concerned. A workshop has been 4
provided for the repair and maintenance of machines Fig.:
after partial decontamination and removal from the 2
caves. 4

(5) RL

Colp, J.L. 1069
Features of the Sandia Engineering Reactor Facility Irradiation Cell
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.289-94, 3 Fig., 1 Tab.)

The irradiation cell is a room 22 x 30 x 9 feet 4
containing the unshielded core of the reactor, Fig.:
located on the room center-line 8 feet from one 4
end. The end walls of the irradiation cell are made of 3.2 density concrete 8 feet thick. This concrete was made with magnetite ore as the coarse aggregate. It was placed in a mixed condition; dry packing was not used. The ceiling is of ordinary concrete 8-1/2 feet thick, except around the pressure vessel, where 3.2 density concrete was used. All the concrete forming the walls, floor and ceiling of the irradiation cell is water-cooled by means of stainless-steel cooling coils imbedded in the concrete about four inches from the exposed surface.

(3) RL

Wilson, M., Thorn, L. 1074
Alpha-Gamma Transfer Systems
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.344-50, 5 Fig.)

Two transfer systems that provide mechanical seal- 4
ing of metal containers were developed for handling Fig.:
alpha-beta-gamma emitters. These systems increase 4
the versatility of the cells and reduce the problems normally associated with plastic bagging techniques. The containers are used for routine transfers and for storage of material or equipment.

(4) RL

Bazire, R., Duhamel, F. 1079
Progrès récents dans la conception et l'équipement des laboratoires de haute activité
(Health Physics in Nuclear Installations. La Physique de Santé dans les installations nucléaires. Symposium org. at the Danish Atomic Centre of Risø, 25-28 May 1959, S.201-17)
(CEA-1503 (1960) 17 S.)

Es wird über die Anlage, Einrichtung und Aus- CEA-1503
rüstung verschiedener Laboratorien für Arbeiten mit 2
radioaktiven Stoffen in Frankreich berichtet. Be- 3
schrieben werden: Das Laboratorium von hoher Akti- 4
vitat in Saclay, das Laboratorium zur Untersuchung 5
von bestrahlten Brennelementen in Saclay, das Laboratorium zur Herstellung von Radioisotopen, das heiße Laboratorium von Grenoble, die α-, ß-, γ-Laboratorien von Fontenay-aux-Roses, ein bewegliches Laboratorium, α-Zellen von großem Ausmaß, Schutzvorrichtungen, Fernbedienungen und Transportmittel.

(8) NSA-1960-16753 RL

Lochanin, G.N., Siničyn, V.I. 1081
New Leak-Tight Glove Boxes for Handling Alpha- and Beta-Emitting Materials
(Atomnaja Energija, 9 (1960) S.344-47, 5 Fig.)
Engl.Übers.in: (Soviet Journal of Atomic Energy, 9 (1961) S.883-887, 5 Fig.)

The dimensions of this glove box model are: height 3
2320 mm, length with one transfer chamber 1270 mm, 4
width 875 mm. All leads coupled into the glove box Fig.:
enclosure are sealed (with acid-resistant soft rubber 4
packing) and held fast with adhesive. The frameless body of the glove box is welded with stainless steel up to 3 mm thick, the glove-box tables are also welded stainless, to 10 mm thickness. The outer surface of the box is given a prime coating after cleaning from grime and scale, and is then finished with a cream-colored acid-proof enamel. The inner surface of the box frame has a smooth streamlined surface.

(5) Forts. RL

Lochanin, G.N., Siničyn, V.I. 1081
New Leak-Tight Glove Boxes for Handling Alpha- and Beta-Emitting Materials Forts.
(Atomnaja Energija, 9 (1960) S.344-47, 5 Fig.)
Engl.Übers.in: (Soviet Journal of Atomic Energy, 9 (1961) S.883-887, 5 Fig.)

The leak-tight volume of the box comprises 0.4 m^3. 3
The support base for the 1KNZh box is welded carbon 4
steel. A rectangular viewing window is built into Fig.:
the front of the glove box to facilitate observation 4
of the work. A special ventilation arrangement is provided in all rooms where radioactive materials are handled in the open, to protect the air environment of occupied rooms and the atmosphere from contamination by radioactive aerosols.

(5) RL

Palmer, R.C., Davis, D.K., Willis, W.V. 1084
A Remote Sampling System for High-Level Gamma Sources
(International Journal of Applied Radiation and Isotopes, 10 (1961) S.128-30, 3 Fig.)

A remote-controlled mechanism for introducing 4
and removing samples from the Georgia Tech. 12 kc Fig.:
cesium-137 irradiator has been designed and built 4
with these primary features: (1) "fail safe" electrical system; (2) minimum radiation exposure to operating personnel and other experimenters in the area.

(5) NSA-1961-19504 RL

Rachinskii, V.V., Platonov, F.P. 1086
The Radioisotope Laboratory of the Timiryazev Academy
(Izvestiya Timiryazevskoi sel'skokhozyaistvennoi akademii, 1959, 6, S.239-250)
Engl.Übers.: (LLU Translations Beulletin, 2 (1960) S.545-67, 12 Fig.)

There are three radiochemical rooms. All preparatory 2
and analytical work with radioactive materials is 4
carried out in these rooms. They are fitted with 5
special laboratory benches with hot and cold water, Fig.:
gas, compressed air and a vacuum line laid on. Each 2
work place at the radiochemical bench is equipped 4
with a set of appliances and protective fixtures for 5
work with radioactive substances. The radiochemical rooms are fitted with fume cupboards of special design. The front sash-windows of these cupboards contain devices for the fixing of long-sleeved gloves.

(6) Forts. RL

Rachinskii, V.V., Platonov, F.P. 1086
The Radioisotope Laboratory of the Timiryazev Academy Forts.
(Izvestiya Timiryazevskoi sel'skokhozyaistvennoi akademii, 1959, 6, S.239-250)
Engl.Übers.: (LLU Translations Bulletin, 2 (1960) S.545-67, 12 Fig.)

This makes work in the fume cupboards possible with 2
the windows shut. Various plexiglass devices are 4
widely used in work with radioactive substances: 5
protective plexiglass stands for filtering, boxes Fig.:
for pipettes, for compounds and plants, and for 2
flasks. 4

(6) 5

RL

Mathers, W.G., Winter, E.E. 1087
Principles and Operation of an Air Operated Mixer-Settler
(Canadian Journal of Chemical Engineering, 37 (1959) S.99-104, 7 Fig., 3 Tab.)
(AECL-843 (1959) 3 Bl., 7 Fig., 3 Tab.)

A mixer-settler for continuous countercurrent AECL-843
solvent extraction is described in which the mixing and pumping of the liquid phases are achieved 4
by air streams. The operating principles of this Fig.:
mixer-settler are presented in the theory and con- 4
firmed by experiment. Measurements include interface heights, capacity, air requirements and entrainment of aqueous phase in the solvent under various operating conditions.

(5) RL

Goriounov, A.A. 1088
Quelques problèmes de la technique de l'expérimentation radiochimique
(CEA-tr-R-534 (1960) 14 S., 17 Fig., 2 Tab.)
(Žurnal analitičeskoj chimii, 11, 5 (1956) S.590-98, 17 Fig., 2 Tab.)

On a décrit une série de dispositifs auxiliaires CEA-tr-R-534
pour la technique de l'expérimentation radio-
chimique, et parmi ceux-ci: 1) une enceinte 4
(chateau) de protection perfectionnée pour comp- Fig.:
teur-"cloche"; 2) Un étui vertical pour absorbeurs 4
en aluminium; 3) Des capsules en celluloïde; 4) Des moules-presses et le réchauffeur pour couler les capsules en celluloïde; 5) Un évaporateur pour le séchage des échantillons radioactifs. Ces dispositifs ont donné de bons résultats dans la pratique et sont recommandés pour l'application dans les laboratoires radiochimiques.

(4) NSA-1961-18092 RL

Taketani, K. 1090
The Design of Special Hoods for Machining Natural Uranium Metal. Studies on Uranium Fuel Element.Pt.4
(AEC-tr-4464 (1961) 14 S., 6 Fig., 1 Tab.)
Übers.aus: (Nihon-Genshiryuko-Gakkai Shi, 1(1959) S.370-5)

This paper reports the consideration, which AEC-tr-4464
the author gave in designing the hoods for
machines, and the experiences he gained in the 3
course of using these hoods. The materials for 4
the hood are 2 mm thick 18-8 stainless steel and Fig.:
3 mm thick acrilite plate. Dimensions of the hood 2
is 600 x 1,200 x 600 mm for lathe, 650 x 650 x 650 4
mm for drilling machine, 1,100 x 2,880 x 1,100 mm Tab.:
for 10 HP grinding cutter, 1,000 x 1,100 x 700 mm 3
for 5 HP grinding cutter, and 650 x 1,000 x 800 mm for hacksaw.

(5) Forts. RL

Taketani, K. 1090
The Design of Special Hoods for Machining Natural Forts.
Uranium Metal. Studies on Uranium Fuel Element.Pt.4
(AEC-tr-4464 (1961) 14 S., 6 Fig., 1 Tab.)
Übers.aus: (Nihon-Genshiryuko-Gakkai Shi, 1(1959) S.370-5)

Plates 1 and 2 show the external views of the AEC-tr-4464
lathe hood and the drilling machine hood re-
spectively. Stainless steel was used for the 3
hood frame, the bottom part and the coolant 4
pan. Acrilite resin was used for the front, Fig.:
rear, side and ceiling of the hood, the chip 2
trap and the air adjusting port. 4

(5) Tab.: 3

RL

Banashek, V.E., Govalov, I.V., Ogilets, M.V., Yanushkovskii, V.A. 1092
Automatic Mixing and Proportioning Apparatus for Preparing Multiple-Component Mixtures, Based on Utilization of Radioactive Radiations
(AEC-tr-4139: Radioactive Methods of Control and Regulation of Industrial Processes (1959) S.196-206, 6 Fig.)
Übers.aus: Radioaktionye metody kontrolya i regulirovaniya proisvodstvennykh protsessov, Riga 1959)

The systems of automatic volumetric propor- AEC-tr-4139
tioning and making of mixtures used in industry
comprise sets of separate measuring tanks and a 4
mixer provided with a stirrer into which are chargen consecutively, from each measuring tank, the specified amounts of components that constitute the mixture. In the automatic systems of preparing granular mixtures by the gravimetric method, which are now being used, are utilized sets of

(7) NSA-1961-15779 Forts. RL

Banashek, V.E., Govalov, I.V., Ogilets, M.V., Yanushkovskii, V.A. 1092 Forts.
Automatic Mixing and Proportioning Apparatus for Preparing Multiple-Component Mixtures, Based on Utilization of Radioactive Radiations
(AEC-tr-4139: Radioactive Methods of Control and Regulation of Industrial Processes (1959) S.196-206, 6 Fig.)
Übers.aus: (Radioaktionye metody kontrolya i regulirovaniya proisvodstvennykh protsessov, Riga 1959)

automatic balances (of the Khar'kov Plant model, or "Libra"), one for each component, under which is installed a suitable mixer, or use is made of a dial-equipped balance of the "Rapido" model. The "Rapido" balance is superior to the "Libra" pan-balance, being more accurate and reliable in operation as well as simpler to handle. AEC-tr-4139 4

(7) NSA-1961-15779 RL

Lee, I.A., Mardon, P.G. 1105
Some Physical Properties of Plutonium Metal Studied at Harwell
(Coffinberry, A.S., Miner, W.N. (ed.): The Metal Plutonium. Chicago: University of Chicago Pr. 1961. Chapter 14, S.133-151, 10 Fig., 7 Tab.)

At Harwell, the glove boxes are usually of the single-skinned free-standing type; one face can be clamped against an adaptor plate on the outside of the double wall of the frogman area, to form a sealed surface. The double wall acts as an air lock, allowing access to this face, which can thus be removed, leaving the box as an extension of the frog-suit area. During normal use, complete box integrity is achieved by the use of a heat-sealed polyvinyl chloride bag technique for tr nsference, together with double-grooved ports to facilitate the changing of gloves and transfer bags. 4 Fig.: 4

(4) Forts. RL

Boase, D.G., Foreman, I.K., Drummond, I.L. 1093
The Complexometric Determination of Plutonium in Reactor Fuel Processing Plant Solutions. I.
(Talanta, 9 (1962) S.53-63, 4 Fig., 7 Tab.)

The extraction unit comprises two vessels attached to a manifold which enables them to be filled and emptied through a capillary swan-necked side-arm by applying suction or compressed air. Mixing of solutions in the vessels is promoted by drawing air through the capillary into the body of the vessel. The photometric titration apparatus is shown diagrammatically in Fig. 2 and the titration cell is shown in detail in Fig. 3. The conical cell, fitted with a few coils of resistance wire to provide gentle heating for the evaporation stage, is situated between an ordinary filament lamp and a photoelectric cell connected to Cambridge galvanometer through a variable resistance. 4 Fig.: 4

(5) RL

Lee, I.A., Mardon, P.G. 1105 Forts.
Some Physical Properties of Plutonium Metal Studied at Harwell
(Coffinberry, A.S., Miner, W.N. (ed.): The Metal Plutonium. Chicago: University of Chicago Pr. 1961. Chapter 14, S.133-151, 10 Fig., 7 Tab.)

To leave the door area as clear as possible, all services are brought to the boxes from overhead. Several different forms of box are in use, the choice being governed by consideration of leak-tightness and vacuum requirements. 4 Fig.: 4

(4) RL

Raleigh, H.D., Scott, R.L. 1102
Nuclear Instrumentation. A Literature Search
(TID-3550(Rev.1) (1961) III, 149 S.)

Included are 1,728 references on the design, construction and application of instruments for radioactive environments (Hot Cell, Radiation Detection Instruments, Remote-Control Equipment). TID-3550(Rev.1) 1 4 5

(7) NSA-1961-22459 RL

La fabrication du combustible de Rapsodie. Etat d'avancement des études et des équipements de fabrication. III, 3: Atelier de découpage des assemblages combustibles (A.D.A.C.) 1107
(Bulletin d'informations scientifiques et techniques, 1961, No.57, S.47-49, 3 Fig.)

Les opérations se font dans des cellules α β γ, c'est-à-dire entièrement étanches, et entourées de murs de béton de 1,20 m d'épaisseur (densité du béton: 3,3). Ces chiffres correspondent à une activité de l'ordre de 10^6 curie pour des gamma de 1 MeV. L'atelier comporte une petite zone froide, une salle pour une cellule-maquette, des salles de décontamination, de stockage de hottes et de châteaux de plomb, etc. (fig. 13). Il couvre une superficie au sol de 1200 m^2 environ. Le bâtiment comporte un sous-sol et un étage technique. 2 4 Fig.: 2 4

(4) RL

Gerard, F. 1103
La Conférence de Grenoble sur la Métallurgie du Plutonium
(Industries Atomiques, 4 (1960) S.97-104, 5 Fig.)

Le tétrafluorure de Pu étant une source énergique de neutrons rapides, des précautions spéciales ont dû être prises pour la protection du personnel (l'opérateur doit être placé à 80 cm de la source, les mains pouvant approcher à 45 cm, et ne doit guère manipuler plus de deux ou trois heures par jour une telle quantité de fluorure). Le mélange réactif de fluorure et de calcium est pastillé; les pastilles sont manipulées à la pince et déposées dans le creuset par un petit transporteur. L'élaboration se fait dans une chaîne linéaire de boîtes à gants, en atmosphère d'argon, reliées entre elles par des tubes de plexiglas recouverts de manches en plastique. Il s'agit de sept boîtes servant successivement. 4 Fig.: 4

(3) RL

Extended-Reach Manipulator Triples Volume Covered in Hot Cell 1108
(Nucleonics, 19, No.12 (1961) S.84, 1 Fig.)

With new AMF Atomics master-slave manipulator an operator can reach the floor and corners of a hot cell that are inaccessible with other remote-handling devices. Moreover he can remain in a comfortable erect position while the slave end moves to all areas in the cell. Thus the extended-reach manipulator eliminates operation problems of other instruments: limitation in vertical motion of the slave end, problems of cramped quarters while working close to the window, trouble seeing the slave end when working close to the floor. 4 Fig.: 4

(3) RL

Tomlinson, R.E. 1109
Radiochemical Plant Containment at Hanford
(Nuclear Safety, 3 (1961) S.51-56, 2 Tab.)

This article discusses plant containment as it is 2
currently applied to the radiochemical plants at 3
Hanford. All cells have removable stepped concrete 4
cover blocks, and processing equipment is remotely Tab.:
installed or removed through these top openings. Re- 3
motely operated cranes traverse the canyon high above the deck formed by the cover blocks. These cranes are equipped with hooks, pipe grabbers, and impact wrenches to perform the necessary manipulations. Periscopes and closed-circuit television provide the necessary visual contact. All manipulations are controlled from shielded cabs on the cranes. Typical pressures and rates of air change maintained in the operating buildings are listed in Tables IV-1 and IV-2, respectively.

(5) RL

Hobbs, T.G. 1112
Tongs Used in Testing for Radioactive Contamination
(Health Physics, 6 (1961) S.225, 2 Fig.)

Ordinary laboratory tongs have been modified by 4
attaching a ring and an insert at the end. The Fig.:
surfaces of the ring and insert are angled 4
slightly so the smear paper will not drop through the ring when the paper is clamped between the ring and insert. The outer surface of the ring is angled to prevent its contact with the area to be smeared. Good surface contact between the paper and the area is provided by a felt pad or blotter paper glued to the lower face of the insert, which extends below the ring. Coating the tongs with strippable paint aids in decontamination if necessary.

(3) RL

Eldred, V.W., Saddington, K. 1114
The Post-Irradiation Examination Facilities at the Windscale Works of the U.K. Atomic Energy Authority
(DPR-Inf-265 (1962) III, 23 S., 10 Fig.)

The paper describes the facilities and the DPR-Inf-265
techniques developed over a number of years 2
at Windscale. These consist primarily of a pilot- 4
scale fuel examination and breakdown cave capable Fig.:
of handling 1000 elements per year, together with 2
the associated metallographic lines for the exami- 4
nation of the fuel and can specimens cut from the fuel elements. The experience gained in the operation of these facilities is described in relation to its influence on the design philosophy underlying the construction of the full-scale cave and line facilities now in operation for the examination of up to 3000 standard and experimental fuel elements per year arising from the United Kingdom Civil Power Programme. (6)

RL

Brubaker, R., Hummel, H.H., MacArthy, A., Smaardyk, A., Kittel, J.H. 1115
Fast Fuel Test Reactor-FFTR
Conceptual Design Study
(ANL-6194 (1960) 101 S., 24 Fig., 23 Tab.)

One of the significant features of the FFTR is ANL-6194
the fuel-transfer cell which is located directly 3
above the reactor and contains shielded windows 4
(see Fig. 11) through which the handling of the Fig.:
spent fuel can be visually followed. The viewing 4
may be done with the aid of mirrors and/or binoculars. Commercially available manipulators are used within the shielded cell and these are operated from the outside of the cell. The inside surface of the shielded cell is covered with a welded and sealed steel surface which serves as a hermetically sealed membrane. Argon gas of high purity is circulated within the fuel-transfer cell and its pressure will be maintained slightly below atmospheric.

(9) RL

Appleton, G.I., Dunster, H.I. 1116
Recommended Practice in the Safe Handling of Plutonium in Laboratories and Plants
(AHSB(RP)R.6 (1961) 44 S., 2 Fig., 1 Tab.)

This report provides a brief introduction to the AHSB(RP)R.6
physical, chemical and toxic properties of plu- 2
tonium, reviews the precautions to be taken in the 4
design and operation of laboratories, plants and 5
stores, and makes recommendations for safe practice. Criticality problems are discussed only in outline. Where available, fire resistant materials should be used for glove box construction. Transparent material must be incorporated to enable ample direct vision and this material, too, should be fire resistant and shatterproof. Special laundry arrangements should be provided for those establishments in which contact clothing may be contaminated with plutonium to levels in excess of the maximum permissible.

(7) Forts. RL

Appleton, G.I., Dunster, H.I. 1116
Forts.
Recommended Practice in the Safe Handling of Plutonium in Laboratories and Plants
(AHSB(RP)R.6 (1961) 44 S., 2 Fig., 1 Tab.)

Provision should be made in each changeroom AHSB(RP)R.6
for collecting contaminated clothing in suit- 2
able containers. Each glove box should be pro- 4
vided with a supply of suitable dry powder in 5
a metal container and a means of transferring the powder in the event of a fire. In the event of a plutonium fire in the box, the scoop should be used to cover the burning material with the dry powder extinguisher - this application should be liberal.

(7) RL

Gowland, L., Johns, T.F. 1117
A Laboratory-Scale Plant for the Enrichment of ^{15}N Using the "Nitrox" Process
(AERE-Z/R-2629 (1961) 12 S., 9 Fig., 1 Tab.)

As far as possible stainless steel has been AERE-Z/R-2629
used as a constructional material, but glass has been used for all the refluxers and some 4
of the pipe-work. All of the long pipes are made Fig.:
of stainless steel. Most of the glass parts have 4
been joined by glass-blowing. Virtually the whole apparatus, apart from the exchange columns themselves, is enclosed in two large enclosures, one at the top, the other at the bottom, fitted with extractor fans. The waste sulphuric acid from the bottom refluxers is run into carboys outside the building.

(5) RL

Bagnall, K.W., Robinson, P.S. 1118
An Electromagnetic Stirrer for Glove Box Use
(AERE-M-941 (1961) 2 S., 2 Fig.)

An electromagnetic stirrer which has no moving AERE-M-941
part other than the polythene-encased rotor has
been designed for use in glove boxes. The electro- 4
magnetic stirrer described above has been found to Fig.:
satisfy the original requirements, will stir up to 4
400 mls. of solution, and is capable of dealing with solutions containing about 50% glycerol. The total overall cost is not greatly in excess of that of the standard stirrer, and since in many cases it will be acceptable to supply several heads alternately from one control unit, it could easily prove to be less, on the whole.

(5) RL

Faugeras, P., Couture, J., Lefort, G. 1119
Etude concernant la réalisation d'un ensemble de cellules destinées à des traitements de combustibles irradiés à l'échelle semi-industrielle
(CEA-1980 (1961) 17 S., 14 Fig.)

La cellule est constituée par un caisson de tôle de 4 m x 3 m et de 5 m de hauteur. Les tôles de 2 mm d'épaisseur qui constituent l'étanchéité α sont soudées entre elles et maintenues extérieurement par des profilés, sans aucune liaison avec la protection γ. Dans notre cellule prototype nous avons expérimenté une fenêtre fournie par la Société Saint-Gobain, comportant 3 dalles de verre de 100 mm d'épaisseur, de densité 6,2, placées entre deux dalles de densité 3,3 de 250 mm d'épaisseur. Dans la cellule prototype, l'eclairage était situé dans le haut de la cellule.

CEA-1980 3 4/6 Fig.: 4

(8) Forts. RL

Faugeras, P., Couture, J., Lefort, G. 1119 Forts.
Etude concernant la réalisation d'un ensemble de cellules destinées à des traitements de combustibles irradiés à l'échelle semi-industrielle
(CEA-1980 (1961) 17 S., 14 Fig.)

Le but des essais de ventilation était double: - Essai d'étanchéité des joints. Vérification des pertes de charge sur les filtres en papier amiante. Sur une dépense totale de 700 000 NF, dont 30 p. 100 pour les éléments de structure et 70 p. 100 pour les éléments fonctionnels, plus de 60 p. 100 de l'appareillage sera réutilisé après démontage (télémanipulator, hublots, vannes, etc...).

CEA-1980 3 4/6 Fig.: 4

(8) RL

Development of Manipulators for Handling Radioactive Materials. a: Operating Experience with the ANL Model 3 Master-Slave Electric Manipulator 1121
(ANL-6433: Reactor Development Program Progress Report. Sept. 1961 (1961) S.45-47, 2 Fig.)

Four ANL Model 3 Manipulators have been operating in the Chemical Engineering Senior Cave at ANL, since mid-1960. These manipulators have a load capacity of 50 pounds for 15 minutes and 30 pounds continuously. The master and slave arm assemblies are mounted on bridge and rail systems. The slave support system, together with the seven master-slave motions of the manipulator make it possible for the slave tongs to reach any point within the cave. The installation in the Chemical Engineering Senior Cave is shown in Figure 8. The experience gained with these manipulators strongly indicates that whenever work is to be performed around reasonably large pieces of equipment, there is a great advantage in using electric master-slave manipulators rather than the mechanically connected type. (4) RL

ANL-6433 4 Fig.: 4

Culler, F.L., Frederick, E.J. 1124
Development Facilities and Aids for Radiochemical Reprocessing
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.807-30, 11 Fig., 3 Tab.)

The information is divided into three general categories for presentation, which are: 1) Cells suitable for high-level analytical and radiochemical work. 2) Selected analytical and process equipment for remote control operation. 3) High level development cell design. Construction cost analysis of the Hot Analytical Facility constructed 1955 and equipment cost for the Analytical Facility are presented.

(7)

TID-7534 3 4/6 Fig.: 2 4 Tab.: 6

RL

Buckham, J.A., Stevenson, C.E. 1125
Dissolution Equipment
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.831-47, 9 Fig., 2 Tab.)

Batch and continuous dissolution equipment used in the United States is briefly described. Certain design criteria for dissolvers are given. A brief comparison is made between continuous and batch dissolvers.

(5)

TID-7534 4 Fig.: 4 Tab.: 4

RL

Unger, W.E. 1126
Auxiliary Radiochemical Equipment
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.891-981, zahlr. Fig. u. Tab.)

Each piece of radiochemical equipment, while similar to others, is still unique, and generalized descriptions are not possible. Discussed here are specific examples both of adapted commercially available equipment and specially designed miscellaneous items, including carrier-chargers, samplers, valves, centrifuges, and filters. Most radiochemical equipment is made of various grades of the 18-8 type austenitic stainless steels, although other materials, such as the ferritic steels, aluminum alloys, nickel alloys, and perhaps titanium and zirconium, may be useful. The additional costs of obtaining the higher quality materials and fabrication required in radiochemical processing work are difficult to predict and the estimates given here are only approximate. (5) RL

TID-7534 4/6 Fig.: 4

Flynn, A.W., Treybal, R.E. 1128
Liquid-Liquid Extraction in Continuous-Flow Agitated Extractors
(American Institute of Chemical Engineers Journal, 1 (1955) S.324-28, 8 Fig., 2 Tab.)

Two dimensionally similar extraction vessels, as shown in Figure 1, were made for the tests. Constructed of commercially available glass tubing clamped between two flat metal plates, each vessel was provided with four radial baffles each 16.7% of the vessel diameter in width. The agitator impeller, the diameter of which was one third the vessel diameter, was driven by a shaft passing through the vertical outlet pipe and was located at the center of the vessel.

4 Fig.: 4

(4) RL

Un atout maître pour les applications des radio-éléments: Le bâtiment 49 de Saclay 1130
(Atomes, 17, No.188 (1962) S.165-66, 2 Fig.)

Le bâtiment 49, appelé encore bâtiment des radio-éléments, comprend quatre zones principales: 1. Un hall des services généraux; 2. Un hall actif; 3. Les laboratoires chauds; 4. Les laboratoires froids. Les laboratoires "chauds" sont disposés le long d'un couloir actif sur lequel débouchent les boîtes de manipulation. Les opérateurs se tiennent dans des locaux placés ainsi de part et d'autre du couloir actif. Ils sont entièrement séparés des produits qu'ils manipulent et n'ont devant eux que les hublots de vision, les télémanipulateurs, et les tableaux de commande électriques.

4 Fig.: 4

(3) RL

Davis, M.W., Jennings, A.S. 1132
Equipment for Processing by Solvent Extraction
(Flagg, J.F. (ed.): Chemical Processing of Reactor Fuels. New York (usw.): Academic Pr. 1961. S.271-303, 23 Fig., 3 Tab.)

Two small extractors, which can be used in the laboratory, to obtain chemical flow sheet information, are described. One of these, the Mini mixer-settler, has provided data which have been found to be satisfactory for scaling up to large pump mix mixer-settlers. The second is the rotary extractor, which can be operated so that the dispersed phase residence time per theoretical stage is very small (5-10 seconds). It can therefore be used for the evaluation of flow sheets for equipment with such characteristics. This would include the centrifugal mixer-settler which has a small stage volume and a high capacity and which could be difficult to build in miniature size for flow sheet evaluation.

4
Fig.: 4
Tab.: 4

(4) RL

Billiau, R., Blumenthal, B., Draulans, J., Vanden Bemden, E. 1133
The Design and Operation of the Plutonium Ceramics Laboratories at Mol
(BLG-64 = BN-6107-03 = R. 2013 (o.J. um 1962) II, 26 S., 9 Fig., 1 Tab.)

Das Laboratorium wurde für die Untersuchung von alpha-aktiven keramischen Materialien ausgerüstet. In den Arbeitskasten werden Uran- und Plutoniumoxyd-Preßkörper hergestellt und untersucht. Es wird über die grundsätzlichen Überlegungen bei der Laboratoriumseinrichtung berichtet. Die allgemeine Anlage und Belüftung des Laboratoriums, die leckdichten Arbeitskästen und ihr Druckregelsystem für wiederholte und einmalige Luftdurchfuhrung, die Filter, Handschuhbefestigungen usw. werden beschrieben. Sicherheitsregeln und Vorschriften für erste Hilfe bei Unfällen werden mitgeteilt.

BLG-64
BN-6107-03
R. 2013
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Fig.: 2
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Tab.: 4

(12) NSA-1962-11811 RL

Slansky, C.M. 1134
Materials of Construction
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.982-86, 1 Tab.)

Materials will be discussed in this report depending on their use in nitric acid, sulfuric acid, or hydrofluoric acid chemistry. Then, the specific problems will be detailed as to the unit operation within the process. Our discussion will include a few words on such buildings as the shielded canyon, laboratories, solution make-up area, and fuel storage basin. Vessels and miscellaneous equipment include fuel carriers, dissolvers, evaporators, centrifuges, extraction columns, tanks, pumps, pulsers, instruments, and floor and wall coverings. Strippable films are sometimes used as special coverings when it is known that the surface will be contaminated and no simple decontaminating procedure is available. (5) RL

TID-7534
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Schwennesen, J.L. 1135
Operating Experience at Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S. 993-1021, 23 Fig.)

In a remote maintenance processing plant all process equipment, including reaction vessels, centrifuges, pumps, agitators, evaporators, etc., is assembled, connected and disconnected by manipulation from a traveling overhead crane. The Plants considered in this report are the Hot Semiworks located at the Hanford Atomic Products Operation near Richland, Washington; the Idaho Chemical Processing Plant (ICPP) located at the National Reactor Testing Station near Idaho Falls, Idaho; and the Metal Recovery Plant and the Thorex Pilot Plant both located at the Oak Ridge National Laboratory.

TID-7534
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Fig.: 4
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(6) Forts. RL

Schwennesen, J.L. 1135 Forts.
Operating Experience at Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S. 993-1021, 23 Fig.)

All of these plants employ Redox, Purex, or Thorex process solvent extraction technology or minor variation therefrom. All of the Plants discussed in this paper have various special design features to facilitate decontamination of equipment which were provided initially or as a result of experience in production activities.

TID-7534
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4
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Fig.: 4
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(6) RL

Sadowski, G.S., Hungerford, T.W., Blanco, R.E., Culler, F.L. 1136
Radiation Exposure and Safety Experience in Radiochemical Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.1022-36, 11 Fig.)

To protect operating personnel from penetrating beta and gamma rays emitted by decaying fission products, the processing equipment in irradiated-fuel separations plants is installed behind heavy concrete shields or for small equipment, behind lead. Equipment is operated remotely using indicating and recording instruments to follow the operations. Sampling is one of the most serious personnel exposure operations in a radiochemical plant. Samples of the radioactive solutions are taken by means of automatic sampling devices which are heavily shielded, and the samples transported in heavily shielded containers to high level analytical cells. (8) RL

TID-7534
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Di Rito, V.L.J. 1139
Description and Operation of a Universal Adaptor for General Mills and Model 8 Manipulators
(WADD-TN-60-305(1960) VI, 11 S., 8 Fig.)

This investigation was undertaken to develop a device which would permit interchangeable power tools for the Model 8 and General Mills manipulators. A universal adaptor was developed that can be attached permanently to the tools used in a hot cell. The design of the universal adaptor and the modifications to the manipulators need to make them capable of receiving the adaptors are described.

WADD-TN-60-305
4
Fig.: 4

(4) NSA-1961-22398 RL

Heydorn, K., Singer, K.A., Wangel, J. 1141
Radioisotope Laboratory Design
(Risö-Report No.26 (1961) 25 S., 9 Fig., 4 Tab.) RISÖ-26

Radioisotope laboratories are often designed by architects and engineers without any idea of radioisotopes, in conjunction with scientists without any idea of laboratory design. The report describes the basic requirements arising from the presence of radioactive material, as well as the limitations imposed by practical and economical possibilities (planning of the laboratory, lay-out, construction of the building, laboratory furniture, sanitary installation, ventilation, air filters, fume hood, glove box, working clothes, cleaning).

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3
4
5
Fig.: 2
3
4
5
Tab.: 5

(9) RL

Carlander, R. **1145**
Development of Remote Metallographic Techniques for Irradiated Materials
(ANL-6316 (1961) 32 S., 27 Fig., 1 Tab.)

A remote metallographic facility has been in operation at Argonne National Laboratory since 1954. During that period of time, many new techniques relative to better contamination control and equipment operation have been developed. Further improvements will continue to be made in the normal evolvement of the operational procedures. The techniques used for microscopic examination of irradiated materials have been standardized with variations only in the final polishing steps, and detailed procedures are given for several alloys. The procedures used for macroscopy vary from sample to sample, and new procedures are developed as required to suit each particular problem.

ANL-6316
4
Fig.: 2
4

(4) NSA-1962-388 RL

Francis, K.E., Hodge, N. **1147**
A Vacuum Furnace for Sintering at Temperatures Up to 2400°C
(AERE-M-963 (1962) 4 S., 5 Fig., 1 Tab.)

The furnace to be described employs a combination of tantalum and tungsten for the heating element. The element is self-supporting, has no ceramic materials of construction, and is operated in a vacuum of 10^{-6} mm Hg. The power is 12 KVA. The design is based on that of a furnace described by J.H. Rendall, of the National Physical Laboratory. Further minor modifications have since proved desirable for the operation of the furnace in a glove box.

AERE-M-963
4
Fig.: 4

(5) NSA-1962-11809 RL

Symonds, A.E., Leith, W.H. **1148**
Containment Box for Radioactive Materials
(DP-724 (1962) 10 S., 5 Fig.)

An economical gloved box for general use was developed at the Savannah River Laboratory. The gloved box is made of a polyester resin reinforced with glass fibers. The plastic construction combines strength with corrosion resistance, lightness, economy, and ease of fabrication. The basic components of the box are easy to assemble, modify, seal, and decontaminate. Special features include a simplified air filtration system and an enlarged material transfer port.

DP-724
4
Fig.: 4

(5) RL

Fontaine, M. **1149**
Le laboratoire de fabrication de l'usine d'extraction du plutonium
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.14-17, 5 Fig.)

Le bâtiment - 92 m de long, 16 m de large, 12 m de haut, en trois étages - abrite 1000 m² de cellules chaudes; la ventilation occupe plus de 2000 m², les couloirs, bureaux, vestiaires, salles de mesures physiques, ateliers, se partagent le reste. Près de 100 000 m³ d'air sont véhiculés pour assurer 15 renouvellements horaires dans les cellules étanches et maintenir avec l'extérieur les gradients nécessaires de dépression. 4 cellules sont réservées aux agents du contrôle continu; 5 cellules aux analyses de bilan, contrôle de pureté, dont 2 en α, β, γ, 3 en α pur; 2 cellules à l'analyse radiochimique (spectrométrie α, γ, analyse isotopique); 1 cellule inactive aux matières premières et préparations de tous les réactifs et solutions titrées, utilisés par le personnel des laboratoires. (4) RL

2
4
Fig.: 4

Posey, W.N., Alewine, G.B. **1150**
Specimen Holders for Remote Metallography
(Metal Progress, 81, No.6 (1962) S.112, 1 Fig.)

Because of potential danger to personnel, radioactive specimens must be ground and polished by remote control. For this purpose, we have devised two types of specimen holders, each of which can be controlled effectively with master-slave manipulators. One holder uses the principle of a pantograph; the other employs a swinging arm.

4
Fig.: 4

(4) RL

Handling Radioactive Materials **1153**
(Nuclear Engineering, 7, No.73 (1962) S.224-27, 9 Fig., 3 Tab.)

Although one would expect α-active material to be handled within a glove box - so giving complete radiation protection - the gloves themselves need protection from solvents, heat, etc., and the U.K.A.E.A. has found it worth while to have developed a series of general purpose tools. The design is very similar to that of the devices for beta/gamma work. The problem of handling is simplified if distance gives sufficient protection, or the radioactive material can be kept under water. In such circumstances an elementary set of shaft-mounted tongs may be all that is required. Such instruments will be referred to as "free-handling" to distinguish them from devices built into a cell wall. From cooling pond tongs to tongs for lead cells is not a very far cry and cell type handling tongs can always be used in free-handling applications.

4
Fig.: 4

(3) RL

Remote Manipulation for Sealed Cells **1155**
(Nuclear Engineering, 7, No.75 (1962) S.335, 3 Fig.)

A manipulator installation, particulars of which arrived too late to be incorporated in our recent "Handling" feature (June 1962), is built in France, under license from the CEA, and has the distinction of being suitable for gas-tight cells under pressure or vacuum, without either the necessity for elaborate sealing or for exposure of motors, etc., to contamination. Built by the Lip Co. of Besançon for Saint-Gobain Nucléaires of Paris, the manipulator has only robust mechanical working parts inside the cell and relies on magnetic coupling through a non-magnetic cell roof to a drive unit operating outside the contaminated zone.

4
Fig.: 4

(3) RL

Extended-Reach Manipulator Triples Volume Covered in Hot Cell **1159**
(Nucleonics, 19, No.12 (1961) S.84, 1 Fig.)

With new AMF Atomics masterslave manipulator an operator can reach the floor and corners of a hot cell that are inaccessible with other remote-handling devices. Moreover he can remain in a comfortable erect position while the slave end moves to all areas in the cell. The extended-reach manipulator combines an extra telescope tube in the slave end that can be extended or contracted easily by operating electrical switches at the master end. So that the operator can quickly see whether the manipulator is in the extended or normal position, this extra tube is colored.

4
Fig.: 4

(3) RL

Wood, A.J., Fudge, A.J. 1160
A Concrete Cell for the Analysis of Multi-Curie Active Materials
(AERE-R-3976 (1962) 9 S., 12 Fig.)

A concrete cell has been adapted for the pur - pose of the analysis of material with up to 1000 MeV curies of β, γ activity, with associated high levels of α activity. Details are given of the construction of the cell and of the installed equipment together with descriptions of the technique and apparatus used for the analysis of irradiated nuclear fuel specimens. The cell consists of an area 10' x 6' surrounded by 2' 6" thick high density concrete walls. Service plugs are situated at regular intervals along the operating face. A pair of Model 8 Master-Slave manipulators, manufactured by Savage and Parsons to the design of the Argonne National Laboratory, have been modified by the Remote Handling Group at Harwell to include PVC gaiters and a special α seal. (6) Forts. RL

AERE-R-3976
3
4
Fig.:
4

Wood, A.J., Fudge, A.J. 1160 Forts.
A Concrete Cell for the Analysis of Multi-Curie Active Materials
(AERE-R-3976 (1962) 9 S., 12 Fig.)

The cell air is changed five times per hour, air being filtered as it is drawn into the cell and being extracted into a bank of ten filter boxes packed with glass fibre paper before being discharged into the main building filtration system.

(6) RL

AERE-R-3976
3
4
Fig.:
4

Miles, L.E., Parsons, T.C., Howe, P.W. 1161
Force Multiplier for Use with Master Slaves
(UCRL-9662 (1961) III, 6 S., 3 Fig.)

A force multiplier has been designed at Lawrence Radiation Laboratory. This piece of equipment was made to increase the gripping force presently available in the Model 8 master slave. The force multiplier described incorporates a novel clamp which can be quickly attached to and detached from the master slave hand.

(6) NSA-1961-30796 RL

UCRL-9662
4
Fig.:
4

Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

An efficient, flexible, and relatively simple system of enclosures for the handling of multicurie amounts of alpha, gamma, and neutron-emitting isotopes has been developed by the Health Chemistry Department at Lawrence Radiation Laboratory, Berkeley. It has been in operation since April of 1961. This system consists basically of interlocking 4-ft water tanks that form the shielding around the leaktight primary enclosure in which operations are conducted by means of totally socked master-slave manipulators. This facility has been successfully used for procedures ranging from multicurie chemical separation to highly refined microtechniques.
(9) NSA-1962-4407 Forts. RL

UCRL-9657
2
3
4
6
Fig.:
2
4

Howe, P.W., Parsons, T.C., Miles, L.E. 1162 Forts.
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

It has served equally well for metallurgical examinations and remote machining and welding procedures. The cost of this totally equipped facility was approximately $60,000. Viewing and ventilation systems are described.

(9) NSA-1962-4407

UCRL-9657
2
3
4
6
Fig.:
2
4

RL

Abbatiello, A.A. 1165
Remotely Controlled Shearing of Pipe and Structural Members
(ORNL-3184 (1961) 13 S., 7 Fig.)

A shearing tool has been developed for remotely controlled severing of pipes or structural members. The shear is rotated about its axis in a wrist motion by the pumped hydraulic fluid that also powers the shear blade. It can be used in a stationary mounting or suspended from a crane. A C-shaped support for the shear has been designed to pass through a small top opening of a shielded cell. The controls for manipulating the shear pass through or along the C-frame. The shear jaw opens to 5 in. in height and 7 in. in width, and the total weight of the tool is only 575 lb. It has been used to cut metal sections 4 3/4 in. thick and 4-in. sched.-40 stainless steel pipe.

(4) NSA-1962-5688 RL

ORNL-3184
4
Fig.:
4

Huff, G.A., Doggett, I.L., Duce, F.A., Hunter, B.R., Painter, M.J., Shogren, H.A., Anderson, R.J., Le Maire, D.N., Lund, D.M. 1166
Shift Laboratory. Remote Analytical Facility
(IDO-14547: Shank, R.C.(ed.): Annual Report of ICPP Analytical Section for 1960 (1961) S.11-12)

Maintenance was required on a number of boxes throughout the year. Because of stripped gears, a motor was replaced on a solvent extraction apparatus. The pipet in the falling drop, specific gravity box developed a leak, requiring its removal for direct maintenance. The stand-by specific gravity box was used to complete the zirconium fuel processing run, proving the need for duplicate equipment. Special equipment for the remote dissolution of radioactive solids was designed by Analytical Development (Section 7.22.3) and installed in a box. The basic components are four heating mantles, glass dissolution flasks, and water-cooled reflux condensers attached to vertically-moving rod runners.
(12) Forts. RL

IDO-14547
4

Huff, G.A., Doggett, I.L., Duce, F.A., Hunter, B.R., Painter, M.J., Shogren, H.A., Anderson, R.J., Le Maire, D.N., Lund, D.M. 1166 Forts.
Shift Laboratory. Remote Analytical Facility
(IDO-14547: Shank, R.C.(ed.): Annual Report of ICPP Analytical Section for 1960 (1961) S.11-12)

The box also contains a small sink, a motorized capping unit, and a small air cylinder adapted to squeeze small clamps. In order to prevent thw spread of contamination into the operating corridor, liquid traps were placed on the outside shielding wall in all syringe lines.

(12) RL

IDO-14547
4

Blin 1167
Le laboratoire de contrôle du centre de production du Bouchet
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.11-13, 2 Fig.)

Le laboratoire ayant pour fonction essentielle de 2
vérifier la marche de l'usine est amené à contrôler: 4
- la qualité des produits entrant à l'usine comme Fig.:
matières premières, - les teneurs en uranium, tho- 4
rium, impuretés des corps obtenus à chaque stade de la fabrication, depuis la mise en solution jusqu'à l'élaboration du métal. Le laboratoire comprend: 1° un laboratoire de chimie, chargé du contrôle courant et 2° un laboratoire physico-chimique (spectrographie et analyses spéciales).

(4) RL

Dykes, F.W. 1168
Remote Apparatus Development
(IDO-14547: Shank, R.C.(ed.): Annual Report of ICPP Analytical Section for 1960 (1961) S.54-56)

The Model B Pipetter, after a maintenance-free IDO-14547
operational period of two years, became inoper-
able in July. All mechanical components were in 4
excellent condition. Teflon components were substituted for polyethylene and the unit was returned to service. The development and construction of a modified falling drop apparatus, based on features of an Oak Ridge design, was completed. Reflux dissolvers and associated apparatus (easily operable with simple tong manipulators) were designed and installed in the Remote Analytical Facility for the dissolution, dilution to volume, and sampling of pencil sized, irradiated fuel specimens. A simplified unit was designed for disposal of residual samples in the Remote Analytical Facility (see Section 4.3). (4) RL

Chvostov, N.N. 1169
Quelques détails au sujet de l'appareillage pour boîtes à gants
(CEA-tr-R-1483 (1962) 5 S., 3 Fig.) CEA-tr-R-1483
Übers.aus: (Medizinskaja radiologija, 6,1(1961) S.68-71, 3 Fig.)

Nous avons élaboré une construction de dispositifs 4
pour la mise et la rechange des gants de boîtes à Fig.:
gants sans dérangement d'étanchéité du box, compte 4
tenu de l'expérience pratique dans les laboratoires radiochimiques à l'étranger. Le processus de rechange des gants de boîtes à gants et la construction de l'anneau principal sont montrés sur la figure 2. La bague métallique de serrage est montrée sur la figure 3.

(4) NSA-1961-18173 RL

Corpel, J., Vie, R. 1170
L'Analyse au département du plutonium:
I. Laboratoire α-γ de l'Atelier-Pilote de Marcoule
II. Laboratoire α-γ (C.E.N.-F.A.R.-Radiochimie)
III. Laboratoire de spectrographie d'émission de plutonium (C.E.N.-F.A.R.)
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.44-49, 5 Fig.)

Tous ces laboratoires sont construits selon la tech- 2
nique des laboratoires chauds. Ils sont équipés de 4
boîtes à gants pour le travail sur le plutonium ou Fig.:
de chaînes αγ pour le travail sur les combustibles 4
irradiés. Ces chaînes αγ sont constituées par des cellules étanches entourées de protection de fonte ou de plomb à travers lesquelles passent les appareils de manipulation. Les cellules d'analyse sont en lucoflex et la cellule-sas en acier inoxydable; des panneaux en plexiglas permettent, sur l'avant,

(5) Forts. RL

Corpel, J., Vie, R. 1170
L'Analyse au département du plutonium:
I. Laboratoire α-γ de l'Atelier-Pilote de Marcoule
II. Laboratoire α-γ (C.E.N.-F.A.R.-Radiochimie)
III. Laboratoire de spectrographie d'émission de plutonium (C.E.N.-F.A.R.)
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.44-49, 5 Fig.) Forts.

l'éclairage et la vision, sur l'arrière, cinq 2
ronds de gant et un rond de diamètre 400 mm 4
sont destinés aux interventions manuelles et Fig.:
aux mouvements de matériel. Les manipulateurs sont 4
des Hobson modèle 7. La vision est assurée par des hublots de verre de densités 6,2 et 3,3.

(5) RL

Baillie, M.G., Cairns, R.C. 1171
Development of a Ten-Stage Mixer-Settler for U 235 Solutions. P.2
(AAEC/E-56 (1960) 15 S., 6 Fig., 8 Tab.)

This report deals with the experimental work AAEC/E-56
which was carried out using the ten-stage
mixer-settler on the basis of the previous 4
work. The hydrodynamic properties of the mixer- Fig.:
settler unit have been investigated and a method 4
for interface control has been found. Actual extraction runs under flowsheet conditions are reported and the mixer-settler efficiency determined. Probes for detecting the interface have also been developed.

(5) RL

[illegible]edy, R.A., Salzano, G.H. 1172
Project CGC-830. Plant Modifications for Reprocessing Non-Production Reactor Fuels. Design Criteria for the Mechanical Processing Cell
(HW-62847 (1960) 21 S., 2 Fig.)

The mechanical cell will be located in Cell 2 HW-62847
of 221-U Building. The cell proper will contain
a saw and a shear for cutting fuel assemblies and 4
special tools will be provided for unusual disas- Fig.:
sembly operations. A manipulator-crane and special 4
conveyors will be used for material handling. Fuel will be carried to and from the mechanical cell by the existing canyon crane. The cell will be partially filled with water to provide cooling for fuel in process and to contain the dust generated by the cutting operations. All operations will be controlled visually through shielding windows. Dissolver debris will be dumped on a table in front of a shielding window for examination.
(5) RL

Kerjean, J. 1173
Réalisation d'une chaîne d'élaboration du plutonium à l'échelle industrielle au centre de Marcoule
(Grison, E., Lord, W.B.H., Fowler, R.D.(ed.): Plutonium 1960 (1961) S.186-91, 3 Fig.)

Après une énumération des principes choisis pour 4
la réalisation, on présente le découpage des Fig.:
opérations de fabrication ainsi qu'une descrip- 4
tion sommaire des boîtes à gants. Enfin, une dernière partie traite des principales difficultés rencontrées qui ont été: l'étanchéité des boîtes à gants, la rupture des creusets en fluorine, et la régulation de l'épuration de l'argon.

(3) RL

Brett, N.H., Harrison, J.D.L., Russell, L.E. 1174
The Production of PuO_2-UO_2 Irradiation Pellets
(Grison, E., Lord, W.B.H., Fowler, R.D.(ed.):
Plutonium 1960 (1961) S.430-48, 16 Fig., 10 Tab.)

The production of dense UO_2 pellets by the route described by Williams et al. involves eight separate operations: The equipment described here was required to perform these eight operations and, in addition, to weigh, measure, and determine the density of the finished pellets. It was installed in the eight gloved boxes illustrated in Figs. 9.1 and 9.2, and an ancillary box was provided as a workshop facility for furnace maintenance and repair. All boxes were connected together as shown in Fig. 9.3 so that powders or pellets could easily follow the operational sequence without the necessity for 'posting' at intermediate stages.

4
Fig.:
4

(5) RL

Sauvagnac, R. 1175
Analyse chimique en milieu radioactif et radiochimie
(Bulletin d'informations scientifiques et techniques, No.58 (1962) S.58-61, 2 Fig.)

Le but à atteindre est la manipulation sans danger de ces solutions radioactives en tenant compte du rayonnement et de la toxicité radioactive des produits étudiés. Une enceinte semi-étanche par 5 cm de plomb nous permet de manipuler plusieurs curies (≃10) de produits de fission refroidis un an, s'ils sont répartis à l'intérieur des 5 mètres d'enceinte. La forte ventilation du laboratoire lui-même (15 renouvellements horaires) et l'utilisation de hottes ventilées nous permet de manipuler une certaine quantité de radioéléments même de grande toxicité, tel que le strontium 90 (voir "Manipulation sans danger des radioisotopes" A.I.E.A.).

4
Fig.:
4

(3) RL

Chikalla, T.D. 1176
Studies on the Oxides of Plutonium
(Grison, E., Lord, W.B.H., Fowler, R.D.(ed.):
Plutonium 1960 (1961) S.455-85, 34 Fig., 5 Tab.)

The present equipment is housed in two full-air-flow glove boxes (Fig.9.23) and contains the normal powder processing equipment. A molybdenum-wound tube furnace is flanged to a stainless steel panel which serves as one end of the hood. The furnace and controls can be seen in greater detail in Fig. 9.24. The furnace may be fully programmed, utilizing various inert and reducing atmospheres, to temperatures on the order of 1700°C.

4
Fig.:
4

(3) RL

Horton, C.T., Ward, B.J. 1177
Rolling and Mechanical Testing of Plutonium
(Grison, E., Lord, W.B.H., Fowler, R.D.(ed.):
Plutonium 1960 (1961) S.499-512, 9 Fig., 2 Tab.)

Experiments on the rolling of pure plutonium are described, and the problem of distortion of the sheet during cooling is discussed. The rolling mill used for this work was a small Stanat Mann experimental mill housed in a glove box. The details of layout, and operation of the mill, as adapted for plutonium work, have been described elsewhere and only points of particular relevance to the present work need be mentioned here. Tensile tests were made using a Hounsfield Tensometer universal testing machine adapted for glove box work. A small resistance furnace split horizontally for ease of specimen mounting was used for heating the specimens.

4
Fig.:
4

(4) Forts. RL

Horton, C.T., Ward, B.J. 1177
Rolling and Mechanical Testing of Plutonium Forts.
(Grison, E., Lord, W.B.H., Fowler, R.D.(ed.):
Plutonium 1960 (1961) S.499-512, 9 Fig., 2 Tab.)

Hot hardness measurements were made in vacuum on small as-cast plutonium block specimens with the test surface prepared by machining and polishing. The hot hardness testing unit which was used in conjunction with a standard Wolpert Diatester hardness machine, is based on designs by Bens with several modifications.

4
Fig.:
4

(4) RL

MacNeese, W.D., Anderson, J.W. 1179
Plutonium Discs for LAMPRE Critical Assembly
(Grison, E., Lord, W.B.H., Fowler, R.D.(ed.):
Plutonium 1960 (1961) S.570-79, 8 Fig.)

Plutonium feed consisting of as-reduced metal prepared by the Los Alamos Metal Production Plant and recycled metal is cast into an extrusion feed ring in a vacuum furnace. A photograph of this furnace is shown in Fig. 10.86 and drawing in Fig. 10.87. This furnace is a large water-cooled brass can supported from an opening into the bottom of a glove enclosure. Except for the inconvenience of working in a gloved enclosure, plutonium is machined in the same way as other materials. A commercially available lathe was modified for enclosing and sealing into a glove box as shown in Fig. 10.88. Since plutonium is pyrophoric, a partially inert (30 per cent helium) atmosphere is provided inside the machining box. Carbide tools are used to give a maximum tool life.

4
Fig.:
4

(4) RL

Glove-Box Valve 1180
(Nuclear Engineering, 7, No.75 (1962) S.336, 1 Fig.)

Illustrated are the parts of a non-return valve developed by AERE, Harwell, for service in the exhaust side of glove boxes which are maintained at a reduced pressure by and air ejector, to prevent pressurization of the box in case of obstruction in the ejector system. The valve itself consists of a five-port moulding supporting a thin membrane which acts as a flap valve and permits passage of air in one direction only.

4
Fig.:
4

(3) RL

"Over-the-Wall", "Through-the-Wall", "Remotely Controlled" Manipulators 1181
(Nuclear Engineering, 7, No.73 (1962) S.228-37, 29 Fig., 3 Tab.)

Early development work in the field of large-cell manipulators emanated from the Argonne National Laboratory where a number of manipulators were devised. The first in the modern line with pivoted shoulder and full wrist and grip movement was the Model 4 from which the present Model 7 over-the-wall manipulators are direct descendants. The other major ANL introduction has been the Model 8 through-the-wall manipulator, which needs no second horizontal linkage and only a short vertical extension above the master arm and none above the slave arm. Two forms of the through-the-wall type are currently in use.

4
Fig.:
4

(3) Forts. RL

"Over-the-Wall", "Through-the-Wall", "Remotely Controlled" Manipulators 1181 Forts.
(Nuclear Engineering, 7, No.73 (1962) S.228-37, 29 Fig., 3 Tab.)

A medium weight version, designed for loads up to a normal man's comfortable single-handed capability appeared first, but is has been found that two-handed operation is difficult to avoid (and hence the equivalent of two-handed loads) so a strengthened version has been developed which one can expect eventually to supersede the standard model. 4 Fig.: 4

(3) RL

Combined Welder Cutter 1182
(Nuclear Engineering, 7, No.73 (1962) S.237-38, 1 Fig.)

A combination seal welding and cutting machine for remote welding and/or serving components in a reactor is manufactured by Cayuga Machine and Fabricating Co. Inc., Depew, New York. The particular unit shown provides for completely remote operation of all operational phases of the welding and cutting processes from a walk level 17 ft above the welding and cutting areas. Interchanging of heads and selector switching of control circuits converts the machine from one that performs a weld cutting process to a true automatic welding process. 4

(3) RL

Handling Burst Elements 1183
(Nuclear Engineering, 7, No.73 (1962) S.238, 1 Fig.)

Palatine (Surbiton) Ltd., have been engaged in the purpose design and manufacture of equipment for the remote handling and processing of irradiated nuclear fuel elements. At the present time the company is designing and manufacturing equipment for the remote handling and canning of "burst" or defective fuel elements. The accompanying photograph shows a heavy remotely controlled power operated general-purpose manipulator, manufactured by Palatine for use by the U.K.A.E.A. at both Dounreay and Windscale. It will lift a load of 2240 lb from floor level and can exert a force of 3/8 ton in any horizontal direction. 4

(3) RL

Removing Burst Elements 1184
(Nuclear Engineering, 7, No.73 (1962) S.238, 2 Fig.)

A special purpose manipulator for removing radioactive cartridges lodged inside graphite moderated reactors was delivered to the U.K.A.E.A four years ago by the Coventry factory of Whitworth Gloster Aircraft Ltd. The unit operates at depths of up to 60 ft from the top of the concrete biological shield. The complete machine consists of a Marconi camera, grab and light mounted on an actuated boom, which is carried on a sectional retractable post. The headgear houses a T.V. monitor, control unit, position indicating dials, self-winding cable drums and hoist. The post can rotate through 180°, the boom can tilt to 90° and the camera itself can rotate through 240° and tilt up to 130°. 4 Fig.: 4

(3) RL

Douis, M., Valade, J. 1185
Une installation de préparation de radioéléments par effet Szilard-Chalmers
(CEA-2072 (1961) 27 S., 9 Fig.)

L'ensemble de l'appareil se présente sous la forme d'un parallépipède de 8 mètres de long, 1 mètre de large, 2,5 mètres de hauteur. L'armature du bâti métallique est en cornière d'acier de 6 x 6 cm qui divise l'ensemble en 6 compartiments égaux. Le bâti supporte une table en béton de 20 cm d'épaisseur placée à 75 cm de hauteur. On a disposé une protection en plomb autour des 6 faces des cloches en plexiglas de l'appareil. Nous avons mis aux endroits intéressants des hublots en verre de 12 cm d'épaisseur contenant 50 pour cent d'oxyde de plomb, ainsi que des rotules pour le passage des pinces. CEA-2072 4 Fig.: 4

(5) Forts. RL

Douis, M., Valade, J. 1185 Forts.
Une installation de préparation de radioéléments par effet Szilard-Chalmers
(CEA-2072 (1961) 27 S., 9 Fig.)

Aux extrémités, deux portes blindées doublent les ouvertures en plexiglas et permettent l'introduction et la sortie de divers objets. En ce qui concerne la ventilation, chaque cloche est reliée à une grande turbine par l'intermédiaire d'un filtre en papier rose de très grande efficacité. CEA-2072 4 Fig.: 4

(5) RL

Evans, J.H., Venables, J.H. 1186
Remote Metallography in the Metallurgy Division at A.E.R.E.
(AERE-R-4078 (1962) 10 S., 18 Fig.)

Remote metallography has been carried out in the Metallurgy Division at AERE, Harwell by several techniques. This paper outlines the problems involved and how the use made of earlier experiments helped in the design of the present metallography cell. In the cells now in use all equipment has been specially designed for easy breakdown into units small enough to be 'posted' through a standard port. By separating the microscope box from the preparation box it is possible to keep the level of contamination low enough to permit simple maintenance of the microscope. The remainder of this paper describes this suite, together with a second suite subsequently built, and the techniques developed for preparing irradiated specimens. AERE-R-4078 4 Fig.: 4

(5) RL

Nicholson, C.K., Williamson, C.L. 1188
A Vibratory Polisher for Remote Metallography
(DP-764 (1962) 9 S., 8 Fig.)

A vibratory polishing machine, suitable for remote use in a hot cell, was developed by modifying a commercial polisher with parts designed to facilitate remote operation and maintenance. The modified polisher will produce an excellent finish in less than two hours with either the chemical attack or the abrasive polishing technique. Three working models have been in use in a high level cell since December 1960. DP-764 4 Fig.: 4

(5) RL

Granil'ščikov, V.P., Parchomenko, G.M. 1191
The Designing of Laboratories and Radiation Safety
[Russ]
(Medizinskaja radiologija, 5, No.12 (1960) S.47-56,
5 Fig.)

The authors commit to paper data pertinent to the 2
importance of designing of laboratories for work 4
with radioactive substances in the problem of Fig.:
securing radiation safety for research workers. 2
Examples are given of zonal designing in accord- 4
ance with the sanitary requirements.

(5) NSA-1961-13203 RL

Douis, M 1193
Equipment du bâtiment de production des radio-éléments
(Bulletin d'informations scientifiques et techniques, 1961, No.51, S.22-8, 9 Fig.)

Ce bâtiment étant original dans sa conception, une 4
grande partie du matériel utilisé a dû être étudié Fig.:
spécialement (boîte, protection en plomb, convoyeur). 3
L'utilisation de sorbonnes blindées (Junior Cave) 4
dont l'usage au Laboratoire de Haute Activité s'est révélé réellement intéressant, a été maintenue, les plans étant modifiés en fonction des nouvelles installations. Dans les lignes qui suivent, nous donnons quelques détails sur les boîtes étanches, la protection de plomb, les accessoires de manipulation, les sorbonnes blindées et les pupitres de commande.

(3) NSA-1961-29326 RL

Valentin, A. 1194
Saclay Hot Cells Advance Plutonium-Fuel Program
(Nucleonics, 20, No.7 (1962) S.84-5, 9 Fig.)

Hot cells for French plutonium-fuel program 4
stand in row at Saclay. Cells are removable Fig.:
stainless-steel caissons (1.56 x 1.5 x 1.3 4
meters) in cast-iron shielding walls. Front wall, 0.55 meter thick, is made of delicately fitted cast-iron blocks meeting at machined faces. In-cell atmosphere is filtered, purified, dried nitrogen circulating at 50 m^3/hr/cell and kept at pressure 20 mm of water below atmospheric. Manipulator in each cell is capable of seven movements, either continuous or impulsive, with loads up to 3.0 kg in jaws.

(3) RL

Scholz, H. 1195
Pneumatische Förderung und Dosierung radioaktiver Losungen im Labormaßstab
(Kerntechnik, 3 (1961) S.261-63, 4 Fig., 1 Tab.)

Da Dosierpumpen für kleine Flussigkeitsmengen 4
nicht erhältlich bzw. für radioaktive Lösungen Fig.:
ungeeignet sind, wurde eine pneumatische Dosier- 4
pumpe fur den Labormaßstab entwickelt. Der besondere Vorteil der pneumatischen Flüssigkeitsförderung besteht darin, daß im radioaktiven Bereich der Anordnung keine mechanisch bewegten Teile und Schmierprobleme vorhanden sind und damit keine Verunreinigung der zu fördernden Flüssigkeit durch Schmiermittel oder Abrieb auftreten kann. Die Apparatur wird beschrieben.

(3) NSA-1961-24928 RL

Bras manipulateurs pour fortes charges 1196
(La propriété industrielle nucléaire, 1961, No.24, S.12-14, 5 Fig.)

Ces télémanipulateurs, inspirés directement du 4
bras humain, dont ils reproduisent la disposition Fig.:
essentielle (bras, avant-bras, main), possèdent en 4
fait une mécanique qui leur confère des performances nettement supérieures, puisque l'on peut obtenir d'eux: a) Une rotation illimitée de l'ensemble, y compris le coude, autour de l'axe de l'avant-bras; b) Une rotation illimitée de la pince autour de l'axe du bras; c) Une levée du coude de 0° à ± 90°; d) Un serrage de la pince. Ces manipulateurs, animés par des moteurs électriques, hydrauliques ou pneumatiques, télécommandés ou non, existent à l'heure actuelle en trois versions pouvant respectivement fournir à la pince des efforts maximums de 250 kg, 400 kg et 1000 kg.

(3) RL

Jelinek, H.F., Iverson, G.M. 1198
Equipment for Remote Injection Casting of EBR-II Fuel
(Nuclear Science and Engineering, 12 (1962) S.405-11, 5 Fig., 2 Tab.)

Two furnaces were designed and constructed during 4
the development program to determine casting variables Fig.:
and handling techniques. The Model I furnace was used 4
to prove the feasibility of injection casting, while the Model II furnace was a full scale pilot furnace used to cast 16000 pins for EBR-II, Core I. A Model III furnace was designed for remote operation in the Fuel Cycle Facility (FCF) in Idaho.

(4) RL

Carson, N.J., Brak, S.B. 1199
Equipment for the Remote Demolding, Sizing, and Inspection of EBR-II Cast Fuel Pins
(Nuclear Science and Engineering, 12 (1962) S.412-18, 8 Fig.)

A semiautomatic, radiation resistant machine has 4
been developed at Argonne National Laboratory for Fig.:
the remote manufacture and inspection of EBR-II 4
fuel pins from injection castings. Castings are stripped from Vycor molds by a device which breaks the molds. Fuel pins are cut from castings by shearing and are inspected. An air gauge, balance, length comparator, and eddy current probe provide progressive diameter, weight, length, and internal quality signals. These signals are fed into a computer which gives digital indications of diameter, weight, length, volume, and density plus an internal quality trace. The accuracy of diameter, weight, and length measurements is 0.0002 in., 0.1 gm, and 0.01 in. respectively.

(4) RL

Lochanin, G.N., Sinicyn, V.J., Štan', A.S. 1200
Schutzgeräte und ihre Anwendungen für die Arbeit mit radioaktiven Substanzen (Russ.)
Moskva: "Gosatomizdat" 1961. 129 S., 91 Fig., 10 Tab. 1

Dieser Katalog enthält Beschreibungen, Abbildun- 3
gen und Tabellen von Geräten und Einrichtungen, die 4
in der Sowjetunion für Arbeiten mit radioaktiven 5
Substanzen verwendet werden. Die Geräte sind unterteilt in: Behälter, Tresore, Schirme, Abschirmklötze, Karren, Abzüge, Kammern, Distanz-Instrumente und Manipulatoren, medizinische Instrumente, sanitär-hygienische Einrichtung, Laboratoriumsmöbel, Geräte zum Sammeln und Entfernen radioaktiver Abfälle, Sichtfenster, Filtermaterial, Kunststoffmaterial zur Auskleidung der Laboreinrichtungen, Schutzkleidung.

(7) RL

Hazen, W.C. 1201
Remote Control Equipment for Plutonium Metal Production
(LA-1387(Del.)(1951) 224 S., 114 Fig., 2 Tab.)

This report describes the design and construction of remote control equipment for plutonium metal production installed at the Los Alamos Scientific Laboratory. The floor plan of the installation is shown.

LA-1387 (Del.)
2
4
Fig.:
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(5)

RL

Irvine, A.R., Lotts, A.L. 1204
Criteria for the Design of the Thorium Fuel Cycle Development Facility
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

Criteria for the conceptual design of the proposed Thorium Fuel Cycle Development Facility have been established and are presented. In addition, conceptual layouts of the building and equipment are included. The hot-cell structure consists of the Clean Fabrication Cell, the Contaminated Fabrication Cell, the Mechanical Processing Cell, the Chemical Cell, the Decontamination Cell, and the Hot-Equipment Storage Cell. The Glove Maintenance Room and the Airlock are appended to this structure. Each viewing window will consist of a steel liner embedded in the concrete structure of the cell with installed glass shielding of approximately 12 in. total thickness on the radioactive side and zinc bromide solution for the remaining wall thickness.

ORNL-TM-149
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4
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Fig.:
2
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Tab.:
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Forts.

(8) NSA-1962-10103 RL

Irvine, A.R., Lotts, A.L. 1204 Forts.
Criteria for the Design of the Thorium Fuel Cycle Development Facility
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

One pair of CRL Model A master-slave manipulators or one pair of CRL Model D heavy-duty master-slave manipulators respectively will be provided for each viewing window of the various cells. Two 30-ton-capacity overhead traveling cranes are to cover almost the entire third-floor area. All interior spaces in the building will be served by fire protection facilities. The cells will have fire protection system of "metalex" cylinders placed at various locations in the cells.

ORNL-TM-149
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Fig.:
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Tab.:
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(8) NSA-1962-10103

RL

Dalesme, R. 1206
Télémanipulateurs de puissance pour laboratoires de haute activité
(Industries atomiques, 6, No.3-4(1962) S.121-22, 2 Fig.)

Deux séries de télémanipulateurs ont été créées. La série des modèles E et P-600 (brevets et licence CEA) tels, par exemple, les quatre appareils qui équipent les salles de déchargement de G-2 et G-3 de l'usine de Marcoule et la série des modèles TE et TS (EDF-Chinon, Saclay). Tous ces appareils comportent des éléments standards qui, en s'adaptant entre eux, permettent de multiples combinaisons. La diversité des problèmes posés en énergie nucléaire réclamait cette souplesse. Tous ces télémanipulateurs se déplacent en X et Y dans les cellules, au moyen d'un ensemble de translation identique à un petit pont roulant sur le chariot duquel ils sont posés.

4
Fig.:
4

(3) RL

Facchini, A., Terrani, S. 1209
L'impianto di celle caldo del CESNEF
(Energia nucleare, 8 (1961) S.701-6, 3 Fig., 1 Tab.)

Das Innere der Zelle besteht aus einem Blechkasten aus Kohlenstoff-Stahl von 5 mm Dicke, der mit einem Lackanstrich von Amercoat 55 versehen ist und einen einzigen Block mit Kanälen für die verschiedenen Öffnungen bildet (Fenster, mechanische Manipulatoren etc.). Die für die Vorderwand gewählte Geometrie (Gesamtstärke 90 cm - Schirm aus Barytbeton 230 g/cm^3) ermöglicht die Verwendung von Fenstern geringer Dichte (etwa 2,5 - 2,6 g/cm^3). Dabei liegt die Stärke der Fenster bei gleichem Abschirmeffekt innerhalb der Wandstärke; außerdem erzielt man einen beträchtlichen wirtschaftlichen Vorteil gegenüber der Verwendung von Fenstern hoher Dichte. Die schon fertiggestellte Zelle ist mit zwei "Savage and Parsons" Modellen SP.8 versehen. Es können damit Lasten bis zu 9 kg gehoben werden.

3
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Fig.:
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Tab.:
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(5) NSA-1962-4260 RL

Lochanin, G.N., Siničyn, V.I. 1210
New General-Purpose Enclosure for Handling Alpha, Beta, and Gamma Emitters
(Atomnaja Energija, 10 (1961) S.420-21)
Engl.Übers.s.:(Soviet Journal of Atomic Energy, 10 (1962) S.414-15, 2 Fig.)

A new general-purpose glove box has been developed by Soviet industry to facilitate handling of alpha-, beta- and gamma-active materials. The general-purpose box consists of a single-operator box type 1-KNZh, and a biologically shielded type KSh junior cave (ball-joint manipulator box), with the two joined by a transfer chamber. Both enclosures are equipped with exhaust and inlet filters and with water pressure gages.

4

(4) RL

Ignat'ev, O.M. 1211
The M-2 Manipulator
(Atomnaja Energija, 10 (1960) S.421-22)
Engl.Übers.s.:(Soviet Journal of Atomic Energy, 10 (1962) S.416-17, 2 Fig.)

The M-2 manipulator is designed to perform manipulative operations with encapsulated radioactive gamma emitters in loading, transfer, and maintenance of containers, both under laboratory and field conditions. The manipulator described below may be employed in radiography laboratories, and other workplaces where encapsulated gamma emitters are being used. The M-2 manipulator consists of two basic components (see Fig.1 and Fig.2); grip handles with actuating trigger and a jaw gripping device.

4

(3) RL

Laskorin, B.N., Yakubovich, I.A., Zuev, G.P., Krasov, V.G., Smirnov, V.F., Pivovarov, V.E. 1214
The Mix-Settle Apparatus for Extraction of Uranium and Rare Metals from Aqueous Solutions [Russ.]
(Atomnaja Energija, 12 (1962) S.503-14, 7 Fig.)

Dans le présent exposé on étudie les tendances de développement actuel des extracteurs du type mélangeur-décanteur. On décrit les processus d'extraction à l'aide de ces appareils, la construction et les essais des mélangeurs-décanteurs à bac et à réacteur avec brassage mécanique ou par air, appareils qui ont reçu un large développement.

4
Fig.:
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Tab.:
4

(8) RL

Garber, H.J., Puechl, K.H. 1215
Project and Facility Administration
(NUMEC-P-30: Development of Plutonium Bearing Fuel Materials. Progress Report for Period April 1 through June 30, 1960 (1960) S.3-5, 3 Fig.)

The major effort has been directed towards assembly of glove boxes and installation and checking out of equipment. Fourteen glove boxes are now installed and connected to the ventilation system. As examples, Fig. 1.2 shows the furnaces and controls for the "drying-calcining-reduction" box. Testing of the ventilation system has demonstrated a need for further working of the plant absolute filter housings to achieve absolute tightness.

NUMEC-P-30
3
4
Fig.:
4

(6) RL

Halteman, E.K., Jones, L.J., Horgos, R.M., Mc Geary, R.K. 1216
Fabrication and Evaluation of Fuel Shapes
(NUMEC-P-30: Development of Plutonium Bearing Fuel Materials. Progress Report for Period April 1 through June 30, 1960 (1960) S.31-33)

All equipment in the powder preparation and hand pressing box has been installed. Included in this box are: Hobart planetary mixer, vacuum drying oven for binder carrier evaporation, set of stainless steel screens for hand granulation, torsion balance for weighing the charges etc. The design of a special glove box for enclosing the F-4 Stokes Press has been completed. A 41 x 41 x 30 inch Plexiglass box will be fastened to a 3/8 inch thick stainless-steel support plate which in turn is fastened to the floor. The design of three autoclaves for glove box installation has been completed.

NUMEC-P-30
4

(7) RL

Peishel, F.L., Hutto, E.L. 1217
Modification of Allied Engineering Corporation Manipulator Tong
(ORNL-TM-37 (1961) 5 S., 3 Fig.)

A manipulator tong manufactured by the Allied Engineering and Production Corporation of Alameda, California, was modified to include an alpha seal at the slave end. This arrangement is used in conjunction with Castle manipulators in a lead-shielded glove box to obtain protection from both gamma and alpha radiation.

ORNL-TM-37
4
Fig.:
4

(5) NSA-1962-1883 RL

Amaev, A.D., Lebedev, L.M. 1218
Testing Machines for Investigating the Mechanical Properties of Irradiated Materials
(NSF-62-35(5)(1960) 12 S., 7 Fig.)
(Transl. from a Publ. of the Order of Lenin Institute of Atomic Energy Academy of Sciences, USSR, Moscow 1960)

The article presents a brief description and technical characteristics of a tension testing machine for testing small specimens at high temperatures, an universal testing machine with remote control and an instrument for measuring the surface hardness by a diamond pyramid or steel ball. The machines are operated in a "hot" metallurgical laboratory and serve for investigation of mechanical properties of the irradiated materials.

NSF-62-35(5)
4
Fig.:
4

(5) NSA-1962-10263 RL

Charles, J.R. 1220
Hot-Cell Gripping Tool and Fuel-Element-Disconnect Tests
(NAA-SR-MEMO-6630 (1961) 18 S., 11 Fig.)

The gripping tool is one of the remotely operated tools provided in the HNPF maintenance cell. It will handle reactor core components such as fuel elements, control rods and fuel canisters (containers in which new and spent fuel are shipped). A tool-positioning slide in the maintenance cell will be used for supporting, elevating, lowering and positioning tools and/or components to be maintained. The slide is mounted on one of two vertical track- and drive assemblies. The gripping tool will be attached to this tool-positioning slide. It will be pneumatically operated (open-closed) remotely by gas pressure (nitrogen).

NAA-SR-MEMO-6630
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Fig.:
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(4) NSA-1962-4321 RL

Zambernard, M. 1223
Box and Equipment Installation
(NUMEC-P-101: Development of Plutonium-Bearing Fuel Materials. Progress Report for Period April 1 through June 30, 1962 (1962) S.33)

Installation of the centerless grinder box and associated equipment has been completed, and the box is currently undergoing leak testing. A Sheffield air gauge has been installed with this equipment to measure ground pellets and to automatically correct for belt wear. A swager box feed mechanism has been built and is currently undergoing initial testing. The swager proper has been installed in a glove, and final outfitting of the system is under way.

NUMEC-P-101
4

(4) RL

Moulthrop, H.A. 1224
Development of Gamma and Neutron Radiation Data for Three Alternate Design Concepts for the Plutonium Reclamation Facility, Project CAC-880
(HW-68023 (1961) 58 S., zahlr. Tab.)

Effect of gamma and neutron radiation is calculated for a Plutonium Reclamation Facility being scoped under Project CAC-880. Shielding required to give a dose around the equipment of approximately 2 mrem/hour for each of three design alternates is as follows: 1. Equipment hood with both tanks and piping valves, etc., in a common hood - one inch of lead and six inches of plexiglass. 2. Piping hood and cell with tanks and piping separated - twenty-four inches of concrete for the cell wall and one inch of lead on the hood. 3. Hermetically sealed equipment with glove boxes eliminated - one inch of lead and one foot of water

HW-68023
4

(4) NSA-1961-28697 Forts. RL

Moulthrop, H.A. 1224 Forts.
Development of Gamma and Neutron Radiation Data for Three Alternate Design Concepts for the Plutonium Reclamation Facility, Project CAC-880
(HW-68023 (1961) 58 S., zahlr. Tab.)

on the tanks and 1/4 inch of lead on the piping. With 1/2 inch of lead on the hermetically sealed equipment, the working area dose rates are lowered to below 1,0 mrem/hour.

HW-68023
4

(4) NSA-1961-28697

Bruns, L.E. 1225
Technical Specifications for Solvent Extraction Columns in the New Plutonium Reclamation Facility -- CAC - 880
(HW-66864 (Rev.)(1961) 6 S.)

The process specifications for the solvent extraction columns are presented for detailed design. This document summarizes the initial rough draft report, plus major and detailed changes initiated since the issuance of the rough draft. Major changes are replacement of the CA and CC column piston pulsers with air pulsers and use of HF as the stripping agent in a plastic organic wash column, instead of a ferrous sulfamate strip in a stainless steel column.

HW-66864 (Rev.)
4

(4) NSA-1961-27713 RL

Horgos, R.M. 1226
Hot Laboratory Equipment Fabrication
(NUMEC-P-101: Development of Plutonium-Bearing Fuel Materials. Progress Report for Period April 1 through June 30, 1962 (1962) S.34-36)

Decontamination of the interior of the steel cell for the metallographic facility has been continued with little success. Sources of high beta-gamma activity have apparently been firmly deposited in the pores of the steel walls. Further attempts will be made to lower the activity before attempting modification of the cell interior to allow acceptance of the alpha enclosure. This alpha enclosure has been fabricated, and the associated radiation-resistant windows have been obtained. Construction and assembly of the alpha boxes for the hot cell is continuing. A prototype hydraulic lifting mechanism to allow positioning of the alpha box within the hot cells has been constructed and satisfactorily tested. (4) RL

NUMEC-P-101
4

Rey, G. 1227
Plutonium Oxalate Disk Filter and Filter Media Studies
(HW-62091(Del.)(1959) 27 S., 13 Fig., 2 Tab.)

Studies were conducted in the 321 Building on a disk type filter which could be adapted for simple and quick (one-nut) replacement of the filter medium. In addition to the tests required to demonstrate the basic operability of the disk type filter, tests were made on several types of filter media. This media tested included rigid porous materials (e.g. porous alumina plate) which could be used only on the disk filter, and various types of filter cloths which could be used with either the disk or the present drum type filter.

HW-62091(Del.)
4
Fig.: 4
Tab.: 4

(4) NSA-1961-36788 RL

Moulthrop, H.A. 1228
An Efficient Method for Radiation and Ventilation Control of Contamination Enclosures. Process Technology Information Report
(HW-53004(Del.)(1957) 13 S., 3 Fig.)

The past and current design philosophy of making process equipment enclosures for "contact" radiation processes as small as possible has resulted in several notable adventages. These include greater potential for localized shielding, simplified contact maintenance and increased adaptability of the equipment to remote operation. This development stage of building small equipment within compactly filled hoods can thus be regarded as an essential step in involving an optimum facility.

HW-53004 (Del.)
3
4
Fig.: 3

(5) NSA-1961-29308 Forts. RL

Moulthrop, H.A. 1228 Forts.
An Efficient Method for Radiation and Ventilation Control of Contamination Enclosures. Process Technology Information Report
(HW-53004(Del.)(1957) 13 S., 3 Fig.)

It is proposed as an alternate for the present "high-density" equipment layouts within a relatively large and shielded hood that consideration be given to the design philosophy based on small "high-density", well shielded equipment units within a spacious, "low-density", easily accessible, unshielded contamination enclosure. Double filtration under present design philosophy is provided to insure against the escape of radioactive contaminants during periods in which one set of the filters is being changed.

HW-53004 (Del.)
3
4
Fig.: 3

(5) NSA-1961-29308 RL

Engle, G.B. 1229
Drying of Glove Box Atmospheres
(GAMD-1931 (1960) 3 S., 1 Fig., 1 Tab.)

This report gives the results of work to obtain and maintain dry argon atmospheres and produces for operating dry boxes equipped with the drying system. Filling the boxes through a silica gel tower and a commercial "Electrodryer" and subsequently circulating the argon from the boxes through the same towers in a closed circuit provides a satisfactory atmosphere to store and handle $(Th,U)C_2$ powder.

GAMD-1931
4
Fig.: 4

(4) NSA-1962-5432 RL

Klima, B.B. 1230
TrU Facility - Alpha Box Accessories - Manipulator Operable Spherical Joint Clamp
(CF-61-3-129 (Rev.1) (1961) 4 S., 1 Fig.)

The alpha-tight facility consists essentially of an alpha-tight box with glass equipment mounted on the rear wall of the box. Connections to the glass equipment and to the process lines must be made up and disconnected using one Model 8 Heavy-Duty manipulator. A special clamp has been designed and developed which is manipulator operable and which will clamp a standard spherical (glass) joint. This version of the clamp can be preadjusted to securely lock on the joint, owing to the incorporation of an adjustable seat for the overcenter clamp.

CF-61-3-129 (Rev.1)
4
Fig.: 4

(4) NSA-1961-30787 RL

Schmets, J. 1231
The Reprocessing of Irradiated Fuels. Progress Report No.1, 2nd Quarter 1960
(EURAEC-23 (1960) 95 S., zahlr. Fig. u. Tab.)

The laboratory which has been set aside for examination of the chemical and physical properties of volatile and nonvolatile fluorides of U and Pu is 5,25 x 3,60 metres and is provided with two special doors. In the laboratory are installed three boxes, it has a ventilation of about 15 changes of volume per hour. In the glove-boxes are placed the thermogravimetric apparatus and two other apparatuses. A third box contains a Mettler analytic balance. For the glove-boxes a ventilation of 10 - 12 changes of volume per hour has been allowed for with a depression of about 20 mm.

EURAEC-23
4
Fig.: 4

(4) NSA-1962-14815 RL

Morand, R.F., Gehring, R.R. 1232
Remote Handling. Comprehensive Technical Report, General Electric Direct-Air-Cycle, Aircraft Nuclear Propulsion Program
(APEX-911 (1961) 68 S., 48 Fig.)

Direct viewing through a shielded window is the most widely used method for visual control of remotely controlled devices in a hot cell. However, certain conditions arise in which better visibility is required than direct viewing provides. Studies of closed-circuit television, periscopes, mirrors, shielded windows are discussed. An important part of the remote handling effort was the work done in developing power tool and torque wrench techniques. At first, standard commercial wrenches were modified for remote use. Later, special torque control wrenches were developed for specific power plant use. Furthermore manipulator-development, remote handling vehicles, and Hot Laboratory Accessories are discussed.

APEX-911
3
4
Fig.: 4

(6) NSA-1962-7624 RL

Garden, N.B. (ed.) 1233
Report on Glove Boxes and Containment Enclosures
(TID-16020 (1962)II, 142 S., zahlr.Fig. u. Tab.)

This report has been prepared by an ad hoc Committee, established by memorandum from the General Manager dated August 27, 1959, for the purpose of establishing guide lines for the design of efficient, safe, and economical glove boxes. Comprehensive discussions of glove box materials and components, safety and fire prevention methods, health physics problems, operational considerations, and brief descriptions of AEC installations, are included.

TID-16020
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Tab.: 3
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(5) RL

Sear, R., Webb, E., Ellis, C.B. 1234
A Holder for Radiochemical Centre Standard Ampoules
(Physics in Medicine and Biology, 6 (1961/62) S.453-55, 1 Fig.)

A holder is described for Radiochemical Centre standard 10 ml ampoules which provides for safe extraction of the radioactive liquid contents by means of a syringe. The design is based to some extent upon that of a similar device already described in this journal, but incorporates several modifications and improvements. The purpose of this equipment is primarily to provide a standard device for use whenever radioactive liquid is to be extracted from an R.C.C. ampoule by syringe, so that there is no hazard from contamination by any spray of liquid from the ampoule.

4
Fig.: 4

(5) NSA-1962-7645

Vogel, G.J. 1236
Plutonium-Handling Facility
(ANL-6543: Chemical Engineering Division, Summary Report, Jan.-March 1962 (1962) S.145-47, 1 Fig.)

The facility consists of 2 alpha-contaminated boxes in which equipment will be installed initially to study variables in the fluorination of uranium-plutonium dioxide pellets. Although the process is to be remotely monitored and controlled, the alpha boxes are to be equipped with glass windows and gloves to allow direct manipulations as required. The larger of the two boxes is 17 1/2 ft high, 27 ft long and 3 1/2 ft wide; the smaller is 10 ft high, 13 ft long and 3 1/2 ft wide. The larger box will contain the equipment that regularly handles plutonium and will be located inside an enclosed cell that will be held at a negative pressure relative to the operating area.

ANL-6543
4
Fig.: 4

(4) RL

Aronin, L.R. 1237
Plutonium and its Alloys.4-2.3 Facilities for Handling Plutonium
(Kaufmann, A.R.(ed.): Nuclear Reactor Fuel Elements. New York: Interscience Publ. 1962. S.92-145, 33 Fig., 13 Tab.)

Buildings may be zoned into cold or hot areas to control spread of contamination. Building heating and ventilation should be designed to minimize the spread of air-borne particles within the structure. Primarily, work on plutonium at all sites is carried out with equipment in suitable glove-box systems. Glove boxes can be of the free-standing or isolated type, or they can be interconnected in trains. Good design requires that interior surfaces have smooth contours to facilitate cleanliness and that the physical dimensions and the arrangement of glove ports be such that all portions of the interior can be reached. Boxes are connected to a filtered exhaust system and maintained at a negative pressure of 1/2 - 1 in. H_2O, which assures that any leakage will be into the glove box. (4) RL

3
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Fig.: 4

Foskett, A.C. 1239
Techniques for Handling Radioactive Materials A Bibliography
(AERE-BIB-122 (1959) 34 S.)

Die Bibliographie enthält 187 Literaturstellen über Laboratorien im Allgemeinen, Arbeitskästen, Ausrüstungen, Pipetten, Fernbedienung, Manipulatoren, Sehvorrichtungen usw.

AERE-BIB-122
1
3
4

(6) RL

Foskett, A.C., Randall, C.H. 1240
Techniques for Handling Radioactive Materials. A Bibliography
(AERE-BIB-122(Suppl.1)(1962) 30 S.)

126 references of the following sections are given: Laboratories, glove boxes, equipment, remote handling, manipulators, remote control, remote viewing etc.

AERE-BIB-122 (Suppl.1)
1
3
4

(7) RL

Murray, F. 1241
Chalk River Describes its Universal Cells
(AECL-1436 (o.J., nach 1957) 1 Faltbl., 4 Fig.)
(Canadian Nuclear Technology, 1, No.3 (o.J., nach 1957) S.30-34, 4 Fig.)

The Operations Division of Atomic Energy of Canada Ltd. operates two universal cells at Chalk River. It is now constructing a third. Cell 3 will have two operating positions side by side in the front face. Glass windows will be cold loaded and tilted downward slightly to give better coveridge. New heavy-duty manipulators have been ordered. A one-ton bridge crane in the new cell will be electrically driven since air-operated hoists in Cells 1 and 2 tended to spread oil films over the interior. The interior will be finished with stainless-steel-clad mild-steel plate to a height just above the windows.

AECL-1436
4
Fig.: 4

(4) Forts. RL

Murray, F. 1241 Forts.
Chalk River Describes its Universal Cells
(AECL-1436 (o.J., nach 1957) 1 Faltbl., 4 Fig.)
(Canadian Nuclear Technology, 1, No.3 (o.J., nach 1957) S.30-34, 4 Fig.)

Above will be painted mild steel. A similar, but smaller, ventilation system will be installed to link up with that now servicing the two original cells. This will assure some ventilation to all three cells in the event of a breakdown to one system.

AECL-1436
4
Fig.:
4

(4) RL

Hobson, H.M., Limited, Wolverhampton, England 1242
The Hobson Master/Slave Manipulator, Model 7. Operating Instructions
Wolverhampton, England: Hobson o.J. [um 1961]. 32 Bl., 16 Fig.

The comparatively simple design and robust construction of this lightweight mechanically operated manipulator is such that little attention, apart from routine adjustments, should be required throughout its considerable life. In view of its versatility, however, installations may vary in accordance with individual requirements and, for this reason, the information set out in this Manual embraces those operations which, in the light of experience gained in connection with the main installations at present in use, may be encountered. Installation instructions are described.

4
Fig.:
4

(3) RL

Griffiths, V. 1243
Some Safety Considerations in Relation to Glove Box Design
(AHSB(S)R 18 (1962) 27, V S., 5 Tab.)

Glove boxes are used widely for handling radioactive materials. Failure of a glove box can lead to serious spread of contamination. This report examines the means of reducing the risk of fire, explosion and other occurrences leading to rupture of the box containment. Comments on methods of fire extinguishing and on other aspects of safety in glove boxes are included.

AHSB(S)R 18
4
5
Tab.:
4

(5) RL

Sheridan, W., Strasser, A., Anderson, J., Taylor, K. 1246
Carbide Fuel Development. Phase III Report, Period of Sept. 15, 1960 to Sept. 15, 1961
(NDA-2162-5 (1961) VII, 61 S., 24 Fig., 12 Tab.)

The post-irradiation examination of the irradiated UC-PuC specimens will be conducted in a new facility consisting of boxes installed in the existing shielded cave structure at the United Nuclear Hot Laboratory. The boxes will be leaktight, made of fireproof materials, and operate at a negative pressure. Two boxes will perform all the post-irradiation examination operations. A plastic bellows will connect the two boxes and permit the transfer of material between them.

NDA-2162-5
4
Fig.:
4

(7) RL

Constant, R., Mekers, J. 1249
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Ce rapport a pour objet d'établir les règles de sécurité adoptées dans le service, dans le but de protéger le personnel contre le double danger de contamination et l'irradiation. Les laboratoires occupés par la section des radioisotopes sont situés dans deux bâtiments principaux. Cet ensemble peut être divisé en trois parties bien distinctes: zone froide, zone tiède, zone chaude. Deux sorties de secours sont prevues. L'installation du conditionnement d'air de l'aile droite du BRI est localisée dans la partie supérieure de l'aile isotopes. Un tableau reprenant la disposition des extincteurs dans l'aile est affiché à l'entrée des laboratoires.

BLG-68
2
3
4
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Fig.:
2
3
4
Tab.:
3
4

(8) Forts. RL

Constant, R., Mekers, J. 1249 Forts.
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Les enceintes de travail employées dans la section pour la manipulation des produits radioactifs sont de trois types principaux: 1) Enceinte de manipulation pour émetteurs β^-; 2) Boîte gantée pour émetteurs β^- et β^--γ à faible activité; 3) Cellule de manipulation pour émetteurs β^--γ à forte activité.

BLG-68
2
3
4
5
Fig.:
2
3
4
Tab.:
3
4

(8) RL

Garber, H.J., Halteman, E.K., Jones, L.J., McGeary, R.K. 1250
Project and Facility Administration
(NUMEC-P-10: Development of Plutonium Bearing Fuel Materials. Progress Report for Period July 1 through Dec. 31, 1959 (1960) S.1-13, 8 Fig., 1 Tab.)

The Cell block, with external dimensions of 24 feet by 12 feet by 13 feet height is surrounded on three sides by a clean control room 38 feet by 15 feet and on the fourth side by a high bag hot-handling area 38 feet by 30 feet. The Cell block consists of three sub-cells of 6 feet by 6 feet floor area by 12 feet maximum working height. Cell walls of three foot thick high density magnetite aggregate concrete (230 lb/ft^3) are calculated to shield 90,000 curies of fission product activity to 1.5 mr/hr at the cell operating faces. Furthermore Glove Box Design and Installation are discussed.

NUMEC-P-10
4
Fig.:
2
4

(7) RL

Garber, H.J., Atkins, R.J., Puechl, K.H. 1251
Project and Facility Administration
(NUMEC-P-40: Development of Plutonium Bearing Fuel Materials. Progress Report for Period July 1 - Sept. 30, 1960 (1961) S.5-7, 1 Fig.)

Twenty-two boxes are connected to the box ventilation system and transport tunnel. The emphasis is now centered on installation of equipment set-ups and checkout of operations with inert materials prior to final sealing the boxes. With the redesigned facility ventilation system, no unfiltered air will be released from the facility.

NUMEC-P-40
3
4
Fig.:
4

(7) RL

Biancheria, A., Branovich, L., Halteman, E., Koeneman, J., Caldwell, C.S., Goodman, J., Karchnak, F., Menis, O. 1258

Preparation and Characterization of Fuel Materials

(NUMEC-P-40: Development of Plutonium Bearing Fuel Materials. Progress Report July 1 - Sept. 30, 1960 (1961) S.8-29, 10 Fig., 8 Tab.)

The three glove boxes assigned to analytical chemistry are being compartmentalized on a functional basis to assure minimum interference between operations and reduced cross contamination. One glove box is designated for dissolution, evaporation, drying and ion exchange work. The second box will be devoted to weighing, both micro and macro amounts, and to various electrochemical methods and extraction with organic solvents. The third box is designated to handle only minimum alpha activity. Associated with this box is a satellite box housing the spark and arc stand of the spectrograph.

NUMEC-P-40
4
Fig.: 4

(11) RL

Makens, R.F., Bush, D. 1253

A Laboratory Unit for Teaching Nuclear Fuel Processing

(AED-Conf.1960-077-19) 8 S., 9 Fig., 4 Tab.)

The universities and colleges have shown an increasing interest in fuels technology training. The development of a few laboratory experiments covering this aspect of nuclear engineering makes the fuels technology course content more teachable and more meaningful to the student. A sixteen counter-current mixer settler was assembled from readily available parts at a cost of about $2500. The unit is described and shown in Fig.1. and 2.

AED-Conf. 1960-077-19
4/6
Fig.: 4

(6) RL

The Analytical Laboratory 1254

(Eurochemic, News Bulletin, No.8 (Nov.1962) S.4-9, 3 Fig.)

The Laboratory Design distinguishes five main sections: 1) a transfer and storage laboratory, 2) a high-activity laboratory with shielded glove-boxes, 3) a high-activity laboratory with unshielded glove-boxes, 4) a low-activity laboratory, 5) an alpha laboratory. A design feature of laboratories 1, 2 and 3 will be the in-line installation of the 26 glove-boxes. An electrically-operated conveyor system running the length of the row will be used to transport samples from the transfer and storage laboratory to the shielded and unshielded boxes on its left and right respectively. The two high-activity laboratories will be separated from the low-activity and alpha laboratories by a corridor which will provide access to all these laboratories.

2
4
Fig.: 2

(4) RL

Moss, G. 1255

A Simple Device for the Rapid Routine Liberation and Trapping of $C^{14}O_2$ for Scintillation Counting

(International Journal of Applied Radiation and Isotopes, 2 (1961) S.47-48, 1 Fig.)

The simple and inexpensive device described has been successfully utilized for the routine (lots of 40-50) analyses of C^{14} in the form of $C^{14}O_3^{2-}$. Results are accurate and reproducible. The units are completely interchangeable, and there is no need for individual calibration. There was no demonstrable difference in the results obtained with aqueous solutions of $C^{14}O_3^{2-}$ when protein was present (plasma).

4
Fig.: 4

(3) RL

Hill, K.M., Parker, H.E. 1256

Safe-By-Shape Chemical Plants

(Criticality Control in Chemical and Metallurgical Plant. Karlsruhe Symposium 1961 (1961) S.209-31, 16 Fig.)

Safe-by-shape chemical plants are plants utilizing unique safety precautions and designed to handle fissile materials arising from reactor and weapons programmes. In processing fissile materials the designer has a choice of five concepts for criticality control: 1. Mass limitation. 2. Concentration limitation. 3. Safe by shape. 4. The addition of nuclear poisons. 5. A combination of (1)-(5). Figures 14, 15 and 12 show views of the highly-active, medium-active and low-active cells, respectively; the lay-out of the units follows the lattice arrangement already described for the dissolver cell.

4/5
Fig.: 2 4

Forts.

(5) NSA-1962-7793 RL

Hill, K.M., Parker, H.E. 1256 Forts.

Safe-By-Shape Chemical Plants

(Criticality Control in Chemical and Metallurgical Plant. Karlsruhe Symposium 1961 (1961) S.209-31, 16 Fig.)

In all the cells some vertical cylindrical tanks are employed: Figure 14 shows how these are arranged to avoid interaction. In the low-active cell 1.5 in. thick slab tanks are utilized, these being placed in such a position as to avoid interaction with the arrays of cylinders and where necessary incorporating nuclear shielding between the tanks.

4/5
Fig.: 2 4

(5) NSA-1962-7793 RL

Ridgeway, C.L. 1257

Remote-Handling Equipment Catalog

(TID-12752 (1961) V, 60 S., 54 Fig.)

This document is a reference catalog of remote-handling equipment at the Idaho Test Station. Each item is illustrated to show shape and primary dimensions. In addition, each illustration includes pertinent facts such as the assembly drawing number, weight, primary materials, and load or load capacity.

TID-12752
1
4
Fig.: 4

(5) NSA-1961-18168 RL

Barton, C.J. 1259

A Review of Glove Box Construction and Experimentation

(ORNL-3070 (1961) 112 S., 11 Fig.)

The literature on construction and operation of glove boxes for work with toxic inorganic materials not requiring biological shielding is reviewed as a contribution to this re-examination, with special emphasis on methods and equipment for working safely with plutonium and other α-active materials. Methods for the detection and measurement of α-active materials and of impurities in controlled atmospheres, window materials, protective coatings, glove materials and design, filters and scrubbers, exhaust systems, laboratory design, etc. are discussed.

ORNL-3070
1
3
4/5
Fig.: 4

(7) NSA-1961-22394 RL

Bingham, C.D., Janeves, D. 1261
Development of an Inexpensive, Remote Sample-Transfer Device
(NAA-SR-MEMO-5834 (1960) 5 S., 2 Fig.)

The device was fabricated from components in stock or readily available from commercial suppliers. The basic components are: a transfer tube, a sample carriage, a mechanical link, a power source. The total cost was less than $80.00. The transfer tube, commonly referred to as "elefant trunk" connects the area through which the sample is to move. The sample carriage is driven through the transfer tube by the mechanical link. The device permits completely remote in-cell movement of intensely radioactive samples over distances as great as 16 feet with no exposure to personnel. The design is such that remote maintenance could be incorporated if necessary. It could find application in the numerous glove-box, junior cave or hot-cell operations within the company.

NAA-SR-MEMO-5834
4
6
Fig.:
2
4

(6) NSA-1961-19491 RL

Watcher, J. 1262
Final Safety Analysis Report of American Processing to be Performed by the Martin Company
(MND-P-2347 (1960) XIII, 63 S., 16 Fig., 4 Tab.)

The processing building is a rectangular, one story, windowless structure approximately 52 feet long and 27 feet, 4 inches wide with a ceiling height of 12 feet. A mechanical equipment room will be located in the northeast portion of the building with single entry from the exterior of the building. The processing area will contain the necessary equipment for direct performance of the processing and fabrication operations. These will include dry boxes, press, furnace, welding and decontamination equipment, and laboratory and mechanical work benches.

MND-P-2347
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3
4
Fig.:
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4
5

(6) Forts. RL

Watcher, J. 1262 Forts.
Final Safety Analysis Report of American Processing to be Performed by the Martin Company
(MND-P-2347 (1960) XIII, 63 S., 16 Fig., 4 Tab.)

The total processing system is enclosed in a series of six interconnected dry boxes. The boxes will be relatively airtight to ensure safe handling operations, with the exception of air intake and exhaust ducts. All dry boxes will be interconnected by stainless steel transfer chambers to be utilized for the transfer of equipment into and out of the dry box system.

MND-P-2347
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3
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Fig.:
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(6) RL

Radioactive Materials Laboratory Safety Report, Martin Nuclear Facility, Quehanna Site 1263
(MND-2410 (1960) getr. Zählg., zahlr. Fig. u. Tab.)

The facility consists of five cells. Each of these cells is provided with manipulator ports for the use of Argonne Model 8 Manipulators. The shielding walls of the cells are constructed of ferrophosphorous concrete with a minimum weight of 280 pounds per cubic foot. The radiation shielding windows are of 3,6 density glass and were received as packaged, oil-filled units ready for insertion into previously installed steel frames. Access to the cells is through doors at the rear which open into the isolation rooms. The decontamination room is used mainly for decontaminating portable equipment and materials. The room contains two fume hoods. A radiochemistry laboratory, equipped to handle curie-level quantities of isotopes, opens off the service area. Details are discussed. Fire equipment is installed in and about the building. Automatic fire detectors and sprinkler systems are installed.

MND-2410
2
3
4
5
Fig.:
2
4

(7) NSA-1961-15895 RL

Davidson, J.K., Schafer, A.C., Haas, W.O. 1265
Purex Process Application
(KAPL-1809: Belgian Symposium on Chemical Processing II. Session: Aqueous Reprocessing Application of Mixer-Settlers to the Purex Process (1957) S.24-29, 3 Fig., 3 Tab.)

The pump-mix mixer-settler is discussed in some detail. Experience with pilot-plant pump-mix units in Purex system studies is cited to show that this equipment is reliable, flexible, in operation, and capable of high efficiency.

KAPL-1809
4
Fig.:
4

(6) NSA-1958-4754 RL

Richardson, G.L. 1266
The Design and Operation of Purex Process Pulse Columns
(HW-SA-2083 (1961) 49 S., 14 Fig., 1 Tab.)

The pulse column as used at Hanford consists of a vertical cylinder containing either fixed, spaced, horizontal perforated plates or conventional Rashig ring packing. The plates are assembled in cartridges which can be inserted or removed by either direct or remote methods. A piston or bellows connected to the bottom of the column superimposes a sinusoidal reciprocating motion to the counter-currently flowing liquids in the column. This motion provides intimate mixing of the two phases, the extent depending on the amount of energy supplied.

HW-SA-2083
4
Fig.:
4

(4) NSA-1961-19488 RL

Hammil, K.H., Brown, J.E. 1267
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

The new laboratory is a $960,000 annex to a large radiochemistry building. Three adjoining cells, through which materials can be transferred internally, are the heart of the installation. The largest of the three cells has a depth of 7 feet, a height of 15 feet, and a width of 15 feet. Stainless steel was used to line the cell's walls and floors. Incased in the walls are 4 foot thick viewing windows. These viewing windows, composed of layers of oil between multiple plates of lead-glass, provide the same shielding as the concrete walls. Inserted into the cells above each window are a pair of masterslave manipulators.

HW-SA-1748
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4
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Fig.:
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(8) NSA-1961-2647 Forts. RL

Hammil, K.H., Brown, J.E. 1267 Forts.
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

Illumination of 300 foot candles permits adequate viewing through the dense viewing windows. A decontamination room and a "set-up" area are also located in the new facility's contamination-control area. A highly efficient ventilation system with built-in safety factors was installed in the facility.

HW-SA-1748
2
3
4
5
Fig.:
2
4

(8) NSA-1961-2647 RL

Brandt, F.A., Mathay, P.W., Zimmerman, D.L. 1268
Compilation of Techniques Used by Vallecitos Radioactive Materials Laboratory
(GEAP-3683 (1961) 23 S., 3 Fig.)

Equipment and techniques for remote examination of irradiated fuel assemblies applicable to the Maritime Program are described. The following subjects are covered: visual and photographic examination, metallographic examination etc.

GEAP-3683
4

(6) RL

Colven, T.J. 1269
Mixer-Settler Development. Operating Characteristics of a Large-Scale Mixer-Settler
(DP-140 (1956) 43 S., 18 Fig., 7 Tab.)

A pump-mix mixer-settler was demonstrated to have an overall efficiency greater than 90 per cent for the extraction of Uranyl nitrate from TBP at total flow rates up to 45 gallons per minute. Each stage of the three-stage mixer-settler consists of a 13-1/2-inch mixing section and a nine-foot settling section, both one foot wide and one foot deep. The mixing and settling sections are separated by vertical louvers. The impeller-mixers enter through nine-inch chimneys that extend above each mixing section. A window is located at the end of each settling section for observing the thickness of the dispersion and the position of the interface in the stage.

DP-140
4
Fig.:
4

(4) NSA-1961-9008 RL

Duquesne Light Company 1270
Cranes and Hoists. Core 1, Seed 1. Test Results ? - 550124
(DLCS-1450102 (1.Iss.)(1960) 7 S., 2 Tab.)

A visual and operational inspection was made of the following cranes and hoists: Fuel Handling Building Crane and Auxiliary Hoists, Core Vault Crane, Clean Room Auxiliary Hoist, etc. Using the same motions and speeds that are employed during actual operation the cranes and hoists were operated using a test weight of approximately 125 % of the rated capacity. No noticeable defects were revealed.

DLCS-1450102
(1.Issue)
4

(4) NSA-1961-11101 RL

Kitt, G.P., Moss, J.H. 1271
A Remotely Operated Hilger Spekker Absorptiometer for Use with Radioactive Solutions
(AERE-C/M-356 (1958) 7 S., 4 Fig.)

A description is given of a small analytical cell housing a Hilger Spekker Absorptiometer Type H560 which is operated remotely through lead shielding for the calorimetric analysis of ß, γ-active solutions.

AERE-C/M-356
4
Fig.:
4

(5) RL

Holz, P.P. 1272
Underwater Electric Arc Cutting Manipulator for HRT Screen Removal
(CF-59-11-130 (1959) 47 S., 23 Fig.)

A manipulator system, incorporating a simplified heliarc underwater cutting torch, was designed, developed and tested to perform remote functions. In outline form, major components of the electric arc cutting manipulator system include: a) concentric triple brass masts; b) mast center rod; c) integral outside mast screen pick-up rod; d) torch support linkage; e) torch.

CF-59-11-130
4
Fig.:
4

(4) NSA-1961-8920 RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., Culler, F.L. 1274
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.3-10, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.296-7, 1 Fig.)

The TRU Facility will consist of nine heavily shielded cells served by master-slave manipulators, and eight laboratories, four on each of two floors. The laboratory side of the building is separated from the cell area by the cell operating gallery, which is regarded as a buffer zone of low contamination potential. The nine shielded process cells are arranged in line. Removable top plugs provide access to the cells. The top and back of the cell line is served by a bridge crane in a limited access area of the building not normally occupied by operating personnel. (9) Forts.

2
3
4
6
Fig.:
2
4

RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., Culler, F.L. 1274 Forts.
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.3-10, 5 Fig. 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.296-7, 1 Fig.)

The front face of the cell is provided with windows, master-slave manipulators, and plugged ports for possible future installation of periscopes. The building is scheduled for full-scale operation by December 1965, at an estimated cost of $8,7 million.

2
3
4
6
Fig.:
2
4

(9) RL

Nichols, J.P., Arnold, E.D., Trubey, D.K. 1275
Evaluation of Shielding and Hazards in the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.11-18, 4 Fig., 3 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.297)

The shielding and containment criteria for the Transuranium Facility obtained by calculations and experiments are given. The shield evaluation studies (for cell walls, cell windows, and fission source carriers) utilized experiments at the ORNL Lid Tank Shielding Facility and IBM-7090 computer calculations for determination of neutron transport, neutron activation, and gamma penetration. These studies also included an evaluation of the effects of credible accidents occurring in the facility.

3
4
5

(7) RL

Yarbro, O.O., English, J.L., Mackey, T.S. 1276
Process-Equipment Design and Development for Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.19 - 26, 9 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.298)

The processing equipment will be located in four of the nine cubicles and seven tank pits of the Transuranium Processing Facility cell bank. Activity and contamination levels in the process equipment necessitate the use of remote or semi-remote maintenance techniques. Maintenance and plant modifications are simplified by a remotely operated piping disconnect developed for this purpose. The choice of materials of construction for the process equipment and piping is limited by the hydrochloric acid environment and intense radioactivity of the process solutions. (5) Forts.

4 Fig.: 4

RL

Yarbro, O.O., English, J.L., Mackey, T.S. 1276 Forts.
Process-Equipment Design and Development for Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.19-26, 9 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.298)

Hastelloy C appears to be acceptable for low temperature service while only tantalum, Zircaloy-2, or glass is suitable for solutions at elevated temperatures.
(5)

4 Fig.: 4

RL

Thurber, W.C., Lotts, A.L. 1277
Development of Procedures and Equipment for Fabrication of HFIR Target Rods
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.27-38, 12 Fig.)
(Transactions of the American Nuclear Society, 5,No.2 (1962) S.298-9, 1 Fig.)

Three cells (or cubicles) are allotted in the TRU for fabrication and inspection of the HFIR target rods. The phases for the Equipment development program are, in sequence: (1) design of remotely operated equipment; (2) procurement and/or construction of equipment; (3) individual equipment testing; (4) equipment testing in cell mockups; (5) redesign and reconstruction of items where necessary; (6) installation and cold operation of the equipment in the TRU; and (7) operation of the equipment to fabricate actual HFIR target elements. (4) Forts.

4 Fig.: 4

RL

Thurber, W.C., Lotts, A.L. 1277 Forts.
Development of Procedures and Equipment for Fabrication of HFIR Target Rods
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.27-38, 12 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.298-9, 1 Fig.)

The project is now well into the design phase and some of the equipment is under construction. The overall program schedule requires that the facility be in fullscale hot operation by December 1965.
(4)

4 Fig.: 4

RL

Youngquist, C.H., Mohr, W.C., Vachta, S.J. 1278
Contamination Control in Argonne Chemistry Cave
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.39-44, 2 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.299-300, 2 Fig.)

A new chemistry cave at Argonne is designed for the use of in-cell containment boxes. Inlet air to the boxes will be through a series of three inlet filters taking air from a clean area through progressively more suspect areas and ending in the containment box. Air is exhausted from the box through three high efficiency filters in series, which have an overall decontamination factor of 10^{10}. A transfer tunnel that utilizes the favorable geometry of two intersecting thick shielding walls permits removal of material from the cell directly into a gloved box for the preparation of assay samples.
(6)

3 4 Fig.: 3 4

RL

Miles, L.E., Howe, P.W., Parsons, T.C. 1279
A 4-Inch Portable Neutron Shield for a Radiochemistry Enclosure
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962-(1962) S.45-48, 3 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.300, 1 Fig.)

The paper describes a simple portable neutron shield enclosure with tong manipulators for surrounding a radiochemistry box-type enclosure. The shield allows the chemist to work with safety with neutron emitters having a flux density equivalent to a point source of 5.56×10^6 neutrons/sec. Except for minor adjustments, the radiochemistry enclosure can be completely equipped and quickly slid into the shield enclosure ready for work. Two types of windows have been provided. One consists of a 6-in.-thick tank which fits the opening in the shield front. (6) Forts.

3 4 Fig.: 4

RL

Miles, L.E., Howe, P.W., Parsons, T.C. 1279 Forts.
A 4-Inch Portable Neutron Shield for a Radiochemistry Enclosure
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.45-48, 3 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.300, 1 Fig.)

The other can replace it when it is necessary to use the glove ports in the sloping front window of the Berkeley box.
(6)

3 4 Fig.: 4

RL

Glen, H.M. 1280
A Survey of Structural Materials for Use in Remote Handling Facilities
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.49-52, 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.300-01)

The kinds of structural materials used in remote handling facilities and the manner in which they are specified can be significant factors in determining the cost of a facility. These materials and factors include concretes with high water retention for neutron shielding; the placement, quality control, and reinforcing of these concretes; and the use of stainless steel for cell liners.
(5)

4 6

RL

Wherritt, C.R., Franke, P., Field, R.E., Lyle, A.R. 1281
New Hot Laboratory Facilities at Los Alamos
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.55-62, 6 Fig.)
(Transactions of the American Nuclear Society, 5,
No.2 (1962) S.302-3, 3 Fig.)

The planned addition to the MAD Building at NRDS provides
four additional hot cells - two side by side in 2
two rows separated back to back by a service corri- 4.
dor and facing an operating gallery. Each cell has Fig.:
two oil-filled, lead glass windows, and provision 2
for one pair of Argonne Model 8 manipulators, and 4
one General Mills Model 100-150 bridge mounted,
manipulator unit. The High Level Chemistry Addition
is now under construction at Los Alamos to provide
additional capability for radiochemical analysis of
Rover fuel elements. There are twelve drybox cells
in two rows of six, separated by a cell corridor
and facing an operating gallery. (7) Forts. RL

Wherritt, C.R., Franke, P., Field, R.E., Lyle, A.R. 1281 Forts.
New Hot Laboratory Facilities at Los Alamos
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.55-62, 6 Fig.)
(Transactions of the American Nuclear Society, 5,
No.2 (1962) S.302-3, 3 Fig.)

The dispensary cell has a pair of AMF, heavy duty, 2
extended reach manipulators mounted over a lead 4
glass window. A bridge mounted device has been Fig.:
designed which is capable of moving along the 2
clean-up cell under remote control, repairing, 4
replacing or adjusting components by using a pair
of General Mills Model 150 manipulators, and a 1-ton
hoist.
(7) RL

Silverman, J., Agnihotri, C.B. 1282
University of Maryland Gamma Laboratory
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.63-68, 7 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.303-04)

A gamma irradiation facility has been constructed 2
at the University of Maryland. It consists of an 4
underground irradiation chamber, 15' x 4' x 7', con- 6
nected to the surface by a Z-shaped labyrinth and Fig.:
a stairway. Targets are placed in the chamber and 4
irradiated by 5,000 curie Co^{60} source that is
lowered from a lead shield located in the ceiling.
The concrete substructure is covered by a pre-
fabricated steel panel structure that houses
control and drive mechanisms, and laboratory
facilities. The entire cost of the installation
is $30,000.
(6) RL

Brebant, C.E., Mathern, F.L. 1283
Four Years Operating Experience at the Saclay
Laboratory for Research on Irradiated Fuels (LECI)
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962) S.
69-82, 14 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.304)

The laboratory at Saclay for very high activity 4
(L.E.C.I.) has been in operation since 1958. It Fig.:
consists of four machining caves and one storage 2
cave in a line with protection for 10^4 c, and six 4
analysis caves with protection for 100 c. The oper-
ating experience with the original equipment in the
machining cave has indicated the need for complete
redesign. This redesign has increased the remote
repairability, reduced the decontamination and
removal time of the equipment. Other changes have
improved the accuracy and efficiency with which
(4) Forts. RL

Brebant, C.E., Mathern, F.L. 1283 Forts.
Four Years Operating Experience at the Saclay
Laboratory for Research on Irradiated Fuels (LECI)
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.69-82, 14 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.304)

The equipment can be operated. The laboratory 4
building has been modified to increase the size Fig.:
of a "hot" change room and a new "cold" change 2
room has been added. 4
(4) RL

Faugeras, P., Couture, J., Guillet, H., Cherel, G. 1284
Safety and Maintenance Characteristics in a Line
of Cells
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.83-89, 6 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.304-05, 1 Fig.)

The external dimensions of the cell line are 79 ft 4
8 in. wide by 6 ft 6 in. high. Each cell of this Fig.:
shielded enclosure contains a removable box. The 4
individual cells are separated by a cast iron wall
of the same height as the box. The internal dimen-
sions of the individual boxes are 5 ft 1 in. in
length by 3 ft 5 in. in width by 2 ft 8-1/2 in. in
height. Manipulation within a box is carried out by
a pair of M7 master-slave manipulators adapted to
the size of the box. The dispatch cell is equipped
with 3 manipulators and 2 viewing windows placed
(6) Forts. RL

Faugeras, P., Couture, J., Guillet, H., Cherel, G. 1284 Forts.
Safety and Maintenance Characteristics in a Line
of Cells
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.83-89, 6 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.304-05, 1 Fig.)

side by side to facilitate the dispatching of 4
samples and small items to the line of analytical Fig.:
cells on either side. 4
(6) RL

Simon, J.P., Wehrle, R.B. 1285
EBR-II Fuel Dismantling Equipment
(Proceedings of the 10th Conf. on Hot Lab. and
Equipment, Washington, Nov.26-28, 1962 (1962)
S.99-110, 6 Fig.)
(Transactions of the American Nuclear Society,
5, No.2 (1962) S.305-6, 1 Fig.)

A remotely operated prototype machine has been de- 4
veloped to carry out the mechanical dismantling Fig.:
of the fuel, blanket and control subassemblies 4
of the Experimental Breeder Reactor II. The machine
is constructed of easily removable units to facili-
tate remote repair. Materials capable of withstand-
ing a radiation exposure of at least 10^9 r were used
in the construction of all in-cell equipment. The
dismantling equipment is remotely operated and is
served by cranes, rigid boom unarticulated manipula-
tors (3) mounted on overhead bridges and ANL Model 8
Mechanical Master-Slave Manipulators. Viewing is
through five-foot thick, multislab glass windows.
(4) RL

Turner, E.C. 1286
Maintenance Cell for Hallam Nuclear Power Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.111-20, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.306-7)

The Hallam Nuclear Power Facility (HNPF) maintenance cell is located beneath the reactor room floor near the reactor fuel storage area. The cell provides facilities for the assembly, disassembly, inspection and maintenance of radioactive reactor core components and the HNPF fuel handling machine internal mechanisms. The maintenance cell is shielded and equipped to maintain a controlled nitrogen or air atmosphere as required by cell operations. Radioactive component access is provided to the cell through ports in the cell roof.

3
4
Fig.:
4

(4) Forts. RL

Turner, E.C. 1286
Maintenance Cell for Hallam Nuclear Power Facility Forts.
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.111-20, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.306-7)

Equipment access is provided through a tunnel from the plant decontamination area. Principal components of the cell ventilation system are a low volume exhaust subsystem and a high volume exhaust subsystem.

3
4
Fig.:
4

(4) RL

Simon, J.P., White, J.R. 1287
Mechanical Decanning of EBR-II Fuel Element
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.91-98, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.306, 1 Fig.)

A semi-automatic, remotely operated machine has been developed for mechanically decanning the Experimental Breeder Reactor II fuel elements and will be installed at the National Reactor Testing Station in Idaho. Three knurled drive rollers and a single point tool provide a fast, chipless method of separating the spent fuel from its jacket. The machine is composed of easily removable units to facilitate remote repair operations. The decanning operation is carried out in an annular process cell which contains an extremely dry, inert atmosphere to prevent reaction of the nuclear alloys being processed. (4)

4
Fig.:
4

Forts. RL

Simon, J.P., White, J.R. 1287
Mechanical Decanning of EBR-II Fuel Elements Forts.
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.91-98, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.306, 1 Fig.)

Viewing is carried out through five-foot-thick glass windows placed at intervals around the outer and inner walls of the cell. Manipulation is provided by unarticulated, unilateral electric, vertical arm manipulators, and handling by five-ton cranes.

4
Fig.:
4

(4) RL

Waterfall, R.G., Ullyett, B.L.J. 1288
Cell Facilities at Commercial Products Division of Atomic Energy of Canada, Limited-Ottawa, Ontario
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.129-40, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.308-9, 1 Fig.)

Over the last six years four hot cells have been built and equipped at the company's Commercial Products Division. The cell has a capacity of 100,000 curies of exposed and 100,000 curies of stored cobalt-60. It has a single operating station and is designed for limited personnel access under controlled conditions. The main operating window in the south wall is an oil filled assembly of 4 blocks of 3.3 density glass in a steel casing. The complete floor area is covered by one pair of Argonne type Model 8 manipulators with powered angular separation and lateral rotation of the slave arms. (4)

4
Fig.:
4

Forts. RL

Waterfall, R.G., Ullyett, B.L.J. 1288
Cell Facilities at Commercial Products Division of Atomic Energy of Canada, Limited-Ottawa, Ontario Forts
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.129-40, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.308-9, 1 Fig.)

Each slave arm is enclosed by a mylar boot with vinyl gauntlet. Air enters the cell through a plug high in the north wall when the cell is closed and is withdrawn from the cell through two stainless steel ducts with intakes just above false floor level against the south wall.

4
Fig.:
4

(4) RL

Haaker, L.W., Olsen, R.A., Jelatis, D.G. 1290
A Gas-Tight Direct-Coupled Mechanical Master-Slave Manipulator for Alpha-Gamma Facilities
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.153-56, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.311, 1 Fig.)

A gas-tight, mechanical master-slave manipulator has been developed for use in alpha-gamma facilities. It has the same operating characteristics and capacities as the well-known Model 8 Master-Slave Manipulator. The seal system allows its use in cells with exotic atmospheres, giving freedom of manipulation while maintaining the integrity of the cell atmosphere. The manipulator consists of three distinct, easily separable assemblies: a master arm, a slave arm, and a seal tube assembly. The entire master arm remains in the operator's environment, the slave arm in the cell environment, and the seal tube in the shielding wall separates the two environments with a pressurized gas lock. (5)

4
Fig.:
4

RL

Jelatis, D.G., Haaker, L.W., Olsen, R.A. 1291
A Rugged-Duty Man-Capacity Master-Slave Manipulator
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, No.26-28, 1962 (1962) S.157-66, 3 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.311-12, 1 Tab.)

The Model D is a ruggedized manipulator interchangeable with the well-known Model 8. Consideration of performance characteristics casts doubt on the validity of oversimplified numerical load ratings, emphasizing instead, classification by functional task description, responsiveness, and effectiveness of operator-to-load coupling. Improved capacity and reliability is achieved by use of stronger materials, reduction of critical contact stresses, introduction of gearing to speed up coupling tapes, and development of a unique gripping concept. "Man-capacity" characterizes the effective utilization of a human operator's maximum exertion.

4
Fig.:
4
Tab.:
4

(5) RL

Hunt, C.L., Linn, F.C. 1292
The Beetle, a Mobile Shielded Cab with Manipulators
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.167-84, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.312-13, 1 Fig.)

A manned, self-propelled, lead shielded, 85-ton vehicle with manipulators, has been built that is designed to operate in radiation environments. The intended operation and development of this vehicle is described. The man is provided with the capabilities to perform useful work. Notable features include: 12 inches of lead shielding; five two-foot thick leaded windows; 550-horsepower main engine; 110-horsepower auxiliary power package; filtered air conditioning; two high capacity manipulators; emergency and safety systems; communic tions equipment; 25-foot vertical movement and 360° rotation of the cab. (5) Forts.

3
4
Fig.:
3
4

RL

Hunt, C.L., Linn, F.C. 1292 Forts.
The Beetle, a Mobile Shielded Cab with Manipulators
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.167-84, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.312-13, 1 Fig.)

One large window directly in front of the operator, and two smaller windows at each side -- a total of 5 windows -- provide for direct vision. A dual-head periscope is mounted on top of the hatch to permit vertical viewing from 80 degrees above horizontal to 80 degrees below, and horizontal viewing of 180 degrees from stop to stop. A 600-line, 3-camera, closed-circuit television systems is incorporated in the vehicle.

(5)

3
4
Fig.:
3
4

RL

Vertut, J. 1293
New Types of Heavy Manipulators
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.185-94, 7 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.313-14, 1 Fig.)

Four types of manipulator arms of 100, 300 and 1000 kg capacity have been developed with different carrier designs for use in general or special purpose hot cells and on a cable controlled vehicle for applications extending over a large area. These manipulators have a low probability of failure, with a capability of being easily repaired remotely. The arm is immersible and easily decontaminated. Emergency drives, accessible from the outside of a cell, are provided to override the drive motors in the event of a failure. The drive motor assemblies are grouped in a remotely interchangeable block and the arm can be disconnected remotely. (3)

4
Fig.:
4

RL

Abram, B.D., Parsons, T.C., Howe, P.W. 1294
A Capsule-Welding Mechanism for Bench or Remote Operation
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.205-09, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.316-17, 1 Fig.)

A compact and efficient mechanism, simple to operate, for welding aluminum capsules containing various elements to be reactor-irradiated has been developed by the Health Chemistry Department at Lawrence Radiation Laboratory, Berkeley. This system assures an atmosphere of helium within the finished capsule, for heat-transfer and leak-detection purposes. The mechanism was designed primarily for remote operation with master-slave manipulators, but works equally well on the bench

(5) Forts.

4
Fig.:
4

RL

Abram, B.D., Parsons, T.C., Howe, P.W. 1294 Forts.
A Capsule-Welding Mechanism for Bench or Remote Operation
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.205-09, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.316-17, 1 Fig.)

top for encapsulation of nonradioactive material. The capsule collet accommodates capsule diameters of 1/2 to 1 in. and capsule length of 1-1/2 to 3-1/2 in.

(5)

4
Fig.:
4

RL

Corrigan, J.E., Nelson, R.C. 1295
In-Cell Fabrication and Testing of Irradiated Fuel Element Cladding Tensile Specimens
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.211-17, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.317, 1 Fig.)

An in-cell tensile testing system has been developed to measure the mechanical properties of irradiated Zircaloy-2 cladding obtained from purposely defected and intact fuel rods from the Vallecitos Boiling Water Reactor core. Curved sections of this irradiated cladding were machined into longitudinal tensile specimens using a remotely operated high speed contour milling machine. Tensile tests were performed in-cell using a tensile tester with special grips to hold the curved test specimens.

(4)

4
Fig.:
4

RL

McCormack, C.G. (Mike) 1296
Improved Collection Equipment for Fission Product Gas
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.233-38, 6 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.319-20, 2 Fig.)

The in-cell portion of the equipment consists of a rigid platform on which interchangeable blocks hold a fuel element so that a vacuum seal is obtained against the side of the element, and through which the element is drilled, allowing the released gases to be collected and measured outside the cell. Fig.1 shows a cutaway view of the in-cell equipment holding a one-inch-diameter element. The action of this apparatus may be compared to that of a vice in which a sliding block compresses the fuel element between the outer holding block and the Neoprene facing of the inner holding block. (3) Forts.

4
Fig.:
4

RL

McCormack, C.G. (Mike) 1296 Forts.
Improved Collection Equipment for Fission Product Gas
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.233-38, 6 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.319-20, 2 Fig.)

Gases released by a fuel element pass through the filter in the sealing assembly and expand into the evacuated external gas collection system shown in Fig.5. This system is constructed primarily of stainless steel with welded joints wherever possible. Only the constant volume bulb, the Todd gage and the gas sample bulbs are of glass.

(3)

4
Fig.:
4

RL

Felber, F.F., Sickle, V.C. van, Farmelo, D.R. 1297
Gas Measurement Apparatus: Operating Experience and Techniques at the CANEL Hot Laboratory
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.239-46, 6 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.320, 1 Fig.)

The gas handling capability developed at the Hot Laboratory included provision for venting the fuel elements and capturing the gas quantitatively and carrier free for mass analysis. A remotely operated closed system dissolution apparatus was also developed to measure the post-irradiation helium concentration in reactor materials. Diffusion studies and vacuum fusion analysis of irradiated fuel and components are performed with the aid of a shielded high frequency induction furnace. Operating experience with the remoted glass apparatus has been very favorable. (5)

4 Fig.: 4 RL

Boyd, C.L. 1298
Improved Macro Camera for Hot Cell Application
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.259-62, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.322, 1 Fig.)

Improved photography equipment developed for hot cell application utilizes a macro camera which has a different approach to the problem of image transmission through a shielding wall. The camera incorporates a high density lead glass shielding window as a part of the bellows extension. This design feature greatly reduces the light reflection problem in the lead glass window without reducing the size of the transmitted image. The projected image will completely fill an 8 inch X 10 inch negative throughout the magnification range of 2X to 12X.

(3) Forts. 4 Fig.: 4 RL

Boyd, C.L. 1298 Forts.
Improved Macro Camera for Hot Cell Application
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.259-62, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.322, 1 Fig.)

Photomacrographs and low power photomicrographs of good definition and depth of field have been routinely taken. The resolution of these photographs is about 2000 lines per inch.

(3) 4 Fig.: 4 RL

Posey, J.C., Butler, T.A., Baker, P.S. 1299
Hot-Cell Calorimetry for Routine Determination of Thermal Power Generated by Kilocurie Sources
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.263-68, 1 Fig., 2 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.322-23, 1 Fig.)

Calorimeters have been developed to measure the thermal power of multikilocurie radioactive sources of Sr-90 and Cs-137. The calorimeters are resistant to accidental damage, occupy little hot-cell space, and are simple to operate. Measurements are accurate to $\pm$ 0.20% when measuring ~20 watts of thermal power.

(5) 4 Fig.: 4 RL

Blumberg, R. 1300
Remote Maintenance of the Molten Salts Reactor Experiment
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.253-258, 3 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.321-22, 1 Fig.)

The system to be used is a combination of the semidirect or long-handled tool technique and the fully remote technique. Almost all the in-cell operations will be performed with long-handled tools operated through bushed holes in a portable maintenance shield that provides 12 in. of steel shielding for the operating crew. Viewing is provided by periscopes. Observations inside the cell will be made directly with leadglass windows and lights built into the maintenance shield and also with a sheathed periscope inserted in the same manner as the long-handled tools. (3) RL

4 Fig.: 4

Saulino, F.A., Andersen, J.C., Taylor, K.M. 1301
Research Facility for the Synthesis and Fabrication of Refractory Plutonium Materials
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.277-86, 7 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.325-26, 1 Fig.)

This paper describes a facility for studying the synthesis and fabrication of refractory plutonium materials. The outstanding features of the facility are its compactness, reliability, low operating cost and the unusually high purity of the atmosphere in the helium glove boxes (2-3 ppm oxygen and less than 1 ppm water vapor). The high purity helium atmosphere results from the leak tightness of the system and the highly effective zirconium-titanium alloy getter system. In addition to the usual health and safety precautions, possible trouble areas are continuously monitored by an extensive alarm system.

(7) 3 4 5 Fig.: 2 4 RL

Vogel, G.J., Carls, E.L., Mechan, W.J., Jonke, A.A. 1302
An Engineering-Scale High-Alpha Facility for Plutonium Fluoride Volatility Process Studies
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.287-92, 6 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.326-27)

The plutonium processing equipment is housed in CENHAM (Chemical Engineering Hood, Alpha Modular) boxes. All process off-gas and ventilation air are humidified to convert any accidentally released plutonium hexafluoride, a gas at most processing conditions, to the filterable plutonyl fluoride particulate. Planning and scheduling phases of the project were aided by use of the Critical Path method. Costs of CENHAM boxes vary approximately as the 0.84 power of box volume.

(7) 4 6 Fig.: 4 RL

Banslaben, A.J., Finston, H.L. 1303
The Adaptation of Commercially Available Stock Parts into an Inexpensive Glove-Box Train
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.293-98, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.327)

By adapting commercially available stock parts designed for other purposes, an interconnecting train of glove boxes was fabricated at a considerable saving in cost over that required for a custom-designed system. The key feature is the utilization of a glass-fiber reinforced polyester vat liner commonly used in chemical processing. Introduction ports, transfer locks, and ventilation system are fabricated from PVC pipe and fittings and Teflon-sealed valves.

(5) Forts. 4 6 Fig.: 4 Tab.: 6 RL

Banslaben, A.J., Finston, H.L. 1303 Forts.
The Adaptation of Commercially Available Stock Parts into an Inexpensive Glove-Box Train
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.293-98, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.327)

Components can be assembled with conventional shop tools and a vacuum-tight bond effected with glass-fiber tape and polyester resin. The system is admirably suited to the handling of alpha-emitters. Actual costs for the component parts of the train of four glove boxes and ventilation system are given.

4 6 Fig.: 4 Tab.: 6

(5) RL

Rush, D. 1306
United Nuclear Corporation Plutonium Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.313-20, 4 Fig., 2 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962)S.328-29, 1 Fig.)

The Plutonium Facility has ten glove boxes and two hoods for the preparation of plutonium fuel elements and samples, and for out-of-pile examination for weight, dimension, density, microscopic structure, thermal expansion at high temperature, melting point, vapor pressure and quantitative chemical composition. In all but the chemistry boxes and hoods, the box atmosphere is either nitrogen or helium, with careful control over oxygen and water vapor content, and maintained at less than ambient pressure. The Facility is engaged in a mixed-carbide fuel development

3 4 Fig.: 2 4 Tab.: 4

(4) Forts. RL

Rush, D. 1306 Forts.
United Nuclear Corporation Plutonium Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.313-20, 4 Fig., 2 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.328-29, 1 Fig.)

program and during more than a year of operation there has been no detectable alpha contamination outside the boxes.

3 4 Fig.: 2 4 Tab.: 4

(4) RL

Phillips, W.D., Hairr, G.M. 1308
An Enclosure for Human Patient Radioisotope Therapy
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.325-28, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.330-31, 1 Fig.)

Basically, the enclosure is a rectangular plywood box mounted on two glove box dollies faced toward each other, as shown in Fig.1. The enclosure section is 7 ft long, 3 ft wide, and 4 ft high. The sides are largely made up of 3/4-in. Plexiglass panels, two on each side, held in place against a gasket with simple turnstops. All four panels are quickly removable, as also is the center support on one side. Good visibility is provided by two 60-watt fluorescent lights. Rotating 8-in. glove ports have been inset in a revolving plexiglass disc in each of the window panels. These versatile glove ports give considerably more access convenience than do fixed ports.

4 Fig.: 4

(4) Forts. RL

Phillips, W.D., Hairr, G.M. 1308 Forts.
An Enclosure for Human Patient Radioisotope Therapy
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.325-28, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.330-31, 1 Fig.)

The entire floor of the enclosure is covered with a plastic tray to catch any spilled liquids and to simplify cleanup measures. The hydraulic fluid lines have quick-disconnect two-way shutoff fittings at the cylinders on the cot, should it be necessary to quickly remove the patient on this body support.

4 Fig.: 4

(4) RL

Hutto, E.L. 1309
Remotely Operated Manipulator
(U.S.Pat.2,996,330 (1959/61) 2 S., 1 Fig.)

An improved remotely operated manipulator for use in an enclosed cell provided with a manipulator opening and containing radioactive materials, comprising an elongated rod provided with fingers on one end, a sleeve shorter than and slidably fitted on said rod, a tubular member enclosing said rod and its sleeve and coaxially spaced therefrom.

U.S.Pat. 2,996,330 4

(4) RL

Goerth, R.C., Lindberg, J.F. 1310
Vehicle for Slave Robot
(U.S.Pat.3,018,980 (1959/62) 3 S., 9 Fig.)

This invention relates to a vehicle for a remote-control manipulator. More particularly, the invention relates to a vehicle for the slave unit of an electrical manipulator and to an arrangement for handling an electrical cable that connects the slave unit with a master unit.

U.S.Pat. 3,018,980 4 Fig.: 4

(5) RL

Sandrock, R.J. 1311
Gripping Tool
(U.S.Pat.3,012,811 (1960/61) 3 S., 3 Fig.)

This invention relates to a releasable gripping tool and more particularly to a gripping tool which is self grasping and remotely actuatable for dis-engaging a load.

U.S.Pat. 3,012,811 4 Fig.: 4

(4) RL

Remote-Controlled Manipulating Apparatus for Manipulating Objects Inside Sealed Chambers 1312
(Brit.Pat.873,441 (1957/61) 3 S., 1 Fig.)

A telemanipulator for manipulating objects inside a sealed chamber, comprising a first group of control units which are outside the chamber and which actuate a second group of corresponding operating units inside the chamber, essentially characterized in that the connection between each control unit and its corresponding operating unit is effected by means of a transmission system known per se and comprising on the one hand a first rotatable magnet disposed outside and against the wall of the chamber, which wall is made of non-magnetic material, and on the other hand a second rotatable magnet disposed inside and against the wall of the chamber, said first and second rotatable magnets being mounted movable along the wall.

Brit.Pat. 873,441 — 4 — Fig.: 4

(4) RL

Remote Control Manipulators 1313
(Brit.Pat.880,152 (1958/61))

A remote control manipulator having at least first and second members connected to one another for relative pivotal or rotational movement about an axis and driving mechanism for said connection, said driving mechanism comprising a differential planetary gear speed reducer having planetary gear assembly and input and output ring gears mounted correlative rotation co-axially of said two members, said planetary gear assembly being co-axially and separately rotatable within said ring gears, said input ring gear being secured to one member and said output ring gear to the other member, a drive motor mounted on one of said members for rotating said planetary gear assembly thereby to cause relative rotation of said input and output ring gears and their associated manipulating members.

Brit.Pat. 880,152 — 4

(4) RL

Driven Pivotal Joint for Manipulators 1314
(Brit.Pat.880,153 (1958/61))

A driven pivoted joint for a manipulator or the like articulated apparatus comprising a drive portion and a driven portion pivotally connected with one another said drive portion including a supporting frame, a drive motor mounted in said frame, a driven shaft rotatably mounted in said frame, said driven shaft having an axial bore therethrough a driven shaft extending through said bore and mounted for rotation with respect thereto, one end of said drive shaft being drivingly connected with said motor, the other end of said drive shaft being connected with the input of a differential gear speed reducer mounted on said frame, the output of said speed reducer being connected with said driven shaft said driven portion being secured to said driven shaft whose axis thus constitutes the pivotal axis of the joint.

Brit.Pat. 880,153 — 4

(4) RL

Guest, W.R. 1315
Improvements in or Relating to Apparatus for Remote Weighing of Radioactive Materials
(Brit.Pat.877,064 (1959/61) 3 S., 2 Fig.)

Apparatus comprising a balance mounted above a shielded cubicle and having, in place of one pan and its associated arrester gear, a suspension unit comprising a rod suspended from the balance beam and extending through the balance bed into the shielded cubicle, a balance pan suspended from the rod, and means for counterbalancing the other balance pan; a vertical tube furnace mounted in the shielded cubicle below the said suspension unit and adapted to be raised so as to surround the balance pan forming part of the suspension unit; and means for withdrawing air from the furnace tube.

Brit.Pat. 877,064 — 4 — Fig.: 4

(4) RL

Butts, H.L. 1317
Glove Box Attachment
(U.S.Pat.3,020,647 (1960/62) 2 S., 5 Fig.)

This invention relates to an attachment for a glove box that will protect the glove and keep it out of the way during evacuation of the glove box for purging purposes.

U.S.Pat. 3,020,647 — 4 — Fig.: 4

(4) RL

Howarth, A.J., Collins, R.W. 1318
Sampling Devices
(U.S.Pat.3,026,730 (1959/62) 1 S., 1 Fig.)

This invention relates to sampling devices and is primarily concerned with the sampling of radioactive liquids. A sampling device having a body member, a hollow sampling needle mounted on said body member, a massive carrier member slidably supported on said body member, an evacuated elastomer-capped sampling bottle mounted on said carrier, resilient means tending to restrain said carrier member and body member against movement in a direction of approach of said bottle and needle, a releasable latch for retaining said members in a relative position in which said needle penetrates the cap of said bottle, and elongate flexible-means secured to said body part so as to be operable to suspend the device in a liquid to be sampled. (5)

U.S.Pat. 3,026,730 — 4 — Fig.: 4

RL

Commins, J.A. 1319
Radioactive Source Container
(U.S.Pat.3,026,414 (1958/62) 3 S., 4 Fig.)

This invention relates to a new and improved method and apparatus for handling radioactive materials. A container for radioactive sources in which said radioactive sources are inserted and removed from said container by fluid pressure comprising, in combination, a housing having an external surface in contact with a surrounding medium.

U.S.Pat. 3,026,414 — 4 — Fig.: 4

(4) RL

Hughes, J.P., Jastrab, A.G. 1320
Fiberglass Reinforced Plastic Gloveboxes for Plutonium Analytical Research
(AED-Conf.1961-119-76 (1961) S.78-86, 6 Fig., 3 Tab.)

An economical fiberglass reinforced plastic glovebox was designed for use in an analytical plutonium laboratory to eliminate chemical corrosion. decrease decontamination time, and increase flexibility of operation. Coupling of boxes into a train and sealing gasketed windows in position, giving a helium-tight enclosure, was made with Thiokol adhesives.

4 — Fig.: 4 — Tab.: 5

(4) RL

Gaunt, A.J., Redford, R.A. 1321
Improvements in or Relating to Sealing Devices
(Brit.Pat.870,351 (1959/61) 3 S., 1 Fig.)

A sealing device for vacuum apparatus comprising an open receptacle perforated by an open-ended stand pipe adapted to communicate with the apparatus, the said receptacle being provided with an internal seating, a sealing cap insertable into the receptacle so as to surround the open-ended portion of the said stand pipe and resilient seal between the cap and the receptacle seating so that when the stand pipe is placed in communication with vacuum and with high density liquid in the receptacle, the sealing cap is urged by ambient pressure on to said seal and together with the said high density liquid seals off the stand pipe end.

Brit.Pat. 870,351 4 Fig.: 4

(5) NSA-1961-23615 RL

Duncombe, E., Pugh, H. 1322
Improvements in or Relating to Centrifugal Pumps and Apparatus for Sampling Radio-Active Liquids
(Brit.Pat.870,829 (1959/61) 5 S., 2 Faltbl., 5 Fig.)

A centrifugal pump having a shaft carrying an impeller and arranged so that the shaft can be supported on an air lubricated thrust bearing, centralised by spaced air lubricated journal bearings, and rotated by the rotor of an air-powered turbine. Apparatus comprising biological shielding having inside the shielding a pipe for radioactive liquors and outside the shielding pipe for radioactive liquors drawn off from said pipe inside the shielding, a centrifugal pump having its inlet communicating with the pipe inside the shielding and its outlet connected with an outlet pipe coupled to the pipe outside the shielding.

Brit.Pat. 870,829 4 Fig.: 4

(5) NSA-1961-23617 RL

Menzies, R.M., Clelland, D.W. 1323
Improvements in or Relating to Mixer-Settler Apparatus
(Brit.Pat.873,599 (1957/61) 2 S., 1 Faltbl., 4 Fig.)

A mixer-settler apparatus comprising alternate mixer compartments and settler compartments with interconnecting ports wherein the ports are in the form of slots and are covered by members having holes smaller than the slots and movable so as to expose only portions of said slots at varying heights through said hole.

Brit.Pat. 873,599 4 Fig.: 4

(5) NSA-1961-32270 RL

A Remotely-Controlled Manipulator 1324
(Brit.Pat.874,104 (1958/61) 2 S., 1 Faltbl., 3 Fig.)

A remotely-controlled manipulator comprising a handle mounted in universal suspension on a housing at one end of a supporting tube, said handle carrying a plate which is in contact with at least three pins, slidably mounted in the housing, said pins respectively being in pressure contact with the same number of further pins which are slidably mounted in a further housing and which are in contact with a further plate carried by an operating member mounted in universal suspension on the further housing at the other end of the supporting tube, said operating member carrying a chuck jaw, wherein movements of the handle are transmitted to the operating member.

Brit.Pat. 874,104 4 Fig.: 4

(4) NSA-1961-27727 RL

A Remote Controlled Manipulator 1325
(Brit.Pat.876,736 (1957/61) 8 S., 3 Faltbl., 7 Fig.)

In a remote control manipulator comprising a horizontal tubular support, a master arm and a slave arm connected to the respective ends of said support for pivotal movement with respect to the support and link means interconnecting said arms for causing the arms to pivot conjointly with respect to the support, the improvement which consists in means for causing relative lateral rotation of said slave arm outside of the plane defined by the longitudinal axes of said tubular support and said master arm.

Brit.Pat. 876,736 4 Fig.: 4

(4) NSA-1961-29341 RL

Remote-Controlled Manipulating Apparatus for Manipulating Objects Inside Sealed Chambers 1326
(Brit.Pat.876,898 (1958/61) 4 S., 2 Fig.)

Telemanipulator as claimed in Patent Application No.36430/58 (Serial No.873,441), wherein all the magnetic control units outside the chamber are mounted in a box half which is movable on the outside surface of the roof of the sealed chamber, and all the controlled magnetic operating units are mounted, within the sealed chamber, in a box half which is movable against the inside surface of the roof so as to be capable of following all the displacements of the controlling external box half, rotary movement of a manipulator itself, inside the chamber, about its own vertical axis being effected by rotation of the controlling external box half producing rotation of the internal box half.

Brit.Pat. 876,898 4 Fig.: 4

(4) NSA-1961-29344 RL

Howarth, A.J., Guest, W.R. 1327
Improvements in or Relating to Apparatus for the Removal of Liquid from Elastomer-Capped Bottles
(Brit.Pat.878,504 (1958/61) 5 S., 3 Fig.)

For the removal of liquid from elastomer-capped sampling bottles, apparatus comprising a shroud member for locating a bottle, a hollow piercing member for piercing the cap of the bottle and a draw-off tube movable into communication with the liquid in the bottle through said hollow piercing member with clearance for allowing venting of the bottle as it is emptied via said draw-off tube.

Brit.Pat. 878,504 4 Fig.: 4

(5) NSA-1961-32272 RL

MacLennan, G., Lindley, J. 1328
Improvements in or Relating to Apparatus for Measuring Fluid Flow
(Brit.Pat.878,866 (1959/61) 3 S., 1 Fig.)

An apparatus for measuring fluid flow comprising a coiled pipe in the fluid flow path, and means for measuring the pressure differential set up across the coiled pipe when fluid flows through it.

Brit.Pat. 878,866 4 Fig.: 4

(5) NSA-1961-32273 RL

Butler, F., Boulton, H. 1329

Improvements in or Relating to Mixing Machines
(Brit.Pat.879,023 (1957/61) 5 S., 1 Bl., 1 Faltbl., 3 Fig.)

A mixing machine comprising a set of mixing drums pivotably mounted on and equally spaced round a drum carrying member being arranged to move the drums in a closed circuit from a charging point to a discharging point and then back to the charging point without reversal, means for intermittently moving the drum carrying member round the closed circuit in steps equal in size to the spacing between the drums, means to support the drums with their axes so inclined that the drums are disposed to retain material adapted to be contained in them, means to rotate the drums about

Brit.Pat. 879,023

4
Fig.: 4

(5) NSA-1961-32274 Forts. RL

Butler, F., Boulton, H. 1329

Improvements in or Relating to Mixing Machines Forts.
(Brit.Pat.879,023 (1957/61) 5 S., 1 Bl., 1 Faltbl., 3 Fig.)

said axes during their intermittent movement round the closed circuit, and means to pivot each drum relative to the drum carrying member as it enters the region of the discharging point into a position in which its axis is so inclined that the drum can discharge.

Brit.Pat. 879,023

4
Fig.: 4

(5) NSA-1961-32274 RL

Kent, I., Lee, R. 1330

Improvements in or Relating to Coupling Devices
(Brit.Pat.879,158 (1959/61) 5 S., 1 Faltbl., 2 Fig.)

A coupling device of the specified kind, wherein the sleeve part is provided externally with gear teeth and internally with a screw-threaded portion engaged with a screw thread on the tubular part so that, on bringing up and engaging of a remotely driven pinion into engagement with the said gear teeth, the said sleeve part can be rotated to move it axially into either of two positions, one position being that in which the tubular part and the cylindrical part are connected and the other being that in which the tubular part and the cylindrical part are disconnected.

Brit.Pat. 879,158

4
Fig.: 4

(5) NSA-1961-32275 RL

Soar, G.K. 1331

Improvements Relating to Remote Inspection Equipment
(Brit.Pat. 879,529 (1959/61) 3 S., 1 Faltbl., 3 Fig.)

Television camera type inspection equipment for inaccessible locations such as in nuclear reactors in which the inspection equipment is carried on the end of a hollow supporting hose by means of which it can be lowered and raised and means are provided for effecting a forward flow of coolant gas through the hose and television camera and a return flow through an outer path which extends around the camera.

Brit.Pat 879,529

4
Fig.: 4

(4) NSA-1962-381 RL

Improvements in or Relating to Gripping Devices 1332
(Brit.Pat.880,162 (1958/61) 5 S., 2 Faltbl., 5 Fig.)

A gripping device for a work piece comprising two support plates in planes normal to one another, a jaw in respect of each plate, each jaw being movable towards and away from its plate in a plane normal to the plane of that plate to grip a work piece between that jaw and its plate and being movable between an operative and an inoperative position by movement about an axis in that plane in which it moves towards and away from its plate, a first fluid operable piston being coupled to both jaws to effect movement of the jaws towards and away from their plates and a second fluid operable means being coupled to both jaws to effect movement of both jaws about said axes.

Brit.Pat. 880,162

4
Fig.: 4

(4) NSA-1962-309 RL

Dickinson, R.W. 1333

Improvements in or Relating to Titrimetric Apparatus
(Brit.Pat.880,428 (1959/61) 6 S., 1 Faltbl., 2 Fig.)

Titrimetric apparatus comprising a bulk sample-taking device, a metering device for taking a measured quantity of the bulk sample, a titration vessel, a valve-controlled pneumatic system for operating in sequence the sample-taking device and the metering device and for transferring the measured quantity of sample to the titration vessel, and an electrical control system for operating the valves of the pneumatic system.

Brit.Pat. 880,428

4
Fig.: 4

(4) NSA-1962-311 RL

Apparatus for Microscopic Examination 1334
(Brit.Pat.880,708 (1957/61) 4 S., 1 Bl., 1 Faltbl., 4 Fig.)

Apparatus for microscopic examination of specimens emitting radioactive radiation and/or toxic emanations, which comprises a microscope, an illuminating device for the microscope consisting of a light source in a housing and a light condensing system, a viewing device for observing the intermediate image formed by the microscope objective, an objective changing device, and control elements for operating the microscope, said microscope being mounted in a chamber protected against said radiation and emanations, characterized in that the illuminating and the viewing device are arranged outside the said chamber, and that two lens systems are provided with at least a part of each arranged within said chamber.

Brit.Pat. 880,708

4
Fig.: 4

(4) NSA-1962-3177 RL

Hebden, D. 1335

Improvements in or Relating to Liquid-Liquid Contacting Apparatus
(Brit.Pat.882,731 (1958/61) 5 S., 2 Faltbl., 6 Fig.)

Mixer-settler apparatus having a pair of fluid flow ducts communicating with each mixer compartment, and means for withdrawing liquid from the compartment into one duct of the pair coincident with returning liquid to the compartment from the other duct of the pair, the ducts each communicating with their respective mixer compartment at a number of levels in the compartment.

Brit.Pat. 882,731

4
Fig.: 4

(4) NSA-1962-1873 RL

Mortimer, J., Kenyon, R.C., Tonkin, J.H. 1336
Improvements in or Relating to Casting Apparatus
(Brit.Pat.883,698 (1959/61) 3 S., 1 Faltbl., 2 Fig.)

For the encapsulation of a radioactive salt, casting apparatus comprising a vessel of oval cross section in which the salt can be fused, means for heating the vessel, a pivot support for the vessel so that it can be tilted about an axis parallel to the major axis of the oval section of the vessel to effect pouring of the fused salt into a capsule, and balance supporting means for the capsule whereby pouring of a predetermined amount of the fused salt into the capsule can be gauged.

Brit.Pat. 883,698

4 Fig.: 4

(6) NSA-1962-3164 RL

Davey, M.E.M., Thornthwaite, E.J., Voice, E.H. 1337
Improvements in or Relating to Liquid Evaporating Apparatus
(Brit.Pat.886,189 (1959/62) 4 S., 1 Fig.)

Liquid evaporating apparatus comprising an upright, heat-conducting, tubular evaporating vessel having a liquid inlet at its lower end and a vapour outlet at its upper end, a heater surrounding the evaporating vessel, and an economiser surrounding the heater and in thermal association there with, so that liquid passed through the economiser is preheated prior to its entering said evaporating vessel at the liquid inlet thereof.

Brit.Pat. 886,189

4 Fig.: 4

(6) NSA-1962-7649 RL

Improvements in and Relating to Electrical Remote Control Apparatus 1338
(Brit.Pat.889,319 (1959/62) 3 S., 2 Fig.)

An electrical remote control apparatus, in particular a remote manipulator comprising two identical electrical devices, that is, a transmitter and a receiver, each device comprising four selsyns, wherein the body of the second selsyn is mounted on the shaft of the first selsyn so that the plane containing the axis of the second selsyn is perpendicular to the axis of the first selsyn, the body of the third selsyn is mounted on the shaft of the second selsyn so that the plane containing the axis of the third selsyn is perpendicular to the axis of the second selsyn, and the fourth selsyn is coupled to a carriage, upon which the first selsyn is mounted, by means of a drive which translates rotational movement into linear movement.

Brit.Pat. 889,319

4 Fig.: 4

(4) NSA-1962-13193 RL

Cherel, G. 1339
Improvements in or Relating to Magnetic Couplings
(Brit.Pat.889,477 (1959/62) 3 S., 2 Fig.)

A magnetic coupling through a plane wall, characterized in that it comprises two identical assemblies, located one on each side of the plane wall, each assembly comprising a substantially horseshoe shaped magnet and a member of soft iron secured to said magnet substantially perpendicularly to the axis of its poles in such a manner that the magnetic field of each of the said magnets passes through the plane wall and completes its circuit through the member of soft iron secured to the other assembly.

Brit.Pat. 889,477

4 Fig.: 4

(4) NSA-1962-10138 RL

Jackson, C. 1340
Improvements in or relating to Laboratory Centrifuges
(Brit.Pat.893,737 (1959/62) 5 S., 3 Fig.)

A laboratory centrifuge comprising vessel for containing a liquid to be centrifuged, of inverted conical or frusto conical shape, and provided with a centrally apertured cover and means whereby it may be end mounted on the spindle of a centrifuge driving motor.

Brit.Pat. 893,737

4 Fig.: 4

(4) NSA-1962-16486 RL

Douis, M., Jouin, J., Laurent, H., Godart, J., Sougi, M. 1341
Improvements in Remote Control Devices for Opening Tubular Containers
(Brit.Pat.894,929 (1957/62) 5 S., 1 Faltbl., 3 Fig.)

A device of the kind specified, such device comprising first means for holding a container in position to be opened, second means for moving a tool having a sharp cutting edge around the axis of the container and also radially of such axis, and remote control means for controlling the operation of said first and second means from the other side of said screen.

Brit.Pat. 894,929

4 Fig.: 4

(8) NSA-1962-16466 RL

Organes de fermeture amovibles pour enceintes sous pression et procédé de fabrication 1342
(B.F.1,207,004 (1957/60) 9 S., 12 Fig.)

Organe amovible de fermeture en métal pour enceinte sous pression comportant deux plaques parallèles espacées, planes ou sensiblement planes, un moyen d'accouplement réunissant rigidement les plaques à proximité de leurs périphéries au moins en des points espacés de ces dernières, des entretoises s'étendant entre les plaques dans l'espace qui les sépare, réparties par rapport aux plaques, rigidement réunies à ces dernières, et destinées à communiquer de la rigidité à l'organe de fermeture à l'encontre des forces exercées par la pression de fluide régnant dans l'enceinte et agissant normalement sur l'une des plaques planes.

B.F.1,207,004

4 Fig.: 4

(4) NSA-1961-32277 RL

Dispositif de commande à distance de mécanismes et accouplements 1343
(B.F.1,211,483 (1958/60) 3 S., 3 Fig.)

L'invention comprend notamment: Un accouplement manoeuvrable à distance qui comprend un premier et un second élément pourvus chacun d'une partie filetée, ces éléments pouvant venir en prise afin d'être reliés l'un à l'autre, des moyens venant en prise avec l'un des éléments de l'accouplement de façon à permettre de le faire tourner, et un dispositif pour actionner ces moyens et les amener en prise avec cet élément de l'accouplement et les en éloigner, et de faire tourner également ledit élément.

B.F.1,211,483

4 Fig.: 4

(4) NSA-1962-5451 RL

Perfectionnements apportés aux filtres industriels démontables, pour microfiltration, et notamment pour filtration de fluides nucléaires 1344
(B.F.1,211,614 (1958/60) 4 S., 6 Fig.)

La présente invention a pour objet des perfectionnements apportés aux filtres industriels démontables, pour micro-filtration, et notamment pour filtration de fluides nucléaires. Ces perfectionnements consistent principalement à constituer un filtre du genre en question, à l'aide d'eau moins une cartouche filtrante placée de façon amovible a l'intérieur d'une enceinte fermée de façon étanche et éventuellement entourée d'un habillage de protection, ladite cartouche filtrante étant constituée par un empilement d'éléments de filtration placés en série sur le passage du fluide, ces éléments de filtration étant avantageusement composés de métal fritté constitué en plaquettes, disques ou analogues.

B.F.1,211,614
4
Fig.:
4

(4) NSA-1961-32278 RL

Perfectionnements apportés à la réalisation de parois démontables 1345
(B.F.1,212,459 (1958/59) 2 S., 4 Fig.)

La présente invention a pour objet: Un procédé de réalisation de parois démontables en particulier de murs de protection contre les radiations, caracterisé par les points suivants pris isolément ou en combinaison: a) on empile les uns sur les autres, en les disposant longitudinalement par rapport à la paroi à établir, des profilés symetriques comportant des saillies et des creux et s'ajustant les uns dans les autres à joints croisés suivant une surface brisée; b) on utilise des profilés dont la section est sensiblement en H ou en I; c) on intercale entre les profilés d'autres profilés; d) on garnit de feuilles ou de fils les intervalles existant entre les profilés.

B.F.1,212,459
4
Fig.:
4

(4) NSA-1961-27058 RL

Bowes, W.H. 1346
Procédé et dispositif de fermeture étanche
(B.F.1,218,877 (1958/60) 3 S., 5 Fig.)

L'invention a pour objet un procédé de fermeture étanché notamment pour un élément de forme tubulaire, ainsi que le produit industriel nouveau qui constitue une fermeture étanché obtenue par ce procédé.

B.F.1,218,877
4
Fig.:
4

(4) NSA-1961-32281 RL

Passeri, A.J. 1347
Disassembly and Examination of NaK-Cooled In-Pile Forced Convection Loops
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.197-204,7 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S. 315-16, 1 Fig.)

Remote handling techniques were developed and used successfully to disassemble two irradiated inpile loops containing NaK. The disassembly of the loop was accomplished in an 8 foot x 16 foot hot cell. Three zinc bromide viewing windows and a Kollmorgen periscope at the operating face of the cell afforded an excellent view of in-cell operations. Model 8 Master-Slave Manipulators and a two-ton crane were used to perform all the remote work. Lazy Susan transfer trays at either end of the cell were used to transfer materials to and from adjacent cells.

4
Fig.:
4

(3) RL

Watson, C.D., West, G.A., Schaffer, W.F. 1348
Performance of Mechanical Equipment for Dejacketing Spent SRE Core 1 Fuel
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.219-32, 14 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S. 317-19, 1 Fig.)

The facility, formerly of solid wall construction, was converted to a direct viewing facility by core drilling cubes of concrete of about 5 tons each from the walls to permit installation of windows. The cell area, 25 by 10 by 15 ft high, is formed by 5-ft-thick concrete walls lined with stainless steel, with three zinc bromide-filled viewing windows, 5 ft thick, at appropriate intervals.

2
4
Fig.:
2
4

(6) Forts. RL

Watson, C.D., West, G.A., Schaffer, W.F. 1348 Forts.
Performance of Mechanical Equipment for Dejacketing Spent SRE Core 1 Fuel
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.219-32, 14 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.317-19, 1 Fig.)

To thwart leakage of radioactive gases and particulate matter from the processing cells into the building proper, (a) the cell was provided with a fail safe ventilation system, (8) (b) all manipulators were encased in leaktight plastic booting both inside and outside the operating face of the cell, and (c) the charging face of the cell and the top of the cell were enclosed by separate entry rooms.

2
4
Fig.:
2
4

(6) PL

Miles, L.E., Wigle, G.L., Bohm, P.A., Altes, R.G., Parsons, T.C., Howe, P.W. 1349
A Remotely-Operated External Target System for the 88-Inch Cyclotron
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.247-52, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.320-21, 1 Fig.)

The target is placed in the external beam by a placement tube which moves the target from the attachment position to intercept the cyclotron beam beyond a 4-ft shielding wall. A new target and holder were designed to provide for much higher levels of induced activity and concentrations of heat than has been experienced at previous accelerators. The placement tube, which maintains the target-holder seal and the coolant utilities, travels in an

4
Fig.:
4

(8) Forts. RL

Miles, L.E., Wigle, G.L., Bohm, P.A., Altes, R.G., Parsons, T.C., Howe, P.W. 1349 Forts.
A Remotely-Operated External Target System for the 88-Inch Cyclotron
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.247-52, 8 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.320-21, 1 Fig.)

airtight containment tube which, in turn, is connected through a plastic sock to the disassembly enclosure in a 6-in. lead cave. The active target is removed from the disassembly box by a sealed-bag passout system.

4
Fig.:
4

(8) RL

Phillips, W.D. 1350
A Compact Inert-Atmosphere Enclosure for Alpha and Low-Level Beta-Gamma Operations
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.330-332, 4 Fig.)

The basic enclosure consists of a welded and flanged sheet metal box open at the top. It is 20 in. wide, 17 in. from front to back, and 19 in. high, and has an approximate volume of 2.2 ft^3. This compact design was emphasized in order to conserve bench space and for economy and speed in operation. Using this enclosure, researchers have worked with alpha-emitting radioisotopes up to 10^{12} dis/min. The top window is a sheet of 1/2-in. Plexiglass bolted to an outside flange on the sheet metal box with a gasket in between. Removal of this window permits the installation of any equipment too large to pass through the air lock.

4
Fig.: 4

(3) Forts. RL

Phillips, W.D. 1350 Forts.
A Compact Inert-Atmosphere Enclosure for Alpha and Low-Level Beta-Gamma Operations
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.330-332, 4 Fig.)

The pass-in air-lock is formed from Plexiglass tubing. One door is operated from inside the box, and the other from outside.

4
Fig.: 4

(3) RL

Gaitanis, M.S., Lamb, C.E., Corbin, L.T. 1351
A Pulverizer-Mixer for Solidified Molten Salt Reactor Fuel Samples
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.333-34, 2 Fig.)

A pulverizer-mixer designed for this purpose is shown disassembled in the photograph in Fig.1. In use, the pulverizer is clamped in a mixer mill. After the pulverization is completed, a polyethylene storage bottle is attached to the mixer, it is clamped bottle end down in a vertical position in the mixer mill, and the pulverized salt is shaken into the bottle and is then ready for analysis. Samples removed from the reactor while in operation will of course be highly radioactive, hence this device is designed to be placed in a shielded cell, and all manipulations will be performed with master-slave manipulators.

4
Fig.: 4

(5) RL

Maddox, W.L. 1352
Remote Decapper
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.335, 1 Fig.)

A motor driven apparatus for removing or replacing the caps of sample bottles has been used in remote analytical facilities at ORNL for some time. The bottle clamp has recently been redesigned in order to eliminate the need for operating a screw clamp with manipulator hands. The new clamp, which is shown in the accompanying photograph, consists of a bottle receptacle and two rubber-faced jaws that hold the bottle under light spring tension. In removing or replacing a cap, the cap is held stationary while the bottle is rotated. The jaws are pivoted in such a way that one of them will tighten against the bottle and cause it to rotate with the clamp in either direction.

4
Fig.: 4

(3) RL

Kitani, R., Terada, M. 1356
TOH-SHIBA Hot Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.654-65, 8 Fig.)

The ground plan of the hot laboratory is shown in Fig.1. The total ground area is about 46 tsubo, including the lot of raised ground. Two sides of the hot cell which face the operating room are provided with ordinary concrete shields of 1 m thickness. The dimensions of the hot cave are 2 m in width, 1,5 m in depth, and 4.5 m in height. A rectangular window with 100 x 50 cm dimension on the hot side and 43 x 25 dimension on the cold side is provided as well as a circular auxiliary window. The operation in the cell can be performed by direct observation through the rectangular window or by use of a periscope. The inside of the hot cell is lined with stainless steel plates for easy cleaning of the walls.

AEC-tr-4482
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3
4
Fig.: 2
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(7) Forts. RL

Kitani, R., Terada, M. 1356 Forts.
TOH-SHIBA Hot Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.654-65, 8 Fig.)

A Toh-Shiba Type UB manipulator, which is equivalent to Argonne type 8, is installed. In this instrument the motions of the master and the slave have a relationship of one-to-one correspondence, and each arm can raise a load weighing up to 5 kg. A 1/2-ton hoist of the hanging type, provided on the ceiling, plays the role of the third hand in the cell. The inside illumination of the hot cell is provided by three sets of sodium lamps. Air in the hot cell is exchanged 20 times per hour.

AEC-tr-4482
2
3
4
Fig.: 2
4

(7) RL

Larsen, R.P., McCown, J.J., Sovereign, W.R. 1360
Analytical Cave Operations on Fuel Processing Development Samples
(TID-7568(Pt.2): Analytical Chemistry in Nuclear Reactor Technology. Instrumentation, Remote Control Techniques, and Nucleonics. 2nd Conf. Gatlinburg, Tenn., Sept. 29-Oct.1, 1958 (1959) S.76-84, 8 Fig.)

The procedure and equipment described serve to illustrate how it has been possible to handle a variety of non-repetitive analytical and related operations, using a single junior cave. Through the use of the rod-runner, rotating ring stand units described in Appendix A, and the central service box with its manipulator-operated disconnects, it is possible to assemble, operate, and dismantle all the apparatus remotely.

TID-7568(Pt.2
4
Fig.: 4

(6) Forts. RL

Larsen, R.P., McCown, J.J., Sovereign, W.R. 1360 Forts.
Analytical Cave Operations on Fuel Processing Development Samples
(TID-7568(Pt.2): Analytical Chemistry in Nuclear Reactor Technology. Instrumentation, Remote Control Techniques, and Nucleonics. 2nd Conf. Gatlinburg, Tenn., Sept.29-Oct.1, 1958 (1959) S.76-84, 8 Fig.)

This philosophy of operation reduces considerably the exposure rates for personnel entering caves to set up or dismantle equipment. Since entry into the cave is not required, less clean-up time is needed and greater utilization of the single cave available is achieved.

TID-7568(Pt.2)
4
Fig.: 4

(6) RL

Ananthakrishnan, S. (comp.) 1361
Remote Handling Facilities at Chalk River
(AECL-1658 (1962) 29 S., 19 Fig., 1 Tab.)

The hot-cell installations for examining irradiated fuel materials are described. A pair of master-slave manipulators, mounted 10 feet from the floor at 28 in. centers are provided at each operating station, i.e. over each window position. The operating area for each cell block contains a fume hood and inactive work bench. Details of shielding windows used in the facilities are given in Table 1. The windows are constructed of plate glass and are either dry mounted, or oil-filled in the interspace between plates. The active face of the window is made up of 3.3 density cerium-stabilised glass in the high activity cells. The cell ventilation philosophy is a once through system where inlet air is obtained by leakage from the op rating area through manipulator ports, cracks around doors, shielding plugs, etc. Both up-draft and down-craft systems are being employed.

AECL-1658
2
3
4
Fig.: 2
4
Tab.: 3

(6) RL

Gaitanis, M.J., Lamb, C.E., Corbin, L.T. 1362
Homogenization of Molten-Salt Reactor Project Fuel Samples
(ORNL-TM-291 (1962) 3 S., 4 Fig.)

A copper pulverizer-mixer was designed for homogenizing Molten-Salt Reactor Project (MSRP) fuel. The copper sampling ladle that contains the solidified fuel is placed in the pulverizer-mixer, which is agitated on a mixer mill. The fuel is fractured out of the ladle, pulverized into a homogeneous powder, and transfered to a storage bottle. The homogenized fuel sample is than available for analysis.

ORNL-TM-291
4
Fig.: 4

(6) RL

Furby, E., Wilkinson, K.L. 1363
The Deposition of Thin Films of Radioactive Materials by Vacuum Evaporation
(AERE C/R-2441 (1958) 7 S., 4 Fig., 3 Tab.)

An apparatus is described by means of which it is possible to deposit, on platinum or aluminium substrates, nearly uniform, adherent films of Uran or Plutonium by high temperature and low pressure evaporation. Progress during evaporation can be observed quantitatively and deposits of up to 1,8 mgms U/cm^2 have been obtained. The equipment is installed in glove boxes.

AERE C/R-2441
4
Fig.: 4

(5) RL

Miner, W.N., Schonfeld, F.W. (comp.) 1364
Plutonium Facility Operating Procedures in CMF-5
(LAMS-2660 (1962) 175 S., 11 Fig.)

LAMS-2660

Safety regulations and operating procedures related to the various types of equipment that are in use in the Plutonium Physical Metallurgy Group at the Los Alamos Scientific Laboratory are described in detail. Consideration of the hazards involved in working with plutonium is emphasized. A brief description of the group's activities and facilities is also included. (Protective clothing, protective equipment, fire prevention and control, working in a hood, changing glove-box gloves, rolling mills, swaging machine, impact testing machine, Vickers hardness testing machine, the electron microscope etc.)

4
5
Fig.: 4

(6) NSA-1962-19179 RL

Development of Manipulators for Handling Radioactive Materials 1366
(ANL-6619: Reactor Development Program Progress Report Sept. 1962 (1962) S.39)

Model A Manipulator Seal Test - A motion seal of the type used in the sealed mechanical master-slave manipulator (CRL Model A) supplied by Central Research Laboratories has been tested under simultaneous conditions of a dry atmosphere and intense irradiation.

ANL-6619
4

(4) RL

Jamrack, W.D., Logsdail, D.H., Short, G.D.C. 1368
Laboratory Mixer-Settlers
(Progress in Nuclear Energy. Ser.3: Process Chemistry, 2 (1958) S.332-54, 17 Fig., 2 Tab.)

The place of the laboratory mixer-settler in obtaining data for the chemical processing of nuclear materials is described. The development of laboratory mixer-settler equipment is traced from simple equilibrating tubes to remotely controlled mechanical mixer-settlers for continuous operation. Different types of mixer settlers are described in detail, their operating and design characteristics discussed and their advantages and disadvantages enumerated.

4
Fig.: 4
Tab.: 4

(5) RL

Spinadel, E. 1369
Cabezal automático para traslado de Muestras Irradiadas
(Informe No.40 (1960) 14 S., 9 Fig.)

Das Verschlußstück einer Transportvorrichtung für bestrahlte oder zu bestrahlende Proben wird beschrieben. Die Transportvorrichtung wird elektrisch ferngesteuert. Zahlreiche Abbildungen sind vorhanden.

Informe No.40
4
Fig.: 4

(4) RL

Moulthorp, H.A. 1370
Shielding Requirements for NPR Production in Plutonium. Reclamation Facility-Project CAC-880
(HW-68021 (1961) 14 S., 8 Tab.)

Die erforderlichen Abschirmdicken für konventionelle Arbeitskästen mit Abzug, zum Schutz vor Neutronen, für mit Plexiglas umgebene Arbeitskästen und für eine Betonzelle werden miteinander verglichen, wenn "NPR" Plutonium statt "NPF" Plutonium in der "Plutonium Reclamation Facility" verarbeitet werden soll. Es zeigt sich, daß die Zellenanordnung in der Praxis am günstigsten ist. Tabellen geben Neutronen- und γ-Dosisleistungen für verschiedene Abschirmdicken an.

HW-68021
4

(4) NSA-1962-23780 RL

Beukelaer, R.C. 1371
Rapport de mission. Visite aux cellules chaudes de Saclay - le 10 juin 1958
(NP-6956 (1958) 7 S.)
NP-6956

L'ensemble "cellules" est constitué par onze cellules alignées côte à côte. Quatre d'entre elles sont prévues pour une activité de 10.000 curies à 1 MeV, séparées des six cellules à basse activité (de 100 à 1.000 curies) par une cellule de stockage. Chaque cellule est munie d'une fenêtre en verre au plomb stabilisé au cérium de densité 3,3 pour les cellules de haute activité et de 2,7 pour les autres. Les fenêtres sont formées de plaques de 25 mm d'épaisseur. L'ensemble des cellules de forte activité est desservi par deux paires de manipulateurs Argonne n° 8 et d'un manipulateur hydraulique. L'ensemble des cellules de basse activité est desservi par une paire de manipulateurs type Argonne n° 8. 3 4

(5) NSA-1959-61 Forts. RL

Beukelaer, R.C. 1371
Rapport de mission. Visite aux cellules chaudes de Saclay - le 10 juin 1958 Forts.
(NP-6956 (1958) 7 S.)

Le manipulateur hydroélectrique construit par la compagnie S.O.M. Berthiot permet de desservir les 4 cellules de forte activité en roulant sur des rails. Sa capacité est de 500 kg verticalement, et de 30 kg dans toutes les autres directions. Les cellules sont ventilées sous dépression de 15 mm d'eau, et un débit de 800 à 1600 m3/h est assuré par cellule. NP-6956 3 4

(5) NSA-1959-61 RL

Valentin, J.P. 1372
Réacteur BR-2 - Aile chaude - Description du complexe des cellules blindées
(NP-7157 (1958) 46, III S., 4 Fig., 2 Tab.)

La colonne de cellules blindées superposées est placée dans l'axe de la piscine du réacteur. Le blindage de ces cellules - 1.371 m de béton de densité 3.8 - a été calculé pour qu'un observateur placé à 2 m d'une source ponctuelle de 60.000 curies de 3 MeV reçoive une dose n'excédant pas 2.5 mR/h. L'ensemble de ces cellules est entouré de planchers de travail. Toutes les parois des cellules, sauf exception expressément notifiée, sont en béton lourd ayant une densité de 3,8. Des fenêtres mixtes en bromure de zinc et verre au plomb ou entièrement en verre au plomb seront installées dans les cellules supérieures. NP-7157 3 4

(5) NSA-1959-5916 Forts. RL

Valentin, J.P. 1372
Réacteur BR-2 - Aile chaude - Description du complexe des cellules blindées Forts.
(NP-7157 (1958) 46, III S., 4 Fig., 2 Tab.)

Les drains s'organisent en deux colonnes verticales assurant d'une part, le plus bref séjour des résidus dans les conduites et, d'autre part, les traversées de béton les plus courtes. Les cellules et tous les locaux et planchers de travail qui l'entourent sont ventilés par circulation forcée sans recyclage permettant, en service normal, respectivement 10 et 6 renouvellements par heure. NP-7157 3 4

(5) NSA-1959-5916 RL

5 Schutz- und Dekontaminationsvorrichtungen

(Schutzkleidung, Schutzanstriche, Bodenbeläge, Duschanlagen, Strahlenschutzgeräte usw.)

Goette, H. 950
Strahlenschutz beim Umgang mit offenen radioaktiven Stoffen. T.1.2.
(Atompraxis, 6 (1960) S.99-107 u. S.148-54, 16 Fig., 6 Tab.)

Handschuhboxen eignen sich für den Umgang mit α- und weichen β-Strahlern, wie z.B. ^{35}S und ^{14}C. Diese Stoffe können in beliebigen Aktivitäten in ihnen verarbeitet werden, da die Reichweite dieser Strahlenarten nicht groß genug ist, um Schichten von mehr als 20 mg/cm^2 zu durchdringen. Sehr starke offene Präparate - insbesondere γ-Strahler über 10 Curie - werden in sogenannten "heißen Zellen" verarbeitet. Das sind Anordnungen, die aus drei starren Betonwänden von 1-1,5 m und einer beweglichen rückwärtigen Tür gleicher Abschirmung bestehen. Ferner wird über Geräte, die zur Handhabung von radioaktiven Stoffen dienen,

4
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Fig.:
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(4) RL Forts.

Goette, H. 950 Forts.
Strahlenschutz beim Umgang mit offenen radioaktiven Stoffen. T.1.2.
(Atompraxis, 6 (1960) S.99-107 u. S.148-54, 16 Fig., 6 Tab.)

über die organisatorischen Maßnahmen, die sich für den Umgang mit offenen radioaktiven Stoffen als notwendig erweisen sowie über die Methoden der Dekontaminationsüberwachung und Schutzmaßnahmen berichtet.

4
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Fig.:
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(4) RL

Gaschermann, A. 960
Bauliche Planung und Aufbau von Isotopen-Laboratorien
(Kerntechnik, 3 (1961) S.204-08, 1 Fig.)

Es wird über die bauliche Planung, die Installation, den Innenausbau, die Beheizung und Beleuchtung, über Strahlenschutzbeton, Einrichtung, Be- und Entlüftung von Isotopenlaboratorien berichtet.

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Fig.:
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(6) RL

Koch, H. 963
Untersuchung der Eignung von Werkstoffen für den Ausbau und die Ausstattung von Isotopenlaboratorien
(Kernenergie, 3 (1960) S.109-16, 8 Tab.)

Es wurde ein Anzahl von Werkstoffen, die sich als Fußboden-, Wand-, Tisch- und Abzugsbeläge verwenden lassen, auf ihre Eignung für Isotopenlaboratorien geprüft. Untersucht wurde die Einwirkung der gebräuchlichsten Säuren und Laugen in konzentrierter Form sowie der verschiedensten Lösungsmittel. Alle Materialien wurden auf ihr Verhalten gegen Radionuklide mit wäßrigen Lösungen von nahezu trägerfreien Kobaltsalzen geprüft. Auf Grund der Versuchsergebnisse haben wir für den Ausbau des Instituts für angewandte Radioaktivität in Frage kommende Werkstoffe ausgesucht.

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Tab.:
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(3) NSA-1960-20294 RL

Woodall, A.J., Wilson, C.G., Jones, A.L., Thomas, D.K. 967
Design and Management of a Nuclear Science Laboratory
(Nature, 182 (1958) S.367-69, 1 Fig.)

A substantial central wall divides the building longitudinally into physics and chemistry sections. The rooms are separately ventilated into the roof void above the light-alloy false ceiling, which is stiffened by overhead girders and rests on the partition walls. All exposed wall surfaces are smooth and coated with hard glossy paint, light in colour, so that splashes are easily visible. The concrete floor is completely covered with waxed polished linoleum and the joints sealed. The laboratory furniture is normal, but bench tops are protected by stout water-proof waxed paper which can easily be removed after contamination.

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Fig.:
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(8) NSA-1958-13782 RL

Harwell's New High-Activity Handling Building "459" 969
(Nuclear Engineering, 3 (1958) S.121-22, 5 Fig.)

The building is roughly "T"-shaped, the crossbar of the T containing what might be termed the "service" departments, such as changing rooms, stores, offices, messroom and workshop, while the leg of the T forms the actual "operations" portion of the building. The five high-activity cells are planned on an 8-ft module. The line of cells is equipped with a 1 1/2-ton remote-controlled overhead travelling crane, a 5-ton self-propelled bogie and a power-operated manipulator. Each cell has a zinc bromide window, 5 ft x 3 ft and 5 ft 6 in. thick, backed up by high-density glass. Each cell is equipped with a pair of master-slave manipulators. Frogmen wearing thick rubber suits and helmets are supervised from a control room that has a window giving a view of the entire maintenance area.

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Fig.:
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(6) NSA-1958-6497 RL

MacIntosh, A.D. 976
The Radiochemical Laboratory - An Architectural Approach to its Design
(Nucleonics, 5, No.5 (1949) S.48-61, 7 Fig.)
(AECU-210 (1949))

How various levels of radioactivity affect planning of labs and offices serves to introduce a proposal for a modular system that offers flexibility in layout. Shielding, waste-disposal facilities, hoods, finishes, heating, and ventilation are touched upon.

AECU-210
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4
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Fig.:
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(7) RL

Butler, H.L., Wyck, R.W. van 978
Protective Clothing Program at the Savannah River Plant
(Annual Meeting of the American Industrial Hygiene Association in Chicago, April 25 - May 1, 1959)
(DPSPU-58-30-20 A)

Protective clothing is frequently worn to prevent contamination of the body with radioactive materials and to exercise contamination control. The cost of this protection, while small compared with other operating costs, nevertheless, requires a substantial yearly expenditure. At large atomic energy facilities such as the Savannah River Plant, protective clothing costs are sufficient to justify a continuous evaluation program in order to protect this investment and to insure that maximum protection is provided for employees.

DPSPU-58-30-20 A
5
6
Fig.:
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(6) RL

Weinberg, D.J. 981
Design of Nuclear Laboratories
(Nuclear Engineering and Science Conference at Chicago, Ill., March 17-21, 1958, Preprint 148, Sess. 19, 22 S.)

Nuclear laboratories require special care in their design to insure adequate personnel protection and efficient use. The facility must be easily decontaminated in case of a spill, special precautions must be taken to prevent spread of contamination, and there must be adequate biological radiation shielding to protect personnel. Building plans, special anti-contamination measures, floor covering, walls, floors, air flow and air conditioning systems are discussed. 2 3 5

(5) NSA-1958-13023 RL

Lide, E.N., Turner, L.A., Shipp, R.L. 983
Remote Area Monitoring System at Air Force Plant No.67
(Proceedings of the 1959 Biannual National Nuclear Instrumentation Symposium, Idaho Falls, Idaho, June 24-26, 1959, Vol.2, S.77-79)

The Radiation Effects Reactor at Air Force Plant 67 operates above ground. This manner of operation may produce above tolerance flux levels at points conserably removed from the reactor building. To insure the safety of personnel in the general vicinity of the site required the installation of a rather comprehensive system for monitoring radiological hazards. The types of radiations monitored include concentration of argon-41 as well as fast neutron and gamma-ray dose rates. Fig.1 is an area map showing the location of the various monitor points associated with the R.E.F. system. (5) RL 5

Panýr, M. 987
[Tschechisch] Řešemi sanitárnich smyček v laboratořich a provozech s radioaktivnimi látkami (Arrangement of Sanitary Loops in Laboratories and Shops Dealing with Radioactive Materials)
(Jaderná energie, 5 (1959) S.161-64, 8 Fig.)

The paper gives informations about sanitary loops in laboratories and shops dealing with radioactive materials. After the principal data have been expounded the classification of loops by categories is described suggestions about their extent and also some examples of their arrangements are given. 5

(3) NSA-1959-18018 RL

Großbritanniens Beteiligung an der Interschutz, Köln, 23.6. - 2.7. 1961 1007
(British Information Services. Presseverlautbarung. Nr. 13 (1961) S.1-2)

Die Schutzeinrichtungen für Arbeiten in Atomanlagen, die von der Firma Spembly gezeigt werden, sind das Ergebnis jahrelanger Erfahrungen aus der Zusammenarbeit mit der britischen Atomenergiebehörde und ausländischen Atomenergieinstitutionen im Entwurf und in der Ausführung von Schutzkleidung. Spembly konstruiert komplette Einrichtungen für die Zufuhr, den Schutz und die Entgiftung von Frischluft. Zu den Ausstellungsstücken gehört ein voll-ventilierter Druckluftanzug, der absoluten Schutz gegen die Alpha-Strahlung von radioaktivem Staub gewährt. 5

(3) RL

Strahlenschutz 1008
(British Information Services. Presseverlautbarung. Nr.13 (1961) S.3-4)

Zwei Schutzgeräte für Anlagen, in denen mit aktiven Materialien gearbeitet wird, stellt die Burndept Ltd. aus. Es sind ein Strahlungsanzeiger, der die Ausstrahlung von verseuchten Apparaten oder Oberflächen mißt und zur Personenkontrolle dienen kann und ein tragbares, geschlossenes Kontrollgerät für schnelle Neutronen als allgemeines Instrument zur Messung der Neutronenstrahlung. 5

(3) RL

Heinemann, H., Seidler, K.H. 1011
Zur Strahlenschutzüberwachung nach der Filmschwärzungsmethode in Radium- und Isotopenlaboratorien
(Atompraxis, 6 (1960) S.483-84).

Die Bestrahlung der Filmplaketten erfolgte mit Standard-Strahlenquellen, deren Leistung von der PTB bzw. dem Atomic Energy Research Establishment Harwell gemessen worden war. Unstimmigkeiten zwischen eingestrahlten Dosen und Auswertungsergebnissen können weder auf schlecht definierte Strahler noch auf nicht termingerechte Verwendung oder Auswertung der Plaketten als Grundursache zurückgeführt werden. Die Verfasser weisen erneut auf die fehlerhafte Bestimmung der Gammastrahlung hin, die insbesondere bei Vorliegen von Strahlengemischen mit weichen Anteilen auftritt. Eine Verbesserung der Filmschwärzungsmethode wird vor ihrer Anwendung in Radium- und Isotopenlaboratorien für unerläßlich gehalten. (4) NSA-1961-11215 RL 5

Samokhvalov, N.V. 1013
Shielding and Manipulative Devices for Work with Radioactive Isotopes
(Soviet Journal of Atomic Energy, Suppl. 5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.22-66, 36 Fig.)

The author has developed a series of interrelated, complementary methods and also pneumatic-hydraulic and electromechanical devices for remote manipulation of radioactive materials in preparative chemical work in shielded, evacuated cupboards. In work under open conditions protection is achieved by distance from the radiation source and the use of screens, particularly, large-sized cellular shielding observation blocks with combined water-glass shielding, which considerably improve the conditions for observation of objects and the lighting inside the chamber. Hand manipulative transfer-holders are used for semi-remote work with radioactive emitters of certain qualitative and quantitative characteristics. 4 5 Fig.: 4 5

(4) Forts. RL

Samokhvalov, N.V. 1013 Forts.
Shielding and Manipulative Devices for Work with Radioactive Isotopes
(Soviet Journal of Atomic Energy, Suppl. 5 (1958): Contemporary Equipment for Work with Radioactive Isotopes (1959) S.22-66, 36 Fig.)

The holding devices described are used in the chemical and other technological processing of harmful materials under laboratory and production conditions. Wet cleaning rooms in which radioactive substances are used and processed (laboratories, vivariums for experimental animals, wash and shower rooms, etc.) is of extreme importance. Multisolution stationary decontaminators are designed for deactivating the hands of operators and small articles of laboratory and production use contaminated with radioactive and other highly toxic materials. 4 5 Fig.: 4 5

(4) RL

Rod, R.L. 1014
Recent Advances in Ultrasonic Decontamination
(Nucleonics, 16, No.7 (1958) S.104-05, 4 Fig.)

Figure 1 shows a special cleaner of a type used 5
to decontaminate a hot object resembling a Fig.:
worker's safety helmet. The transducers are 5
mounted to concentrate the energy at the surface of the hemispherically shaped part. The continous action of the cavitation prevents the contaminating material from readhering to the part as it is withdrawn from the cleaning solution. Another tank (Figure 2) is designed to decontaminate 6 x 3-ft steel plates.

(3) NSA-1958-12280 RL

Wilson, A.R.W. 1018
Activity Levels in Relation to Laboratory Design and Practice
(Martin, J.H.(ed.): Radiation Biology. Proceedings of the 2nd Australasian Conference on Radiation Biology, ... Melbourne, 15-18 Dec. 1958, S.147-51)

All of the laboratories in the radiochemical 2
building fall within the classification (I) 5
of Dunster, being provided with readily decontaminable surfaces, adequate fume hoods and forced ventilation giving approximately 20 room changes an hour. Following British practice, areas within the radio-chemical building are classified as red, blue or white. The blue and red contamination areas are located in the active section of the building and access to them is by way of a change room. Measures against spread of contamination in these latter areas include regular monitoring of all laboratory

(4) Forts.

RL

Wilson, A.R.W. 1018
Activity Levels in Relation to Laboratory Design Forts.
and Practice
(Martin, J.H.(ed.): Radiation Biology. Proceedings of the 2nd Australasian Conference on Radiation Biology, ... Melbourne, 15-18 Dec. 1958, S.147-51)

surfaces, systematic cleaning procedures, cloth- 2
ing and shoe changes for persons entering and 5
leaving the area, showering, prohibition of smoking and eating, and the monitoring of hands for contamination.

(4) RL

Krawczynski, S., Meixner, A. 1020
Kontaminations-Schutzanzüge zum Arbeiten in radioaktiv kontaminierter Umgebung
(Kerntechnik, 2 (1960) S.231-33, 4 Fig.)

Es werden zwei Kontaminations-Schutzanzüge beschrie- 5
ben, die ein Arbeiten in kontaminierter Umgebung auch Fig.:
bei Anwesenheit radioaktiver Aerosole gestatten. Es 5
handelt sich erstens um einen bereits praktisch erprobten englischen Anzug der Fa. Spembley und zweitens um eine Neuentwicklung der deutschen Fa. Matter und der Kernreaktor Bau- und Betriebs-Gesellschaft mbH, Karlsruhe. Letzteres Modell zeichnet sich besonders durch mechanische Stabilitat, chemische Resistenz, Feuerfestigkeit und Aerosoldichtigkeit aus. Ein besonderer Anzugschnitt gestattet zudem ein sehr bequemes An- und Ausziehen ohne Hilfestellung durch zweite Personen.

(4) RL

Jaeger, Th. 1030
Entwurf von Speicherbehältern für hochgradig radioaktive Abfallstoffe
(Kerntechnik, 3 (1961) S.307-12, 10 Fig.)

Der Aufsatz gibt an Hand der Beschreibung aus- 5
geführter Konstruktionen eine Übersicht über Fig.:
die konstruktiven Fragen des Entwurfes von 5
großen Speicherbehältern für hochgradig radioaktive Abfallflüssigkeiten aus dem radiochemischen Trennprozeß. Die Grundlagen für den Entwurf von Speicherkammern für Festkörper mit in hoher Konzentration inkorporierten Spaltprodukten werden erläutert. Abschließend wird ein Konstruktionsbeispiel für einen kleineren Speicherbehälter gezeigt.

(3) RL

Cochinal, R. 1036
Les masques filtrants póur la protection des aérosols de plutonium
Saclay: Département d'Electronique, section Autonome d'Electronique Appliquée 1961, 2 S.

Bestimmungen über die Benutzung von Masken zum 5
Schutz gegen Pu-haltige Aerosole werden angeführt. Wenn die Möglichkeit für eine Kontamination besteht oder die Pu-Konzentration unter dem 10-fachen der zulässigen Tagesdosis liegt, sind Masken mit Filter zu benutzen mit denen der Aufenthalt in der aktiven Zone bis zu einigen Stunden gestattet ist. Bei dem 10 bis 20-fachen der Tagesdosis reduziert sich diese Zeit auf 5 bis 10 Minuten. Liegt die Kontamination über dem 20-fachen der Tagesdosis, so sind Sauerstoffatemgeräte zu benutzen. Über die einzelnen Bestandteile der Filtermasken wird berichtet.

(3) RL

King, R.R. 1046
The Prevention and Control of Fires in Glove Boxes Containing Plutonium
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.71-77, 5 Fig.)

Numerous and varied fire hazards exist in glove 5/4
boxes containing plutonium. They range from oils, Fig.:
solvents, and paper products to pyrophoric metals. 4
The glove box itself (i.e., gloves, plastic bags, Plexiglas panels, exhaust filters) is vulnerable. A dry chemical type extinguisher discharged into the glove box through a quick-coupling will safely extinguish all but the metal and filter fire. Burning plutonium can be safely contained by smothering with MgO sand. No effective method has been devised to extinguish a filter fire but a wire mesh prefilter minimizes the hazard by acting as an oil mist eliminator and fire stop.

(3) RL

Chow, J.G.Y., Hare, J.R., Nielsen, A.F., Pallas, F.P. 1057
Procedure for Disassembling an Uranium-Bismuth Loop in the BNL Metallurgy Hot Cell
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.188-94, 7 Fig.)

The BNL metallurgy hot cell was constructed and 4
equipped to handle alpha contaminated material 5
and no extensive modifying of the cell was neces- Fig.:
sary. However, the contamination control area 4
(isolation room) where the coffin was located 5
during the disassembling operation was only partially shielded and temporary shielding was set up to protect the operating personnel. Figure 2 shows the general layout of the cutting cell and the isolation room. Figure 3 shows schematically the layout in the cutting cell for advancing and sawing the loop.

(7) Forts. RL

Chow, J.G.Y., Hare, J.R., Nielsen, A.F., Pallas, F.P. 1057 Forts.

Procedure for Disassembling an Uranium-Bismuth Loop in the BNL Metallurgy Hot Cell

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.188-94, 7 Fig.)

The initial pull was done with the cell 1-ton crane. Subsequent advancing was done with a special vise mounted on a sliding table. The vise can also be moved in a vertical direction to position the loop for cutting. Figure 4 shows an assembly drawing of this special vise. Manipulation in the cell was performed with a Lee Asociate arm mounted on a jib boom, a pair of model 8 manipulators and a bridge crane.

4 5 Fig.: 4 5

(7) RL

McMahan, M.E. 1058

New Decontamination Chamber

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.195-200, 4 Fig., 1 Tab.)

This new chamber was designed to use steam, water or decontaminating solutions, one at a time or in any combination, in the decontamination of casks, plug-mounted equipment, manipulators, hand tools, and related accessories. The details of cleaning a manipulator are described below because the chamber has proved its value on this piece of equipment more than any other unit. The slave end of the manipulator is all that is cleaned as it is the only part that is exposed to the radioactive contamination.

5 Fig.: 5 Tab.: 5

(3) RL

Dascenzo, R.W. 1065

Pneumatically Placed Concrete Shielding

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.244-52, 5 Fig., 1 Tab.)

Hanford's High Level Radiochemistry Cell walls required 175 cubic yards of high density magnetite aggregate concrete with a unit weight of 220 lb. per cu. ft. and compressive strength of 3000 psi. From the experiences gained on this facility it can be demonstrated that the spraying of the pneumatically applied mortar will save from 15 to 20% of the per-cubic-yard cost over using pre-pack or pre-mix pour concrete instead of the 5% as shown in Tab. I. (3) The principal cost advantages realized by the Gunite method were from the lower cost of forms below that required for other types of placement and the magnetite fine sand, readily available at low cost.

4 5 Fig.: 4 Tab.: 5

(4) RL

Duvaux, Y., Mas, R., Junca, A., Dick, H. 1070

Laboratory for Plutonium Fuel Element Fabrication at Cadarache

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.307-14, 7 Fig.)

The building includes two working areas, East, with two parallel lines of 6 laboratories each; West, a large hall. A traffic corridor serves on the one hand the 12 laboratories, and on the other hand the hall, as well as workshops, stores, decontamination room, checked entrance and exit of material. The whole building is ventilated and air-conditioned. At the entrance and exit, the air passes through absolute filters. Four showers, accessible from the outside only, are provided for possible decontamination of the personnel who could have left the laboratory in case of accident without passing by the change-room showers again.

2 5 Fig.: 2 4

(7) Forts. RL

Duvaux, Y., Mas, R., Junca, A., Dick, H. 1070 Forts.

Laboratory for Plutonium Fuel Element Fabrication at Cadarache

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.307-14, 7 Fig.)

All services can be cut from lockers outside the laboratories, located in the material corridor. In case of contaminating accident in one of the laboratories, it is possible to proceed to decontamination operations in frog-suits. A general alarm network to inform the central control station of a very serious accident, such that the personnel must leave the laboratory. This signal can be transmitted by pressing one of the 35 buttons installed in different places in the laboratory.

2 5 Fig.: 2 4

(7) RL

Blomgren, R.A. 1071

Personnel Access to Alpha-Gamma Caves Using Plastic Suits and Enclosures

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.324-30, 4 Fig.)

A nylon-reinforced vinyl "step-in" tunnel suit has been designed for personnel protection during the repair and replacement of equipment in radioactively contaminated areas. The low crotch of the suit enables an operator to step in or out when the tunnel is retracted. This ease of entry makes short term work possible and thus reduces the gamma dosage to the operator. Four cables inside the tunnel are fastened to the back of the suit and tensioned to counteract the differential air pressure due to the reduced pressure in the cave. These cables also pull the suit against the front of the operator's body to keep it out of his way.

5 Fig.: 5

(3) RL

Csiba, L. 1072

New Frogman Technique

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.331-38, 13 Fig.)

A new frogman technique has been developed for working in rooms contaminated by alpha emitters or other dangerously radioactive materials. This technique avoids the extensive cleaning of the frogman and his suit after finishing the work. Cold areas are not contaminated by the frogman when leaving the hot rooms.

5 Fig.: 5

(3) RL

Fleischer, E.S., Parsons, T.C., Howe, P.W., 1073

Remote Plastic Bag Passout Unit for High-Level Radiochemical Operations

(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.339-43, 9 Fig.)

This system presents a method for making remote sealed-bag passouts from a multicurie-level chemistry processing enclosure. In addition, the polyethylene bags are changed remotely without exposing contaminated surfaces while always maintaining a low leak-rate seal. Our system employs an interchange box (the Passout Box) attached to the chemistry enclosure. Integrated with the box is a hydraulically operated jack that raises and lowers the bags, and a welder-cutter for sealing them. A single master-slave manipulator teamed with the above units handles all operations.

5 Fig.: 5

(5) RL

Bazire, R., Duhamel, F. **1079**
Progrès récents dans la conception et l'équipement des laboratoires de haute activité
(Health Physics in Nuclear Installations. La Physique de Santé dans les installations nucléaires. Symposium org. at the Danish Atomic Centre of Risø, 25-28 May 1959, S.201-17)
(CEA-1503 (1960) 17 S.)

Es wird über die Anlage, Einrichtung und Aus- CEA-1503
rüstung verschiedener Laboratorien für Arbeiten mit 2
radioaktiven Stoffen in Frankreich berichtet. Be- 3
schrieben werden: Das Laboratorium von hoher Akti- 4
vität in Saclay, das Laboratorium zur Untersuchung 5
von bestrahlten Brennelementen in Saclay, das Laboratorium zur Herstellung von Radioisotopen, das heiße Laboratorium von Grenoble, die α-, β-, γ-Laboratorien von Fontenay-aux-Roses, ein bewegliches Laboratorium, α-Zellen von großem Ausmaß, Schutzvorrichtungen, Fernbedienungen und Transportmittel.

(8) NSA-1960-16753 RL

Mestre, E. **1082**
Le contrôle de la contamination atmosphérique dans les laboratoires ou ateliers
(Bulletin d'informations scientifiques et techniques, No.43 (1960) S.32-43, 15 Fig.)

Afin de connaître la concentration d'aérosols ra- 3
dioactifs ou toxiques dans l'air, les agents char- 5
gés du contrôle des radiations disposent d'un cer- Fig.:
tain nombre d'appareils. L'appareil de prélèvement 3
du type "8 heures" est placé dans tous les labora- 5
toires et ateliers où le travail est susceptible de produire une contamination atmosphérique par libération dans l'air d'aérosols. L'agent chargé du contrôle des radiations dans les laboratoires ou ateliers relève tous les soirs les filtres. L'appareil de prélèvement instantané est utilisé auprès des installations en fonctionnement ou encore d'une opération présentant un caractère exceptionnel. Forts.

(4) NSA-1961-9250 RL

Mestre, E. **1082** 1.Forts.
Le contrôle de la contamination atmosphérique dans les laboratoires ou ateliers
(Bulletin d'informations scientifiques et techniques, No.43 (1960) S.32-43, 15 Fig.)

L'embout porte-filtre est placé aussi près que pos- 3
sible de la tête de l'opérateur. Le volume d'air que 5
l'on fait passer à travers le filtre de papier est Fig.:
d'environ 1 m^3. Il existe deux types d'appareils 3
de prélèvement de poussières atmosphériques basés 5
sur le principe de l'impacteur: - l'impacteur annulaire, - l'impacteur en cascade. L'appareil "Impacteur annulaire" est utilisé au même titre qu'un prélèvement instantané. L'impacteur en cascade, comme l'impacteur annulaire, utilise le principe de la force centrifuge pour collecter des poussières sur des surfaces planes. 2. Forts.

(4) NSA-1961-9250 RL

Mestre, E. **1082** 2.Forts.
Le contrôle de la contamination atmosphérique dans les laboratoires ou ateliers
(Bulletin d'informations scientifiques et techniques, No.43 (1960) S.32-43, 15 Fig.)

Le contrôle de la pollution de l'atmosphère est 3
effectué soit par piégeage du gaz, c'est le cas 5
par exemple pour ^{131}I, soit par comptage de la Fig.:
radioactivité de l'air par circulation à travers 3
une chambre d'ionisation, c'est le cas de ^3H. 5

(4) NSA-1961-9250 RL

Rachinskii, V.V., Platonov, F.P. **1086**
The Radioisotope Laboratory of the Timiryazev Academy
(Izvestiya Timiryazevskoi sel'skokhozyaistvennoi akademii, 1959, 6, S.239-250)
Engl.Übers.: (LLU Translations Beulletin, 2 (1960) S.545-67, 12 Fig.)

There are three radiochemical rooms. All preparatory 2
and analytical work with radioactive materials is 4
carried out in these rooms. They are fitted with 5
special laboratory benches with hot and cold water, Fig.:
gas, compressed air and a vacuum line laid on. Each 2
work place at the radiochemical bench is equipped 4
with a set of appliances and protective fixtures for 5
work with radioactive substances. The radiochemical rooms are fitted with fume cupboards of special design. The front sash-windows of these cupboards contain devices for the fixing of long-sleeved gloves.

(6) Forts. RL

Rachinskii, V.V., Platonov, F.P. **1086** Forts.
The Radioisotope Laboratory of the Timiryazev Academy
(Izvestiya Timiryazevskoi sel'skokhozyaistvennoi akademii, 1959, 6, S.239-250)
Engl.Übers.: (LLU Translations Bulletin, 2 (1960) S.545-67, 12 Fig.)

This makes work in the fume cupboards possible with 2
the windows shut. Various plexiglass devices are 4
widely used in work with radioactive substances: 5
protective plexiglass stands for filtering, boxes Fig.:
for pipettes, for compounds and plants, and for 2
flasks. 4
5

(6)

RL

Gruber, G.H. **1089**
Plutonium Monitor for Puncture Wounds
(DP-508 (1960) 12 S., 6 Fig.)

An instrument capable of detecting at least 0.06 DP-508
microgram of plutonium-239 within a puncture wound
was needed for use in the medical treatment of per- 5
sonnel who may sustain such injuries from plutonium- Fig.:
contaminated material. An instrument was designed 5
that can detect as little as 0.015 microgram of Pu 239 within a wound. Scintillation techniques are used to count X-rays produced by the radioactive disintegrations of Pu 239. Special components (a thin scintillation crystal with a thin window, and a specially selected low noise photomultiplier tube) and careful isolation of the monitor from background radiation and electrical switching transients make it possible to count Pu 239 X-rays with a single-channel pulse height selector.

(4) NSA-1961-9009 RL

Cathey, L. **1094**
Area Radiation Monitor
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.52-54, 2 Fig.)

In areas where personnel handle radioactive AECL-802
sources it is of interest to know the general
radiation level of the area as a whole so that 5
unexpected changes may be detected and the causes Fig.:
investigated. A monitor has been built that utilizes 5
a scintillation counter with a 3-in. by 3-in. cylindrical crystal of NaI(Tl). The circuit counts all interactions that release more than 10keV in the crystal.

(4) NSA-1961-8985 RL

Dilworth, R.H., Borkowski, C.J. 1095
Personal Radiation Monitor
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.74-81, 6 Fig.)

The instrument to be described is sensitive to gamma radiation intensity. Visual indication of the intensity is given at all times by a neon lamp whose flashing rate is proportional to the dose rate. If the dose rate exceeds a predetermined threshold, an aural alarm sounds in the form of a tone whose frequency increases in proportion to dose rate. The instrument is of the size and shape of a fountain pen, and a spring clip is provided for holding in a shirt or coat pocket. In the interest of reliability no on-off switch is provided.

AECL-802
5
Fig.: 5

(5) NSA-1961-8990 RL

Gentry, W.O., Schede, R.W., Smith, R.C. 1096
Monitors for Alpha Air Contamination
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.94-102, 6 Fig.)

The major health-physics instrumentation problem at the gaseous-diffusion plants concerns the detection of airborne uranium dust. Present instrumentation requires a four- to five-hour delay between the collection of a sample and its measurement. The monitor in use at the Oak Ridge Gaseous Diffusion Plant utilizes a roll of moving filter paper and the reading is printed out after the delay. An impaction type of monitor was investigated as a means of eliminating this delay but provided no improvement because the particle size of the dust

AECL-802
5
Fig.: 5

(6) NSA-1961-8991 Forts. RL

Gentry, W.O., Schede, R.W., Smith, R.C. 1096
Monitors for Alpha Air Contamination Forts.
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.94-102, 6 Fig.)

from a gaseous release is comparable with that associated with natural radioactivity. Work is in progress on a monitor with fixed filter paper wherein the sample is continuously collected.

AECL-802
5
Fig.: 5

(6) NSA-1961-8991 RL

Sanders, H.S., Cook, L.H., Hardison, H.V. 1097
Walk-Over Shoe Monitor
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.103-5, 2 Fig.)

A shoe or traffic monitor was needed that would monitor shoes with little or no delay as employees leave their work areas. The detector consists of 28 Type RCL 11-7 Geiger-Mueller tubes arranged in seven sets of four tubes each staggered in a frame to cover an area approximately 2 ft by 4 ft. The seven channels are identical. The signal from the channel pulses a cold-cathode trigger tube, an Amperex 6539. The output of the 6539 is indicated by a 20-μA full-scale meter relay. A signal in excess of the relay alarm setting energizes an alarm circuit composed of a bell and light. Each channel is reset individually by a push-to-open switch in the meter-relay-to-alarm-relay circuit.

AECL-802
5
Fig.: 5

RL

Sanders, H.S., Cook, L.H., Burke, A.L., Hardison, H.V. 1098
Criticality-Incident Alarm
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.106-08, 4 Fig.)

The criticality alarm is an instrument designed to detect the large gamma-radiation field that results from a criticality accident and then give an immediate alarm. The design emphasized reliability. Unitized construction was used with the detector, measuring circuit, alarm circuit and battery charger on separate plug-in chassis. The detector is an air-filled ionization chamber used in a Neher-White circuit. The alarm levels in the laboratories were set at 1 R/h for this instrument which had a maximum delay of three-quarters second.

AECL-802
5
Fig.: 5

(7) NSA-1961-8992 RL

Howell, W.D. 1099
Beta-Gamma Hand and Foot Monitor
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.125-9, 6 Fig., 1 Tab.)

These instruments are intended to detect small quantities of beta-gamma activity on hands or footwear or both. In order to satisfy a variety of requirements, provision is made, by use of unitized subassemblies, for the following monitoring facilities: (1) a console model for monitoring both hands and feet, (2) a monitor for feet only, (3) a monitor for hands only. Figure 1 shows a view of the complete monitor.

AECL-802
5
Fig.: 5
Tab.: 5

(4) NSA-1961-8997 RL

Marr, J.D. 1100
A Doorway Personnel Monitor for Use in Varying-Background Areas
(AECL-802: Proceedings of the 6th Tripartite Instrumentation Conference held at Chalk River, Ontario, April 1959 (1960) Pt.2: Radiation Dosimetry, S.130-32, 1 Fig.)
(CRR-797-2.9)

The sensitivity of doorway personnel monitors at Chalk River has always been limited by the varying gamma-ray background due to ^{41}Ar in the reactor air effluent. In order to circumvent this limitation in sensitivity, an alarm system has been developed that is sensitive only to fast changes in counting rate such as would be produced by a contaminated person approaching a counter at walking speed. In the basic arrangement of the monitor, a detector is followed by a ratemeter with a short integrating time constant.

AECL-802
CRR-797-2.9
5
Fig.: 5

(4) NSA-1961-8998 RL

Raleigh, H.D., Scott, R.L. 1102
Nuclear Instrumentation. A Literature Search
(TID-3550(Rev.1) (1961) III, 149 S.)

Included are 1,728 references on the design, construction and application of instruments for radioactive environments (Hot Cell, Radiation Detection Instruments, Remote-Control Equipment).

TID-3550(Rev. 1
4
5

(7) NSA-1961-22459 RL

Ritter, H.-J. 1106
Strahlenschutz für Jedermann: Handbuch für Unterricht und Einsatz im Strahlenschutz. 2., verb. Aufl.
(Mainz & Heidelberg: Hüthig & Dreyer (1961) 199 S., 178 Fig. (Schriften des Deutschen Roten Kreuzes))

Unter anderem wird ausführlich über die Konstruktion, Arbeitsweise und Handhabung von Strahlennachweis- und Meßgeräten sowie über Schutzkleidung berichtet. Zahlreiche Abbildungen sind vorhanden.

5
Fig.:
5

(3) RL

Gupton, E.D. 1110
Personnel Monitoring
(Nuclear Safety, 3 (1961) S.65-68)

Until recently the methods and equipment available for warning individuals of radiation hazards and for measuring the doses which they may have received were considered to be generally adequate. Present opinion suggests, however, that we should improve methods for (1) internal dosimetry of alpha-particle-emitting radionuclides, (2) low-level neutron dosimetry, (3) gamma-ray dosimetry for doses greater than 500 rads, (4) detection of particulate-associated alpha-particle emitters in the presence of radon daughters, (5) dosimetry for those involved in criticality accidents, and (6) individual dose-rate warning.

5

(3) RL

Smith, R.D., Johnson, V.P. 1111
Equipment for Self-Monitoring in a Plutonium Facility
(Health Physics, 6 (1961) S.218-19, 4 Fig.)

The effect to provide adequate self-monitoring equipment has resulted in three instruments, each suited for a distinct application. These instruments are: (1) a modification of the Eberline Instrument Corporation's PAC-1A; (2) Combo, a battery-powered console-type instrument; and (3) a modification of the NRD Instrument Company's CRM-560 Count Rate Meter. As all of the work with plutonium is done in dry boxes, a compact, lightweight instrument is needed for a dry-box worker. This instrument should be portable enough to be easily moved from one location to another.

5
Fig.:
5

(4) RL

Farmer, F.R. 1113
The Packaging, Transport and Related Handling of Radioactive Materials
(DPR-INF-264 (1961) 13 S.)

Considerable progress has been made in formulating international and national regulations for the safe handling of radioactive material in transport, and with this end in view a great deal of effort has gone into international co-operation in this field. But public policy demands that constant vigilance should be exercised. In fact, in a field in which advances in knowledge are made so quickly, it is essential to keep procedure and practice under constant review, and to promote exchanges of information at an international level on such topics as design, testing, emergencies and operating results. Only in this way will it be possible for radioactive materials to be accepted in the transport world as just "dangerous goods", and the traffic in them flow as easily as operators would wish and as their importance requires. (4) RL

DPR-INF-264
5

Appleton, G.I., Dunster, H.I. 1116
Recommended Practice in the Safe Handling of Plutonium in Laboratories and Plants
(AHSB(RP)R.6 (1961) 44 S., 2 Fig., 1 Tab.)

This report provides a brief introduction to the physical, chemical and toxic properties of plutonium, reviews the precautions to be taken in the design and operation of laboratories, plants and stores, and makes recommendations for safe practice. Criticality problems are discussed only in outline. Where available, fire resistant materials should be used for glove box construction. Transparent material must be incorporated to enable ample direct vision and this material, too, should be fire resistant and shatterproof. Special laundry arrangements should be provided for those establishments in which contact clothing may be contaminated with plutonium to levels in excess of the maximum permissible.

AHSB(RP)R.6
2
4
5

(7) Forts. RL

Appleton, G.I., Dunster, H.I. 1116
Forts.
Recommended Practice in the Safe Handling of Plutonium in Laboratories and Plants
(AHSB(RP)R.6 (1961) 44 S., 2 Fig., 1 Tab.)

Provision should be made in each changeroom for collecting contaminated clothing in suitable containers. Each glove box should be provided with a supply of suitable dry powder in a metal container and a means of transferring the powder in the event of a fire. In the event of a plutonium fire in the box, the scoop should be used to cover the burning material with the dry powder extinguisher - this application should be liberal.

AHSB(RP)R.6
2
4
5

(7) RL

Development of Manipulators for Handling Radioactive Materials. d: Personnel Access to Alpha-Gamma Caves Using Plastic Suits and Enclosures 1122
(ANL-6433: Reactor Development Program Progress Report. Sept. 1961 (1961) S.48)

Plastic tunnel suits and enclosures have been used for some time to permit personnel access into contaminated areas to repair, replace, and decontaminate equipment. Many of these tunnel suits are difficult or awkward to enter. In order to help eliminate time consuming entry procedures, a versatile "step-in" tunnel suit and isolation tent have been developed. The low crotch of the suit enables an operator to step in or out when the tunnel is retracted. This ease of entry makes short team work possible and thus reduces the gamma dosage to the operator.

ANL-6433
5

(4) RL

Rowlands, R.P. 1123
A Catalogue of Available Whole Body Protective Clothing
(AHSB(RP)R.9 (1961) 70 S., 14 Fig.)

A brief general description, together with illustrations, is given for each of the whole body pressurized or unpressurized impermeable suits in regular use within the Authority. The Catalogue sets out to provide a record of the equipment available and in regular use within the Authority for whole body protection. Attention has been focused on the suits themselves without undue reference to ancillary and installed equipment which may also be required when the suits are in use. Brief descriptive details of the design and fabricating materials of each suit are given together with an outline of its uses.

AHSB(RP)R.9
1
5
Fig.:
5

(5) RL

Lochanin, G.N., Siničyn, V. I. 1129
Decontaminating Enclosure
(Atomnaja Energija, 9 (1960) S.341-44, 4 Fig.)
Engl.Übers.s.: (Soviet Journal of Atomic Energy, 9 (1961) S.880-83, 4 Fig.)

In order to create the conditions for cleaning laboratory ware from radioactive contamination, special washing hoods had to be developed and fabricated. The ShM washing and decontaminating enclosure is now being manufactured to service Soviet industry. The hood is designed to facilitate washing laboratory ware, instruments, and other equipment contaminated by α-, β-, and γ-active materials. The hood (Fig.1,2) consists of three separate glove boxes interconnected by coupling flanges. The length of the enclosure is 3580 mm, width 825 mm, height 2320 mm, weight (of the whole assembly) 860 kg. The internal volume of each box is 0.4 m^3. 5 Fig.: 5

(4) Forts. RL

Lochanin, G.N., Siničyn, V.I. 1129 Forts.
Decontaminating Enclosure
(Atomnaja Energija, 9 (1960) S.341-44, 4 Fig.)
Engl.Übers.s.: (Soviet Journal of Atomic Energy, 9 (1961) S.880-83, 4 Fig.)

Each box is a gastight frameless enclosure resting on a supporting base. The boxes are fitted with viewing windows, removable fluorescent lamps, rubber gloves, ventilation ducts (intake and exhaust filters, gate valves), a liquid waste drain, liquid waste receptacle, hot and cold water taps, water pressure gages etc. 5 Fig.: 5

(4) RL

Snyder, W.A. 1131
Safety Review of Hanford Laboratories Pilot Plant
(HW-69587(Rev.) (1961) 15 S.)

Es wird über Schutz- und Sicherheitsvorkehrungen beim Arbeiten mit Plutonium und Spaltprodukten in verschiedenen Laboratorien in Hanford sowie über administrative Anordnungen bei der Ausführung von Versuchen berichtet. Die wesentlichen Merkmale bezüglich Anlage und Funktion der Laboratorien werden diskutiert. HW-69587(Rev.) 2 5

(5) NSA-1962-3261 RL

Billiau, R., Blumenthal, B., Draulans, J., Vanden Bemden, E. 1133
The Design and Operation of the Plutonium Ceramics Laboratories at Mol
(BLG-64 = BN-6107-03 = R. 2013 (o.J. um 1962) II, 26 S., 9 Fig., 1 Tab.)

Das Laboratorium wurde für die Untersuchung von alpha-aktiven keramischen Materialien ausgerüstet. In den Arbeitskästen werden Uran- und Plutoniumoxyd-Preßkörper hergestellt und untersucht. Es wird über die grundsätzlichen Überlegungen bei der Laboratoriumseinrichtung berichtet. Die allgemeine Anlage und Belüftung des Laboratoriums, die leckdichten Arbeitskästen und ihr Druckregelsystem für wiederholte und einmalige Luftdurchführung, die Filter, Handschuhbefestigungen usw. werden beschrieben. Sicherheitsregeln und Vorschriften für erste Hilfe bei Unfällen werden mitgeteilt. BLG-64 BN-6107-03 R. 2013 2 3 4 5 Fig.: 2 4 Tab.: 4

(12) NSA-1962-11811 RL

Slansky, C.M. 1134
Materials of Construction
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.982-86, 1 Tab.)

Materials will be discussed in this report depending on their use in nitric acid, sulfuric acid, or hydrofluoric acid chemistry. Then, the specific problems will be detailed as to the unit operation within the process. Our discussion will include a few words on such buildings as the shielded canyon, laboratories, solution make-up area, and fuel storage basin. Vessels and miscellaneous equipment include fuel carriers, dissolvers, evaporators, centrifuges, extraction columns, tanks, pumps, pulsers, instruments, and floor and wall coverings. Strippable films are sometimes used as special coverings when it is known that the surface will be contaminated and no simple decontaminating procedure is available. (5) TID-7534 4 5

RL

Schwennesen, J.L. 1135
Operating Experience at Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S. 993-1021, 23 Fig.)

In a remote maintenance processing plant all process equipment, including reaction vessels, centrifuges, pumps, agitators, evaporators, etc., is assembled, connected and disconnected by manipulation from a traveling overhead crane. The Plants considered in this report are the Hot Semiworks located at the Hanford Atomic Products Operation near Richland, Washington; the Idaho Chemical Processing Plant (ICPP) located at the National Reactor Testing Station near Idaho Falls, Idaho; and the Metal Recovery Plant and the Thorex Pilot Plant both located at the Oak Ridge National Laboratory. TID-7534 2 4 5 Fig.: 4 5

(6) Forts. RL

Schwennesen, J.L. 1135 Forts.
Operating Experience at Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S. 993-1021, 23 Fig.)

All of these plants employ Redox, Purex, or Thorex process solvent extraction technology or minor variation therefrom. All of the Plants discussed in this paper have various special design features to facilitate decontamination of equipment which were provided initially or as a result of experience in production activities. TID-7534 2 4 5 Fig.: 4 5

(6) RL

Heydorn, K., Singer, K.A., Wangel, J. 1141
Radioisotope Laboratory Design
(Risö-Report No.26 (1961) 25 S., 9 Fig., 4 Tab.) RISÖ-26

Radioisotope laboratories are often designed by architects and engineers without any idea of radioisotopes, in conjunction with scientists without any idea of laboratory design. The report describes the basic requirements arising from the presence of radioactive material, as well as the limitations imposed by practical and economical possibilities (planning of the laboratory, lay-out, construction of the building, laboratory furniture, sanitary installation, ventilation, air filters, fume hood, glove box, working clothes, cleaning). 2 3 4 5 Fig.: 2 3 4 5 Tab.: 5

(9) RL

Boutot, P., Capitaine, A., Giachetto, L. 1142
Elimination comme déchet radioactif d'un four de fluorination en provenance de l'usine d'extraction du plutonium
(CEA-2102 (1961) 17 S., 11 Fig.) CEA-2102

The furnace, 1.60 x 0.75 x 0.80 m in dimensions, was placed inside a 2.50 x 1.25 x 2 m glove box. The operations were as follows: - removal of the furnace from the glove box; - storage of the furnace in a special container; - reduction to a minimum volume and elimination of the glove box. A very high α activity, oxidation of the various canalisations, and waste products in the box necessitated special safety measures such as fixing of the contamination, crushing, the use of appropriate vinyl envelopes. This long and tedious work was carried out with no resulting bodily or atmospheric contamination.

5 Fig.: 5

(6) RL

Cartwright, D.K., Todd, M.J. 1156
Instrumentation for Criticality Protection of Chemical Plants
(Nuclear Power, 6, No.66 (1961) S.79-82, 7 Fig., 1 Tab.)

Application of conventional nuclear radiation detectors for locating uranyl deposits and accumulations of plutonium in chemical plants are discussed. To meet this problem, the use of nuclear radiation detectors was investigated: neutron monitors had previously been found satisfactory for detecting condensed uranium hexafluoride. In chemical plants for the separation of plutonium from irradiated fuel, dangerous build-up of plutonium may occur, and it is desirable to have a measure of plutonium hold-up in the actual stages of the plant. In addition, particularly when the time for a dangerous build-up of plutonium may be short, it may be necessary to have installed instruments.

5 Fig.: 5

(4) NSA-1962-274 RL

Evans, H.D. 1151
Radiochemical Research Laboratories and the Law
(Nature, 194, No.4831 (1962) S.808-9)

The legal requirements which have to be fulfilled by persons or organizations using radioactive materials are not clearly understood by the vast majority of workers in this field. Clearly, the Nuclear Installations (Licensing and Insurance) Act, 1959, applies to any organization operating a reactor or processing nuclear fuel, and a few research laboratories, both in industry and the universities, will therefore be affected. Apart from this, it would appear that research laboratories have considerable scope for malpractice in the use of radioactive materials, and it is

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(3) Forts. RL

Henry, H.F. 1157
Developments in the Safe Handling of Fissionable Materials
(Nuclear Safety, 3, No.1 (1961) S.4-7)

This review discusses developments in the handling of fissionable materials subsequent to the previous reviews of this subject in "Nuclear Safety". Reactor considerations, except as they also involve other aspects of nuclear safety, are not separately discussed here. Similarly, no reference is made to the rather considerable effort, both administrative and technical, which has gone into the various aspects of handling criticality accidents.

5

(3) RL

Evans, H.D. 1151 Forts.
Radiochemical Research Laboratories and the Law
(Nature, 194, No.4831 (1962) S.808-9)

to be regretted that in many, due largely to ignorance of the necessary precautions, work is carried out under conditions which, if not an immediate danger to health, are potentially hazardous. What is so often forgotten is that such practices open the door to justifiable or spurious claims under Common Law.

5

(3) RL

Bradshaw, R.L. 1158
Instruments for Environmental Surveys
(Nuclear Safety, 3, No.1 (1961) S.68-73)

In the field of environmental monitoring, there is yet much to be desired in the way of instrumentation. Some recent developments, such as the large sodium iodide crystal gamma detector, the low-level beta counter, and the transistorized multichannel gamma-spectrometer analyzer, have done much to improve the speed and accuracy of laboratory analyses of environmental samples. Although some improvements "in situ" monitoring, such as transistorization of standard instruments, applications of scintillation detectors, remote station telemetering, and vehicle and aerial surveying. have been made, the greatest current need for further development appears to lie here. Perhaps the semiconductor detector will meet this need.

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(3) RL

Morton, R.A., Glover, J. 1152
Safety in Laboratories
(Nature, 194, No.4831 (1962) S.809-11)

As universities and similar institutions grow larger, and the work done in laboratories and workshops becomes more complicated, there is greater need to maintain and strengthen safety precautions. Members of staff, technicians, and senior students were instructed as to their duties in case of fire. The next step was to appoint a member of the staff of the Department of Physics to act as 'radiation officer', responsible for the safety of persons using radiation equipment and radioactive isotopes in university laboratories.

5

(4) RL

Lindeken, C.L., Beard, E.L., Barlow, O.M. 1163
A Simple, High-Level Alpha Air Monitor
(UCRL-6425 (1961) III, 13 S., 6 Fig.)

This report describes a continuously indicating alpha air monitor with an audio alarm in case of high-level airborne "spills". The monitor features are simplicity and economy of design, small size, light weight, operation at a low noise level, and minimal maintenance. Sampling flow rate is controlled at 2 cfm.

UCRL-6425

5 Fig.: 5

(6) NSA-1961-30848 RL

Single-Hand Monitor 1178
(Nuclear Engineering, 7, No.75 (1962)
S.335-36, 1 Fig.)

Monitoring one hand at a time - yet operating at the rate four persons a minute - the EMI type HM2 monitor gives simultaneous readings of alpha and beta contamination with audible and visual alarms (maximum permissible levels can be adjusted to suit the standards of the particular establishment). Alpha and beta readings are displayed on two 3 1/2 in rectangular meters, scaled 0-1-2 MPL, the normal value of unity MPL being 10^{-3} µc (24 counts in five seconds) with the standard alpha hand (Pu-239) and 3×10^{-2} µc (1700 counts in five seconds) with the standard beta hand (Sr-90). Transistorized throughout, the instrument is quite small and light and suitable for wall mounting. 5

(3) RL

Estournel, R., Rodier, J. 1187
Materiel d'intervention en cas d'accident radioactif grave
(CEA-2113 (1962) 21 S., 7 Fig.)

The Anti-radiation Protection Service at Marcoule has organised mobile detection teams and designed a mobile laboratory and a mobile shower-unit. After describing the duty of the mobile teams, the report gives a description of the apparatus which would be used at the Marcoule Centre in the case of a serious radioactive accident. The method of using this apparatus is given. CEA-2113 5 Fig.: 5

(5) NSA-1962-16597 RL

Gorodinskij, S.M., Nosova, L.M., Panfilova, Z.E. 1190
Protective Coating on Building Designs and Means of Their Inactivation of Radioactive Pollution [Russ.]
(Medizinskaja radiologija, 5, No.11 (1960) S.57-61)

Problems of inactivation of premises and equipment of laboratories in their pollution with radioactive substances are discussed. The authors depict their personal experience and literature data on this matter. Protective plastic materials are discussed. 5 Tab.: 5

(5) NSA-1961-11384 RL

Le Gallic, Y. 1192
Les mesures d'activité à faible niveau
(Bulletin d'informations scientifiques et techniques, 1961, No.51, S.101-4, 6 Fig.)

Le seuil des activités directement mesurables est d'autant plus bas que cette condition est mieux réalisée. Pour atteindre cet objectif il est donc nécessaire de réduire respectivement les effets des trois origines du mouvement propre:- le rayonnement cosmique; - la contamination des matériaux utilisés; - le rayonnement ambiant du laboratoire. Ceci n'est possible qu'en utilisant un local, des dispositifs de protection, et des détecteurs appropriés. Dans ce qui suit nous décrivons brièvement les caractéristiques essentielles du laboratoire, dépendant du L.M.R., ou s'effectuent les mesures d'activité à faible niveau. 5 Fig.: 5

(3) NSA-1961-29440 RL

New Shielding Materials 1197
(Atomnaja Energija, 8 (1960) S.285)
Engl.Übers.s.:(Soviet Journal of Atomic Energy, 8 (1961) S.252)

Shielding of portable facilities is usually achieved with a mixture of heavy and light elements: iron-water shielding, lead-water, lead-polyethylene, and iron-graphite shielding combinations. However, use of combination of shielding materials often involves added difficulties in assembly and operation (corrosion, stability to heat load, impact strength, and other problems). Close attention is therefore required in developing new materials combining the properties of "heavy" and "light" shielding. 5

(3) RL

Lochanin, G.N., Sinicyn, V.J., Štan', A.S. 1200
Schutzgeräte und ihre Anwendungen für die Arbeit mit radioaktiven Substanzen (Russ.)
Moskva: "Gosatomizdat" 1961. 129 S., 91 Fig., 10 Tab. 1

Dieser Katalog enthält Beschreibungen, Abbildungen und Tabellen von Geräten und Einrichtungen, die in der Sowjetunion für Arbeiten mit radioaktiven Substanzen verwendet werden. Die Geräte sind unterteilt in: Behälter, Tresore, Schirme, Abschirmklötze, Karren, Abzüge, Kammern, Distanz-Instrumente und Manipulatoren, medizinische Instrumente, sanitär-hygienische Einrichtung, Laboratoriumsmöbel, Geräte zum Sammeln und Entfernen radioaktiver Abfälle, Sichtfenster, Filtermaterial, Kunststoffmaterial zur Auskleidung der Laboreinrichtungen, Schutzkleidung. 3 4 5

(7) RL

Ayer, J.E., Pokorny, G.J. 1202
Radiation Resistant, Remotely Operated, High Capacity Spring Balance
(Review of Scientific Instruments, 32 (1961) S.1114-16, 4 Fig., 1 Tab.)

A balance with a weighing range between 9 and 24 kg has been tested. The use of radiation resistant sensing devices makes it acceptable for use in hot cell applications. With an unrefined read-out method the system sensitivity, including resolution of chart reading by eye, at 65 % confidence limits is ± 10 g in 2.5-kg intervals. Over the entire 9 to 24 kg range the linearity of the system is such that the sensitivity is reduced to ± 17 g. It is predicted that digital indication of weight and use of a low inertia, low friction indicating system will double the system sensitivity. 5 Fig.: 5

(4) RL

Quinton, A. 1203
Safety Assessments in the Nuclear Industry. Part I
(Chemical and Process Engineering, 42 (1961) S.402-4, 2 Fig., 1 Tab.)

More factors must govern safety assessment in chemical plant associated with the nuclear industry than are generally associated with the siting of normal chemical plant. Various such safety criteria are discussed in this article. It is pointed out that the selection of site position is affected by the position of existing facilities of particular importance to radioactive material processing; in addition there is also a need to ensure that the introduction of a new process does not produce an unacceptable hazard to surrounding buildings. References are made throughout to official recommendations and regulations which must be followed meticulously. 5

(3) NSA-1961-29292 RL

Irvine, A.R., Lotts, A.L. 1204
Criteria for the Design of the Thorium Fuel Cycle Development Facility
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

Criteria for the conceptual design of the pro- ORNL-TM-149
posed Thorium Fuel Cycle Development Facility 2
have been established and are presented. In 3
addition, conceptual layouts of the building 4
and equipment are included. The hot-cell structure 5
consists of the Clean Fabrication Cell, the Con- Fig.:
taminated Fabrication Cell, the Mechanical Pro- 2
cessing Cell, the Chemical Cell, the Decontamina- 4
tion Cell, and the Hot-Equipment Storage Cell. The Tab.:
Glove Maintenance Room and the Airlock are appended 4
to this structure. Each viewing window will consist
of a steel liner embedded in the concrete structure
of the cell with installed glass shielding of approximately 12 in. total thickness on the radioactive side
and zinc bromide solution for the remaining wall Forts.
thickness. (8) NSA-1962-10103 RL

Irvine, A.R., Lotts, A.L. 1204
Criteria for the Design of the Thorium Fuel Cycle Development Facility Forts.
(ORNL-TM-149 (1962) 80 S., 13 Fig., 5 Tab.)

One pair of CRL Model A master-slave manipu- ORNL-TM-149
lators or one pair of CRL Model D heavy-duty 2
master-slave manipulators respectively will be 3
provided for each viewing window of the various 4
cells. Two 30-ton-capacity overhead traveling 5
cranes are to cover almost the entire third-floor Fig.:
area. All interior spaces in the building will be 2
served by fire protection facilities. The cells will 4
have fire protection system of "metalex" cylinders Tab.:
placed at various locations in the cells. 4

(8) NSA-1962-10103

RL

Vanstone, A.H. 1205
(Protective Coatings for Nuclear Reactors, Ancillary Plants and Buildings, deutsch)
Schutzüberzüge im Kernreaktorbau - Referat -
(Paintindia, 11, No.1 (1961) S.85-96)
(Farbe und Lack, 67 (1961) S.769-70)

Für radioaktiv verseuchte Räume werden Spezial- 5
farben auf Basis von Epoxyharzen und Chlorkautschuk angewendet. Der amingehärtete 4-Schichten-Epoxyharzanstrich wird in Gefahrenzonen mit einem Vinylharz-Abziehlack überzogen, der bei Verseuchung abgezogen und erneuert wird. Vielfach müssen zwecks Dichtung etc. auch Epoxyharz-Kitte aufgebracht werden, die gleichermaßen beständig gegen Sauren und Alkalien sein müssen.

(3) RL

Marter, W.L. 1208
Radiation and Contamination Control Improvements for a Plutonium Processing Plant
(Health Physics, 8 (1962) S.435-38, 5 Fig.)

Process cabinets, in which metallic reductions 3
are performed, have highly contaminated atmo- 5
spheres. These cabinets are individually supplied Fig.:
with filtered air which is exhausted through in- 2
dividual filters on each cabinet. All air and 3
cabinet filters are of the high-efficiency fire-resistant type. The interior of the plant was designed to simplify decontamination. All piping and conduit is contained in smooth plaster walls, buried in concrete, or located above false ceilings. An oil-modified phenolic protective coating on all walls permits ready decontamination without resorting to harsh or corrosive chemicals. All rooms have air samplers recessed in small cabinets in the walls. All process and maintenance areas are provided with a supply of clean, dry air for use in air masks or plastic suits. (4) RL

Komarovskii, A.N. 1212
Wall Surface Coatings for Radioactive Room Interiors
(Atomnaja Energija, 10, No.6 (1961) S.597-605)
Engl.Übers.: (Soviet Journal of Atomic Energy, 10, No.6 (1962) S.592-600, 4 Fig.)

Problems concerned with coatings and finishes on 5
the walls, floors, and ceilings of rooms in 6
nuclear facilities are discussed. Experience in Fig.:
the use of various internal surface coatings in 5
the USSR is illustrated and inferences are drawn Tab.:
therefrom, and recommendations on their proper 5
use are presented. Data on costs of various materials employed in coatings and finishes are adduced.

(4) RL

Dolishnyuk, B.M. 1213
A Facility for Irradiating Personal Film Holders
(Atomnaja Energija, 9, No.8 (1960) S.156-57)
Engl.Übers.s.:(Soviet Journal of Atomic Energy, 9, No.2 (1961) S.669-71, 4 Fig.)

Photographic-film methods for radiation detection 5
have enjoyed wide popularity in dosimetry, espe- Fig.:
cially in personnel film-badge dosimetry appli- 5
cations. In order to photometrically scan the irradiated films, it is required to plot the calibration curve of film density vs γ-radiation dose absorbed by the photosensitive film layer in developing each of the films. For this purpose, films covered with different screens (to differentiate the spectral response) are γ-irradiated by photons originating in a standard source. An automated facility which has been functioning reliably over a long service period was devised for standard irradiation exposures of the filmpacket holders, and is described below. (3) RL

Oppenheimer, E.D., Lazarus, S. 1219
Philosophy of Design for the NDA Plutonium Facility
(NDA-MEMO-2145-3 (1960) VII, 21 S., 2 Fig.)

The purpose of this report is to state the NDA-MEMO-2145-3
basic points of design philosophy which will
be followed as a guide in the design of a 3
facility for handling, analyzing, cladding, 5
and performing other operations on plutonium Fig.:
carbide. Toxicity, resulting from the alpha 2
activity of plutonium, requires that the material 3
be isolated from personnel by continuously containing it within leaktight containers or glove boxes. The pressure within, the contained volume will be kept below the surrounding atmospheric pressure at all regions of the system by an amount that will insure that in-leakage flow velocity will be sufficient to prevent escape of contamination in quantities exceeding tolerance levels. (6) NSA-1961-23592 Forts. RL

Oppenheimer, E.D., Lazarus, S. 1219
Philosophy of Design for the NDA Plutonium Facility Forts.
(NDA-MEMO-2145-3 (1960) VII, 21 S., 2 Fig.)

All the normally clothed parts of the body NDA-MEMO-2145-3
and the head of personnel should be covered.
Normally unclothed parts such as face, neck, 3
eyes and hands will be covered and respirators 5
worn when the contamination hazard is suffi- Fig.:
ciently great. Skin decontamination equipment 2
for personnel, such as showers, shall be pro- 3
vided. In the operating area and storage areas, all ceiling, wall, and floor surfaces will be smooth and sealed and will be washable.

(6) NSA-1961-23592 RL

Sakagishi, S. 1221
Précautions à prendre par les ingénieurs chimistes contre les dangers d'irradiation
(Japan Analyst, 9, 10 (1960) S.910-15)
(CEA-TR-X-499 (1961) S.27-53, 4 Tab.)

Les laboratoires de la classe C sont des lieux au seuil de radioactivité le plus bas. L'installation d'un tel laboratoire peut se faire comme pour celle d'un laboratoire moderne de chimie. Les laboratoires de la classe B sont des laboratoires où le seuil radioactif est la moyenne. On doit appliquer de la peinture lavable, dure et sans pores sur le plancher, le plafond et les murs pour faciliter le lavage du laboratoire de cette catégorie. En prévision de l'installation d'un écran contre les rayonnements gamma, il faut que le plancher ait une résistance de 800-1000 kg/m^2. Les blouses du personnel doivent être fabriquées en dérivés vinyliques, de sorte que la décontamination puisse se faire aisément. On prévoit également l'utilisation de gants protecteurs ainsi que de couvre-chaussures. Les laboratoires de la classe A sont dits "hot cells".

CEA-TR-X-499
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(5) RL

Faust, L.G., Unruh, C.M. 1222
Radiological Design Criteria for the Fuel Recycle Pilot Plant
(HW-68954(Rev.1)(1961) 14 S.)

Automatic dose rate alarms shall be provided at routinely occupied work locations and the detectors shall be placed such that they will detect the dose rate to personnel at their work location. These alarms should be adjustable to alarm at any point between 5 mr/hr and 100 mr/hr. Work locations where air-borne contamination ranges from one to twenty MPC can be entered with an assault mask. Concentrations above twenty MPC require fresh air or independent air supply masks for entry. An air flow from clean areas to contaminated areas helps to prevent the spread of contamination to clean areas. Air locks provide a proven means for maintaining air balance and contamination control. A pressure differential of minus 1:4 to minus 1 inch of water assures a reasonable flow of air from the room to the hoods or cells.

HW-68954 (Rev.1)
3
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(6) NSA-1962-10098 RL

Savouyaud, A., Diéval, M., Rigaut, H. 1238
Protection contre les dangers des rayonnements dans l'industrie
(Selected Topics in Radiation Dosimetry. Proceedings of the Symposium on ... Vienna, 7-11 June 1960 (1961) S.25-32, 18 Fig., 1 Tab.)

Dans une première partie, les auteurs traitent des principes généraux applicables dans les laboratoires ou les installations de traitement de matières radioactives, - d'une part pour le contrôle et la dosimétrie aux rayonnements ionisants; - d'autre part pour le contrôle des contaminations du personnel, des surfaces et des fluides. Dans une deuxième partie, on présente l'instrumentation mise au point pour remplir les fonctions précédemment indiquées. Cette présentation sera suivie d'exemples d'équipements, caractéristiques du type de laboratoire à surveiller (nature et densité du matériel à prévoir).

5
Fig.:
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(5) RL

Griffiths, V. 1243
Some Safety Considerations in Relation to Glove Box Design
(AHSB(S)R 18 (1962) 27, V S., 5 Tab.)

Glove boxes are used widely for handling radioactive materials. Failure of a glove box can lead to serious spread of contamination. This report examines the means of reducing the risk of fire, explosion and other occurrences leading to rupture of the box containment. Comments on methods of fire extinguishing and on other aspects of safety in glove boxes are included.

AHSB(S)R 18
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Tab.:
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(5) RL

Dujancourt, S., Roche, J. 1244
Appareil de contrôle de la contamination radioactive des dispositifs filtrants adaptés sur les appareils de protection des voies respiratoires
(CEA-2037 (1961) 12 S., 2 Fig.)

Un appareil de mesure et de localisation de la contamination de cartouches filtrantes individuelles a été mis au point. Son utilisation de routine a montré l'intérêt d'une localisation rapide des taches contaminées permettant de concentrer sur elles les efforts de décontamination d'une facon plus rationnelle et efficace. Sa sensibilité a permis de l'utiliser, après décontamination des cartouches filtrantes, pour l'évaluation de l'activité résiduelle et fixée sur le filtre. Cet appareil a ainsi sa place parmi ceux permettant la surveillance et la protection respiratoire dans un Centre Atomique.

CEA-2037
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Fig.:
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(5) RL

A Description of SGR Test Installations Available at Atomics International 1248
(NAA-SR-MEMO-4411(Rev.)(1960) VIII, 43 S., 38 Fig.)

The radioactive-waste disposal facility is a centralized facility erected to handle radioactive wastes. Its two basic structures are the decontamination building and the vault building. Adjacent to the vault building is the decontamination building containing the packaging, change and decontamination rooms. The decontamination room is used to remove radioactive contamination from equipment and contains steam, sand, and acid equipment for this purpose.

NAA-SR-MEMO-4411 (Rev.)
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(5) NSA-1961-4082 RL

Constant, R., Mekers, J. 1249
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Ce rapport a pour objet d'établir les règles de sécurité adoptées dans le service, dans le but de protéger le personnel contre le double danger de contamination et l'irradiation. Les laboratoires occupés par la section des radioisotopes sont situés dans deux bâtiments principaux. Cet ensemble peut être divisé en trois parties bien distinctes: zone froide, zone tiède, zone chaude. Deux sorties de secours sont prevues. L'installation du conditionnement d'air de l'aile droite du BRI est localisée dans la partie supérieure de l'aile isotopes. Un tableau reprenant la disposition des extincteurs dans l'aile est affiché à l'entrée des laboratoires.

BLG-68
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Fig.:
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Tab.:
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(8) Forts. RL

Constant, R., Mekers, J. 1249 Forts.
Conditions de travail et de sécurité dans les laboratoires du service des radioisotopes à Mol
(BLG-68 (1961) 36 S., 15 Fig., 5 Tab.)

Les enceintes de travail employées dans la section pour la manipulation des produits radioactifs sont de trois types principaux: 1) Enceinte de manipulation pour émetteurs β^-; 2) Boîte gantée pour émetteurs β^- et β^--γ à faible activité; 3) Cellule de manipulation pour émetteurs β^--γ à forte activité.

BLG-68
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Fig.:
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Tab.:
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(8) RL

Hill, K.M., Parker, H.E. 1256
Safe-By-Shape Chemical Plants
(Criticality Control in Chemical and Metallurgical Plant. Karlsruhe Symposium 1961 (1961) S.209-31, 16 Fig.)

Safe-by-shape chemical plants are plants utilizing 4
unique safety precautions and designed to handle 5
fissile materials arising from reactor and weapons Fig.:
programmes. In processing fissile materials the 2
designer has a choice of five concepts for criti- 4
cality control: 1. Mass limitation. 2. Concentration limitation. 3. Safe by shape. 4. The addition of nuclear poisons. 5. A combination of (1)-(5). Figures 14, 15 and 12 show views of the highly-active, medium-active and low-active cells, respectively; the lay-out of the units follows the lattice arrangement already described for the dissolver cell.

Forts. RL

(5) NSA-1962-7793

Hill, K.M., Parker, H.E. 1256 Forts.
Safe-By-Shape Chemical Plants
(Criticality Control in Chemical and Metallurgical Plant. Karlsruhe Symposium 1961 (1961) S.209-31, 16 Fig.)

In all the cells some vertical cylindrical tanks 4
are employed: Figure 14 shows how these are 5
arranged to avoid interaction. In the low-active Fig.:
cell 1.5 in. thick slab tanks are utilized, these 2
being placed in such a position as to avoid inter- 4
action with the arrays of cylinders and where necessary incorporating nuclear shielding between the tanks.

(5) NSA-1962-7793 RL

Jansen, G., Bolger, J.C., Prince, B.E. 1258
In-Line Radioactivity Monitors
(TID-6173 (1957) 15 S., 3 Fig., 5 Tab.)

Radioactivity monitors for continuous measure- TID-6173
ment of radiation from flowing streams of radio-
active process solutions consist of a detector cell 5
installed in a process line and of an amplifier-recorder located in an instrument control area. It has been proposed to utilize electrochemical means to control radioactive contamination. The monitor would be insulated from the rest of the process and would be used as an electrode of an electric cell.

(6) NSA-1960-21685 RL

Barton, C.J. 1259
A Review of Glove Box Construction and Experimentation
(ORNL-3070 (1961) 112 S., 11 Fig.)

The literature on construction and operation of ORNL-3070
glove boxes for work with toxic inorganic ma- 1
terials not requiring biological shielding is 3
reviewed as a contribution to this re-examination, 4
with special emphasis on methods and equipment for 5
working safely with plutonium and other α-active Fig.:
materials. Methods for the detection and measure- 4
ment of α-active materials and of impurities in controlled atmospheres, window materials, protective coatings, glove materials and design, filters and scrubbers, exhaust systems, laboratory design, etc. are discussed.

(7) NSA-1961-22394 RL

Radioactive Materials Laboratory Safety Report, 1263
Martin Nuclear Facility, Quehanna Site
(MND-2410 (1960) getr. Zählg., zahlr. Fig. u. Tab.)

The facility consists of five cells. Each of these MND-2410
cells is provided with manipulator ports for the use 2
of Argonne Model 8 Manipulators. The shielding walls 3
of the cells are constructed of ferrophosphorous 4
concrete with a minimum weight of 280 pounds per 5
cubic foot. The radiation shielding windows are of Fig.:
3,6 density glass and were received as packaged, oil- 2
filled units ready for insertion into previously in- 4
stalled steel frames. Access to the cells is through doors at the rear which open into the isolation rooms. The decontamination room is used mainly for decontaminating portable equipment and materials. The room contains two fume hoods. A radiochemistry laboratory, equipped to handle curie-level quantities of isotopes, opens off the service area. Details are discussed. Fire equipment is installed in and about the building. Automatic fire detectors and sprinkler systems are installed.

(7) NSA-1961-15895 RL

Mahar, J.T., Beebe, R.L., Gasper, G.W. 1264
Radiological Services Standard Practice Manual
(KAPL-A-HP-2(Rev.1)(1960) VII, 145 S., Fig. u. Tab.)

Personnel exposure limits and contamination KAPL-A-HP-2
limits for material and equipment are given. The (Rev.1)
operation and description of radiation monitor-
ing equipment are presented. Radiation protection 5
procedures are given for various situations including slave removal from RML cell, entry into RML cells, waste transfer, event of radioactive spill etc. The KAPL air monitoring system is outlined.

(6) NSA-1960-25776 RL

Hammil, K.H., Brown, J.E. 1267
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

The new laboratory is a $960,000 annex to a HW-SA-1748
large radiochemistry building. Three adjoin- 2
ing cells, through which materials can be trans- 3
ferred internally, are the heart of the installa- 4
tion. The largest of the three cells has a depth of 5
7 feet, a height of 15 feet, and a width of 15 feet. Fig.:
Stainless steel was used to line the cell's walls 2
and floors. Incased in the walls are 4 foot thick 4
viewing windows. These viewing windows, composed of layers of oil between multiple plates of lead-glass, provide the same shielding as the concrete walls. Inserted into the cells above each window are a pair of masterslave manipulators.

(8) NSA-1961-2647 Forts. RL

Hammil, K.H., Brown, J.E. 1267 Forts
Hanford's New High-Level Radiochemistry Facility
(HW-SA-1748 (1959) 7 S., 10 Fig.)

Illumination of 300 foot candles permits HW-SA-1748
adequate viewing through the dense viewing 2
windows. A decontamination room and a "set-up" 3
area are also located in the new facility's contam- 4
ination-control area. A highly efficient ventila- 5
tion system with built-in safety factors was in- Fig.:
stalled in the facility. 2

(8) NSA-1961-2647 4

RL

Nichols, J.P., Arnold, E.D., Trubey, D.K. 1275
Evaluation of Shielding and Hazards in the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.11-18, 4 Fig., 3 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.297)

The shielding and containment criteria for the 3
Transuranium Facility obtained by calculations 4
and experiments are given. The shield evaluation 5
studies (for cell walls, cell windows, and fission source carriers) utilized experiments at the ORNL Lid Tank Shielding Facility and IBM-7090 computer calculations for determination of neutron transport, neutron activation, and gamma penetration. These studies also included an evaluation of the effects of credible accidents occurring in the facility.

(7) RL

McGary, T.E., Mazza, J.S. 1289
A Procedure for Cleaning Clouded Oil-Filled Radiation Shielding Windows
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.149-52)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.310-11)

A procedure for the cleaning of clouded, oil filled 3
radiation shielding windows has been developed. 5
This procedure, which is a filling and draining technique, has been successfully field tested. A severely clouded window was restored nearly to the original state of clarity as judged by visual observation. The technique uses glacial acetic acid to dissolve the cloudy sludge from the window interior. An inert atmosphere within the window must be used during cleaning to prevent component damage. A solvent rinse must precede and follow the acid cleaning to permit cleaning and minimize reclouding.
(5) RL

Saulino, F.A., Andersen, J.C., Taylor, K.M. 1301
Research Facility for the Synthesis and Fabrication of Refractory Plutonium Materials
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.277-86, 7 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.325-26, 1 Fig.)

This paper describes a facility for studying the 3
synthesis and fabrication of refractory plutonium 4
materials. The outstanding features of the facility 5
are its compactness, reliability, low operating cost Fig.:
and the unusually high purity of the atmosphere in 2
the helium glove boxes (2-3 ppm oxygen and less than 4
1 ppm water vapor). The high purity helium atmosphere results from the leak tightness of the system and the highly effective zirconium-titanium alloy getter system. In addition to the usual health and safety precautions, possible trouble areas are continuously monitored by an extensive alarm system.
(7) RL

Roach, W.J., Walker, R.J. 1304
Diversified Applications of Basic Alpha Instrumentation
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov. 26-28, 1962 (1962) S.299-304, 5 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.327-28)

A desire for small size, low cost, and flexibility 5
in alpha instrumentation has prompted the formation Fig.:
of a "building block" method. This system is composed 5
of several simple basic units that are easily combined into more complex ones. Such problems as air-borne alpha detection, detection and recording of fast or thermal neutrons, area alarms for alpha or beta-gamma radiation or neutrons, and large-area floor and hallway alpha survey devices have been satisfactorily solved by this method.

(4) RL

Rhude, H.V. 1305
Fire and Explosion Tests of Plutonium Glove-Boxes
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.305-11, 4 Fig., 3 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.328, 1 Fig.)

To test the fire and explosion resistance of new 5
plutonium metallurgy gloveboxes and to obtain in- Fig.:
formation pertinent to fire control, fire and ex- 5
plosion tests were conducted in one of the gloveboxes. It was found that over 10% oxygen is required for non-metal, and that over 5% oxygen is required for freely burning metal fires. However, metal chips will burn with as little as 1% oxygen if additional heat is furnished. Standard dry chemical, Met-L-X and carbon dioxide extinguishers were excellent for non-metal fires. A eutectic salt mixture was excellent for metal fires.

(3) RL

Walker, R.J., Roach, W.J. 1307
An Air Proportional Alpha Hand and Shoe Counter
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S. 321-24, 2 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.329-30, 1 Fig.)

A need for sensitive, stable alpha hand and shoe 5
monitoring equipment was met by a transistorized Fig.:
air proportional instrument. Many features incor- 5
porated in the design were first used in portable alpha survey meters for several years and have demonstrated reliability. The large-area air proportional detectors are unaffected by penetrating background radiations or rf or magnetic fields. They have a uniform surface response and 16% efficiency at 5 MeV. Novel pedestal-type packaging and transistorization resulted in a compact, efficient, and attractive instrument. Maintenance is much less than for scintillation-type counters. (4) RL

Cope, L.H. 1316
Improvements in or Relating to Powders for Extinguishing Fires
(Brit.Pat.884,946 (1959/61) 5 S.)

A fire extinguishing powder for extinguishing Brit.Pat.
fires of burning uranium, plutonium or thorium 884,946
metal, the powder comprising a mixture of in-
organic chloride and/or fluoride salts which 5
are inert towards such burning metals, and which are fused together and ground to powder in such proportions that the melting point of the mixture is below 640° C.

(4) RL

Hamada, T., Okano, M. 1354
Construction of Radioisotope Handling Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on AEC-tr-
Radioisotopes, Febr. 1958 (1961) S.619-27, 6 Fig.) 4482

The laboratory is one-storied and consists of a 2
control room, a dressing room, a shower room, a 3
radioisotope handling room, a contaminated material 5
disposal room, a storage area, a radioactive material Fig.:
storage area, a contaminated material storage area, 2
a machine room, a power room, toilets and corridors. 5
The air exhaust is located in the lower part of a wall in each unit, and the air exhaust ducts lead vertically to the ceiling where they converge in one place, and are finally connected to the ventilator on the roof. The discharge through the special drainage system provided to each unit is connected in the storage tank located in this room, and merge into the general drainage system through a "biruji" pump.

(7) Forts. RL

Hamada, T., Okano, M. 1354 Forts.
Construction of Radioisotope Handling Laboratory
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.619-27, 6 Fig.) AEC-tr-4482

The floor was covered with asphalt mortar. The walls and ceilings are covered with vinyl type paints. All the fixtures on the wall, ceiling, and floor are in most cases waterproofed. Sinks are lined with stainless steel or vinyl plates, as mentioned before, and the boundaries between the sinks and the walls are covered with polyethylene.

2 3 5 Fig.: 2 5

(7) RL

Iimura, S., Isahaya, T. 1357
Experimental Construction of a Radioactive Aerosol Processing Device
(AEC-tr-4482: Proceedings of the 2nd Japan Conf. on Radioisotopes, Febr. 1958 (1961) S.694-712, 12 Fig., 1 Tab.) AEC-tr-4482

We constructed an experimental model of a wet electric dust collector as device with an expected dust-collection efficiency higher than 99.9% when radioactive aerosol is involved. We also constructed experimental models of wet, glass-wool mat filters, reverse air jet bag filters, and four types of jet scrubbers as mechanical devices for collecting dust.

5 Fig.: 5

(5) RL

Miner, W.N., Schonfeld, F.W. (comp.) 1364
Plutonium Facility Operating Procedures in CMF-5
(LAMS-2660 (1962) 175 S., 11 Fig.) LAMS-2660

Safety regulations and operating procedures related to the various types of equipment that are in use in the Plutonium Physical Metallurgy Group at the Los Alamos Scientific Laboratory are described in detail. Consideration of the hazards involved in working with plutonium is emphasized. A brief description of the group's activities and facilities is also included. (Protective clothing, protective equipment, fire prevention and control, working in a hood, changing glove-box gloves, rolling mills, swaging machine, impact testing machine, Vickers hardness testing machine, the electron microscope etc.)

4 5 Fig.: 4

(6) NSA-1962-19179 RL

Technology of Safety and Labor Protection in Work with Radioactive Isotopes - USSR - 1373
(JPRS-453-D (1958) 3 S.) JPRS-453-D

As a measure of preventative sanitary control, it is necessary to control designing and construction in areas where radioactive materials are expected to be utilized. The chief sanitary doctors of the Dnepropetrovsk, Odessa, Stalin, Lvov, and Kharkov oblasts, and of the city of Kiew, have received recommendations to provide sanitary control for the designing and construction of cleaning plants to clean the special clothing which has been contaminated by radioactive materials, as well as for the organization of central points for the destruction of radioactive wastes and the establishment of special transport facilities for their movement.

5

(4) NSA-1959-16135 RL

6 KOSTENFRAGEN

Trouve, S., Rapin, M., Mestre, E. 954
Un laboratoire chaud mobile
(CEA-1379 (1960) 21 S., 15 Fig.)

La cellule est constituée de plusieurs éléments metalliques qui sont faits de plaques d'acier de 2 mm raidies par des profilés en U. Ces éléments, dont le nombre varie en fonction des dimensions que l'on veut donner à la cellule, sont reliés entre eux à l'aide de serre-joints. L'étanchéité est assurée par des joints plats en caoutchouc. Chaque cellule dispose d'une unité standard de ventilation. La cellule est en dépression par rapport à l'atmosphère. L'air, préalablement chauffé et filtré, y entre donc sans le secours d'un ventilateur de soufflage. Les filtres sont du type à tiroir, et peuvent être changés de facon étanche à l'aide de sacs en chlorure de polyvinyle.

CEA-1379
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4
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Fig.:
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4

Forts.

(8) RL

Trouve, S., Rapin, M., Mestre, E. 954 Forts.
Un laboratoire chaud mobile
(CEA-1379 (1960) 21 S., 15 Fig.)

Le coût de la fabrication d'une cellule, unité de ventilation comprise, s'élève à environ 40.000 NF ($8.000). La surface utile est comprise entre 20 et 30 m^2.

CEA-1379
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4
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Fig.:
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4

(8) RL

Ellis, R.E. 965
Reduction of Radiation Hazards in the Use of Radium and Similar Sources. II: The Construction of a Remote Handling Room for Radioactive Sources
(British Journal of Radiology, 34, No.403 (1961) S.415-20, 7 Fig., 1 Tab.)

The basic plan consists of a long working bench of 1 ft. thick concrete, 14 ft. long, with a 2 in. lead barrier up to 5 ft. 3 in. from the ground. At four positions, 4 ft. thick 6 x 6 in. lead glass blocks have been inserted to form working positions. The bench is 2 ft. 6 in. from the ground so that the operator should be seated. A remote manipulator runs on an overhead trolley along the length of the bench. The bench top was sealed with Tretoplast[2] which is a strippable P.V.C. coating sprayed on. Table 1 shows the approximate cost of the main items in the room. This makes a total of nearly £ 9,000, of which a third is for the safe and manipulator which could always be used elsewhere.

4
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Fig.:
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Tab.:
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(4) RL

Butler, H.L., Wyck, R.W. van 978
Protective Clothing Program at the Savannah River Plant
(Annual Meeting of the American Industrial Hygiene Association in Chicago, April 25 - May 1, 1959)
(DPSPU-58-30-20 A)

Protective clothing is frequently worn to prevent contamination of the body with radioactive materials and to exercise contamination control. The cost of this protection, while small compared with other operating costs, nevertheless, requires a substantial yearly expenditure. At large atomic energy facilities such as the Savannah River Plant, protective clothing costs are sufficient to justify a continuous evaluation program in order to protect this investment and to insure that maximum protection is provided for employees.

DPSPU-58-30-20 A
5
6
Fig.:
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(6) RL

Wilson, H.W., Watt, D.E., Ramsden, D. 1016
A Low-Background Laboratory
(International Journal of Applied Radiation and Isotopes, 10 (1961) S.158-66, 6 Fig., 3 Tab.)

Consideration of the design, cost and construction of a low-background laboratory for the measurement of low specific activity samples leads to the choice of demineralized water as the main shielding material. Background figures and spectra obtained for a range of proportional and scintillation counters in the completed laboratory, show that the shielding is slightly better than 12 in. of steel. It is deducted from energy and intensity measurements that the gamma-ray peaks occurring in the background spectrum arise mainly from ThC" present in the counter construction materials. The cell was built at a total cost of some £ 20,000. This cost includes all services and air conditioning.

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Fig.:
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Tab.:
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(7) RL

Evans, J.H., Venables, H.H. 1049
Remote Metallography in the Metallurgy Division at AERE
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.91-106, 18 Fig.)

A 100 Curie beta gamma metallography suite used for remote metallography, has been in operation for two years. Designed for ease of operation and maintenance it consists of a single, free standing lead cell with 9 inches of shielding; it contains two alpha boxes, one for preparation and one for viewing, separated by a 9 inch shielding wall but connected by a posting tunnel. The suite is operated with a reduced pressure of nitrogen and it is possible to isolate either box from the other for leak testing and to permit entry into the examination alpha box for major maintenance work. The inner walls of both alpha boxes are coated with an epoxy resin paint for protection against alkalis and weak acids;

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Fig.:
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(5) Forts. RL

Evans, J.H., Venables, H.H. 1049 Forts.
Remote Metallography in the Metallurgy Division at AERE
(Proceedings of the 9th Conf. on Hot Lab. and Equipment, Chicago 1961, S.91-106, 18 Fig.)

the preparation box is also sprayed with a strippable film for acid protection and to speed up decontamination when necessary. Several types of machine have been used for remote metallography, the choice being largely governed by the size and design of the cell used. The cost of the 100 curie suite with all equipment was approximately £ 38,500.

4
6
Fig.:
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(5) RL

Faugeras, P., Couture, J., Lefort, G. 1119
Etude concernant la réalisation d'un ensemble de cellules destinées à des traitements de combustibles irradiés à l'échelle semi-industrielle
(CEA-1980 (1961) 17 S., 14 Fig.)

La cellule est constituée par un caisson de tôle de 4 m x 3 m et de 5 m de hauteur. Les tôles de 2 mm d'épaisseur qui constituent l'étanchéité α sont soudées entre elles et maintenues extérieurement par des profilés, sans aucune liaison avec la protection γ. Dans notre cellule prototype nous avons expérimenté une fenêtre fournie par la Société Saint-Gobain, comportant 3 dalles de verre de 100 mm d'épaisseur, de densité 6,2, placées entre deux dalles de densité 3,3 de 250 mm d'épaisseur. Dans la cellule prototype, l'eclairage était situé dans le haut de la cellule.

CEA-1980
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4
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Fig.:
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(8) Forts. RL

Faugeras, P., Couture, J., Lefort, G. 1119
Etude concernant la réalisation d'un ensemble de cellules destinées à des traitements de combustibles irradiés à l'échelle semi-industrielle Forts.
(CEA-1980 (1961) 17 S., 14 Fig.)

Le but des essais de ventilation était double: - Essai d'étanchéité des joints. Vérification des pertes de charge sur les filtres en papier amiante. Sur une dépense totale de 700 000 NF, dont 30 p. 100 pour les éléments de structure et 70 p. 100 pour les éléments fonctionnels, plus de 60 p. 100 de l'appareillage sera réutilisé après démontage (télémanipulator, hublots, vannes, etc...).
(8)

CEA-1980
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6
Fig.:
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RL

Schwennesen, J.L. 1137
Capital and Operating Cost Information on Several Existing U.S. Nuclear Fuel Processing Plants Forts.
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.1133-53, 30 Fig.)

A comparison of investment cost on this basis is presented in Fig. 6. Within the cost comparison accuracy that is possible considering the fact that Plants have different duties, locations, numbers of auxiliaries, etc., investment costs are quite comparable.
(4)

TID-7534
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Fig.:
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RL

Culler, F.L., Frederick, E.J. 1124
Development Facilities and Aids for Radiochemical Reprocessing
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.807-30, 11 Fig., 3 Tab.)

The information is divided into three general categories for presentation, which are: 1) Cells suitable for high-level analytical and radiochemical work. 2) Selected analytical and process equipment for remote control operation. 3) High level development cell design. Construction cost analysis of the Hot Analytical Facility constructed 1955 and equipment cost for the Analytical Facility are presented.
(7)

TID-7534
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Fig.:
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Tab.:
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RL

Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

An efficient, flexible, and relatively simple system of enclosures for the handling of multicurie amounts of alpha, gamma, and neutron-emitting isotopes has been developed by the Health Chemistry Department at Lawrence Radiation Laboratory, Berkeley. It has been in operation since April of 1961. This system consists basically of interlocking 4-ft water tanks that form the shielding around the leaktight primary enclosure in which operations are conducted by means of totally socked master-slave manipulators. This facility has been successfully used for procedures ranging from multicurie chemical separation to highly refined microtechniques.
(9) NSA-1962-4407 Forts. RL

UCRL-9657
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Fig.:
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Unger, W.E. 1126
Auxiliary Radiochemical Equipment
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.891-981, zahlr. Fig. u. Tab.)

Each piece of radiochemical equipment, while similar to others, is still unique, and generalized descriptions are not possible. Discussed here are specific examples both of adapted commercially available equipment and specially designed miscellaneous items, including carrier-chargers, samplers, valves, centrifuges, and filters. Most radiochemical equipment is made of various grades of the 18-8 type austenitic stainless steels, although other materials, such as the ferritic steels, aluminum alloys, nickel alloys, and perhaps titanium and zirconium, may be useful. The additional costs of obtaining the higher quality materials and fabrication required in radiochemical processing work are difficult to predict and the estimates given here are only approximate. (5) RL

TID-7534
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Fig.:
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Howe, P.W., Parsons, T.C., Miles, L.E. 1162
The Water-Shielded Cave Facility for Totally Enclosed Master-Slave Operations at Lawrence Radiation Laboratory Forts.
(UCRL-9657 (1961) V, 28 S., 9 Fig.)

It has served equally well for metallurgical examinations and remote machining and welding procedures. The cost of this totally equipped facility was approximately $60,000. Viewing and ventilation systems are described.
(9) NSA-1962-4407

UCRL-9657
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Fig.:
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RL

Schwennesen, J.L. 1137
Capital and Operating Cost Information on Several Existing U.S. Nuclear Fuel Processing Plants
(TID-7534, Book 3: Symposium on the Reprocessing of Irradiated Fuels, Brussels, Belgium, May 20-25, 1957 (1957) S.1133-53, 30 Fig.)

It is the objective of this paper to present capital and operating costs of several existing U.S. Nuclear Fuel Processing Plants in terms of capacity, flexibility, and other design features. Generalizations with respect to these costs will be developed in terms of the process technology represented by these Plants. A cost comparison among the four Plants may be made on the basis of the amount of shielded process area or process cell volume in each Plant since such an area or volume represents the basic nucleous of the plant and to a great extent determines Plant investment.
(4) Forts. RL

TID-7534
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Fig.:
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Komarovskii, A.N. 1212
Wall Surface Coatings for Radioactive Room Interiors
(Atomnaja Energija, 10, No.6 (1961) S.597-605)
Engl.Übers.: (Soviet Journal of Atomic Energy, 10, No.6 (1962) S.592-600, 4 Fig.)

Problems concerned with coatings and finishes on the walls, floors, and ceilings of rooms in nuclear facilities are discussed. Experience in the use of various internal surface coatings in the USSR is illustrated and inferences are drawn therefrom, and recommendations on their proper use are presented. Data on costs of various materials employed in coatings and finishes are adduced.
(4)

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Fig.:
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Tab.:
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RL

Makens, R.F., Bush, D. 1253
A Laboratory Unit for Teaching Nuclear Fuel Processing
(AED-Conf.1960-077-19) 8 S., 9 Fig., 4 Tab.)

The universities and colleges have shown an increasing interest in fuels technology training. The development of a few laboratory experiments covering this aspect of nuclear engineering makes the fuels technology course content more teachable and more meaningful to the student. A sixteen counter-current mixer settler was assembled from readily available parts at a cost of about $2500. The unit is described and shown in Fig.1. and 2.

AED-Conf. 1960-077-19
4
6
Fig.: 4

(6) RL

Glen, H.M. 1280
A Survey of Structural Materials for Use in Remote Handling Facilities
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.49-52, 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2.(1962) S.300-01)

The kinds of structural materials used in remote handling facilities and the manner in which they are specified can be significant factors in determining the cost of a facility. These materials and factors include concretes with high water retention for neutron shielding; the placement, quality control, and reinforcing of these concretes; and the use of stainless steel for cell liners.

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(5) RL

Bingham, C.D., Janeves, D. 1261
Development of an Inexpensive, Remote Sample-Transfer Device
(NAA-SR-MEMO-5834 (1960) 5 S., 2 Fig.)

The device was fabricated from components in stock or readily available from commercial suppliers. The basic components are: a transfer tube, a sample carriage, a mechanical link, a power source. The total cost was less than $80.00. The transfer tube, commonly referred to as "elefant trunk" connects the area through which the sample is to move. The sample carriage is driven through the transfer tube by the mechanical link. The device permits completely remote incell movement of intensely radioactive samples over distances as great as 16 feet with no exposure to personnel. The design is such that remote maintenance could be incorporated if necessary. It could find application in the numerous glove-box, junior cave or hot-cell operations within the company.

NAA-SR-MEMO-5834
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Fig.: 2
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(6) NSA-1961-19491 RL

Silverman, J., Agnihotri, C.B. 1282
University of Maryland Gamma Laboratory
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.63-68, 7 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.303-04)

A gamma irradiation facility has been constructed at the University of Maryland. It consists of an underground irradiation chamber, 15' x 4' x 7', connected to the surface by a Z-shaped labyrinth and a stairway. Targets are placed in the chamber and irradiated by 5,000 curie Co^{60} source that is lowered from a lead shield located in the ceiling. The concrete substructure is covered by a prefabricated steel panel structure that houses control and drive mechanisms, and laboratory facilities. The entire cost of the installation is $30,000.

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Fig.: 4

(6) RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., Culler, F.L. 1274
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.3-10, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.296-7, 1 Fig.)

The TRU Facility will consist of nine heavily shielded cells served by master-slave manipulators, and eight laboratories, four on each of two floors. The laboratory side of the building is separated from the cell area by the cell operating gallery, which is regarded as a buffer zone of low contamination potential. The nine shielded process cells are arranged in line. Removable top plugs provide access to the cells. The top and back of the cell line is served by a bridge crane in a limited access area of the building not normally occupied by operating personnel. (9) Forts.

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Fig.: 2
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RL

Vogel, G.J., Carls, E.L., Mecham, W.J., Jonke, A.A. 1302
An Engineering-Scale High-Alpha Facility for Plutonium Fluoride Volatility Process Studies
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.287-92, 6 Fig.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.326-27)

The plutonium processing equipment is housed in CENHAM (Chemical Engineering Hood, Alpha Modular) boxes. All process off-gas and ventilation air are humidified to convert any accidentally released plutonium hexafluoride, a gas at most processing conditions, to the filterable plutonyl fluoride particulate. Planning and scheduling phases of the project were aided by use of the Critical Path method. Costs of CENHAM boxes vary approximately as the 0.84 power of box volume.

4
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Fig.: 4

(7) RL

Unger, W.E., Bottenfield, B.F., Hannon, F.L., Culler, F.L. 1274 Forts.
Design of the Transuranium Processing Facility
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.3-10, 5 Fig. 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.296-7, 1 Fig.)

The front face of the cell is provided with windows, master-slave manipulators, and plugged ports for possible future installation of periscopes. The building is scheduled for full-scale operation by December 1965, at an estimated cost of $8,7 million.

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4
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Fig.: 2
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(9) RL

Banslaben, A.J., Finston, H.L. 1303
The Adaptation of Commercially Available Stock Parts into an Inexpensive Glove-Box Train
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.293-98, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.327)

By adapting commercially available stock parts designed for other purposes, an interconnecting train of glove boxes was fabricated at a considerable saving in cost over that required for a custom-designed system. The key feature is the utilization of a glass-fiber reinforced polyester vat liner commonly used in chemical processing. Introduction ports, transfer locks, and ventilation system are fabricated from PVC pipe and fittings and Teflon-sealed valves.

4
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Fig.: 4
Tab.: 6

(5) Forts. RL

Banslaben, A.J., Finston, H.L. 1303
The Adaptation of Commercially Available Stock Forts.
Parts into an Inexpensive Glove-Box Train
(Proceedings of the 10th Conf. on Hot Lab. and Equipment, Washington, Nov.26-28, 1962 (1962) S.293-98, 5 Fig., 1 Tab.)
(Transactions of the American Nuclear Society, 5, No.2 (1962) S.327)

Components can be assembled with conventional shop tools and a vacuum-tight bond effected with glass-fiber tape and polyester resin. The system is admirably suited to the handling of alpha-emitters. Actual costs for the component parts of the train of four glove boxes and ventilation system are given.

4
6
Fig.:
4
Tab.:
6

(5)

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