Forschungszentrum Karlsruhe
Technik und Umwelt

Wissenschaftliche Berichte
FZKA 5675

Three-dimensional Activation and Afterheat Analyses for the Dual Coolant Breeder Blanket

H. Tsige-Tamirat, U. Fischer

Institut für Neutronenphysik und Reaktortechnik
Projekt Kernfusion

Januar 1996

Forschungszentrum Karlsruhe
Technik und Umwelt

Wissenschaftliche Berichte

FZKA 5675

Three-dimensional Activation and Afterheat Analyses for the Dual Coolant Breeder Blanket

H. Tsige-Tamirat, U. Fischer

Institut für Neutronenphysik und Reaktortechnik
Projekt Kernfusion

Forschungszentrum Karlsruhe GmbH, Karlsruhe

1996

Forschungszentrum Karlsruhe GmbH
Postfach 3640, 76021 Karlsruhe

ISSN 0947-8620

Abstract

This report presents results of three-dimensional activation and afterheat calculations performed for the self-cooled liquid metal breeder blanket with helium-cooled first wall ("Dual Coolant Blanket Concept"). This concept has been developed for a Demo fusion power reactor at Forschungszentrum Karlsruhe within the European Fusion Technology Program. Coupled neutron transport and activation calculations have been performed in a three-dimensional torus sector model of the Demo reactor equipped with the dual coolant breeder blanket. The Monte Carlo transport code MCNP has been used for the neutronic calculations. Activation analysis were performed with the FISPACT inventory code and activation cross-section data from the European Activation File EAF making use of the neutron spectra provided by the MCNP-calculations. Following this approach, activation characteristics have been determined for all relevant reactor components. It is shown that three-dimensional activation and afterheat calculations can be performed in a convenient way on this basis. The applied methodology is briefly described in the report and comprehensive numerical results are presented to provide a sound data base for subsequent design and safety-related analyses.

This work has been performed in the framework of the Nuclear Fusion Project of the Forschungszentrum Karlsruhe and is supported by the European Union within the European Fusion Technology Program.

Dreidimensionale Aktivierungs- und Nachwärmeanalysen für das Dual-Coolant-Brutblanket

Zusammenfassung

Der Bericht dokumentiert Ergebnisse von dreidimensionalen Aktivierungs- und Nachwärmerechnungen, die für ein selbstgekühltes Flüssigmetall-Blanket mit heliumgekühlter erster Wand ("Dual-Coolant-Blanketkonzept") durchgeführt wurden. Das zugrunde gelegte Blanketkonzept wurde am Forschungszentrum Karlsruhe im Rahmen des Europäischen Fusionstechnologie-Programms für einen Fusion-Demonstrationsreaktor entwickelt. Gekoppelte Neutronentransport- und Aktivierungsrechnungen wurden in einem dreidimensionalen Torus-Sektormodell des Demo-Reaktors durchgeführt, das mit dem Dual-Coolant-Brutblanket ausgerüstet ist. Das Monte-Carlo-Programm MCNP wurde für die neutronenphysikalischen Rechnungen benutzt. Die Aktivierungsanalysen wurden unter Verwendung der von MCNP bereitgestellten Neutronenspektren mit dem Inventarcode FISPACT und Aktivierungwirkungsquerschnitten der europäischen Aktivierungsdatenbibliothek EAF durchgeführt. Nach diesem Verfahren wurden die Aktivierungscharakteristika für alle relevanten Reaktorkomponenten bestimmt. Es wird gezeigt, daß dreidimensionale Aktivierungs- und Nachwärmerechnungen auf dieser Grundlage durchgeführt werden können. Im Bericht wird das angewandte methodologische Verfahren kurz beschrieben. Es werden umfangreiche numerische Resultate präsentiert, um eine tragfähige Datenbasis für nachfolgend durchzuführende Konzeptauslegungs- und Sicherheitsuntersuchungen bereitzustellen.

Die vorliegende Arbeit wurde im Rahmen des Projekts Kernfusion des Forschungszentrums Karlsruhe durchgeführt und ist ein von der Europäischen Union geförderter Beitrag im Rahmen des Fusionstechnologieprogramms.

Contents

1. Introduction

Safety and environmental (S&E) impact issues have acquired increasing importance for the development of fusion power reactors. In the European Blanket Concept Selection Exercise (BCSE), the safety and environmental impact issue is a major selection criterion for the evaluation of the suitability of a blanket concept for the Demo-type fusion reactor [1].

S&E-analyses require a sound and reliable data base on the neutron-induced transmutation, radioactivity inventory and afterheat generation in the various fusion reactor components. The radioactivity inventory depends on the specific design of a reactor and its components, its geometrical configuration and material composition, and the given irradiation conditions (fusion power, operation scenario, neutron source distribution). It is essential to include in the blanket design development properly performed activation inventory calculations that are consistent with both the blanket and the overall reactor design. This requires three-dimensional activation and afterheat calculations using an appropriate reactor model that closely replicates the technical layout.

This report presents results of three-dimensional activation and afterheat calculations performed for the self-cooled liquid metal breeder blanket with helium-cooled first wall ("Dual Coolant Blanket Concept"). The concept has been developed for a Demo fusion power reactor at Forschungszentrum Karlsruhe within the framework of the European Fusion Technology Programme [2].

The main objective of the report is to provide numerical results of activation and afterheat calculations that serve as data base for subsequent design, safety and environmental related analyses.

The applied Calculational procedure comprises the following two major steps:

- Neutron transport calculations to provide the spatial distribution of neutron energy spectra and energy-integrated fluxes.
- Activation calculations for each spatial zone making use of the associated neutron spectra and fluxes and taking into account the proper irradiation conditions.

Neutron transport calculations are performed with the Monte Carlo transport code MCNP [3]. This allows a realistic three-dimensional modeling of the Demo reactor configuration including the vacuum chamber, blanket segments, divertors, vacuum vessel and other reactor components. In addition, the proper spatial neutron source distribution is accounted for in the transport calculation. In principle no model-related uncertainties are imposed on the calculated activation inventory when following this approach. This is a clear advantage over the conventionally performed activation calculations that rely on one-dimensional models.

In the three-dimensional approach, uncertainties in the calculated activation inventories are mainly due to the following two major sources:

- Uncertainties in the calculated neutron spectra
  - due to uncertainties in the transport cross-section data
  - due to statistical uncertainties of the Monte Carlo calculation.

Note that these may be reduced to negligible level only by using a sufficient high number of source neutron histories and/or applying enhanced variance reduction techniques if necessary

- Uncertainties in the available activation cross-section and/or decay data libraries.

Depending on the specific activation product and its production pathway, the latter ones may impose a large uncertainty margin on the calculated activation inventory. It is a major ongoing task to assess and minimize these uncertainties for the major contributors to the activation inventory and the radiotoxic hazard potential.

2. Blanket Description

The dual coolant blanket concept has been developed at Forschungszentrum Karlsruhe as part of the Demo Test Blanket Programme in the framework of the European Fusion Technology Project. The boundary conditions and main parameters for a Demo fusion reactor were elaborated by the Test Blanket Advisory Group (TAG) and selected parameters are given in table 2.1 [4].

The design of the dual coolant blanket has evolved from the concept of a self-cooled liquid metal blanket using the eutectic alloy Pb-17Li as breeder/coolant [5]. The layout of the self-cooled liquid metal blanket provides large poloidal flow channels which are needed to minimize the magneto-hydrodynamic (MHD) pressure drop encountered when the liquid metal flows perpendicularly to the magnetic field. The large flow channels provide high volume fractions for the liquid metal breeder while the steel fraction is at a low level due to the absence of any cooling tubes. This results in an inherent high tritium breeding potential. Tritium self-sufficiency can be easily attained for a Demo reactor using as breeder/coolant both the Pb-17Li alloy with a high ^6Li -enrichment (typically 90 at%) and liquid lithium with a low ^6Li -enrichment (typically 30 at%) [6].

High flow velocities and, therefore, small flow channels are needed for cooling the first wall with liquid metal. To avoid the resulting excessively large (MHD) pressure drop in the first wall cooling channel, the solution of a dual coolant blanket has been elaborated combining a liquid metal cooled breeder zone and a helium-cooled first wall [2]. In addition, this solution offers improved safety and reliability features over the entirely self-cooled blanket.

Major radius	6.3 m
Minor radius	1.82 m
Aspect ratio	3.45
Plasma current	20 MA
Fusion power	2200 MW
Average neutron wall loading	2.2 MW/ m^2
Operation mode	continuous
Impurity control	double-null divertor
Number of TF coils	16
Toroidal magnetic field on axis	6 T
Number of segments	32 inboard
	48 outboard
Blanket/shield thickness	1.18 m inboard
	1.86 m outboard
Structural material	MANET

Table 2.1: Main Demo reactor parameters

The main neutronic characteristic of the dual coolant blanket is its use of the Pb-17Li alloy as breeding material and the absence of any neutron moderating material in the blanket. The lead neutron multiplier is the major alloy constituent showing a high neutron reflection but a low neutron slowing down power. As a consequence, a sufficiently high blanket coverage and a large breeder zone thickness are required to make full use of the tritium breeding potential of Pb-17Li.

2.1 Technical blanket layout

The geometrical configuration of the blanket segments follows the Demo reactor boundary conditions and is mainly dictated by magneto-hydrodynamic (MHD), mechanical, and thermal-hydraulic constraints.

The Demo reactor is divided into 16 sectors in toroidal direction each containing 3 outboard and 2 inboard blanket segments. The inboard segment is split into two poloidal halves to reduce the MHD pressure drop caused by the higher magnetic field and the more restricted space at the inboard side. Liquid metal cooling lines come from the top and the bottom of the torus. The liquid metal flow is diverted at the torus midplane. Fig. 2.1 shows a vertical cross-section of the Demo reactor equipped with dual coolant blanket segments.

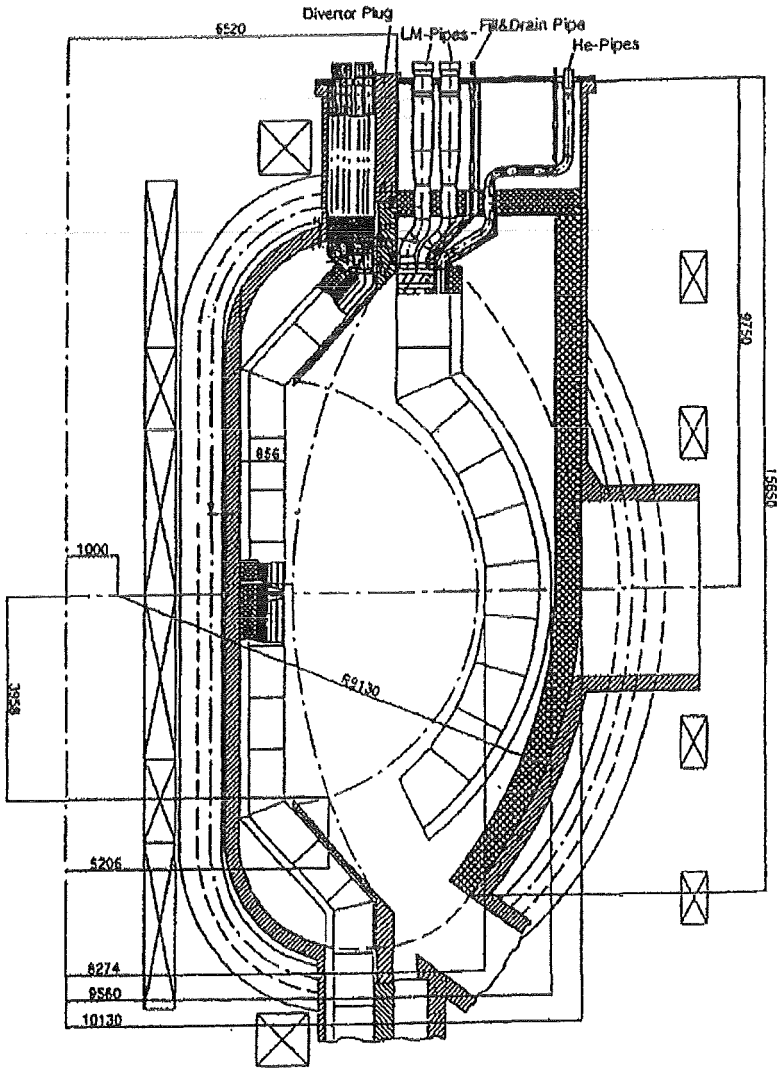

Figure 2.1: Vertical cross-section of the Demo reactor equipped with dual coolant blanket

A blanket segment basically consists of a steel box containing the liquid metal breeder (Fig. 2.2). The box is formed by a U-shaped first wall with helium cooling channels in radial-toroidal direction and the helium manifold at the back side [2]. There is a grid of steel plates inside the box creating large liquid metal ducts and reinforcing the steel box. The liquid metal enters the blanket at the top, flows downward in four parallel channels at the rear side, turns around at the bottom by 180, and flows upward in the first row. This flow scheme allows to adjust the velocity of liquid metal in each row according to the local heat generation rate.

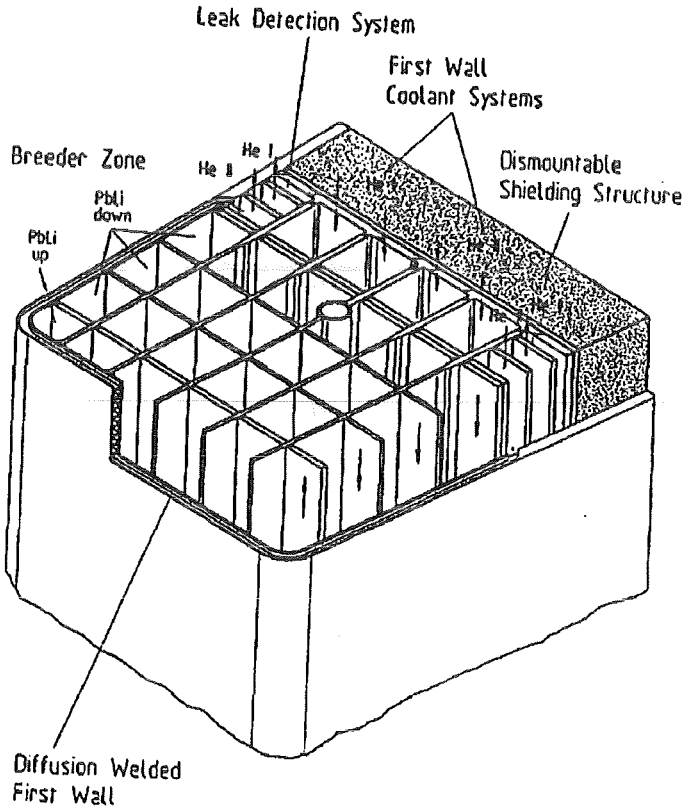

Figure 2.2: Perspective view of an outboard segment

The first wall is cooled by helium to avoid high MHD pressure drops that would result in applying liquid metal cooling with high velocities. There are two independent helium cooling systems. The cooling channels are alternatively connected to one of the systems in order to minimize a first wall temperature increase in case of a loss-of-coolant accident in one of the circuits. The helium manifolds are an integral part of the blanket segment box.

According to the TAG-specifications, the radial thickness available to blanket and shield is 118 and 186 cm, inboard and outboard, respectively, leaving about 86 and 129 cm for the blanket segments. In addition, the divertor region is assumed to be utilized for breeding. Based on the Demo reactor boundary conditions, the dual coolant blanket utilizes a blanket thickness of 56 and 100 cm for the inboard and outboard blanket segments, respectively, including the helium manifolds with thicknesses of 19.0 and 20.0 cm, to assure tritium self-sufficiency. This includes safety margins to cover tritium losses, computational and data related uncertainties and the reduced tritium breeding capability due to the presence of radial blanket ports. The

total radial thickness of the liquid metal breeder zone amounts to 30 and 68 cm, inboard and outboard, respectively.

2.2 Material specification

The material selection follows the TAG Demo reactor specifications and the requirements for the blanket layout with regard to tritium breeding and cooling . Martensitic steel MANET (DIN 1.4914) has been specified by TAG as structural material for the Demo reactor to accommodate with the anticipated maximum radiation induced damage of 70 dpa at the first wall of the Demo reactor. The eutectic lead-lithium alloy Pb-17Li, with a ^{6}Li enrichment of 90 atom% , is used both as tritium breeder material and coolant in the breeder region.

With regard to radioactivity product generation in the liquid metal and the structural material, it is essential to include in the activation calculations potential impurities and tramp elements, whereas there is no need to consider them in the neutron transport calculation.

Detailed elemental compositions have been specified for the martensitic steel MANET-1 by Schirra et al. [7], see table 2.2, and have been used in the activation calculations. There is a wide spread in potential elemental impurities for the liquid metal breeder material Pb-17Li [8]. In the present analysis the elemental specification of Metaux speciaux S. A. St. Marcel, for commercially available Pb-17Li has been used [8], see table 2.2.

Element	MANET	Pb-17Li
Fe	Bal.	0.001
Pb	-	Bal.
Li	-	0.700
C	0.13	-
Si	0.35	-
Mn	1.00	-
P	0.005	-
S	0.004	-
Cr	10.5	-
Ni	0.85	0.0002
Mo	0.75	-
V	0.20	-
Nb	0.15	-
B	0.008	-
N	0.03	-
Al	0.05	-
Co	0.02	-
Cu	0.02	-
Zr	0.09	-
Zn	-	0.001
Bi	-	0.0043
Cd	-	0.0005
Ag	-	0.0005
Sn	-	0.0005

Table 2.2: Chemical composition of MANET and Pb-17Li including impurities in Weight %

The radial build of the inboard and outboard blanket segments at torus midplane including the material compositions are displayed in fig. 2.3. The specified material distribution has been used both in the neutron transport and the activation calculation.

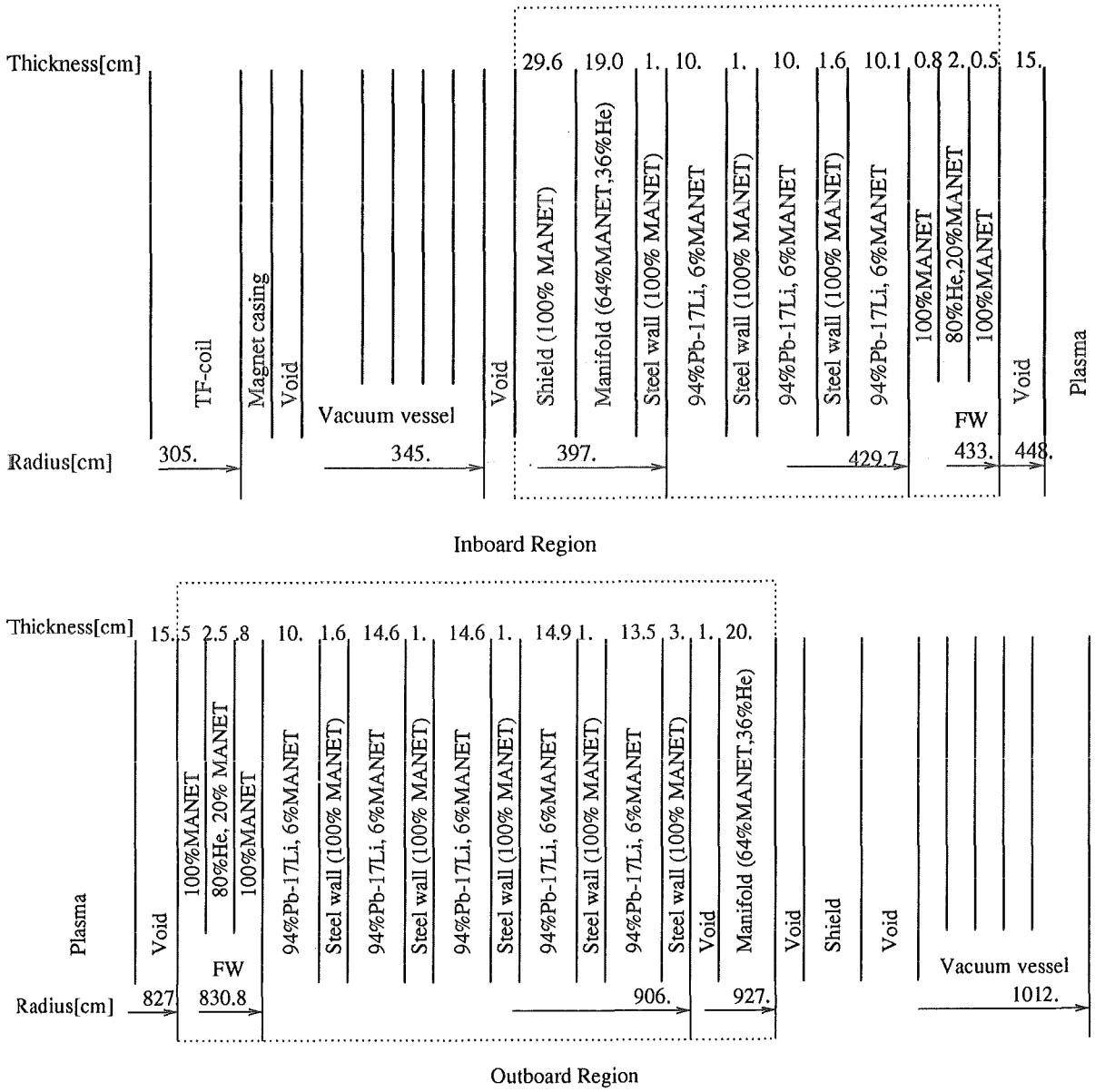

Figure 2.3: Radial build of the inboard and outboard blanket segments at torus midplane

2.3 Irradiation conditions

The irradiation conditions assumed in the activation and afterheat calculations are based on the minimum requirements that have been specified by the TAG for Demo-relevant blanket concepts.

The blanket has to sustain a full power lifetime of 20000 hours at a continuous fusion power of 2200 MW. In the specified Demo reactor configuration, the resulting mean neutron wall loading amounts to 2.2 MW/m^2 , when averaged over the inboard and outboard first wall.

A full power steady state operation is assumed for the Demo reactor over the lifetime of the blanket. In the activation calculation, the irradiation history is represented by a single continuous irradiation period.

Burn-up effects on the energy integrated fluxes and neutron energy spectra are not considered in the activation calculations.

3. Computational procedure

3.1 Code system for coupled neutron and activation calculations

A reliable assessment of the afterheat generation and the activation inventory in the blanket segments and the other reactor components requires the application of three-dimensional computational procedures. An appropriate code system has been developed that allows three-dimensional activation and afterheat calculations by coupling the Monte Carlo transport code MCNP [3] and the inventory code FISPACT [15], see fig. 3.1. Neutron fluxes and spectra are provided by 3-d Monte Carlo calculations performed with the MCNP-code in an appropriate torus sector model of the Demo reactor.

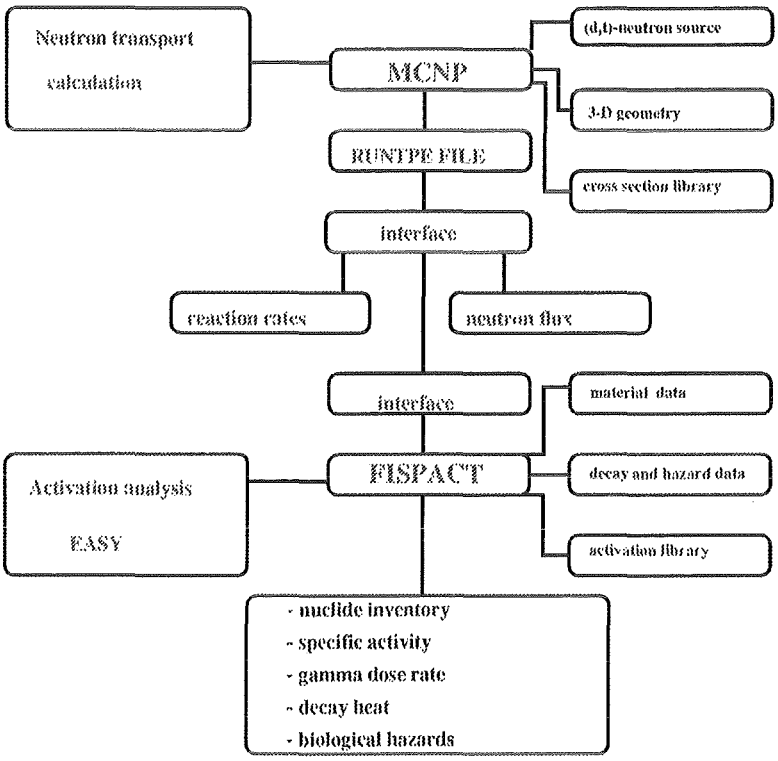

Figure 3.1: Code system for activation and afterheat calculation

An interface program routes the calculated spectra to the FISPACT-code to perform the inventory calculations in each specified zone. FISPACT collapses the multi-group activation cross-sections to effective one group cross-sections by using the proper neutron spectra of the specified zones. The inventory calculations are performed step by step in running subsequent FISPACT-calculations for each zone and using the proper set of one-group activation cross-sections, neutron fluxes and material data associated to that zone. The individual results of the single zone inventory calculations are merged together to obtain the radial-poloidal distribution of the activation quantities of interest.

3.2 Neutron transport

Three-dimensional neutron transport calculations are performed with the Monte Carlo transport code MCNP and nuclear cross-section data from the European Fusion File EFF [10].

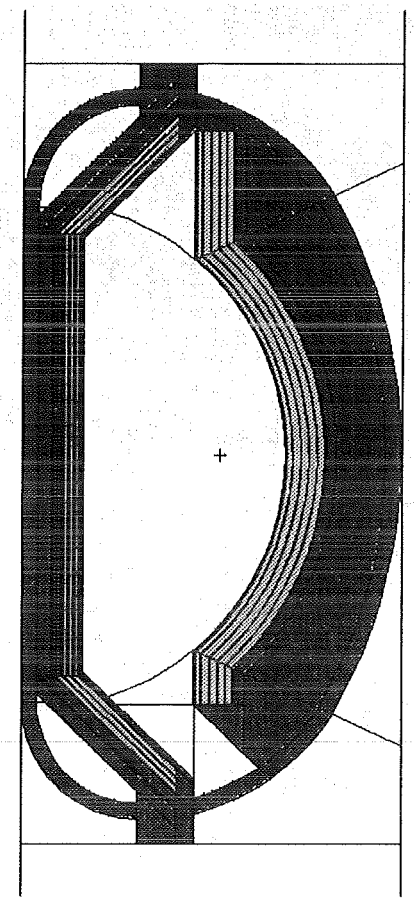

Figure 3.2: Radial-poloidal cross-section of the torus sector model

A three-dimensional torus sector model of the Demo reactor has been developed for use in the Monte Carlo transport calculations assuming the boundary conditions specified by the TAG for the Demo reactor. The model has been designed for half a 22.5^o torus sector of the Demo reactor (1/32 of the torus) including one inboard and one and a half outboard segments. Reflecting boundary conditions were applied at the lateral walls of the modeled torus sector. The sector model includes the vacuum chamber, first wall and blanket segments, the vacuum vessel, top and bottom divertor and the bottom divertor exhaust chamber with a pumping duct entrance. Fig. 3.2 shows a radial-poloidal cross-section of the MCNP generated torus sector model. Inside the blanket segment boxes, the heterogeneous array of steel plates, forming the liquid metal ducts, has been taken into account only partially. The radial heterogeneity has been explicitly modeled whereas material homogenizing has been applied in the toroidal direction. The radial build of the inboard and outboard blanket segments including the material composition used in the transport calculations is given in fig. 2.3 above.

In the Monte Carlo calculation the neutron source term is described in a special FORTRAN routine linked to the MCNP-code. The spatial neutron source distribution is sampled according to the probability distribution of the 14-MeV neutron source density s(a) [11] :

$$s(a) = [1 - (\frac{a}{A})^2]^4 \qquad for\ 0 \leq a \leq A \tag{3.1}$$

where A is the minor plasma radius. The parameter a fixes a contour line at constant source

density that is described in a parametric representation [9].

According to the TAG-specifications, the following plasma parameters are used for the source description of the Demo reactor:

Major plasma radius $R_0 = 630$ cm	Plasma elongation E = 2.17
Minor plasma radius A = 182 cm	Plasma excentricity e = 16.2 cm

3.3 Activation and afterheat

The activation and afterheat calculations are performed with the fusion inventory code FISPACT-3.04 [15] forming an integral part of the neutron transport and activation code system described above (see e. g. fig. 3.1).

Activation calculations require a bulk amount of data including transmutation cross sections, decay data, and conversion factors for a large number of nuclides and transmutation reactions that may occur in a fusion reactor spectrum. Activation cross-section data are taken from the European Activation File EAF3.1 [16], which contains 729 target nuclides, including actinides, with 12,899 reactions kinematically allowed below 20 MeV. Decay data have been taken from the DECAY1 library [17], which covers data (half-life, decay-scheme, and branching ratio) for 1626 nuclides.

The inventory code FISPACT collapses the multigroup transmutation cross sections to effective one-group cross-sections making use of the neutron energy spectra provided by an appropriate interface to the MCNP output file (see above). FISPACT integrates the time dependent inventory equation for each nuclide over a suitable time interval. In addition to nuclide inventories, FISPACT calculates quantities such as specific activities, contact γ-dose rates, afterheat, and radiotoxic hazard potentials.

A FISPACT inventory calculation is performed for each specified zone in the blanket segments and the other reactor components of interest making use of the proper set of one group activation cross-sections, neutron fluxes and material data associated to that zone. Integral quantities of interest - e. g. the total activation product inventory, the total afterheat generation etc., in individual reactor components as well as in the whole reactor - are finally obtained by properly weighing and summing up the individual results of the single zone inventory calculations.

4. Neutron transport calculations

Three-dimensional neutron transport calculations were performed to :

- assess the neutronic performance of the dual coolant blanket with regard to its tritium breeding potential
- provide the neutron energy spectra and flux distributions for the activation inventory calculations
- obtain the direct nuclear heating for comparison to the afterheat generation

In the following are reported the main results with regard to the tritium breeding potential of the dual coolant blanket and more extensive results on the neutron spectra, flux and direct heating rate distributions. In addition to this, more detailed results on the neutronic and shielding performance of the liquid metal breeder blanket my be found in Refs. [9] and [12].

4.1 Tritium breeding potential

A two-stage approach has been followed to asses the tritium breeding potential of the dual coolant blanket in the Demo reactor configuration. Firstly, the global tritium breeding ratio (TBR) has been calculated applying the three-dimensional torus sector model of the Demo reactor. About 90,000 source neutron histories have been tracked in the TBR-calculation to assure a sufficient statistical accuracy. Secondly, tritium breeding losses have been assessed that are assumed to occur in the Demo reactor due to the presence of blankets ports for plasma heating, remote handling, pellet injection, diagnostics etc..

According to the TAG-specifications, ten horizontal ports centered at the equatorial plane of the outboard blanket segments are assumed for the Demo reactor, each blanket port covering an area of 340 cm height times the full segment width. Their impact on the breeding performance has been estimated by means of three- dimensional Monte Carlo calculations applying a multi torus sector model [13]. A TBR-loss of about 5% is expected for the liquid metal blanket in the Demo reactor configuration [13]. This has to be accounted for in the TBR-calculation with no ports included. As the tritium breeding potential of the self-cooled liquid metal breeder

Neutron multiplication	1.59 +/- 0.1%
Tritium breeding ratio	
Outboard blanket segment	0.82 +/- 0.3%
Inboard blanket segment	0.23 +/- 0.5%
Divertor breeding region	0.10 +/- 0.9%
Total tritium breeding ratio	1.15 +/- 0.2%

Table 4.1: Tritium breeding ratio and neutron multiplication, Results of 3d Monte Carlo calculations (no blanket ports)

blanket is inherently high, it was attempted not to exceed the level of TBR=1.15 in order to avoid unnecessary tritium excesses. For the previous version of the dual coolant blanket, a high

global tritium breeding ratio of TBR=1.22 was attained [14]. Therefore, the radial thickness of the inboard breeder zone was reduced by about 20 cm to 30 cm in the present design. This offers the advantage of making available more space for shielding material at the inboard side. Alternatively, the high tritium breeding capability of the dual coolant blanket would allow to cope without using the divertor region for tritium breeding. The final results for the TBR and the neutron multiplication with no ports included are shown in table 4.1. Note that there is large room for enhancing the tritium breeding for the dual coolant blanket without technical implications - if there is a need to. Taking into account the mentioned port effect, the actual tritium breeding ratio would decrease to TBR = 1.09 in the presence of ten blanket ports in the Demo reactor.

4.2 Neutron spectra and flux distributions

Spatial distributions of the neutron spectrum and the energy integrated neutron flux density were obtained by three-dimensional MCNP calculations applying appropriate spatial segmentation schemes for the neutron flux tallies.

Both the outboard and the inboard blanket have been divided into 7 poloidal segments, 5 of which are forming the central blanket parts. The radial segmentation used for calculating the spatial distribution of the neutron spectra essentially follows the given material zone distribution. This is sufficient since the spectra are varying only weakly across the blanket segments. As a result, there are 12 and 9 radial segments at the outboard and inboard side, respectively. Accordingly, there are 147 volume elements for which the spectra have to be provided. In the subsequent activation calculations for the blanket segments, use is made only of the poloidally averaged and the midplane segment spectra. The latter ones give the maximum values for the neutron fluxes, the material activation and afterheat production, whereas the first ones form the basis for the calculation of the total activation product inventories and the total afterheat power generation.

A more refined segmentation scheme has been applied for calculating the spatial distribution of the energy integrated neutron flux density. This is required by the fact that the spatial variation is very strong for the geometry. In particular this holds for the radial direction. To better cope with this, the radial segmentation has been extended to 24 zones in the central outboard blanket part, 14 zones in the upper and lower part of the outboard blanket, 20 zones in the central part of the inboard blanket and 12 zones in the upper and lower divertor region. As a result of this fine spatial segmentation, there are 96 poloidally averaged volume elements and 44 midplane segments for the central blanket segments. This fine segmentation scheme is also used in the subsequent activation calculations, i. e. there are performed 96 FISPACT calculation runs for providing the total activation product inventory and 44 FISPACT calculation runs for obtaining the maximum material activation at torus midplane.

A large number of neutron histories has to be tracked to assure a sufficient statistical accuracy for the neutron spectra to be calculated. For that purpose, use is made of the track length estimator (MCNP F4-tally) applying an energy segmentation that corresponds to the VITAMIN-J group structure with 175 energy groups. In the MCNP calculation for the neutron spectra, about 1,000,000 source neutron histories have been followed consuming about 12 h CPU time on an IBM-3090 main frame.

Figures 4.1 to 4.4 show the neutron energy spectra in the first wall and the first three liquid metal channels of the outboard, the inboard, and the divertor region, respectively. Note that the spectral shape shift is rather modest in poloidal direction, whereas it is more pronounced in radial direction. This is due to the inherent nuclear properties of the Pb-17Li eutectic alloy showing no significant neutron slowing down power. The neutron spectrum itself essentially is formed by the secondary energy distribution of the (n,2n)-reaction on Pb.

Volume averaged energy integrated flux densities are plotted as a function of the radial distance to the FW for all poloidal segments in figures 4.5 through 4.8. In addition, numerical values are given in appendix II.I.

The maximum total neutron flux density is obtained in the first wall region of the outboard blanket at torus midplane. It amounts to $1.615 \times 10^{14}\ cm^{-2}s^{-1}$. The corresponding value at the inboard first wall is $1.295 \times 10^{14}\ cm^{-2}s^{-1}$. Note that the radial flux attenuation is rather weak across the inboard blanket segment. It is not more than a factor of 7 due to the small blanket thickness of 56 cm and the inherent nuclear properties of Pb-17Li. At the outboard side, the corresponding attenuation factor amounts to 22.5 across the blanket depth of 100 cm. The differences in the total neutron fluxes in the upper and lower divertor regions are caused by the asymmetric poloidal geometry. This also affects the neutron flux distribution at the outboard blanket segments when comparing the upper and lower parts.

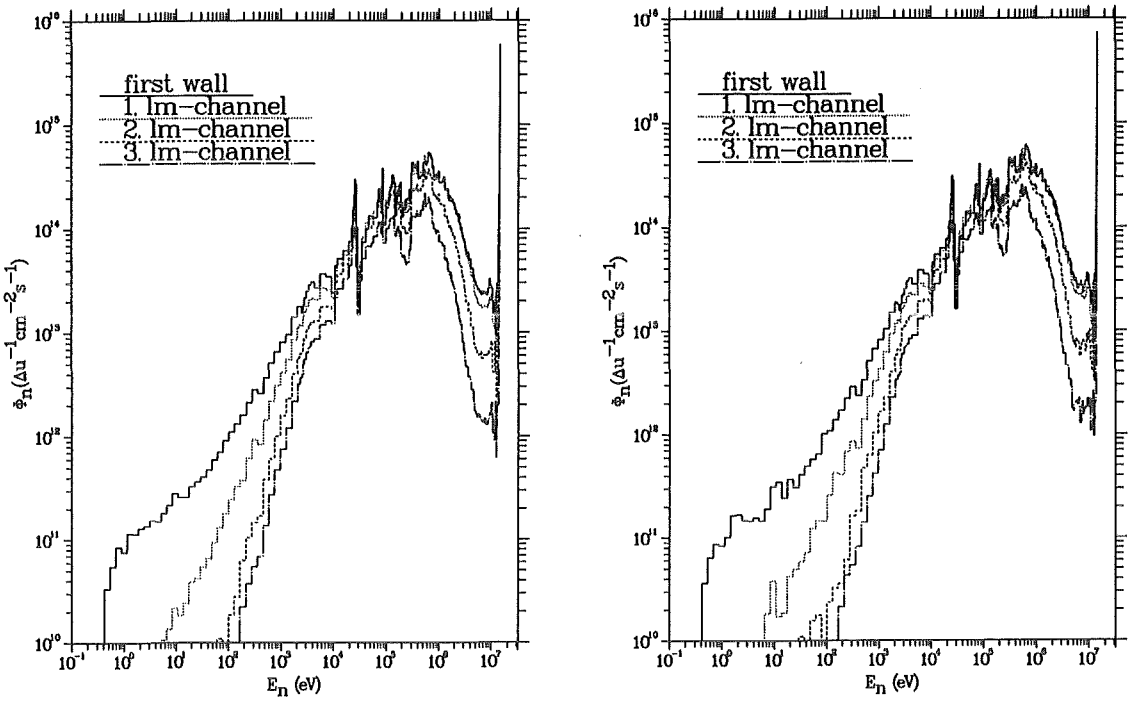

Figure 4.1: Poloidally averaged and midplane neutron spectra in the central part of the outboard blanket

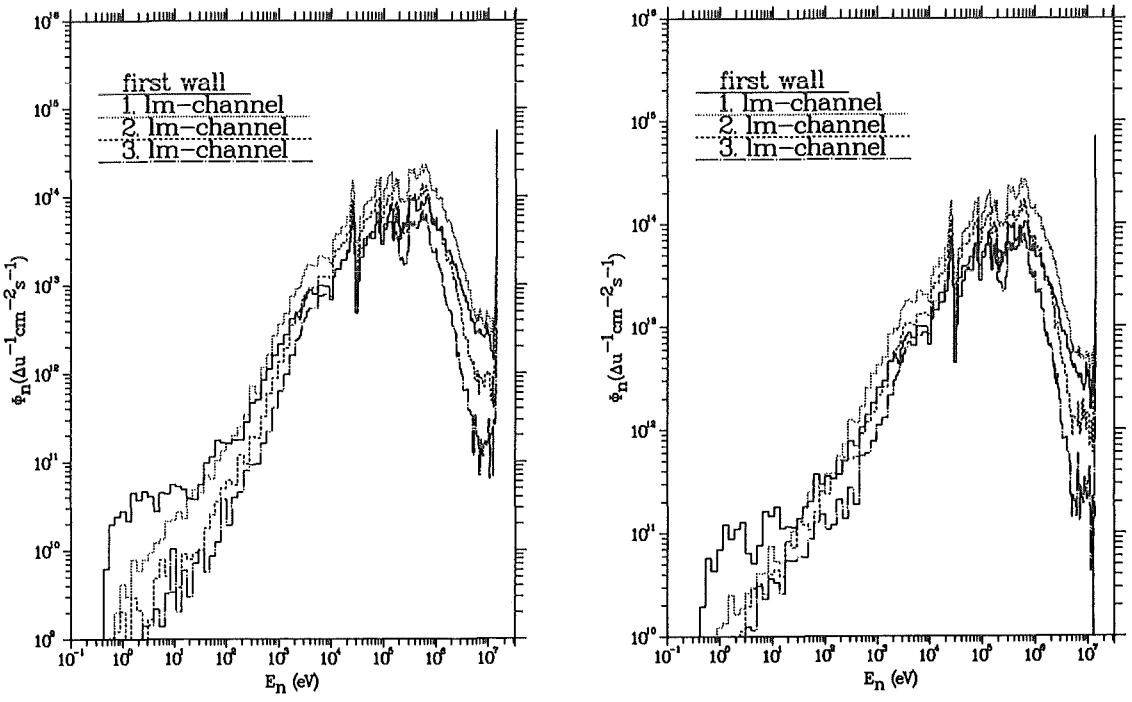

Figure 4.2: Poloidally averaged neutron spectra in the upper and lower part of the outboard blanket

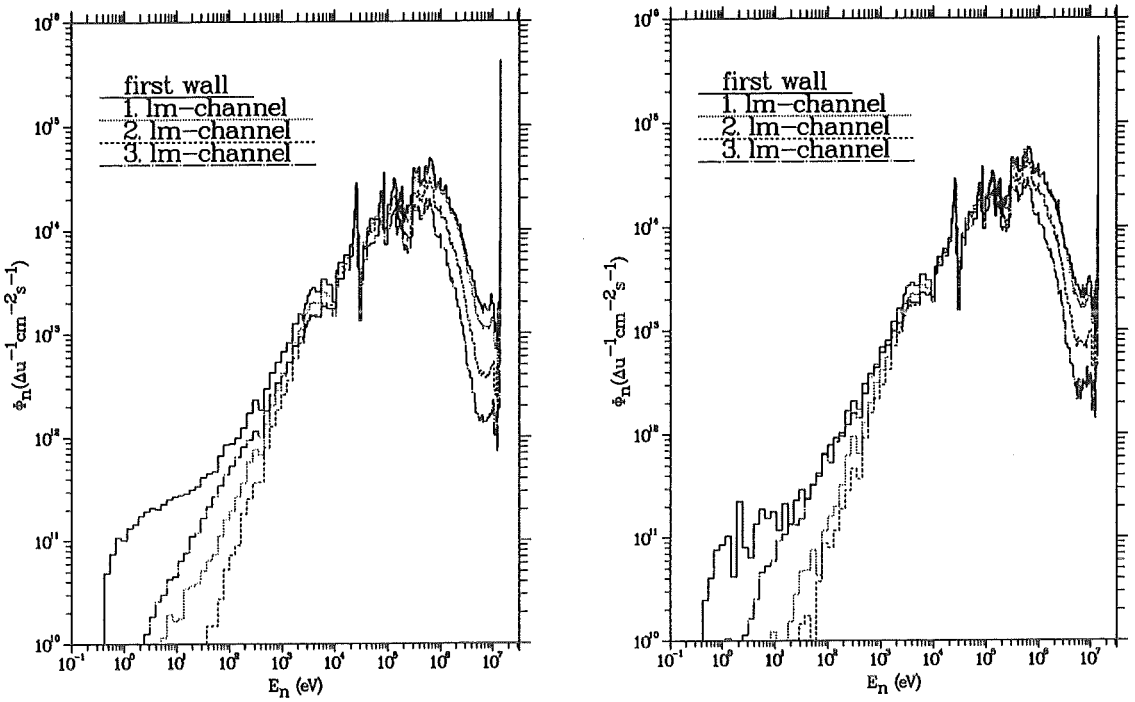

Figure 4.3: Poloidally averaged and midplane neutron spectra in the central part of the inboard blanket

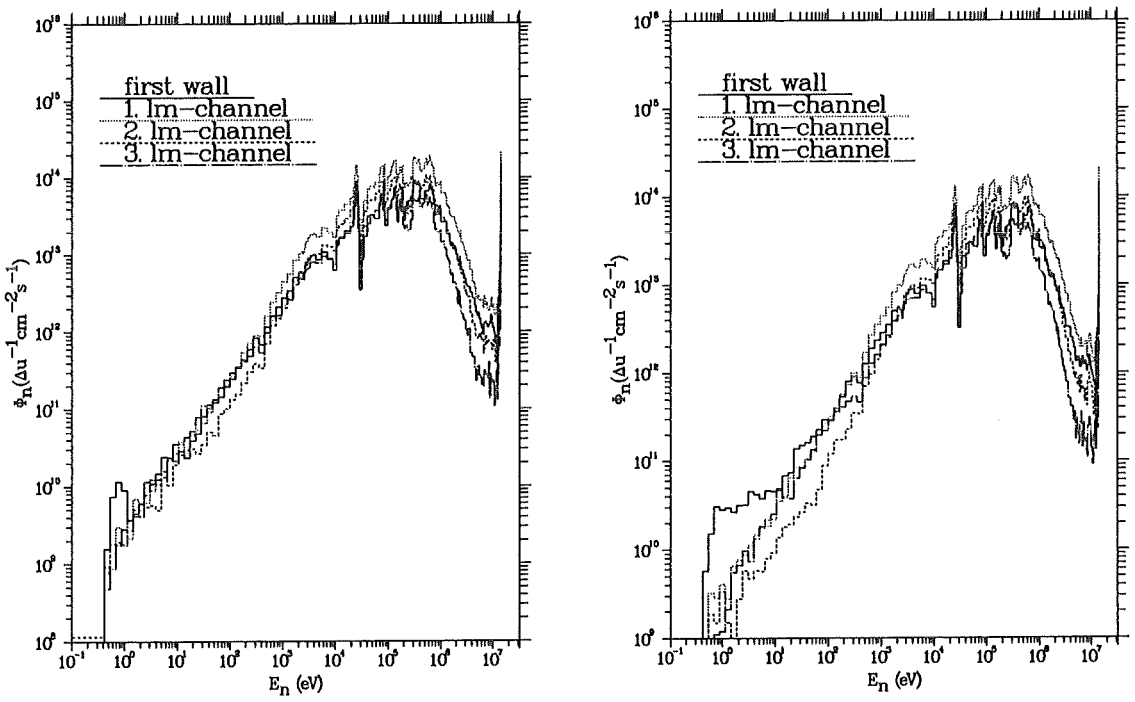

Figure 4.4: Poloidally averaged neutron spectra in the upper and lower divertor region

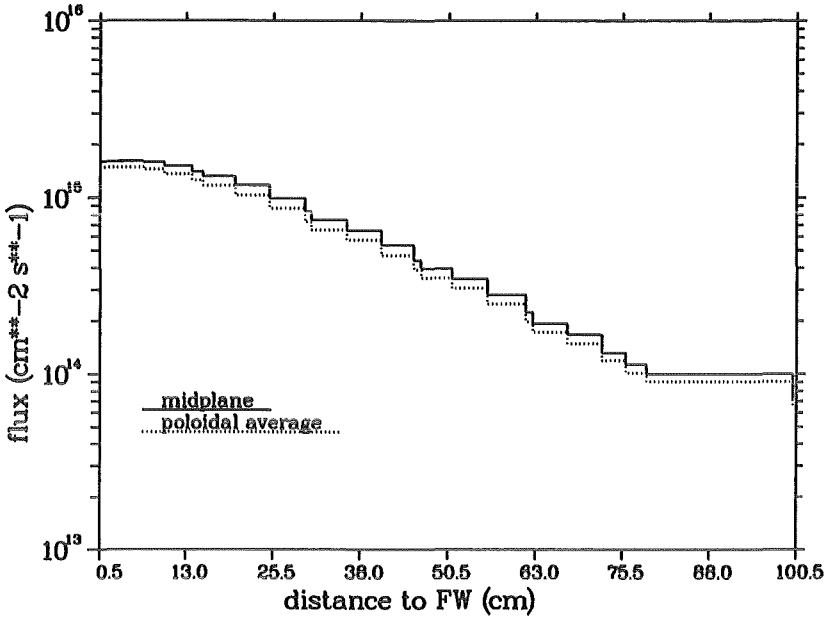

Figure 4.5: Midplane and poloidally averaged total fluxes in the central part of the outboard blanket as a function of the radial distance to first wall

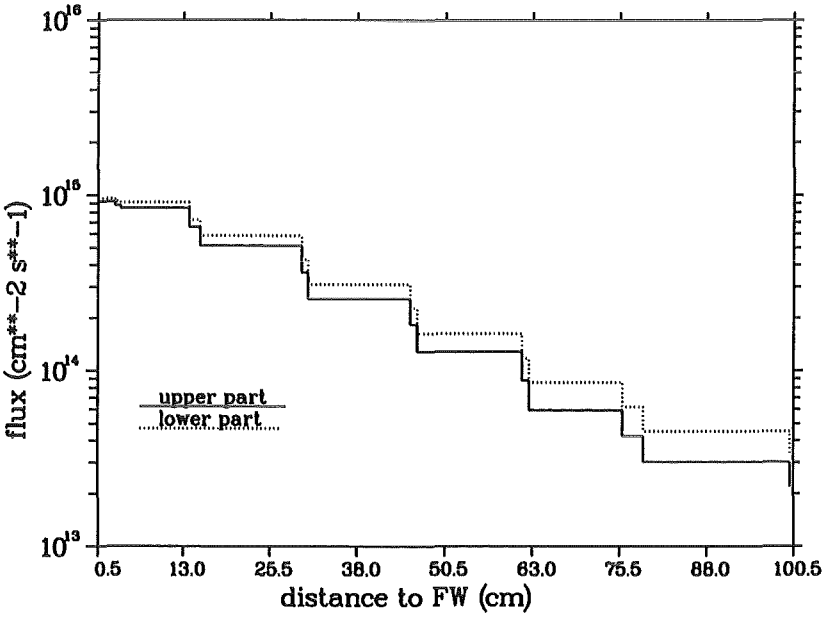

Figure 4.6: Poloidally averaged total fluxes in the upper and lower parts of the outboard blanket as a function of the radial distance to first wall

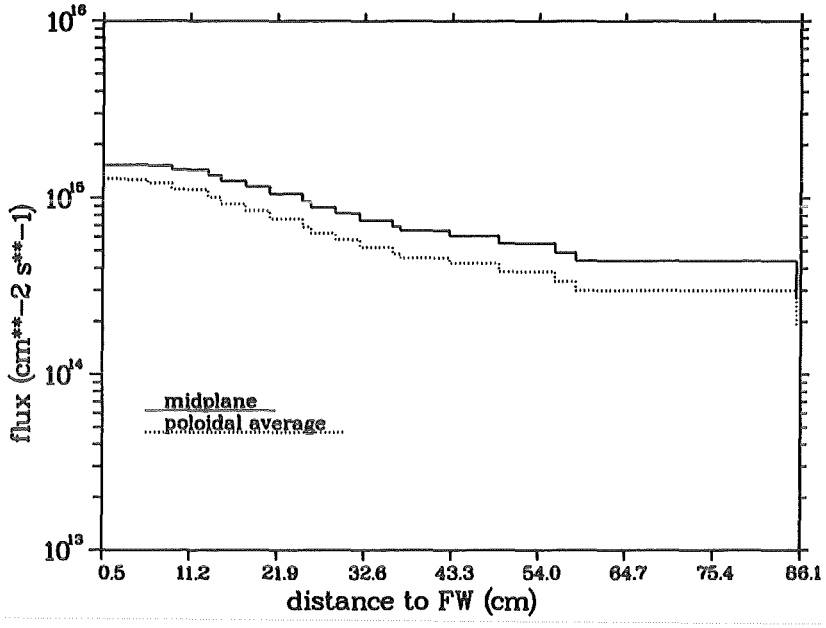

Figure 4.7: Midplane and poloidally averaged total fluxes in the central part of the inboard blanket as a function of the radial distance to first wall

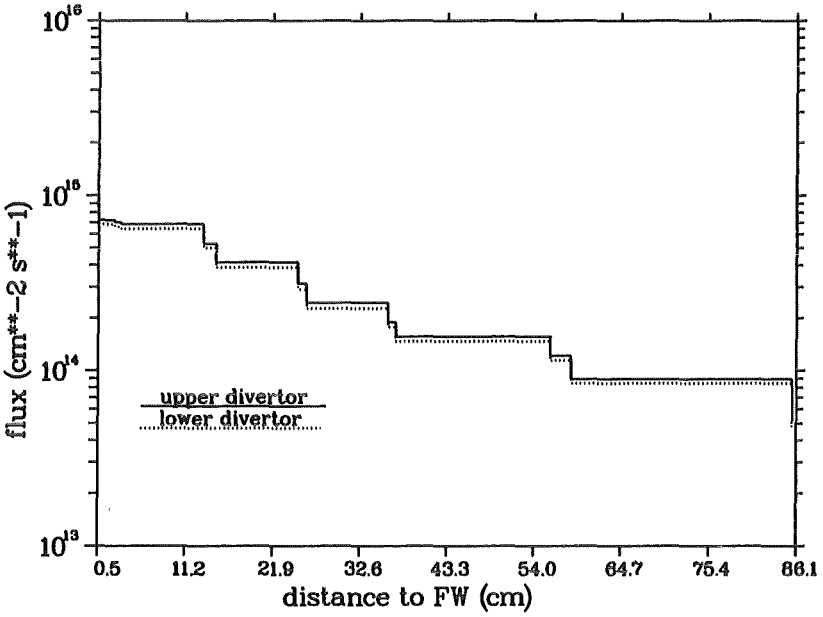

Figure 4.8: Poloidally averaged total fluxes in the upper and lower divertor region as a function of the radial distance to first wall

4.3 Direct nuclear power generation

One of the main functions of the fusion reactor blanket is to convert into heat the nuclear power generated by nuclear reactions in the blanket materials. There are two sources of the nuclear power generation: The direct nuclear heating arising from the neutron and photon interactions with the materials and the afterheat being produced by charged particles and photons that are emitted by decaying radionuclides.

The afterheat in general is in the order of 2 % of the direct power generation . In calculating the nuclear heating for the purpose of the thermal-hydraulic blanket layout, the afterheat contribution usually is not considered. For safety considerations under both normal and off-normal conditions, the afterheat generation , however, is of great importance. Therefore, a reliable assessment of the nuclear heating is needed including both direct and afterheat contributions.

The direct and the afterheat power generation is calculated in two separated steps. The calculation of the direct nuclear heating requires a coupled neutron-photon transport calculation which is presented in this section. The calculation of the afterheat generation actually is part of the activation inventory calculations making use of neutron spectra and flux distributions provided by transport calculations. Results of the afterheat calculation are presented in the subsequent section 5.

The direct nuclear heating is calculated with coupled neutron-photon Monte Carlo transport calculations making use of the torus sector model of the Demo reactor. Neutron and photon energy release rates are scored by making use of the track length estimator and the heating numbers related to the specific nuclear reactions. After normalizing to the fusion power of the Demo reactor, the spatial distribution of the power density is obtained as well as the total power produced by direct nuclear reactions in the blanket and the other reactor components.

A detailed nuclear heating calculation has been performed previously for the dual coolant breeder blanket [12] applying a fine radial-poloidal segmentation scheme. A total number of 700,000 source neutron histories were followed in that nuclear heating calculation. An ad hoc supplementary nuclear heating calculation has been performed for this study to allow the use of the same spatial segmentation scheme than that used for the neutron spectrum and flux calculation.

Representative radial power density profiles are shown in figures 4.9 and 4.10 for the MANET structural material and the Pb-17Li liquid metal, respectively, in the central outboard blanket segment. Note that the power density profiles are comparatively flat due to the inherent nuclear properties of the Pb-17Li alloy and the absence of any neutron moderator. As a consequence, the peak power densities in both the Pb-17Li breeder and the MANET steel structure are rather modest. At the outboard side the Pb-17Li peak power density is 19.4 W/cm^3 (at torus midplane), at the inboard side 17.1 W/cm^3. The poloidally averaged values amount to 16.6 and 12.3 W/cm^3, outboard and inboard, respectively. For the MANET of the first wall (5mm thickness) the peak values are 23.9 and 20.3 W/cm^3, the poloidally averaged ones 20.7 and 15.2 W/cm^3, outboard and inboard, respectively.

The resulting nuclear power generated in the inboard and outboard blanket segments is shown in table 4.2. About 75% of the nuclear power is generated in the front part of the blanket segments (first 30 cm), although the radial power density profiles are comparatively flat for Pb-17Li. The MANET first wall contributes 10% and the liquid metal about 80% to the total nuclear power generation. If the Demo reactor would be equipped with 32 inboard and 48 outboard segments of the dual coolant blanket type, a total nuclear power of 2019 MW would be produced. This does not include the power radiated from the plasma. Thus the neutron energy multiplication for the dual coolant blanket amounts to 1.15.

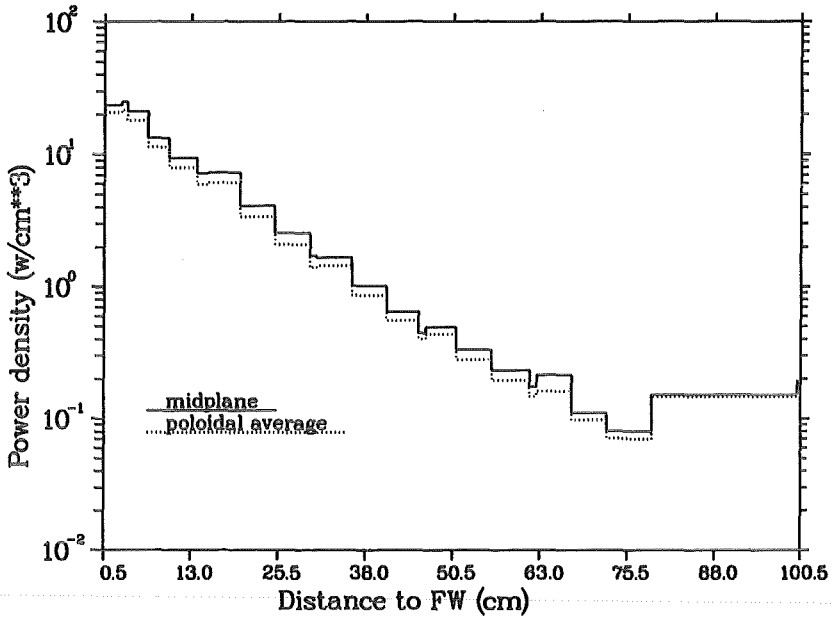

Figure 4.9: Direct power density distribution in MANET in the outboard blanket

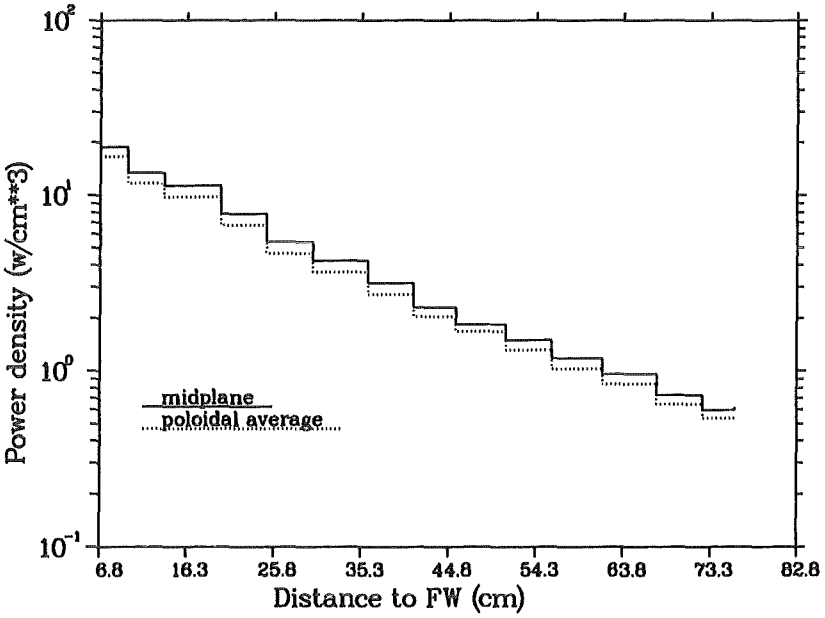

Figure 4.10: Direct power density distribution in Pb-17Li in the outboard blanket

Outboard segment (7.5^o)		Inboard segment (11.25^o)	
Blanket segment	27.6	Central blanket segment	13.5
		Divertor breeding region	3.7
		Divertor plates	4.5
Total outboard	27.6	Total inboard	21.7

Table 4.2: Nuclear power generation [MW] in the blanket segments, results of 3d Monte Carlo calculations (2200 MW fusion power)

5. Activation and afterheat calculations

Activation and afterheat calculations were performed with the FISPACT fusion inventory code making use of the neutron spectra and flux distributions provided by three-dimensional MCNP-calculations for the Demo reactor equipped with the dual coolant blanket, as described in section 3 above.

FISPACT inventory calculations were performed for the MANET structural material and the Pb-17Li breeder material in each radial segment of the inboard and outboard blanket and the divertor breeding regions making use of the proper set of one-group activation cross-sections, neutron fluxes and material data including impurities and tramp elements. For comparison, activation inventory calculations with no material impurities were also included. Following this approach there were performed 96 FISPACT calculation runs for MANET and 40 for the Pb-17Li alloy. Nuclide inventories (in terms of atom numbers per kg of initial material), specific activity and afterheat power densities were obtained in the specified spatial segments. Based on these results, the total activation inventory and the afterheat power generation was calculated for the blanket segments. FISPACT also calculates contact γ-dose rate that would be obtained on the surface of an infinitely extended slab of the irradiated material. Note that this quantity gives only a very crude estimate of the γ-dose rate that actually would be expected for the blanket components in the Demo reactor (e. g. mechanical structure, liquid metal circuit), as this would require three-dimensional transport calculations for the decay γ-rays.

In addition, FISPACT inventory calculations were performed for the torus midplane section of the Demo reactor where the materials are exposed to the highest neutron fluence. As a consequence of that, the highest specific material activation will be obtained in the first wall region of that locations. To obtain the radial profiles of the specific activation and afterheat power density in the torus midplane section, 44 FISPACT calculation runs were performed for the MANET and 24 for the Pb-17Li alloy using again the proper set of one-group activation cross-sections, neutron fluxes and material data.

The activation calculations have been performed assuming the irradiation conditions described above, i. e. 20,000 hours continuous irradiation at a fusion power of 2200 MW. Note that no liquid metal circulation is accounted for in the activation calculation, i. e. Pb-17Li is assumed to be static instead. With regard to the tritium production in liquid metal, a continuous removal of tritium is assumed, i. e. the presence of tritium in the irradiated Pb-17Li is not accounted for.

5.1 Specific activity and contact γ-dose rate

Specific activities and contact γ-dose rates are shown as functions of the cooling time in figures 5.1,5.2,5.3, and 5.4 for the MANET of the first wall and the Pb-17Li in the front channel row of the outboard blanket segment at torus midplane. Note that the materials are exposed to the highest neutron fluence in the Demo reactor at these positions. Dominant nuclides contributing to the given activation quantity at the specified times are included in the curves. In addition, decay curves with and without material impurities are given, and the difference is shown in a separate curve.

5.1.1 Dominant radionuclides and pathway analyses

The dominant radionuclides and their relative contribution to the indicated activation quantities are listed in tables 5.1 and 5.2 at selected cooling times for MANET and Pb-17Li , respectively. The principal reaction pathways for the production of the most important radionuclides are given in tables 5.3 through 5.12 for the first wall region of the outboard blanket segment at

torus midplane.

Note that the contributions to specific nuclide production pathways are strongly dependent on the neutron energy spectrum. In the first wall region, because of the fast neutron spectrum threshold reactions like (n,2n) and (n,p) are dominating in general. In the blanket back region and the shield the neutron spectrum is softer resulting in enhanced activation reactions of the (n, γ)-type. For instance, for MANET in the rear, shield region the main contributor to the specific activity at shutdown is ^{56}Mn with 56%, which is mainly produced by (n, γ)-reactions on ^{55}Mn, whereas in the first wall region its contribution at shutdown amounts to about 32% and it is mainly produced by the $^{56}Fe(n,p)^{55}Mn$ reaction. On the other hand the contribution of ^{55}Fe to the specific activity at shutdown in the first wall region is about 40% and decreases to about 10% in the rear shield region, thereby also changing its main production path from $^{56}Fe(n,2n)^{55}Fe$ to $^{54}Fe(n,\gamma)^{55}Fe$.

5.1.2 Discussion of results

For the MANET steel both the activity, the contact γ-dose rate and the radiological hazard potential are not significantly affected by impurities. Major contributors to the γ-dose rate of MANET are ^{54}Mn and ^{56}Mn (activation products mainly ^{54}Fe and ^{56}Fe,respectively, and of ^{55}Mn, secondly) at short term, ^{60}Co (activation product mainly of ^{60}Ni and of ^{59}Co, secondly) at medium term and ^{94}Nb and ^{26}Al (activation products of ^{93}Nb and ^{27}Al, respectively) at long term cooling times.

At medium and long term cooling times (more than one year after shutdown) both the contact γ-dose rate and the radiological hazard potential of Pb-17Li are dominated by activation products of the assumed material impurities. Major contributors to the γ-dose rate at medium term cooling times are ^{110m}Ag ($T_{1/2} = 250d$), ^{65}Zn ($T_{1/2} = 244d$) and ^{60}Co ($T_{1/2} = 5.27y$) and the lead isomer ^{207m}Pb ($T_{1/2} = 0.8s$). The formation of ^{207m}Pb at this time scale is by electron capture decay of ^{207}Bi ($T_{1/2} = 33.4y$) being mainly an activation product of the assumed ^{209}Bi-impurity. At long term cooling times the γ-dose rate is dominated by ^{108m}Ag ($T_{1/2} = 127y$), while there is still a significant contribution by ^{207m}Pb.

As a consequence of the included assumed material impurities, the Pb-17Li γ-dose rate does not fall below the hands-on-level limit of 25 μ Sv/h. Note that this holds for the highest loaded liquid metal in the first channel row (first 3 cm) of the outboard blanket at torus midplane. In the activation calculation it is assumed that the liquid metal is irradiated stationary over the integral operation time of 20,000 hours. Actually, the liquid metal is circulating permanently, inside and outside the radiation field, during reactor operation, and, therefore, the actual fluence to the liquid metal will be considerably smaller. This effect, however, is not taken into account in the activation calculation resulting in a corresponding overestimation of the calculated γ-dose rate. Likewise, this holds for the calculated specific activity of Pb-17Li, whereas the total activity inventory is not affected in a first approximation.

5.2 Total activation inventory

Total activation inventories are given in table 5.13 for the MANET steel and the Pb-17Li breeder in the inboard and outboard blanket segments.

The total activation product inventory of the Demo reactor is largely dominated by the contribution of the MANET structural material. The Pb-17Li breeder contributes significantly to the total activation inventory only for short term cooling times (up to a few days after shutdown). The contributing radionuclides are the short-lived lead activation products $^{207m}Pb(T_{1/2} = 0.8s)$, $^{204m}Pb(T_{1/2} = 67.2m)$, and $^{203}Pb(T_{1/2} = 51.9h)$. At intermediate term cooling times (1 to 50 years) the specific activity of Pb-17Li is dominated by the tritium retained in the liquid

metal breeder, which is not considered in the data and figures given for Pb-17Li. At long term cooling times (more than 100 years) the activation inventory of Pb-17Li is dominated by $^{205}Pb(T_{1/2} = 1.9 \times 10^7 y)$.

5.3 Production of ^{210}Po in Pb-17Li

Because of its high radiological hazard potential, special care has been devoted to a reliable assessment of the generation of the radiotoxine ^{210}Po in the Pb-17Li liquid metal [18] ^{210}Po ($T_{1/2} = 138d$) dominates the short term (up to about 2 year after shutdown) radiological hazard potential of irradiated Pb-17Li. It is formed both as lead activation product through the reaction $^{208}Pb(n,\gamma)^{209}Pb(\beta^-, T_{1/2} = 3.5h)^{209g}Bi(n,\gamma)^{210}Bi(\beta^-, T_{1/2} = 5.0d)^{210}Po$ and as activation product of the Bi-impurity contained in the Pb-17Li alloy, starting from ^{209}Bi in that case. Thus the ^{210}Po production depends on the Bi-impurity content of the Pb-17Li on one hand, and in a very sensitive way on the irradiation conditions on the other hand.

In checking the involved cross-section data it was recognized that the UKACT1-data library [19] contained unphysical cross-sections for the $^{208}Pb(n,\gamma)^{209}Pb$ reaction. The UKACT1 data was most likely the result of simple model calculations performed earlier for the ACTL activation library [20]. Both the REAC [21] and the UKACT1 activation libraries made use of these data. The more recent EAF-3 and ENDF/B-VI data libraries provide more reliable ^{208}Pb cross-section data evaluations that rely on the use of experimental data. The ACTL based ^{208}Pb cross-section had led to large overestimations (by a factor 5 to 10) of the calculated ^{210}Po inventory in previous assessments when comparing to more reliable EAF and ENDF/B-VI data. In calculating the ^{210}Po inventory for the dual coolant blanket, it is necessary to take into account the liquid metal circulation. This is due to the ^{210}Po production pathway involving two sequential (n, γ)-reactions when starting from 208Pb and, therefore, leading to a quadratic dependence on the neutron flux for the accumulating ^{210}Po inventory. To cope wit this, the following approach has been followed.

In a first step, the internal liquid metal circulation is simulated, i. e. the circulation in the irradiation field inside the blanket segment at power operation. For this purpose the irradiation time is subdivided into a large number of irradiation intervals. At the end of each interval the liquid metal masses are blended according to their actual volume fractions. Irradiation is continued then for the next time interval by using the properly blended liquid metal of the previous irradiation step.

In a second step, the external liquid metal circulation is simulated, too. Essentially, the same blending procedure is applied. In addition, the total liquid metal mass inventory is increased by a factor 3, whereas the irradiation time is reduced to 1/3 of the total one. In this way it is accounted for that 2/3 of the total liquid metal inventory is permanently outside and 1/3 inside the irradiation field.

Table 5.14 shows the resulting ^{210}Po activity inventories and specific activities for the different blending modes obtained with ENDF/B-VI cross-section data. There is included a static case where the liquid metal is kept stationary during irradiation, i. e. no blending is applied as it is generally assumed for activation calculations. In addition, the effect of varying initial Bi-impurities has been analyzed for the different blending modes. In simulating the internal liquid metal circulation, the calculated ^{210}Po activity (both the total inventory and the specific activity) is reduced by about 40% with regard to the static case and no initial bismuth is present. The reduction is the less the higher is the initial bismuth content, i. e. the more the single $^{209g}Bi(n,\gamma)^{210}Bi$ transition contributes to the ^{210}Po production path. Taking into account the external liquid metal circulation results in a reduction of the specific ^{210}Po activity by one order of magnitude with regard to the static case (no initial bismuth). The total ^{210}Po activity inventory is lower only by a factor 3 because of the larger liquid metal

mass inventory.

The effect of initial Bi-impurities on the ^{210}Po activity inventory is dependent on the blending mode for liquid metal and the impurity level itself. There is a linear increase of the ^{210}Po activity inventory by about 4.2×10^3 Ci per 10 appm Bi both in the internally circulated and the static liquid metal case, and an increase by about 9.5×10^3 Ci in case of the externally circulated liquid metal. Thus the Bi-impurity effect becomes dominant above 20-30 appm initial bismuth content in the internally circulated and the static liquid metal case, but is dominant at all impurity levels in case of the externally circulated liquid metal.

The increase of the Bi-content in the irradiated Pb-17Li alloy amounts to about 4.4 appm in case of the externally circulated liquid metal, which is the most realistic case for the dual coolant blanket. Thus it would be beneficial to keep the bismuth content of the Pb-17Li alloy well below this level. This would require an on- line purification at about 1-2 appm bismuth. In view of the very low polonium release fractions found experimentally for Pb-17Li [22], it is questionable, however, if this is really necessary.

5.4 Detailed spatial distributions

Material activation and related properties have been calculated in a fine radial-poloidal segmentation scheme as described in section 3. previously.

Detailed results of the calculated spatial distributions are reproduced in the appendix for the central inboard and outboard segments, both at torus midplane and poloidally averaged, the upper and lower divertor regions and the upper and lower blanket segment parts. Numerical values are given for the radial profiles of the calculated specific activity, the contact γ-dose rate and the afterheat power density at reactor shutdown and at several cooling times.

Figures 5.5 to 5.8 illustrate the radial profiles of specific activity of MANET and the Pb-17Li in the central inboard and outboard blanket segments at short-term (shutdown to 1 day) and long-term (1 month to 100 years) cooling times. Analogously, figures 5.9 to 5.12 show the contact γ-dose rate distribution in the MANET structural material and the Pb-17Li liquid metal in the central inboard and the outboard blanket segments.

There are significant spatial variations of the material activation that are caused by the underlying radial-poloidal neutron flux distribution and spectral shifts. Analogous to the neutron flux distribution, the activation shows its maximum at torus midplane, both for the inboard and the outboard side, and decreases asymmetrically with the poloidal height. The spatial variation of the activation, however, is in general different to that of the neutron flux due to its dependence on the production pathway (e. g. single vs. multi-step reaction).

The poloidal variation can be expressed with the help of a form factor being defined as the ratio of the poloidal maximum to the average value at an equidistant radial position from the first wall. Form factors calculated for the specific activity and the γ-dose rate of MANET and PB-17Li are given in table 5.15 for the first wall and the rear shield.

Note that the difference in the form factors of the specific activity and the γ-dose rate is negligible and is due to the implicit dependence γ-dose rate on the activity in the approximation used for the calculations. Analogously, this holds for the nuclear heating rate distribution being not included in the table.

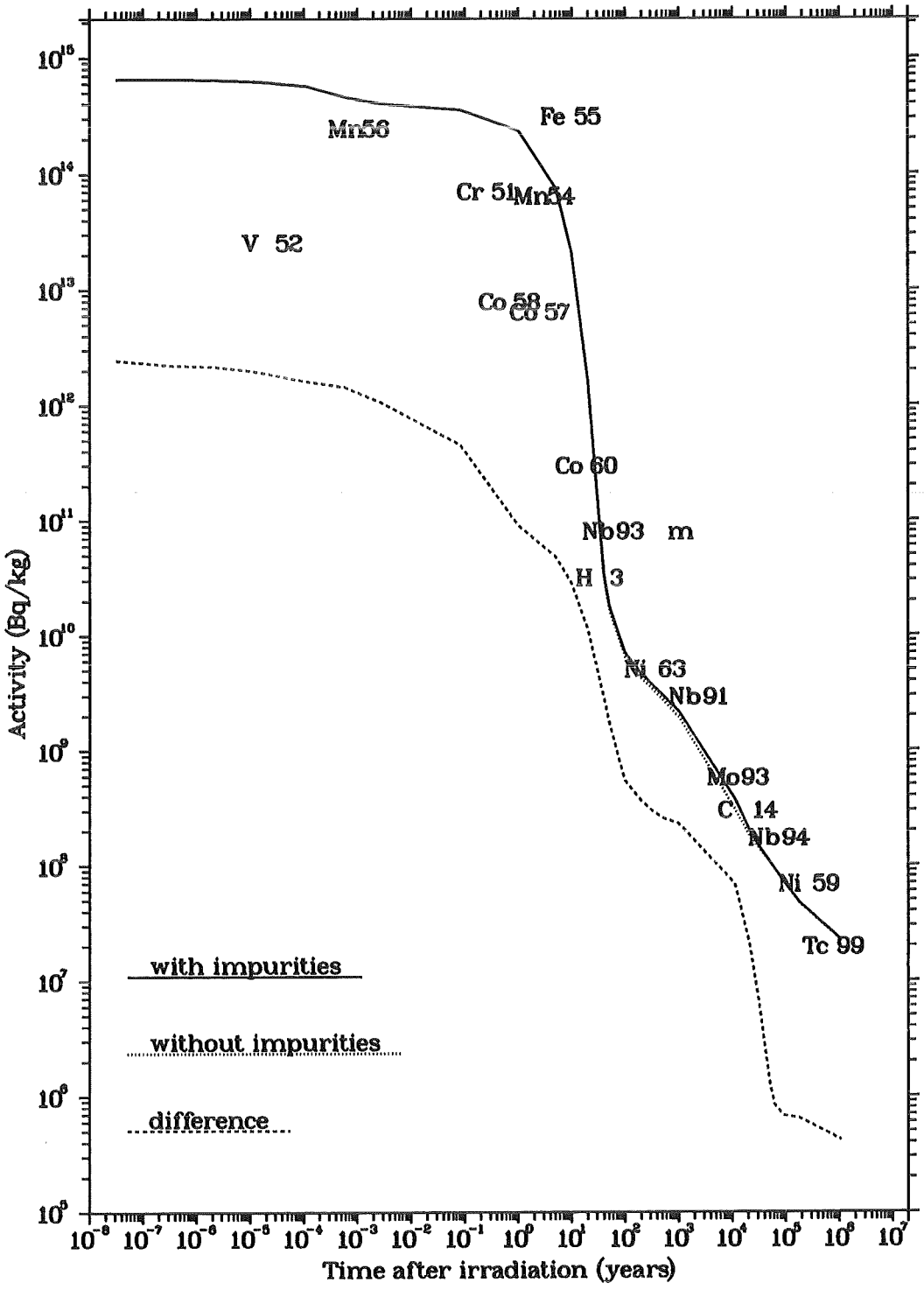

Figure 5.1: Specific activity versus cooling time for MANET irradiated at the midplane of the outboard blanket FW

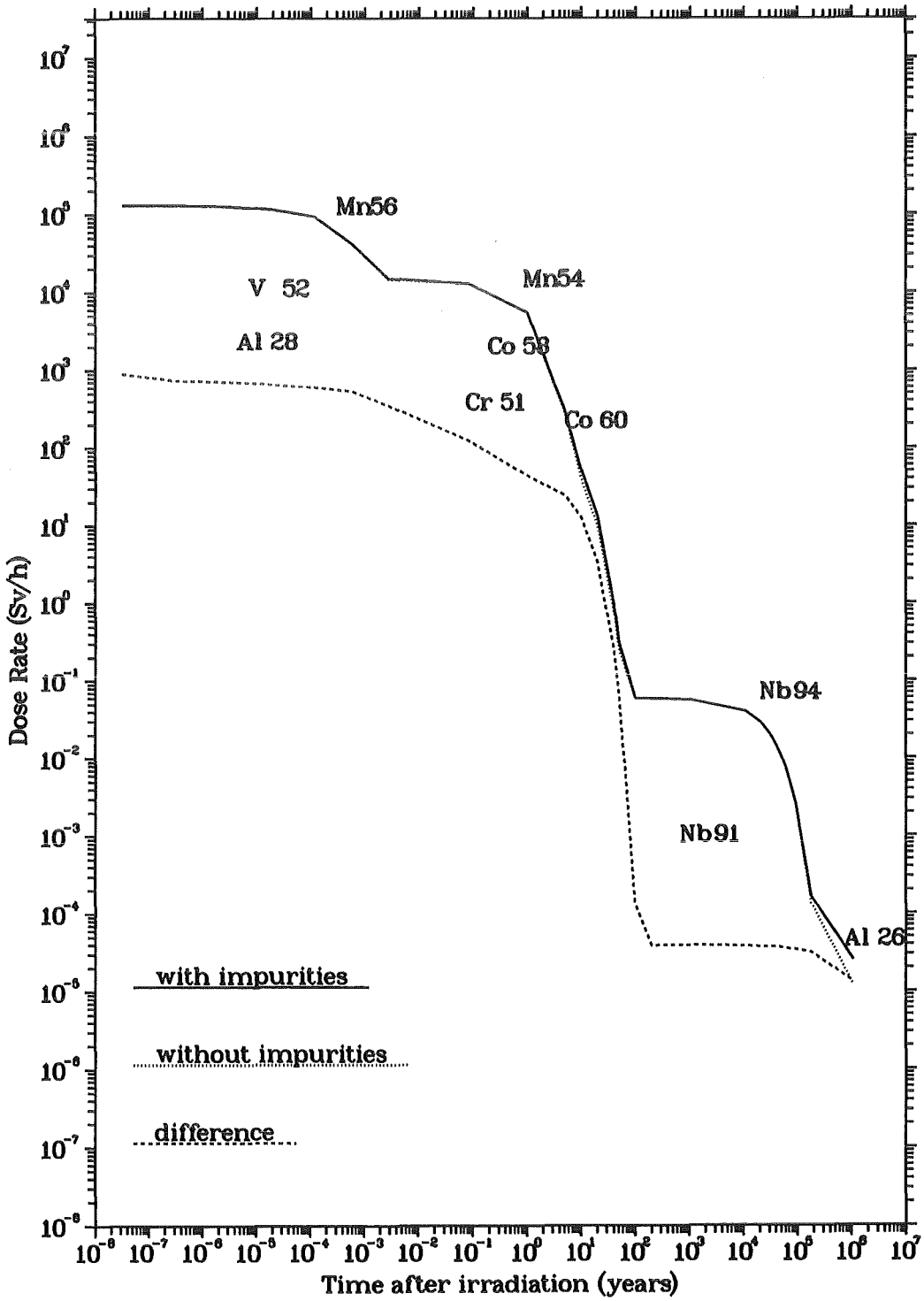

Figure 5.2: Contact γ-dose rate versus cooling time for MANET irradiated at the midplane of the outboard blanket FW

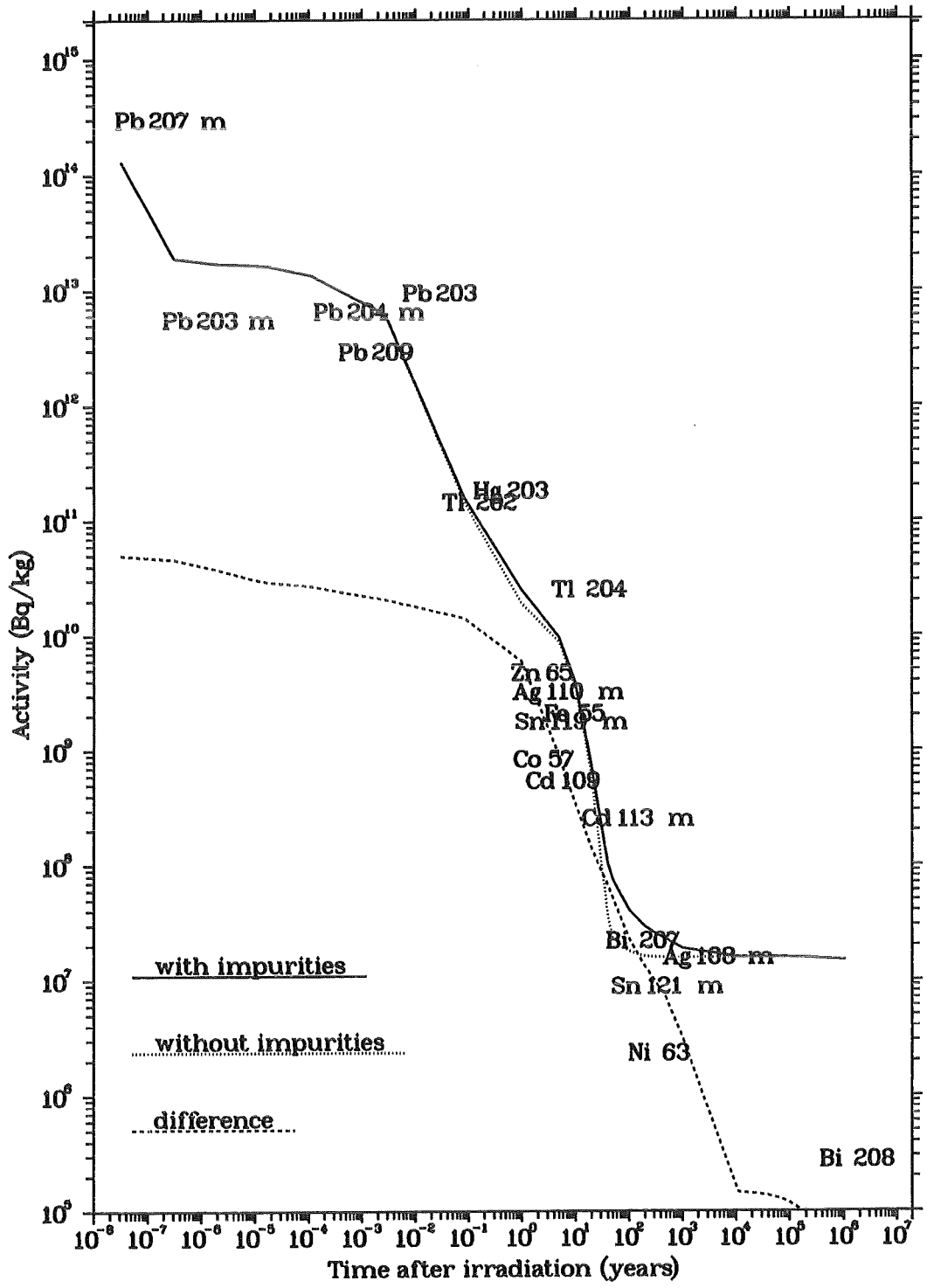

Figure 5.3: Specific activity versus cooling time for Pb-17Li irradiated at the midplane of the outboard blanket

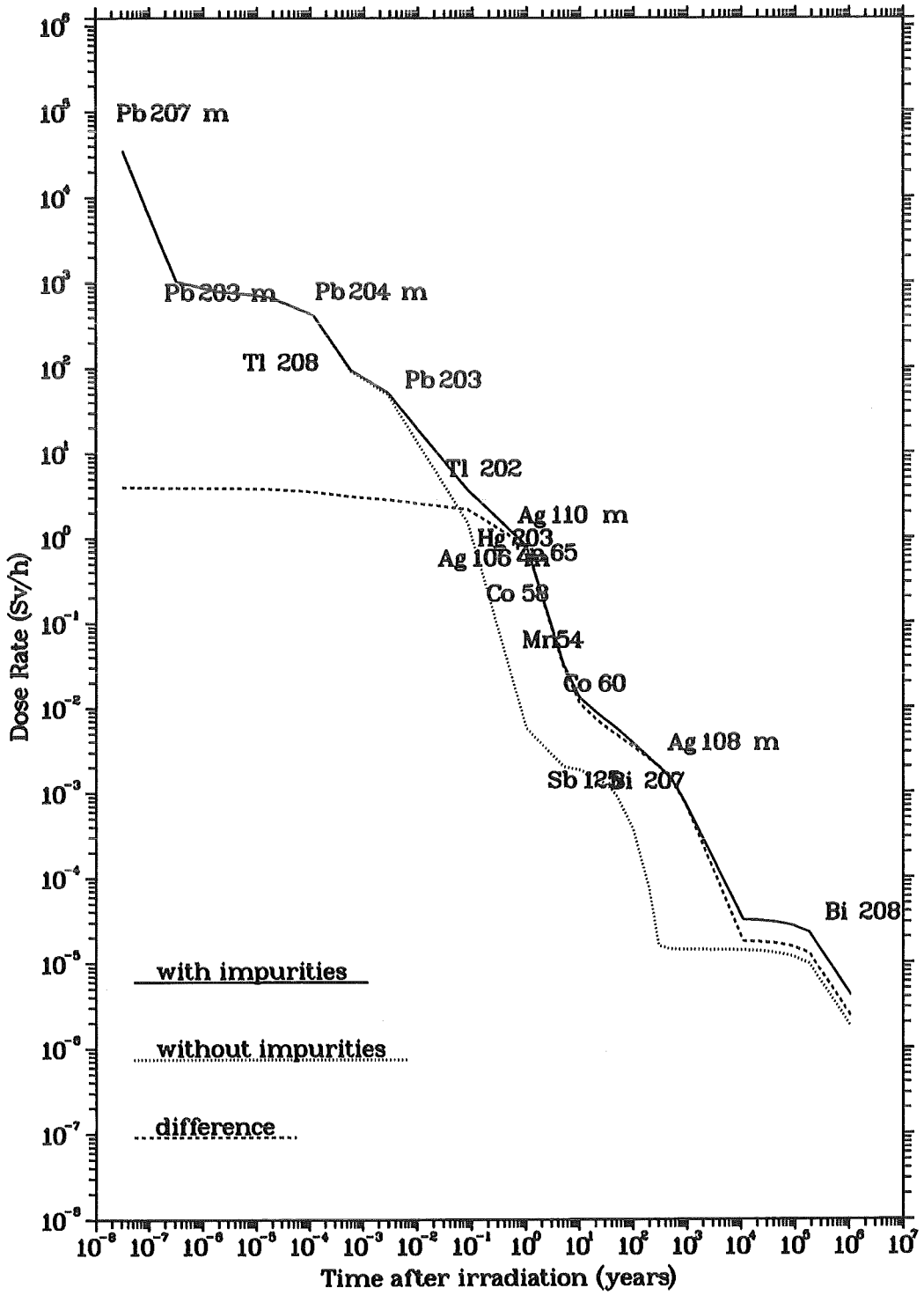

Figure 5.4: Contact γ-dose rate versus cooling time for Pb-17Li irradiated at the midplane of the outboard blanket

Table 5.1

MANET — DOMINANT NUCLIDES

Time after shutdown 0.0

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	6.5435E+14		Total	1.0805E-01		Total	1.3029E+05	
Fe 55	2.6622E+14	40.69E+00	Mn 56	8.5050E-02	78.72E+00	Mn 56	1.0259E+05	78.74E+00
Mn 56	2.1150E+14	32.32E+00	V 52	8.7755E-03	81.22E-01	Mn 54	1.1897E+04	91.32E-01
Cr 51	6.0292E+13	92.14E-01	Mn 54	7.4380E-03	68.84E-01	V 52	9.0793E+03	69.69E-01
Mn 54	5.5263E+13	84.46E-01	Al 28	1.6435E-03	15.21E-01	Al 28	1.8797E+03	14.43E-01
V 52	2.1787E+13	33.30E-01	Co 58	1.0901E-03	10.09E-01	Co 58	1.6383E+03	12.58E-01
Co 58	6.7277E+12	10.28E-01	Mn 57	4.7383E-04	43.85E-02	Na 24	3.7437E+02	28.73E-02
Co 57	5.4779E+12	83.72E-02	V 53	3.9056E-04	36.15E-02	V 53	3.4524E+02	26.50E-02
Al 28	3.3961E+12	51.90E-02	Cr 51	3.5010E-04	32.40E-02	Zr 90m	3.4262E+02	26.30E-02
Co 58m	3.3920E+12	51.84E-02	Cr 55	3.2639E-04	30.21E-02	Cr 51	3.1276E+02	24.01E-02
Mn 57	2.5226E+12	38.55E-02	Fe 55	2.5126E-04	23.25E-02	Co 60	1.8077E+02	13.87E-02
Rest	1.7765E+13	27.15E-01	Rest	2.2564E-03	20.88E-01	Rest	1.6472E+03	12.64E-01

Time after shutdown 1.0 hour

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	5.6863E+14		Total	7.5393E-02		Total	9.3707E+04	
Fe 55	2.6622E+14	46.82E+00	Mn 56	6.4999E-02	86.21E+00	Mn 56	7.8403E+04	83.67E+00
Mn 56	1.6164E+14	28.43E+00	Mn 54	7.4373E-03	98.65E-01	Mn 54	1.1896E+04	12.69E+00
Cr 51	6.0230E+13	10.59E+00	Co 58	1.0899E-03	14.46E-01	Co 58	1.6380E+03	17.48E-01
Mn 54	5.5258E+13	97.18E-01	Cr 51	3.4973E-04	46.39E-02	Na 24	3.5744E+02	38.14E-02
Co 58	6.7263E+12	11.83E-01	Fe 55	2.5125E-04	33.33E-02	Cr 51	3.1244E+02	33.34E-02
Co 57	5.4774E+12	96.33E-02	Na 24	2.0775E-04	27.56E-02	Co 60	1.8077E+02	19.29E-02
Co 58m	3.1445E+12	55.30E-02	Mo 99	1.9907E-04	26.40E-02	Fe 59	1.3695E+02	14.61E-02
Mo 99	2.2929E+12	40.32E-02	Co 57	1.2635E-04	16.76E-02	Ni 57	1.3590E+02	14.50E-02
V 49	2.2658E+12	39.85E-02	Co 60	1.0669E-04	14.15E-02	Nb 92m	1.1189E+02	11.94E-02
Tc 99m	2.0404E+12	35.88E-02	Zr 89	8.7917E-05	11.66E-02	Zr 89	1.0659E+02	11.37E-02
Rest	3.3426E+12	58.78E-02	Rest	5.3787E-04	71.34E-02	Rest	4.2856E+02	45.73E-02

Table 5.1

MANET DOMINANT NUCLIDES

Time after shutdown 1 day

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	4.0125E+14		Total	1.0151E-02		Total	1.4995E+04	
Fe 55	2.6604E+14	66.30E+00	Mn 54	7.4215E-03	73.11E+00	Mn 54	1.1871E+04	79.17E+00
Cr 51	5.8803E+13	14.66E+00	Co 58	1.0820E-03	10.66E+00	Co 58	1.6261E+03	10.84E+00
Mn 54	5.5141E+13	13.74E+00	Cr 51	3.4145E-04	33.64E-01	Cr 51	3.0503E+02	20.34E-01
Co 58	6.6773E+12	16.64E-01	Fe 55	2.5108E-04	24.73E-01	Co 60	1.8070E+02	12.05E-01
Co 57	5.4645E+12	13.62E-01	Mo 99	1.5635E-04	15.40E-01	Mn 56	1.6168E+02	10.78E-01
V 49	2.2612E+12	56.36E-02	Mn 56	1.3404E-04	13.20E-01	Fe 59	1.3494E+02	89.99E-02
Mo 99	1.8008E+12	44.88E-02	Co 57	1.2605E-04	12.42E-01	Na 24	1.2331E+02	82.24E-02
Tc 99m	1.7220E+12	42.92E-02	Co 60	1.0665E-04	10.51E-01	Nb 92m	1.0480E+02	69.89E-02
Co 58m	5.5064E+11	13.72E-02	Fe 59	8.4963E-05	83.70E-02	Ni 57	8.7364E+01	58.26E-02
Nb 92m	4.2259E+11	10.53E-02	Zr 89	7.1746E-05	70.68E-02	Zr 89	8.6985E+01	58.01E-02
Rest	2.3681E+12	59.02E-02	Rest	3.7559E-04	37.00E-01	Rest	3.1332E+02	20.89E-01

Time after shutdown 1 month

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	3.5402E+14		Total	8.5121E-03		Total	1.2881E+04	
Fe 55	2.6067E+14	73.63E+00	Mn 54	6.9592E-03	81.76E+00	Mn 54	1.1131E+04	86.42E+00
Mn 54	5.1706E+13	14.61E+00	Co 58	8.1482E-04	95.72E-01	Co 58	1.2246E+03	95.07E-01
Cr 51	2.8463E+13	80.40E-01	Fe 55	2.4601E-04	28.90E-01	Co 60	1.7883E+02	13.88E-01
Co 57	5.0754E+12	14.34E-01	Cr 51	1.6528E-04	19.42E-01	Cr 51	1.4765E+02	11.46E-01
Co 58	5.0287E+12	14.20E-01	Co 57	1.1708E-04	13.75E-01	Fe 59	8.6415E+01	67.09E-02
V 49	2.1276E+12	60.10E-02	Co 60	1.0555E-04	12.40E-01	Co 57	4.5626E+01	35.42E-02
Fe 59	2.5992E+11	73.42E-03	Fe 59	5.4408E-05	63.92E-02	Nb 95	2.6917E+01	20.90E-02
Co 60	2.5327E+11	71.54E-03	Nb 95	1.9475E-05	22.88E-02	Nb 92m	1.4463E+01	11.23E-02
Nb 95	1.5022E+11	42.43E-03	Nb 92m	9.0986E-06	10.69E-02	Zr 95	1.0256E+01	79.62E-03
Nb 93m	6.8731E+10	19.41E-03	Zr 95	8.1252E-06	95.45E-03	Y 88	5.2490E+00	40.75E-03
Rest	2.2414E+11	63.31E-03	Rest	1.3124E-05	15.42E-02	Rest	9.4883E+00	73.66E-03

Table 5.1

MANET — DOMINANT NUCLIDES

Time after shutdown 1 year

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	2.3426E+14		Total	3.6795E-03		Total	5.5184E+03	
Fe 55	2.0595E+14	87.91E+00	Mn 54	3.3084E-03	89.91E+00	Mn 54	5.2918E+03	95.89E+00
Mn 54	2.4581E+13	10.49E+00	Fe 55	1.9437E-04	52.82E-01	Co 60	1.5848E+02	28.72E-01
Co 57	2.1558E+12	92.03E-02	Co 60	9.3537E-05	25.42E-01	Co 58	4.5938E+01	83.24E-02
V 49	1.0521E+12	44.91E-02	Co 57	4.9730E-05	13.52E-01	Co 57	1.9380E+01	35.12E-02
Co 60	2.2446E+11	95.81E-03	Co 58	3.0566E-05	83.07E-02	Y 88	1.0126E+00	18.35E-03
Co 58	1.8864E+11	80.52E-03	V 49	7.6365E-07	20.75E-03	Nb 95	6.2992E-01	11.41E-03
Nb 93m	6.6132E+10	28.23E-03	Y 88	5.5421E-07	15.06E-03	Fe 59	4.9991E-01	90.59E-04
H 3	2.5530E+10	10.90E-03	Nb 95	4.5578E-07	12.39E-03	Zr 95	2.7140E-01	49.18E-04
Cr 51	6.4779E+09	27.65E-04	Nb 93m	3.1711E-07	86.18E-04	Co 56	2.5712E-01	46.59E-04
Ni 63	4.3273E+09	18.47E-04	Fe 59	3.1475E-07	85.54E-04	Nb 94	5.7786E-02	10.47E-04
Rest	1.2650E+10	54.00E-04	Rest	5.7369E-07	15.59E-03	Rest	1.2500E-01	22.65E-04

Time after shutdown 10 years

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	2.0588E+13		Total	5.0465E-05		Total	5.2157E+01	
Fe 55	2.0433E+13	99.25E+00	Co 60	2.8619E-05	56.71E+00	Co 60	4.8489E+01	92.97E+00
Co 60	6.8675E+10	33.36E-02	Fe 55	1.9284E-05	38.21E+00	Mn 54	3.6059E+00	69.13E-01
Nb 93m	4.5347E+10	22.03E-02	Mn 54	2.2544E-06	44.67E-01	Nb 94	5.7768E-02	11.08E-02
Mn 54	1.6750E+10	81.36E-03	Nb 93m	2.1745E-07	43.09E-02	Co 57	4.3774E-03	83.93E-04
H 3	1.5393E+10	74.77E-03	Nb 94	4.0906E-08	81.06E-03	Nb 91	8.2875E-04	15.89E-04
Ni 63	4.0656E+09	19.75E-03	H 3	1.4074E-08	27.89E-03	Al 26	3.7987E-05	72.83E-06
Nb 91	2.4898E+09	12.09E-03	Co 57	1.1233E-08	22.26E-03	Nb 92	9.5970E-06	18.40E-06
V 49	1.0554E+09	51.26E-04	Ni 63	1.1139E-08	22.07E-03	Na 22	4.6382E-06	88.93E-07
Mo 93	4.9560E+08	24.07E-04	Nb 91	6.8689E-09	13.61E-03	Tc 98	2.5439E-06	48.77E-07
Co 57	4.8694E+08	23.65E-04	C 14	2.0451E-09	40.52E-04	Zn 65	1.5023E-06	28.80E-07
Rest	4.6976E+08	22.82E-04	Rest	4.3947E-09	87.08E-04	Rest	0.0000E+00	0.000E+00

MANET DOMINANT NUCLIDES

Time after shutdown 50 years

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	1.7908E+10		Total	2.5256E-07		Total	3.0955E-01	
Nb 93m	8.7392E+09	48.80E+00	Co 60	1.4815E-07	58.66E+00	Co 60	2.5102E-01	81.09E+00
Ni 63	3.0815E+09	17.21E+00	Nb 93m	4.1906E-08	16.59E+00	Nb 94	5.7689E-02	18.64E+00
Nb 91	2.3903E+09	13.35E+00	Nb 94	4.0850E-08	16.17E+00	Nb 91	7.9564E-04	25.70E-02
H 3	1.6246E+09	90.72E-01	Ni 63	8.4424E-09	33.43E-01	Al 26	3.7985E-05	12.27E-03
Fe 55	7.0896E+08	39.59E-01	Nb 91	6.5945E-09	26.11E-01	Nb 92	9.5970E-06	31.00E-04
Mo 93	4.9169E+08	27.46E-01	C 14	2.0352E-09	80.58E-02	Tc 98	2.5438E-06	82.18E-05
Co 60	3.5552E+08	19.85E-01	H 3	1.4853E-09	58.81E-02	Y 90	3.6085E-07	11.66E-05
C 14	2.5675E+08	14.34E-01	Mo 93	1.3058E-09	51.70E-02	K 42	5.6147E-09	18.14E-07
Nb 94	1.4828E+08	82.80E-02	Fe 55	6.6910E-10	26.49E-02	Tc 97	1.6546E-09	53.45E-08
Ni 59	5.8986E+07	32.94E-02	Y 90	6.1601E-10	24.39E-02	Kr 85	4.2026E-10	13.58E-08
Rest	5.2015E+07	29.05E-02	Rest	4.9977E-10	19.79E-02	Rest	0.0000E+00	00.00E+00

Time after shutdown 100 years

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	7.0115E+09		Total	6.4259E-08		Total	5.8746E-02	
Nb 91	2.2715E+09	32.40E+00	Nb 94	4.0780E-08	63.46E+00	Nb 94	5.7591E-02	98.03E+00
Ni 63	2.1792E+09	31.08E+00	Nb 93m	7.0358E-09	10.95E+00	Nb 91	7.5611E-04	12.87E-01
Nb 93m	1.4673E+09	20.93E+00	Nb 91	6.2668E-09	97.53E-01	Co 60	3.4861E-04	59.34E-02
Mo 93	4.8685E+08	69.44E-01	Ni 63	5.9703E-09	92.91E-01	Al 26	3.7983E-05	64.66E-03
C 14	2.5520E+08	36.40E-01	C 14	2.0229E-09	31.48E-01	Nb 92	9.5970E-06	16.34E-03
Nb 94	1.4802E+08	21.11E-01	Mo 93	1.2930E-09	20.12E-01	Tc 98	2.5438E-06	43.30E-04
H 3	9.7727E+07	13.94E-01	Tc 99	2.3245E-10	36.17E-02	Y 90	1.0976E-07	18.68E-05
Ni 59	5.8959E+07	84.09E-02	Co 60	2.0576E-10	32.02E-02	K 42	1.9644E-09	33.44E-07
Mn 53	2.6069E+07	37.18E-02	Y 90	1.8737E-10	29.16E-02	Tc 97	1.6546E-09	28.17E-07
Tc 99	1.6949E+07	24.17E-02	H 3	8.9352E-11	13.91E-02	Kr 85	1.6575E-11	28.22E-09
Rest	3.7315E+06	53.22E-03	Rest	1.7485E-10	27.21E-02	Rest	0.0000E+00	00.00E+00

Table 5.1: Dominant radionuclides in MANET irradiated at the midplane of the outboard blanket FW

Table 5.2

Pb-17Li DOMINANT NUCLIDES

Time after Shutdown 0.0

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	2.7922E+14		Total	7.0659E-02		Total	8.1342E+04	
Pb207m	2.5624E+14	91.77E+00	Pb207m	6.7041E-02	94.88E+00	Pb207m	7.9802E+04	98.11E+00
Pb203	8.1412E+12	29.16E-01	Pb204m	1.9812E-03	28.04E-01	Pb204m	6.5329E+02	80.31E-02
Pb204m	5.6581E+12	20.26E-01	Pb203m	6.3462E-04	89.81E-02	Pb203m	6.3253E+02	77.76E-02
Pb203m	4.8040E+12	17.20E-01	Pb203	4.9785E-04	70.46E-02	Tl208	9.6209E+01	11.83E-02
Pb209	2.5310E+12	90.65E-02	He 6	1.6795E-04	23.77E-02	Pb203	5.9805E+01	73.52E-03
He 6	6.6898E+11	23.96E-02	Pb209	8.0026E-05	11.33E-02	Li 8	4.6302E+01	56.92E-03
Hg205	1.8894E+11	67.67E-03	Tl208	7.3640E-05	10.42E-02	Pb203n	2.7240E+01	33.49E-03
Tl206	1.7009E+11	60.92E-03	Li 8	7.0767E-05	10.02E-02	Tl207m	1.3614E+01	16.74E-03
Tl207	1.6232E+11	58.13E-03	Pb203n	2.7816E-05	39.37E-03	Tl202	5.4104E+00	66.51E-04
Hg203	1.5709E+11	56.26E-03	Hg205	1.6389E-05	23.19E-03	Ag110m	1.5350E+00	18.87E-04
Rest	5.0303E+11	18.02E-02	Rest	6.8367E-05	96.76E-03	Rest	4.2500E+00	52.25E-04

Time after Shutdown 1.0 hour

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	1.3449E+13		Total	1.6432E-03		Total	4.1964E+02	
Pb203	8.0337E+12	59.74E+00	Pb204m	1.0640E-03	64.75E+00	Pb204m	3.5085E+02	83.61E+00
Pb204m	3.0387E+12	22.59E+00	Pb203	4.9127E-04	29.90E+00	Pb203	5.9015E+01	14.06E+00
Pb209	2.0453E+12	15.21E+00	Pb209	6.4668E-05	39.35E-01	Tl202	5.3976E+00	12.86E-01
Hg203	1.5700E+11	11.67E-01	Tl202	1.0072E-05	61.30E-02	Ag110m	1.5348E+00	36.58E-02
Tl202	1.2422E+11	92.37E-02	Hg203	8.4663E-06	51.52E-02	Hg203	8.1809E-01	19.50E-02
Tl204	2.1689E+10	16.13E-02	Ag110m	1.2595E-06	76.65E-03	Zn 65	5.4881E-01	13.08E-02
Zn 65	4.0644E+09	30.22E-03	Po210	1.0536E-06	64.12E-03	Ag106m	4.7668E-01	11.36E-02
Ag110m	2.7909E+09	20.75E-03	Mn 56	4.1294E-07	25.13E-03	Mn 56	4.2934E-01	10.23E-02
Fe 55	1.7993E+09	13.38E-03	Ag106m	4.0905E-07	24.89E-03	Co 58	1.8255E-01	43.50E-03
Sn119m	1.5351E+09	11.41E-03	Zn 65	3.8504E-07	23.43E-03	Mn 54	5.1915E-02	12.37E-03
Rest	1.7731E+10	13.18E-02	Rest	1.1988E-06	72.96E-03	Rest	3.2837E-01	78.25E-03

Table 5.2

Pb-17Li DOMINANT NUCLIDES

Time after Shutdown 1 day

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	6.2456E+12		Total	3.8383E-04		Total	5.2216E+01	
Pb203	5.9142E+12	94.69E+00	Pb203	3.6166E-04	94.22E+00	Pb203	4.3445E+01	83.20E+00
Hg203	1.5478E+11	24.78E-01	Tl202	9.5398E-06	24.85E-01	Tl202	5.1123E+00	97.91E-01
Tl202	1.1766E+11	18.84E-01	Hg203	8.3465E-06	21.75E-01	Ag110m	1.5307E+00	29.32E-01
Tl204	2.1679E+10	34.71E-02	Ag110m	1.2561E-06	32.73E-02	Hg203	8.0651E-01	15.45E-01
Pb209	1.5218E+10	24.37E-02	Po210	1.0541E-06	27.46E-02	Zn 65	5.4732E-01	10.48E-01
Zn 65	4.0534E+09	64.90E-03	Pb209	4.8116E-07	12.54E-02	Ag106m	4.4069E-01	84.40E-02
Ag110m	2.7835E+09	44.57E-03	Zn 65	3.8399E-07	10.00E-02	Co 58	1.8122E-01	34.71E-02
Fe 55	1.7981E+09	28.79E-03	Ag106m	3.7816E-07	98.52E-03	Mn 54	5.1805E-02	99.21E-03
Sn119m	1.5316E+09	24.52E-03	Co 58	1.5852E-07	41.30E-03	Cd115	1.9659E-02	37.65E-03
Bi210	1.2426E+09	19.90E-03	Cd115m	9.4736E-08	24.68E-03	Co 60	1.5806E-02	30.27E-03
Rest	1.0657E+10	17.06E-02	Rest	4.7893E-07	12.48E-02	Rest	6.5216E-02	12.49E-02

Time after Shutdown 1 month

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	1.5996E+11		Total	1.0126E-05		Total	3.6931E+00	
Hg203	1.0054E+11	62.85E+00	Hg203	5.4216E-06	53.54E+00	Ag110m	1.4124E+00	38.25E+00
Tl202	2.2742E+10	14.22E+00	Tl202	1.8440E-06	18.21E+00	Tl202	9.8816E-01	26.76E+00
Tl204	2.1365E+10	13.36E+00	Ag110m	1.1590E-06	11.45E+00	Hg203	5.2388E-01	14.19E+00
Zn 65	3.7332E+09	23.34E-01	Po210	9.4582E-07	93.41E-01	Zn 65	5.0409E-01	13.65E+00
Ag110m	2.5684E+09	16.06E-01	Zn 65	3.5366E-07	34.93E-01	Co 58	1.3648E-01	36.95E-01
Fe 55	1.7618E+09	11.01E-01	Co 58	1.1938E-07	11.79E-01	Mn 54	4.8578E-02	13.15E-01
Sn119m	1.4301E+09	89.41E-02	Cd115m	6.0364E-08	59.61E-02	Ag106m	4.0955E-02	11.09E-01
Po210	1.0917E+09	68.25E-02	Mn 54	3.8242E-08	37.77E-02	Co 60	1.5641E-02	42.35E-02
Co 58	7.3678E+08	46.06E-02	Ag106m	3.5145E-08	34.71E-02	Pb207m	5.4690E-03	14.81E-02
Co 57	6.6674E+08	41.68E-02	Pb203	3.4119E-08	33.69E-02	Pb203	4.0986E-03	11.10E-02
Rest	3.3231E+09	20.78E-01	Rest	1.1462E-07	11.32E-01	Rest	1.3317E-02	36.06E-02

Table 5.2

Pb-17Li DOMINANT NUCLIDES

Time after Shutdown 1 year

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	2.4808E+10		Total	8.8596E-07		Total	8.0889E-01	
Tl204	1.8053E+10	72.77E+00	Ag110m	4.5735E-07	51.62E+00	Ag110m	5.5735E-01	68.90E+00
Zn 65	1.4421E+09	58.13E-01	Po210	1.7658E-07	19.93E+00	Zn 65	1.9472E-01	24.07E+00
Fe 55	1.3920E+09	56.11E-01	Zn 65	1.3661E-07	15.42E+00	Mn 54	2.3094E-02	28.55E-01
Ag110m	1.0135E+09	40.85E-01	Hg203	3.6982E-08	41.74E-01	Co 60	1.3862E-02	17.14E-01
Hg203	6.8579E+08	27.64E-01	Mn 54	1.8180E-08	20.52E-01	Pb207m	5.3781E-03	66.49E-02
Sn119m	6.4702E+08	26.08E-01	Co 60	9.3065E-09	10.50E-01	Co 58	5.1196E-03	63.29E-02
Co 57	2.8321E+08	11.42E-01	Sn119m	9.0300E-09	10.19E-01	Hg203	3.5735E-03	44.18E-02
Ag109m	2.7053E+08	10.90E-01	Co 57	6.5330E-09	73.74E-02	Ag108m	3.2007E-03	39.57E-02
Cd109	2.7053E+08	10.90E-01	Cd113m	6.3526E-09	71.70E-02	Bi207	1.1001E-03	13.60E-02
Cd113m	2.1002E+08	84.66E-02	Pb207m	4.5181E-09	51.00E-02	Sb125	9.0593E-04	11.20E-02
Rest	5.3972E+08	21.76E-01	Rest	2.4513E-08	27.67E-01	Rest	5.9235E-04	73.23E-03

Time after Shutdown 10. years

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	3.8235E+09		Total	1.6909E-08		Total	1.3117E-02	
Tl204	3.4622E+09	90.55E+00	Cd113m	4.0801E-09	24.13E+00	Pb207m	4.5634E-03	34.79E+00
Fe 55	1.3810E+08	36.12E-01	Pb207m	3.8336E-09	22.67E+00	Co 60	4.2412E-03	32.33E+00
Cd113m	1.3489E+08	35.28E-01	Ag108m	3.5565E-09	21.03E+00	Ag108m	3.1549E-03	24.05E+00
Bi207	1.5756E+07	41.21E-02	Co 60	2.8474E-09	16.84E+00	Bi207	9.3341E-04	71.16E-01
Pb205	1.5554E+07	40.68E-02	Bi207	9.2560E-10	54.74E-01	Sb125	9.2047E-05	70.17E-02
Pb207m	1.4653E+07	38.32E-02	Tl204	6.8967E-10	40.79E-01	Ag110m	6.1135E-05	46.61E-02
Ag108m	1.3512E+07	35.34E-02	Sn121m	1.7072E-10	10.10E-01	Bi208	3.1835E-05	24.27E-02
Co 60	6.8328E+06	17.87E-02	Sb125	1.5029E-10	88.88E-02	Zn 65	1.7331E-05	13.21E-02
Sn121m	6.6309E+06	17.34E-02	Fe 55	1.3034E-10	77.08E-02	Mn 54	1.5736E-05	12.00E-02
Sn121	5.1458E+06	13.46E-02	Ag108	1.2111E-10	71.62E-02	Ag108	3.0891E-06	23.55E-03
Rest	1.0241E+07	26.78E-02	Rest	4.0353E-10	23.86E-01	Rest	2.7344E-06	20.85E-03

Pb-17Li DOMINANT NUCLIDES

Time after Shutdown 50 years

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	7.3662E+07		Total	6.6537E-09		Total	5.6656E-03	
Cd113m	1.8855E+07	25.60E+00	Ag108m	3.3359E-09	50.14E+00	Ag108m	2.9593E-03	52.23E+00
Pb205	1.5554E+07	21.12E+00	Pb207m	1.8473E-09	27.76E+00	Pb207m	2.1989E-03	38.81E+00
Ag108m	1.2674E+07	17.21E+00	Cd113m	5.7031E-10	85.71E-01	Bi207	4.4977E-04	79.39E-01
Bi207	7.5919E+06	10.31E+00	Bi207	4.4601E-10	67.03E-01	Bi208	3.1832E-05	56.18E-02
Pb207m	7.0605E+06	95.85E-01	Ag108	1.1359E-10	17.07E-01	Co 60	2.1956E-05	38.75E-02
Sn121m	3.8085E+06	51.70E-01	Sn121m	9.8052E-11	14.74E-01	Ag108	2.8975E-06	51.14E-03
Sn121	2.9555E+06	40.12E-01	Bi208	7.3753E-11	11.08E-01	Tl202	7.3740E-07	13.02E-03
Tl204	2.2479E+06	30.52E-01	Pb205	6.5975E-11	99.16E-02	Cd113m	2.6176E-07	46.20E-04
Ni 63	1.4245E+06	19.34E-01	Sn121	5.3601E-11	80.56E-02	Po209	1.6769E-08	29.60E-05
Ag108	1.1279E+06	15.31E-01	Po209	2.7986E-11	42.06E-02	Sb125	3.5505E-09	62.67E-06
Rest	3.6203E+05	49.15E-02	Rest	2.1299E-11	32.01E-02	Rest	2.2352E-08	39.45E-05

Time after Shutdown 100 years

NUCLIDE	ACTIVITY (Bq/kg)	PERCENT ACTIVITY	NUCLIDE	HEAT (kW/kg)	PERCENT HEAT	NUCLIDE	DOSE RATE (Sv/hr)	PERCENT DOSE RATE
Total	4.0488E+07		Total	4.3935E-09		Total	3.8303E-03	
Pb205	1.5554E+07	38.42E+00	Ag108m	3.0793E-09	70.09E+00	Ag108m	2.7316E-03	71.32E+00
Ag108m	1.1699E+07	28.89E+00	Pb207m	7.4161E-10	16.88E+00	Pb207m	8.8278E-04	23.05E+00
Bi207	3.0479E+06	75.28E-01	Bi207	1.7906E-10	40.75E-01	Bi207	1.8057E-04	47.14E-01
Pb207m	2.8345E+06	70.01E-01	Ag108	1.0486E-10	23.87E-01	Bi208	3.1829E-05	83.10E-02
Sn121m	1.9042E+06	47.03E-01	Bi208	7.3746E-11	16.79E-01	Ag108	2.6746E-06	69.83E-03
Cd113m	1.6115E+06	39.80E-01	Pb205	6.5975E-11	15.02E-01	Tl202	7.3692E-07	19.24E-03
Sn121	1.4778E+06	36.50E-01	Sn121m	4.9026E-11	11.16E-01	Co 60	3.0492E-08	79.61E-05
Ag108	1.0412E+06	25.72E-01	Cd113m	4.8742E-11	11.09E-01	Cd113m	2.2372E-08	58.41E-05
Ni 63	1.0074E+06	24.88E-01	Sn121	2.6801E-11	61.00E-02	Po209	1.1939E-08	31.17E-05
Bi208	2.3969E+05	59.20E-02	Po209	1.9924E-11	45.35E-02	Bi210m	2.6941E-09	70.34E-06
Rest	7.0800E+04	17.49E-02	Rest	4.5048E-12	10.25E-02	Rest	-3.0268E-09	-79.02E-06

Table 5.2: Dominant radionuclides in Pb-17Li irradiated at the midplane of the front liquid metal channel of the outboard blanket

radionuclide	reaction path	percent contribution
Fe55		
	Fe54(n,g)Fe55	1.410
	Fe56(n,2n)Fe55	98.257
Mn56		
	Mn55(n,g)Mn56	2.908
	Fe56(n,p)Mn56	96.497
Cr51		
	Cr50(n,g)Cr51	2.844
	Cr52(n,2n)Cr51	81.163
	Fe54(n,a)Cr51	15.728
Mn54		
	Mn55(n,2n)Mn54	24.674
	Fe54(n,p)Mn54	72.648
	Fe56(n,d)Mn55(n,2n)Mn54	0.924
V52		
	V51(n,g)V52	2.264
	Cr52(n,p)V52	91.834
	Cr53(n,d)V52	1.567
	Mn55(n,a)V52	3.102
Co58		
	Co59(n,2n)Co58	1.758
	Ni58(n,p)Co58	47.788
	Co59(n,2n)Co58m(IT)Co58	2.238
	Ni58(n,p)Co58m(IT)Co58	47.788
Co57		
	Ni58(n,d)Co57	95.306
	Ni58(n,2n)Ni57(b+)Co57	4.604
Al28		
	Al27(n,g)Al28	0.794
	Si28(n,p)Al28	98.089
	P31(n,a)Al28	0.764
Co58m		
	Co59(n,2n)Co58m	4.444
	Ni58(n,p)Co58m	94.930

Table 5.3: Production paths of principal nuclides in MANET

radionuclide	reaction path	percent contribution
Mn57		
	Fe57(n,p)Mn57	95.873
	Fe58(n,d)Mn57	1.049
	Fe56(n,g)Fe57(n,p)Mn57	2.797
V53		
	Cr53(n,p)V53	93.667
	Cr54(n,d)V53	1.108
	Mn55(n,h)V53	0.621
	Fe56(n,a)Cr53(n,p)V53	3.604
Cr55		
	Cr54(n,g)Cr55	8.937
	Mn55(n,p)Cr55	73.125
	Fe58(n,a)Cr55	5.471
	Fe56(n,d)Mn55(n,p)Cr55	4.238
	Fe54(n,p)Mn54(b+)Cr54(n,g)Cr55	0.589
	Fe56(n,2n)Fe55(b+)Mn55(n,p)Cr55	6.987
Na24		
	Al27(n,a)Na24	65.684
	Si28(n,na)Mg24(n,p)Na24	0.667
	Si28(n,d)Al27(n,a)Na24	2.368
	Al27(n,a)Na24m(IT)Na24	29.362
Zr90m		
	Zr90(n,n')Zr90m	86.048
Zr 90m	Zr91(n,2n)Zr90m	12.870
Co60		
	Co59(n,g)Co60	11.284
	Ni60(n,p)Co60	38.970
	Co59(n,g)Co60m(IT)Co60	13.362
	Ni60(n,p)Co60m(IT)Co60	34.464
	Cu63(n,a)Co60m(IT)Co60	0.736
Mo99		
	Mo98(n,g)Mo99	46.441
	Mo100(n,2n)Mo99	53.099
Ni57		
	Ni58(n,2n)Ni57	99.999

Table 5.4: Production paths of principal nuclides in MANET

radionuclide	reaction path	percent contribution
V49		
	Cr50(n,d)V49	95.367
	Cr50(n,p)V50(n,2n)V49	0.583
	Cr50(n,2n)Cr49(b+)V49	3.386
Nb93m		
	Nb93(n,n')Nb93m	96.668
	Mo94(n,d)Nb93m	0.698
	Nb93(n,g)Nb94(n,2n)Nb93m	0.679
H3		
	B10(n,2a)H3	20.771
	B10(n,a)Li7(n,na)H3	2.744
	B11(nn2a)H3	4.606
	N14(n,X)H3	35.839
	Fe57(n,X)H3	10.401
Ni63		
	Ni62(n,g)Ni63	35.716
	Ni64(n,2n)Ni63	54.098
	Cu63(n,p)Ni63	9.663
Y88		
	Zr90(n,d)Y89(n,2n)Y88	0.628
	Nb93(n,na)Y89(n,2n)Y88	0.560
	Mo92(n,d)Nb91(n,a)Y88	2.586
	Mo92(n,na)Zr88(b+)Y88	48.637
	Zr90(n,d)Y89m(IT)Y89(n,2n)Y88	1.148
	Nb93(n,na)Y89m(IT)Y89(n,2n)Y88	0.561
	Zr90(n,2n)Zr89(b+)Y89(n,2n)Y88	36.647
	Mo92(n,a)Zr89(b+)Y89(n,2n)Y88	3.069
Nb95		
	Mo95(n,p)Nb95	16.466
	Mo96(n,d)Nb95	19.749
	Nb93(n,g)Nb94(n,g)Nb95	3.243
	Zr94(n,g)Zr95(b-)Nb95	9.481
	Zr96(n,2n)Zr95(b-)Nb95	23.133
	Mo98(n,a)Zr95(b-)Nb95	5.551
	Mo95(n,p)Nb95m(IT)Nb95	4.908
	Mo96(n,d)Nb95m(IT)Nb95	4.793
	Nb93(n,g)Nb94m(IT)Nb94(n,g)Nb95	7.184
	Nb93(n,g)Nb94(n,g)Nb95m(IT)Nb95	0.853

Table 5.5: Production paths of principal nuclides in MANET

radionuclide	reaction path	percent contribution
Fe59		
	Fe58(n,g)Fe59	87.551
	Co59(n,p)Fe59	7.354
	Ni62(n,a)Fe59	2.558
	Fe57(n,g)Fe58(n,g)Fe59	0.870
Zr95		
	Zr94(n,g)Zr95	24.788
	Zr96(n,2n)Zr95	60.466
	Mo98(n,a)Zr95	14.494
Co56		
	Ni58(n,t)Co56	1.087
	Ni58(n,d)Co57(n,2n)Co56	94.124
	Ni58(n,2n)Ni57(b+)Co57(n,2n)Co56	4.547
Nb94		
	Nb93(n,g)Nb94	29.162
	Mo94(n,p)Nb94	2.286
	Mo95(n,d)Nb94	0.713
	Nb93(n,g)Nb94m(IT)Nb94	64.581
	Mo95(n,d)Nb94m(IT)Nb94	2.618
Nb91		
	Mo92(n,d)Nb91	80.411
	Mo92(n,d)Nb91m(IT)Nb91	2.773
	Mo92(n,2n)Mo91(b+)Nb91	14.704
	Mo92(n,2n)Mo91m(b+)Nb91	0.590
Mo93		
	Mo92(n,g)Mo93	37.544
	Mo94(n,2n)Mo93	60.943
C14		
	N14(n,p)C14	99.884
Al26		
	Al27(n,2n)Al26	98.127
Na22		
	Al27(n,na)Na23(n,2n)Na22	31.032
	Al27(n,2n)Al26(n,na)Na22	65.738
	Si28(n,na)Mg24(n,d)Na23(n,2n)Na22	1.203
	Si28(n,d)Al27(n,na)Na23(n,2n)Na22	0.560
	Si28(n,d)Al27(n,2n)Al26(n,na)Na22	1.188

Table 5.6: Production paths of principal nuclides in MANET

radionuclide	reaction path	percent contribution
Nb92		
	Nb93(n,2n)Nb92	83.630
	Mo92(n,p)Nb92	15.702
Tc98		
	Mo98(n,g)Mo99(b-)Tc99(n,2n)Tc98	5.764
	Mo100(n,2n)Mo99(b-)Tc99(n,2n)Tc98	6.596
	Mo98(n,g)Mo99(b-)Tc99m(IT)Tc99(n,2n)Tc98	40.347
	Mo100(n,2n)Mo99(b-)Tc99m(IT)Tc99(n,2n)Tc98	46.172
Zn65		
	Cu63(n,g)Cu64(b-)Zn64(n,g)Zn65	31.712
	Cu65(n,2n)Cu64(b-)Zn64(n,g)Zn65	34.473
	Cu65(n,g)Cu66(b-)Zn66(n,2n)Zn65	33.769
	Ni58(n,g)Ni59	46.901
	Ni60(n,2n)Ni59	53.079
Y90		
	Zr90(n,p)Y90	41.552
	Zr91(n,d)Y90	3.581
	Nb93(n,a)Y90	15.829
	Zr90(n,p)Y90m(IT)Y90	11.366
	Nb93(n,a)Y90m(IT)Y90	24.675
	Zr90(n,2n)Zr89(b+)Y89(n,g)Y90	1.264
K42		
	Cr50(n,na)Ti46(n,a)Ca43(n,d)K42	1.027
	Cr50(n,a)Ti47(n,na)Ca43(n,d)K42	0.531
	Cr50(n,na)Ti46(n,d)Sc45(n,a)K42	7.471
	Cr50(n,a)Ti47(n,t)Sc45(n,a)K42	6.453
	Cr50(n,a)Ti47(n,d)Sc46(n,na)K42	4.866
	Cr50(n,d)V49(n,a)Sc46(n,na)K42	5.748
Kr85		
	Zr91(n,a)Sr88(n,a)Kr85	54.523
	Zr92(n,na)Sr88(n,a)Kr85	1.399
	Zr91(n,a)Sr88(n,a)Kr85m(IT)Kr85	3.633
Mn53		
	Fe54(n,d)Mn53	99.434
Tc99		
	Mo98(n,g)Mo99(b-)Tc99	5.804
	Mo100(n,2n)Mo99(b-)Tc99	6.640
	Mo98(n,g)Mo99(b-)Tc99m(IT)Tc99	40.625
	Mo100(n,2n)Mo99(b-)Tc99m(IT)Tc99	46.481

Table 5.7: Production paths of principal nuclides in MANET

radionuclide	reaction path	percent contribution
Pb207m		
	Pb207(n,n')Pb207m	9.919
	Pb208(n,2n)Pb207m	89.231
Pb203		
	Pb204(n,2n)Pb203	39.814
	Pb204(n,2n)Pb203m(IT)Pb203	58.722
	Pb204(n,2n)Pb203n(IT)Pb203	0.987
Pb204m		
	Pb204(n,n')Pb204m	49.879
	Pb204(n,g)Pb205(n,2n)Pb204m	0.817
	Pb206(n,2n)Pb205(n,2n)Pb204m	48.689
Pb203m		
	Pb204(n,2n)Pb203m	99.492
Pb209		
	Pb208(n,g)Pb209	99.980
He6		
	Li6(n,p)He6	8.874
	Li7(n,d)He6	91.098
Hg205		
	Pb208(n,a)Hg205	99.946
Tl206		
	Pb206(n,p)Tl206	81.527
	Pb207(n,d)Tl206	14.652
	Pb208(n,t)Tl206	1.350
	Pb207(n,2n)Pb206(n,p)Tl206	1.175
Tl207		
	Pb207(n,p)Tl207	36.184
	Pb208(n,d)Tl207	18.334
	Pb207(n,p)Tl207m(IT)Tl207	28.434
	Pb208(n,d)Tl207m(IT)Tl207	14.480
	Pb208(n,2n)Pb207m(IT)Pb207(n,p)Tl207	0.950

Table 5.8: Production paths of principal nuclides in Pb-17Li

radionuclide	reaction path	percent contribution
Tl208		
	Pb208(n,p)Tl208	99.981
Li8		
	Li7(n,g)Li8	100.000
Pb203n		
	Pb204(n,2n)Pb203n	99.493
Hg203		
	Pb206(n,a)Hg203	95.609
	Pb207(n,na)Hg203	2.295
	Pb207(n,2n)Pb206(n,a)Hg203	1.268
Tl207m		
	Pb207(n,p)Tl207m	64.551
	Pb208(n,d)Tl207m	32.877
	Pb208(n,2n)Pb207(n,p)Tl207m	0.822
Tl202		
	Pb206(n,a)Hg203(b-)Tl203(n,2n)Tl202	1.666
	Pb204(n,2n)Pb203(b+)Tl203(n,2n)Tl202	39.162
Ag110m		
	Ag109(n,g)Ag110m	99.783
Tl204		
	Pb204(n,p)Tl204	24.288
	Pb206(n,t)Tl204	1.966
	Pb206(n,a)Hg203(b-)Tl203(n,g)Tl204	1.097
	Pb204(n,2n)Pb203(b+)Tl203(n,g)Tl204	27.548
	Pb208(n,a)Hg205(b-)Tl205(n,2n)Tl204	2.603
Mn56		
	Fe56(n,p)Mn56	99.540

Table 5.9: Production paths of principal nuclides in Pb-17Li

radionuclide	reaction path	percent contribution
Zn65		
	Zn64(n,g)Zn65	59.826
	Zn66(n,2n)Zn65	40.092
Ag106m		
	Ag107(n,2n)Ag106m	99.649
Fe55		
	Fe54(n,g)Fe55	2.408
	Fe56(n,2n)Fe55	92.988
	Ni58(n,a)Fe55	4.546
Sn119m		
	Sn118(n,g)Sn119m	17.054
	Sn119(n,n')Sn119m	10.127
	Sn120(n,2n)Sn119m	72.371
Co57		
	Ni58(n,d)Co57	95.365
	Ni58(n,2n)Ni57(b+)Co57	4.578
Ag109m		
	Ag109(n,n')Ag109m	81.644
	Ag107(n,g)Ag108m(n,g)Ag109m	3.424
	Ag109(n,2n)Ag108m(n,g)Ag109m	1.060
	Cd108(n,g)Cd109(b+)Ag109m	1.618
	Cd110(n,2n)Cd109(b+)Ag109m	8.187
Pb206		
	Pb206(n,a)Hg203	95.609
	Pb207(n,na)Hg203	2.295
	Pb207(n,2n)Pb206(n,a)Hg203	1.268
Cd109		
	Cd108(n,g)Cd109	12.853
	Cd110(n,2n)Cd109	65.058
	Ag107(n,g)Ag108(b-)Cd108(n,g)Cd109	12.157

Table 5.10: Production paths of principal nuclides in Pb-17Li

radionuclide	reaction path	percent contribution
Cd113m		
	Cd112(n,g)Cd113m	31.810
	Cd113(n,n')Cd113m	33.412
	Cd114(n,2n)Cd113m	33.672
Po210		
	Bi209(n,g)Bi210(b-)Po210	46.231
	Pb208(n,g)Pb209(b-)Bi209(n,g)Bi210(b-)Po210	53.104
Mn54		
	Fe54(n,p)Mn54	98.060
Co60		
	Ni60(n,p)Co60	52.574
	Ni60(n,p)Co60m(IT)Co60	46.497
Co58		
	Ni58(n,p)Co58	49.866
	Ni58(n,p)Co58m(IT)Co58	49.866
Ag108m		
	Ag107(n,g)Ag108m	76.149
	Ag109(n,2n)Ag108m	23.778
Ni63		
	Ni62(n,g)Ni63	17.599
	Ni64(n,2n)Ni63	15.409
	Zn66(n,a)Ni63	63.059
	Zn67(n,na)Ni63	0.593
	Zn64(n,p)Cu64(b+)Ni64(n,2n)Ni63	2.317

Table 5.11: Production paths of principal nuclides in Pb-17Li

radionuclide	reaction path	percent contribution
Bi207		
	Bi209(n,2n)Bi208(n,2n)Bi207	61.120
	Bi209(n,2n)Bi208(n,2n)Bi207m(IT)Bi207	5.506
Sb125		
	Sn124(n,g)Sn125(b-)Sb125	52.403
	Sn124(n,g)Sn125m(b-)Sb125	47.560
Pb205		
	Pb204(n,g)Pb205	1.643
	Pb206(n,2n)Pb205	97.637
Sn121m		
	Sn120(n,g)Sn121m	42.816
	Sn122(n,2n)Sn121m	57.152
Sn121		
	Sn120(n,g)Sn121	78.918
	Sn122(n,2n)Sn121	18.470
	Sn120(n,g)Sn121m(IT)Sn121	0.717
	Sn122(n,2n)Sn121m(IT)Sn121	0.957
Ag108		
	Ag107(n,g)Ag108	81.730
	Ag109(n,2n)Ag108	17.612
Bi208		
	Bi209(n,2n)Bi208	57.177
	Pb208(n,g)Pb209(b-)Bi209(n,2n)Bi208	42.818
Po209		
	Bi209(n,g)Bi210(b-)Po210(n,2n)Po209	60.949
Bi210m		
	Bi209(n,g)Bi210m	57.185
	Pb208(n,g)Pb209(b-)Bi209(n,g)Bi210m	42.810

Table 5.12: Production paths of principal nuclides in Pb-17Li

	MANET		Pb-17Li		Total	
Time after shutdown	Inboard 11.25^o segment	Outboard 7.5^o segment	Inboard 11.25^o segment	Outboard 7.5^o segment	Inboard 11.25^o segment	Outboard 7.5^o segment
0	9.574E+17	1.097E+18	1.115E+18	2.254E+18	2.073E+18	3.350E+18
1 sec	9.567E+17	1.096E+18	5.316E+17	1.069E+18	1.488E+18	2.165E+18
10 sec	9.540E+17	1.093E+18	9.533E+16	1.829E+17	1.049E+18	1.276E+18
1 min	9.433E+17	1.082E+18	8.842E+16	1.688E+17	1.032E+18	1.251E+18
5 min	9.086E+17	1.048E+18	8.577E+16	1.637E+17	9.943E+17	1.212E+18
10 min	8.822E+17	1.026E+18	8.327E+16	1.589E+17	9.655E+17	1.185E+18
1 h	7.776E+17	9.410E+17	6.750E+16	1.295E+17	8.451E+17	1.071E+18
5 h	5.696E+17	7.525E+17	3.953E+16	7.828E+16	6.092E+17	8.308E+17
1 day	4.538E+17	6.482E+17	2.335E+16	4.817E+16	4.771E+17	6.964E+17
1 month	3.635E+17	5.624E+17	6.005E+14	1.232E+15	3.641E+17	5.637E+17
1 y	2.309E+17	3.685E+17	1.098E+14	2.086E+14	2.310E+17	3.687E+17
5 y	7.593E+16	1.179E+17	3.112E+13	6.533E+13	7.596E+16	1.179E+17
10 y	2.162E+16	3.245E+16	1.261E+13	2.636E+13	2.163E+16	3.248E+16
20 y	2.048E+15	2.649E+15	2.838E+12	5.603E+12	2.050E+15	2.654E+15
40 y	9.641E+13	7.680E+13	6.798E+11	1.185E+12	9.709E+13	7.799E+13
50 y	5.563E+13	4.517E+13	5.215E+11	8.987E+11	5.615E+13	4.607E+13
100 y	2.687E+13	1.848E+13	3.056E+11	5.174E+11	2.717E+13	1.900E+13
200 y	1.722E+13	1.173E+13	2.346E+11	3.909E+11	1.746E+13	1.212E+13
300 y	1.311E+13	9.445E+12	2.036E+11	3.398E+11	1.331E+13	9.785E+12
500 y	9.776E+12	7.387E+12	1.633E+11	2.781E+11	9.939E+12	7.665E+12

Table 5.13: Total activity inventories [Bq] in the blanket segments

Initial Bi (appm)	Liquid metal Circulation	Specific activity (Ci)	Total activity (Ci/kg Pb)
0	Static	$1.75.10^{-3}$	$8.31.10^{3}$
	Internal	$1.06.10^{-3}$	$5.05.10^{3}$
	External	$1.90.10^{-4}$	$2.71.10^{3}$
10	Static	$2.63.10^{-3}$	$1.25.10^{4}$
	Internal	$1.94.10^{-3}$	$9.21.10^{3}$
	External	$8.52.10^{-4}$	$1.22.10^{4}$
100	Static	$1.05.10^{-2}$	$5.0.10^{4}$
	Internal	$9.80.10^{-3}$	$4.67.10^{4}$
	External	$6.89.10^{-3}$	$9.83.10^{4}$

Table 5.14: Calculated ^{210}Po activity inventories and concentrations for different liquid metal blending different liquid metal blending modes, results of 3d activation calculations (2200 MW fusion power,20000 h irradiation)

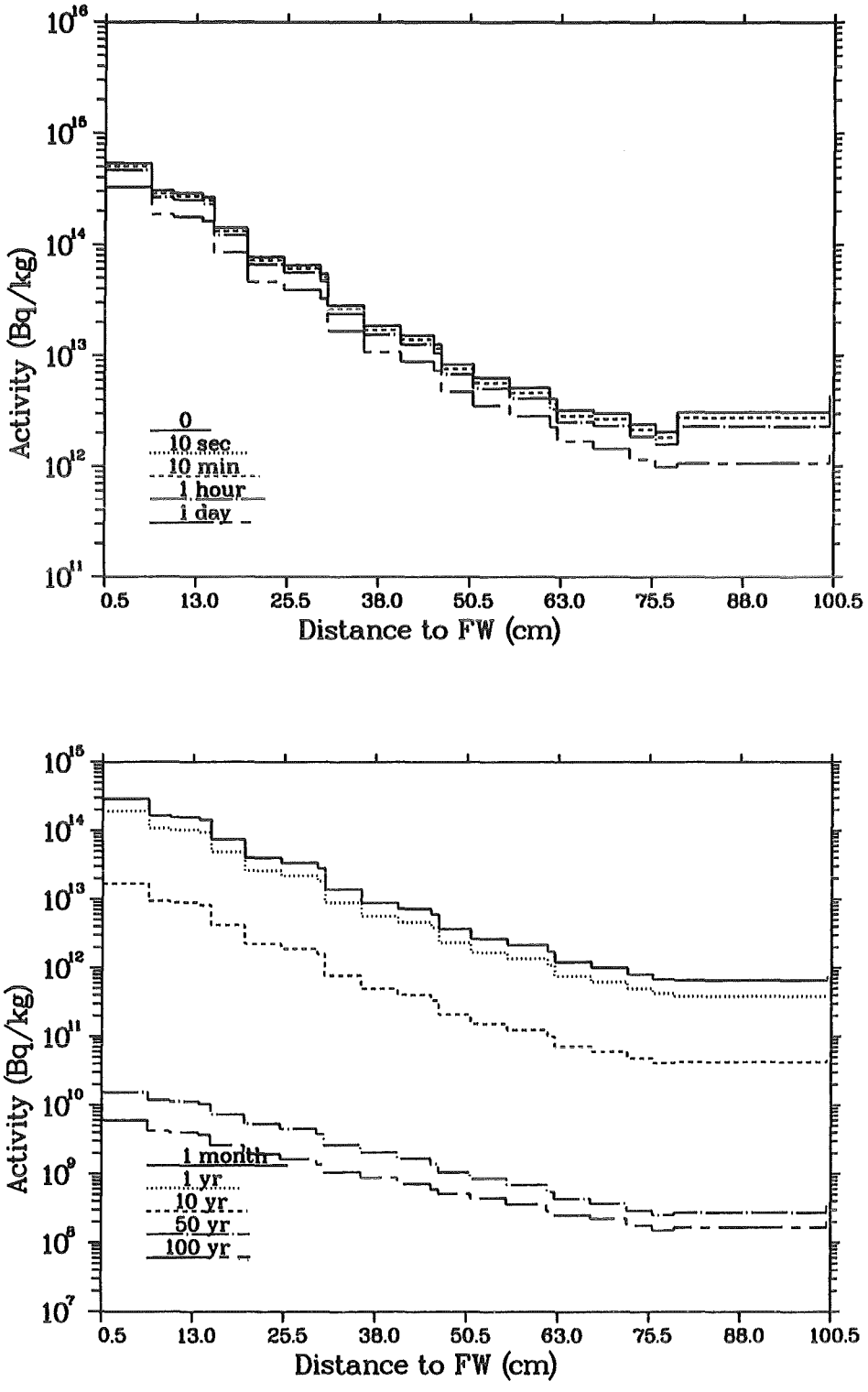

Figure 5.5: MANET: time dependent radial activity distribution in the central part of the outboard blanket

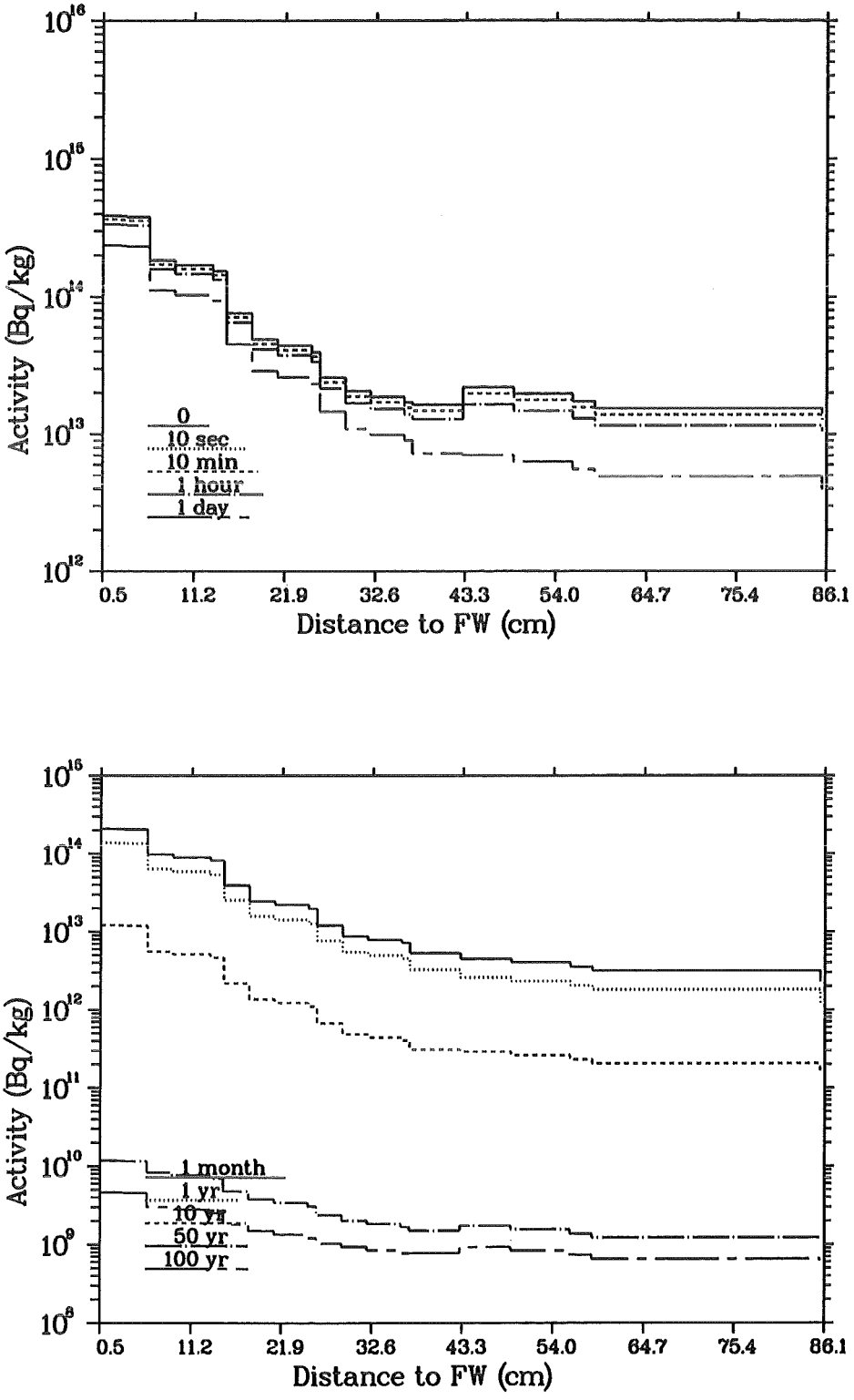

Figure 5.6: MANET: time dependent radial activity distribution in the central part of the inboard blanket

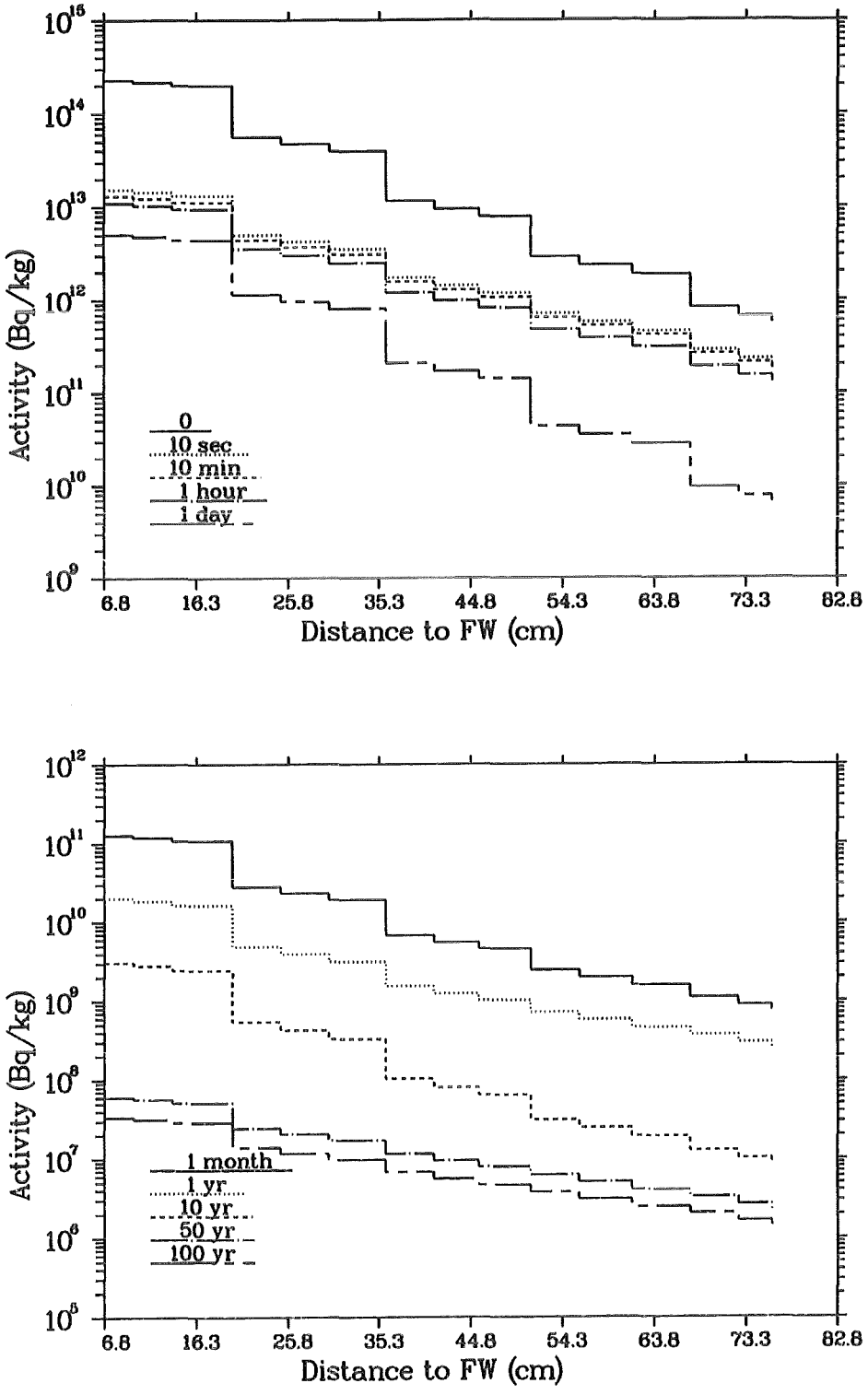

Figure 5.7: Pb-17Li: time dependent radial activity distribution in the centeral part of the outboard blanket

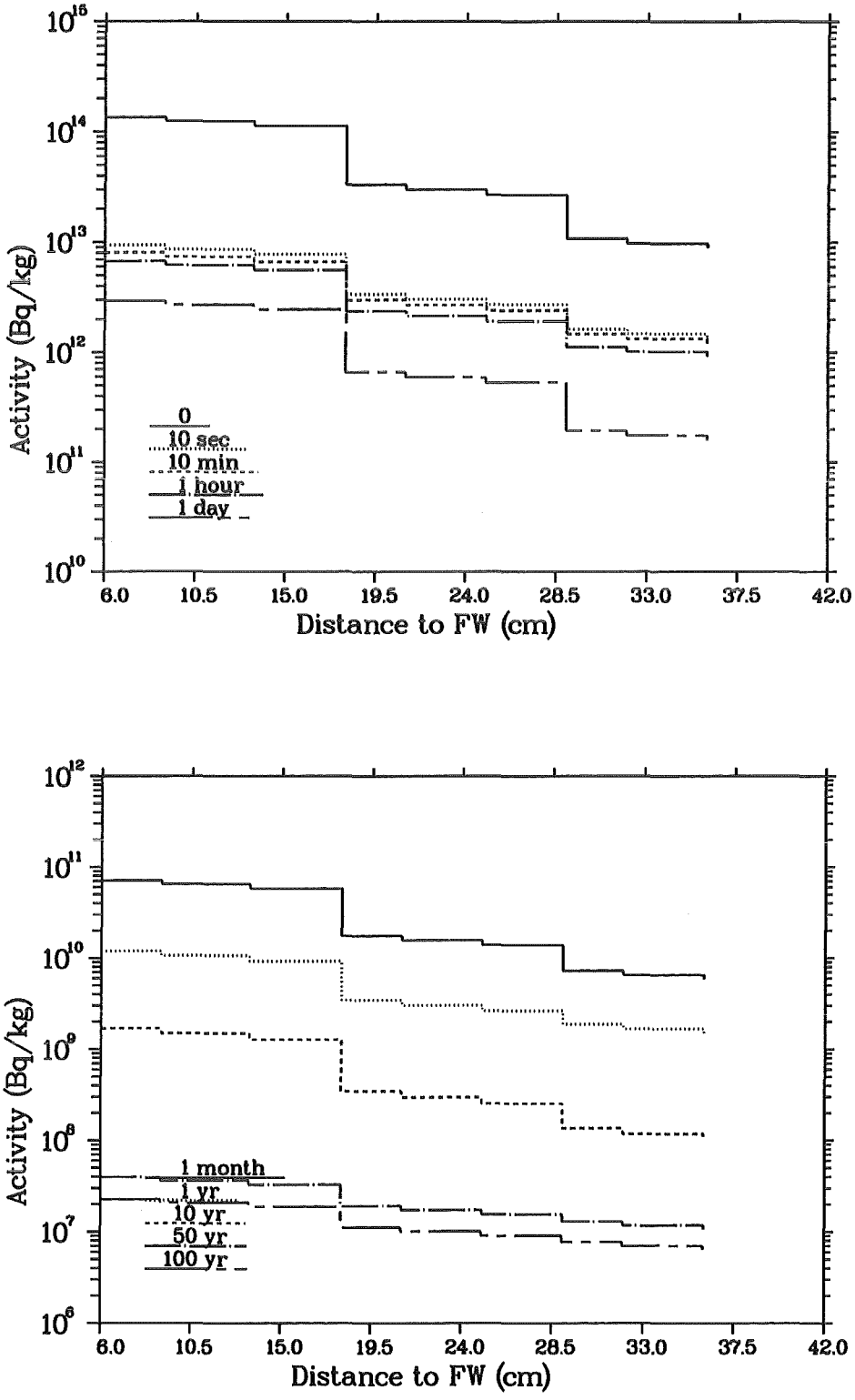

Figure 5.8: Pb-17Li: time dependent radial activity distribution in the central part of the inboard blanket

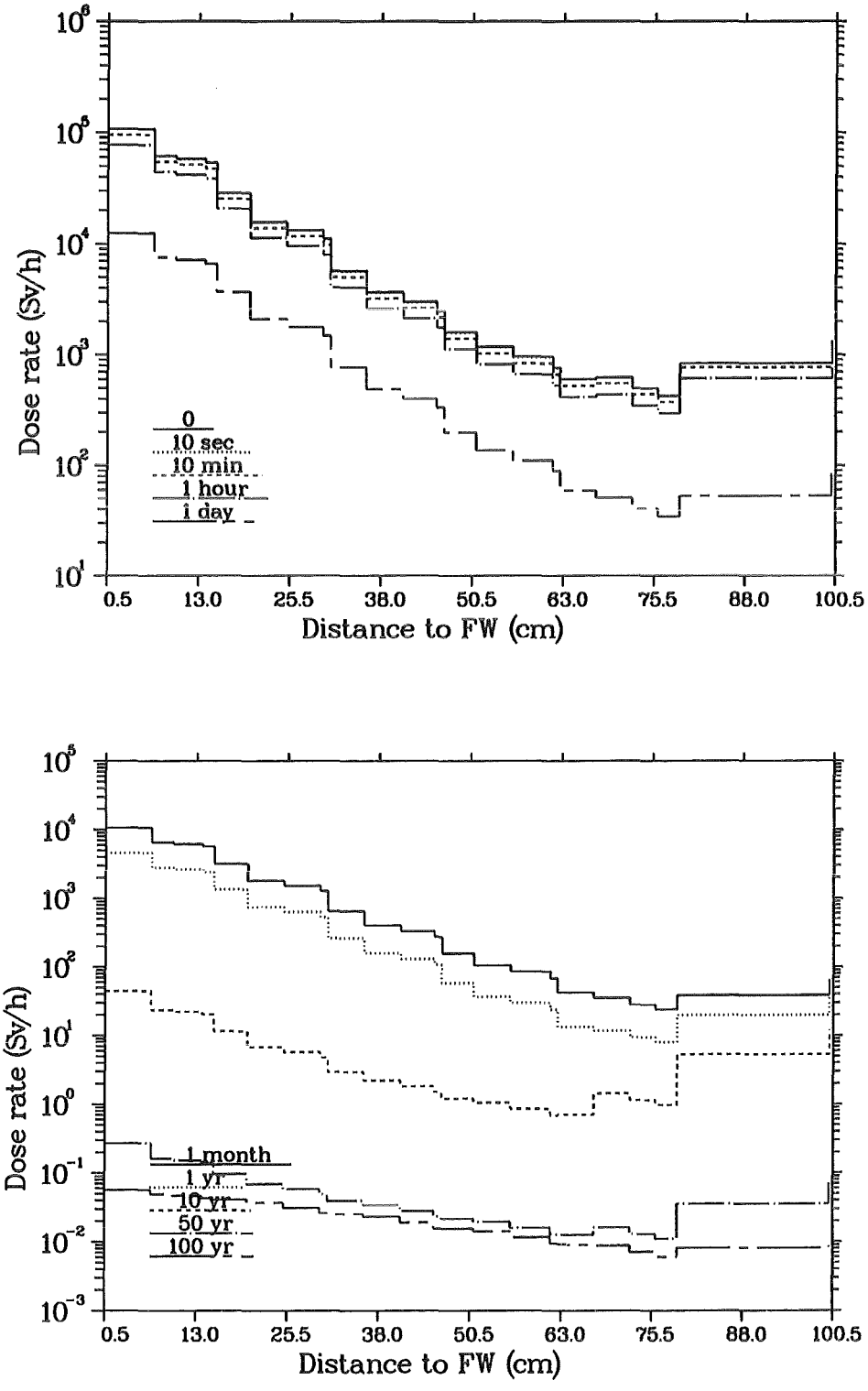

Figure 5.9: MANET: time dependent radial γ-dose rate distribution in the central part of the outboard blanket

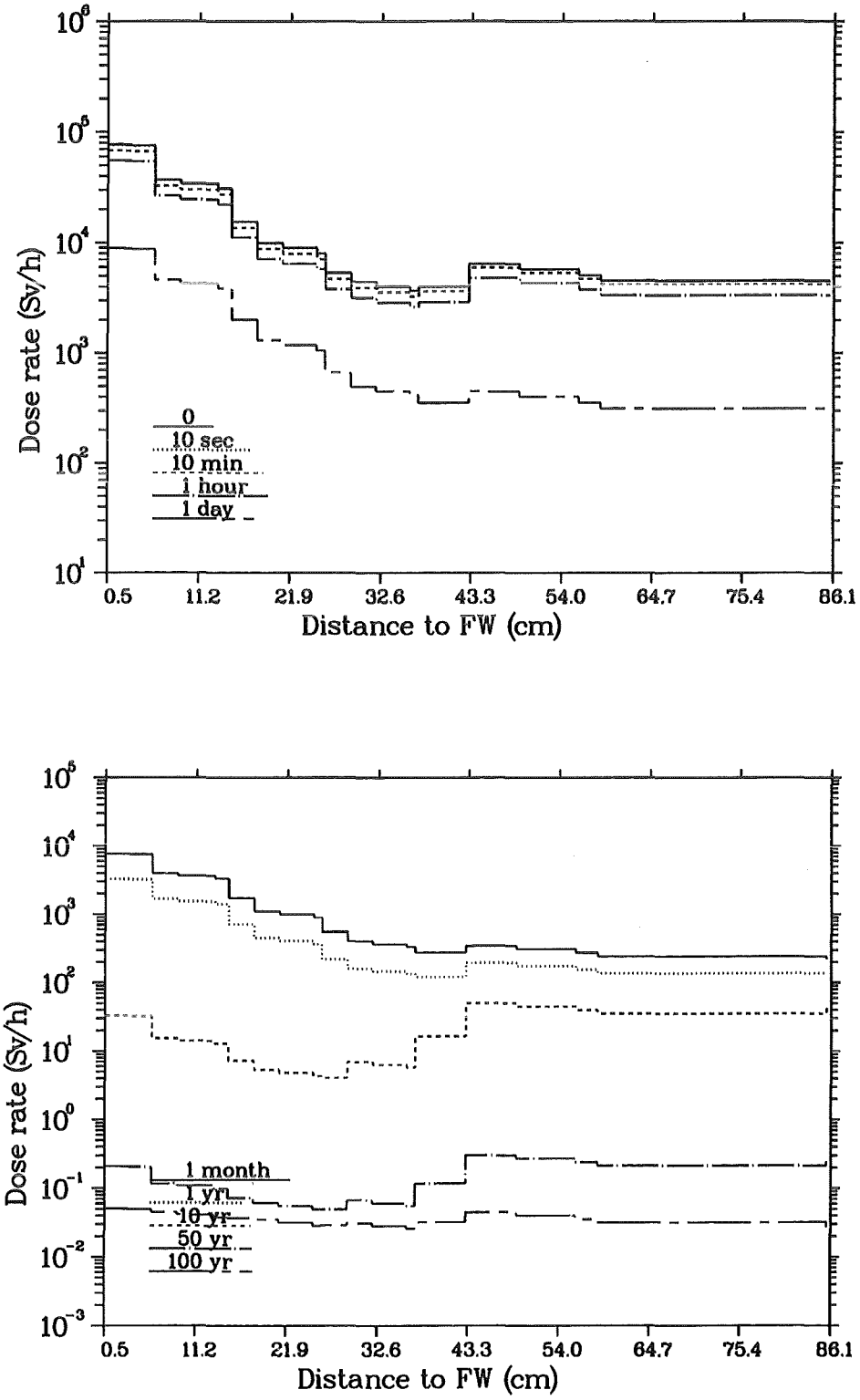

Figure 5.10: MANET: time dependent radial γ-dose rate distribution in the central part of the inboard blanket

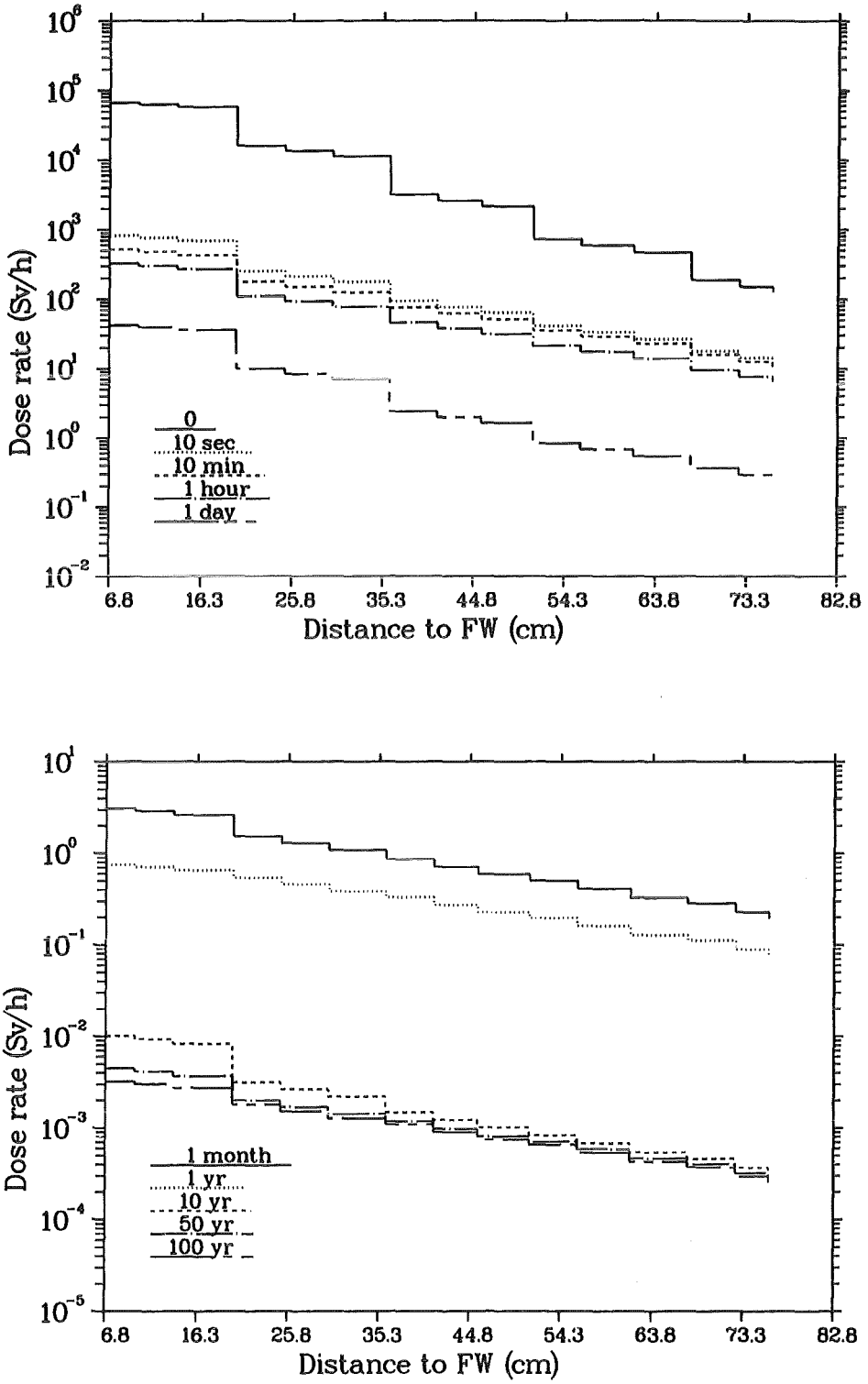

Figure 5.11: Pb-17Li: time dependent radial γ-dose rate distribution in the centeral part of the outboard blanket

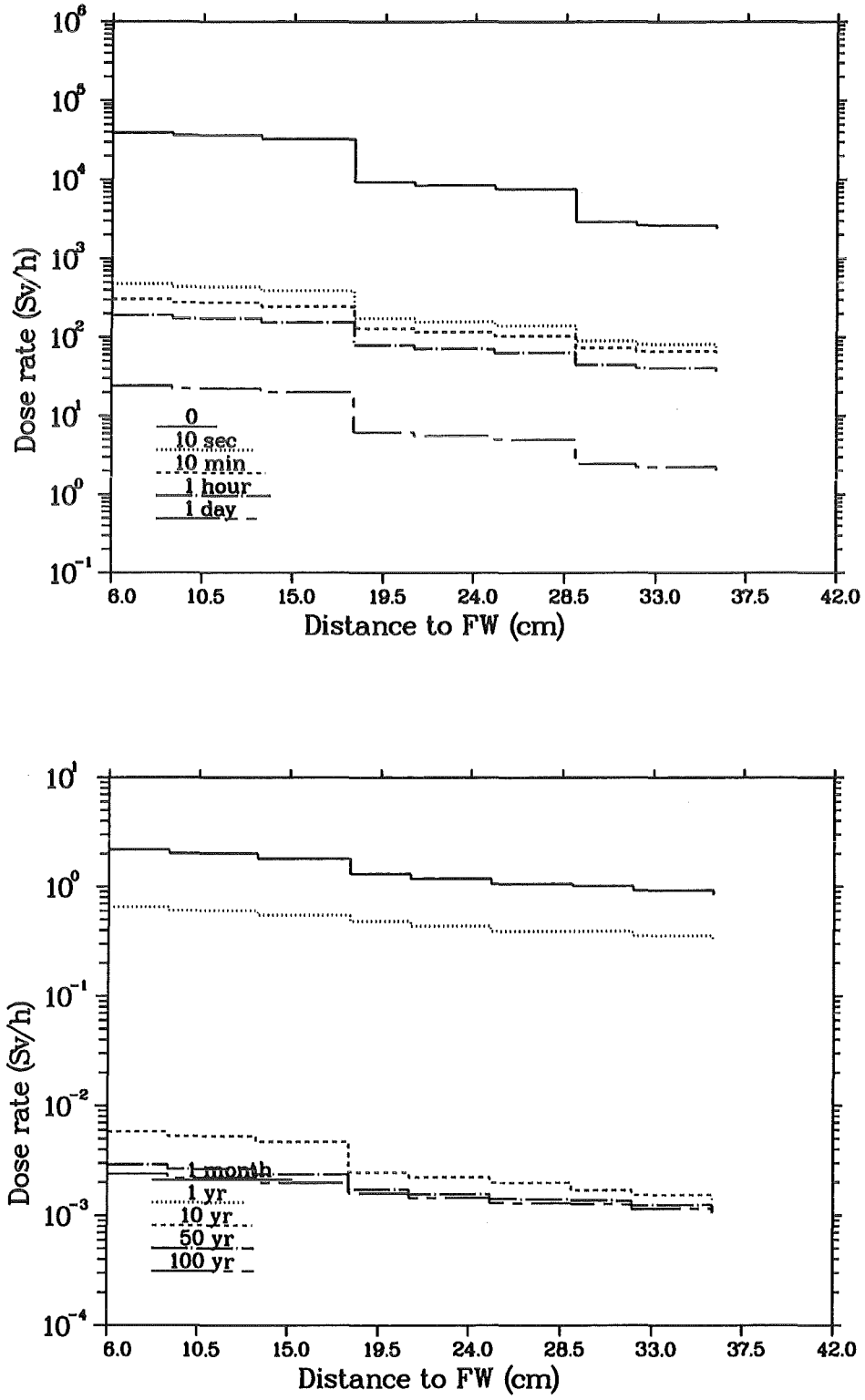

Figure 5.12: Pb-17Li: time dependent radial γ-dose rate distribution in the central part of the inboard blanket

		MANET		Pb-17Li	
		Inboard blanket	Outboard blanket	Inboard blanket	Outboard blanket
first	activity	3.51	2.15	4.01	2.68
wall	dose rate	3.40	2.13	4.05	2.69
rear	activity	2.72	1.73	4.32	2.2
shield	dose rate	2.70	1.71	4.52	2.34

Table 5.15: Poloidal form factor of the specific activity and the contact γ-dose rate for MANET and Pb-17Li

5.5 Afterheat generation

The afterheat density is shown in figure 5.13 function of the cooling time for the MANET of the first wall at torus midplane. Analogously, the Pb-17Li power density is shown in figure 5.14 for the front channel row of the outboard blanket segment at torus midplane. This gives the maximum afterheat power densities as the materials are exposed to the highest neutron fluence in the Demo reactor at these positions.

The dominant radionuclides and their relative contribution to the afterheat at torus midplane are listed in tables 5.1 and 5.2 at selected cooling times for MANET and Pb-17Li, respectively. The principal reaction pathways for the production of these radionuclides for the specified position can be found in tables 5.3 through 5.12.

5.5.1 Afterheat power densities

The spatial distribution of the afterheat power density again has been calculated in a fine radial-poloidal segmentation scheme as described above. Radial distributions of the afterheat power density at reactor shutdown and at several cooling times are included in the tables given in the appendix for the central inboard and outboard segments, both at torus midplane and poloidally averaged, the upper and lower divertor regions and the upper and lower blanket segment parts.

As the afterheat production is directly related to the activity inventory, its spatial distribution is essentially analogous to the spatial distribution of the specific activity. The maximum is at torus midplane, both for the inboard and the outboard side, and it decreases asymmetrically with the poloidal height. The poloidal profiles are steeper at the inboard side than at the outboard side and they are more pronounced in the liquid metal than in the MANET structure.

The maximum afterheat power density is 0.84 for the MANET of the first wall and 0.66 W/cm3 for the Pb-17Li breeder in the first liquid metal channel row. This corresponds to 3.6% and 3.4% of the direct heating for the MANET steel and the Pb-17Li breeder, respectively. After a few seconds, the Pb-17Li afterheat power density decreases below the 0.1% level. Thus the MANET structure is left as the main source of the afterheat power. Actually this behavior is affected by assuming in the afterheat calculation that the energy released in the radioactive decay is deposited locally. This assumption is valid for the recoil nuclei and the charged particles emitted in the decay process (mainly beta-particles). It is in general not valid for the decay photons that have to be transported and would be absorbed in the liquid metal with a high probability. This would increase the afterheat power density in the Pb-17Li breeder to a significant level while the MANET afterheat power density would decrease only marginally.

At the inboard side the maximum afterheat power density at torus midplane amounts to 0.74 W/cm^3 and 0.53 W/cm^3 for the MANET of the first wall and the Pb-17Li breeder in the front channel, respectively.

Figures 5.15 to 5.18 illustrate the radial profiles of the afterheat power density for MANET and the Pb-17Li in the central inboard and outboard blanket segments at short-term (shutdown to 5 minutes) and long-term (10 minutes to 1 month) cooling times.

The afterheat power density of MANET decreases across the blanket according to the neutron flux attenuation and saturates in the blanket back part, both at the inboard and outboard side. This is mainly caused by the poor shielding efficiency of the Pb-17Li breeder with no additional neutron moderator included. Thus the blanket back part is subjected to a comparatively high neutron and photon radiation resulting in enhanced activation reactions on one side and enhanced decay photon absorptions on the other side. In addition, the softer neutron spectrum at the blanket back allows additional exothermic activation reactions of the (n, γ)-type on the steel constituents resulting in an enhanced energy deposition by the emitted decay photons.

The Pb-17Li afterheat power density, on the other hand, decreases with a steep gradient in radial direction. This is caused by the fact that the generation of nuclides with significant

afterheat contributions, i.e. ^{207m}Pb , ^{204m}Pb , ^{203}Pb , and ^{203m}Pb, is by endothermic activation reactions with high reaction thresholds. For the Pb-17Li alloy, there is no significant afterheat contribution by exothermic activation reactions of the (n, γ)-type because of the low cross-sections of the Pb-17Li constituents. Thus the Pb-17Li afterheat power density follows the steep radial decrease of the high energy neutron flux. Taking into account the transport of the decay photons would change significantly the afterheat power density profile of Pb-17Li.

5.5.2 Total afterheat power generation

The total afterheat power calculated for the individual materials in the inboard and outboard blanket segments is given in table 5.16 at reactor shutdown (t=0) and various cooling times.

At reactor shutdown it typically amounts to 2 - 3% of the direct power generation. At this time the Pb-17Li liquid metal contributes 60% and 75% to the afterheat power in the inboard and outboard segments, respectively. The afterheat power of Pb-17Li is decreasing to a low level within a few seconds (table 5.16) because it mainly originates from a short-lived meta-stable state ($T_{1/2} = 0.8s$) of the lead isotope ^{207}Pb. After one minute the Pb-17Li contributes in the order of 10% to the total afterheat generation. At this time the dominant nuclides are $^{204m}Pb(T_{1/2} = 62.7m)$ and $^{203}Pb(T_{1/2} = 51.9h)$. After one month the contribution of the Pb-17Li liquid metal to the total afterheat power is negligible. Note that the afterheat share of the liquid metal is considerably larger at the outboard than at the inboard side. This is due to the fact that the dual coolant blanket provides large liquid metal volumes in the flow channels at the outboard side, resulting in a comparatively high activation of the liquid metal and a corresponding lower one of the MANET steel. As a consequence, the total afterheat power generation is comparatively low at the outboard side after a few seconds (see table 5.16).

The decay heat power in MANET is constant over the time period of a few minutes after shutdown. It decreases by one order of magnitude after one day according to the half life of the main contributor $^{56}Mn(T_{1/2} = 2.58h)$. Afterwards it is dominated by $^{55}Fe, ^{54}Mn$ and ^{60}Co. These radionuclides are mainly produced by activation reactions on the steel constituents $^{56}Fe, ^{54}Fe$ and ^{55}Mn, and ^{60}Ni, respectively. Note that the time behavior is different for the MANET afterheat power at the inboard and outboard side. This is due to the fact that the afterheat generation at the outboard side is mainly in the blanket front region, whereas at the inboard side it originates to a larger extent from the blanket back region because of the smaller liquid metal breeder zone. In the back region the neutron spectrum is softer resulting in enhanced activation reactions of the (n, γ) - type, whereas threshold reactions like (n,2n) and (n,p) are dominating in the first wall region. In particular this leads to a significant generation of ^{60}Co via the (n, γ) - reaction on ^{59}Co in the back region, whereas in the front region ^{60}Co is mainly produced by the threshold reaction $^{60}Ni(n,p)^{60}Co$. As a consequence, $^{60}Co(T_{1/2} = 5.27y)$ dominates the afterheat power in the MANET of the back region at intermediate term cooling times (about 1 to 10 years). For the MANET in the front region, the afterheat power is dominated by $^{54}Mn(T_{1/2} = 312d)$ and $^{55}Fe(T_{1/2} = 2.7y)$ at these cooling times, mainly originating from the threshold reactions $^{55}Fe(n,p)^{54}Mn$, $^{55}Mn(n,2n)^{54}Mn$ and $^{56}Fe(n,2n)^{55}Fe$, respectively.

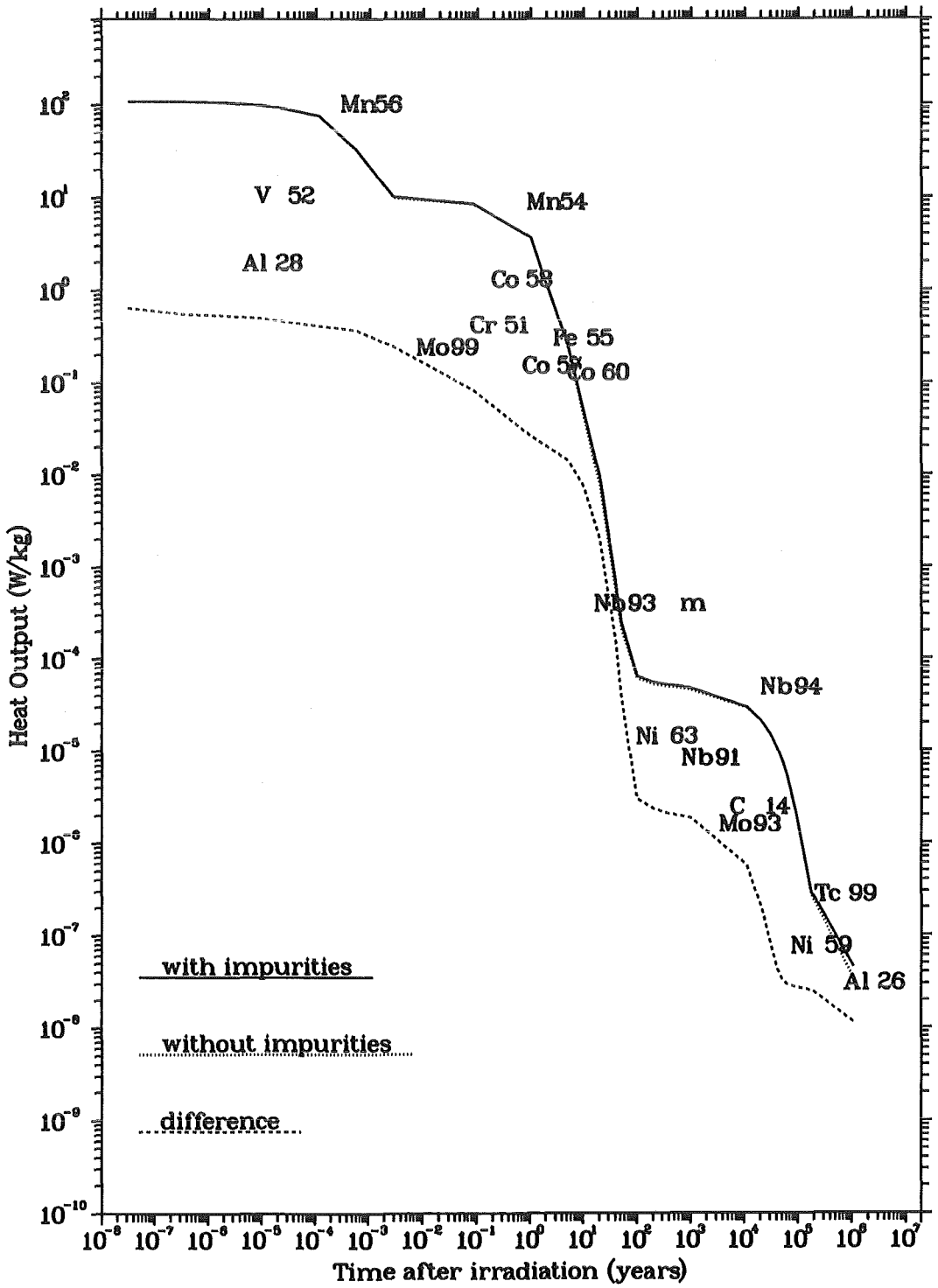

Figure 5.13: Afterheat output versus cooling time for MANET irradiated at the midplane of the outboard blanket FW

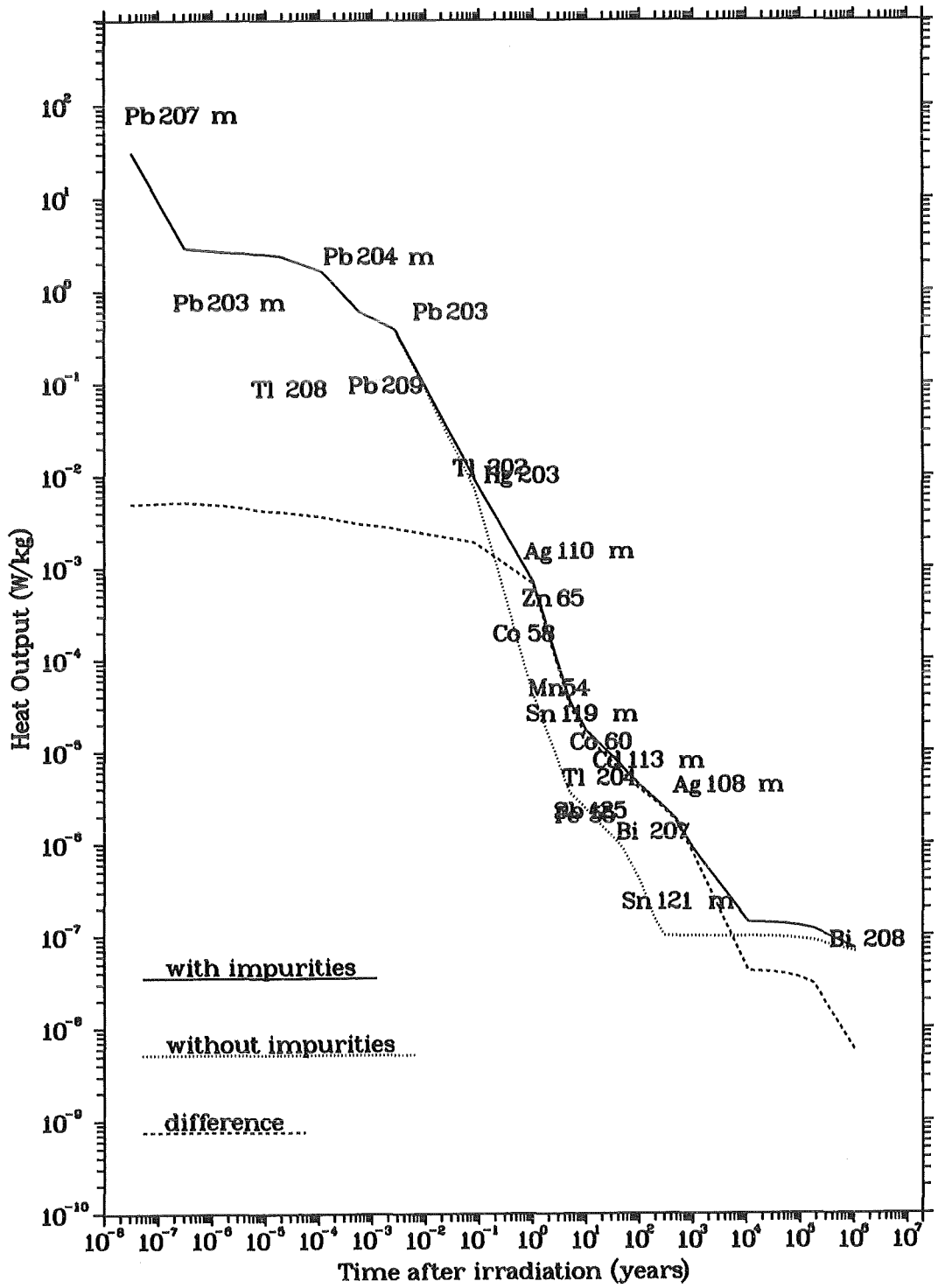

Figure 5.14: Afterheat output versus cooling time for Pb-17Li irradiated at the midplane of the outboard blanket

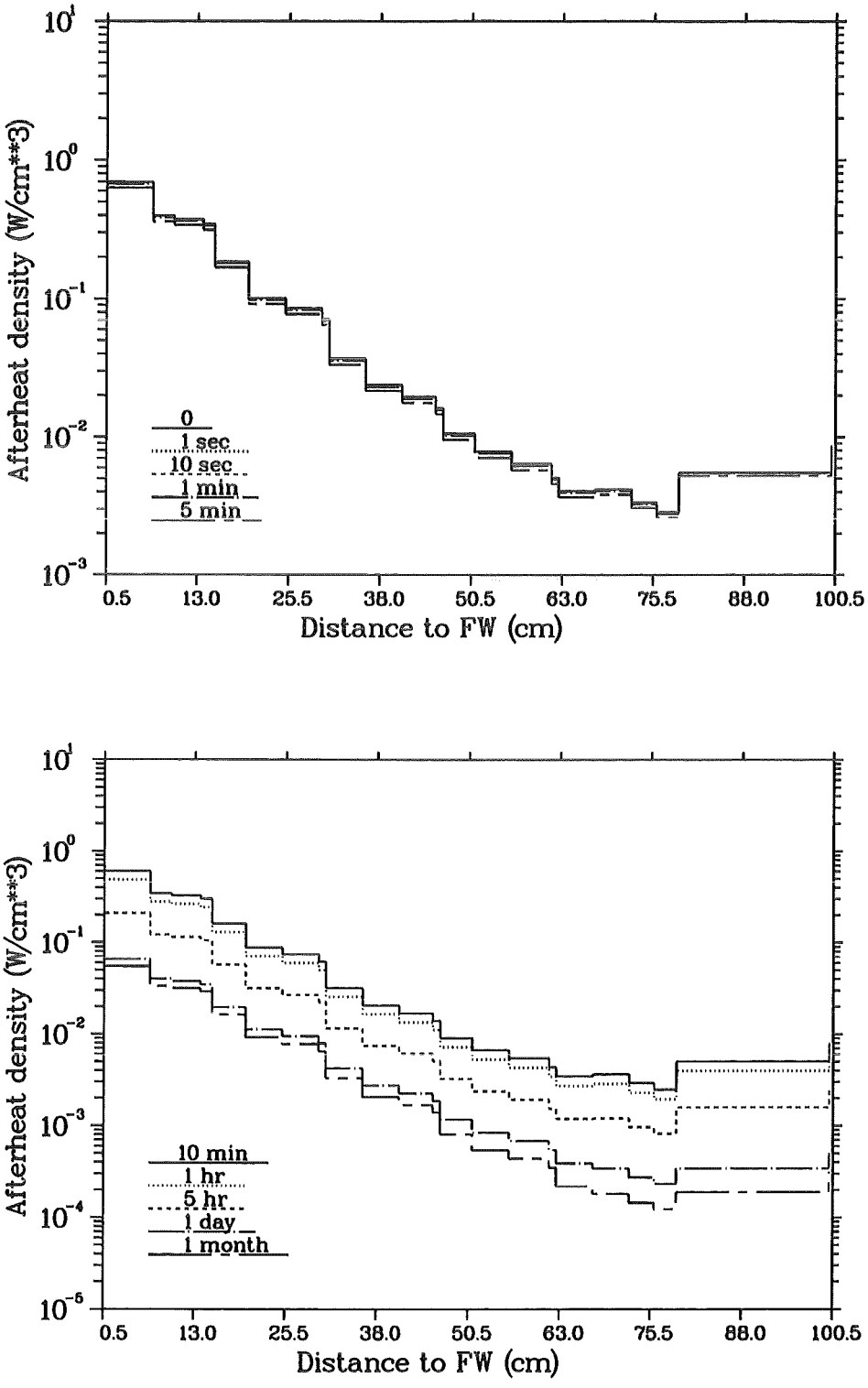

Figure 5.15: MANET: time dependent radial afterheat density distribution in the central part of the outboard blanket

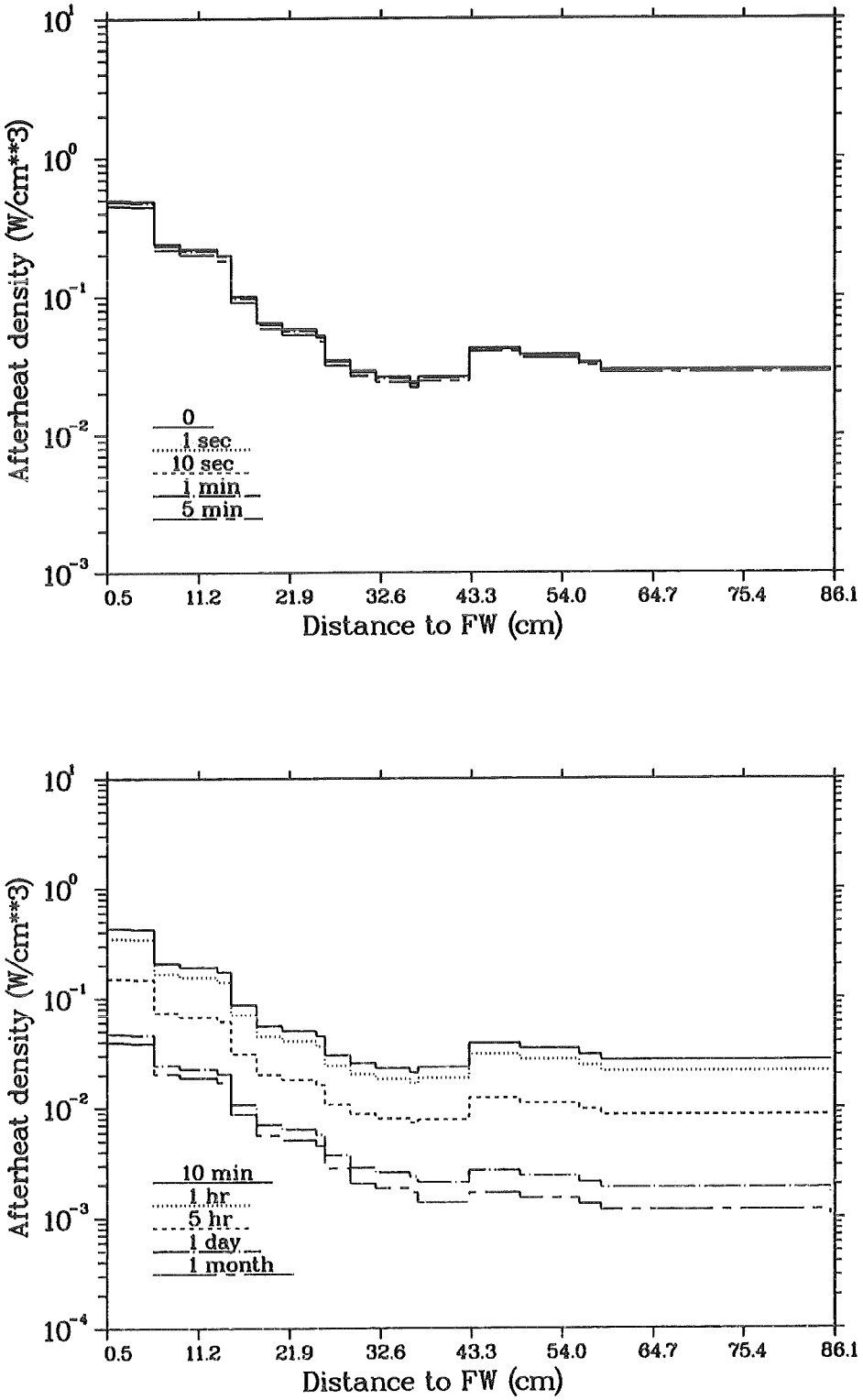

Figure 5.16: MANET: time dependent radial afterheat density distribution in the central part of the inboard blanket

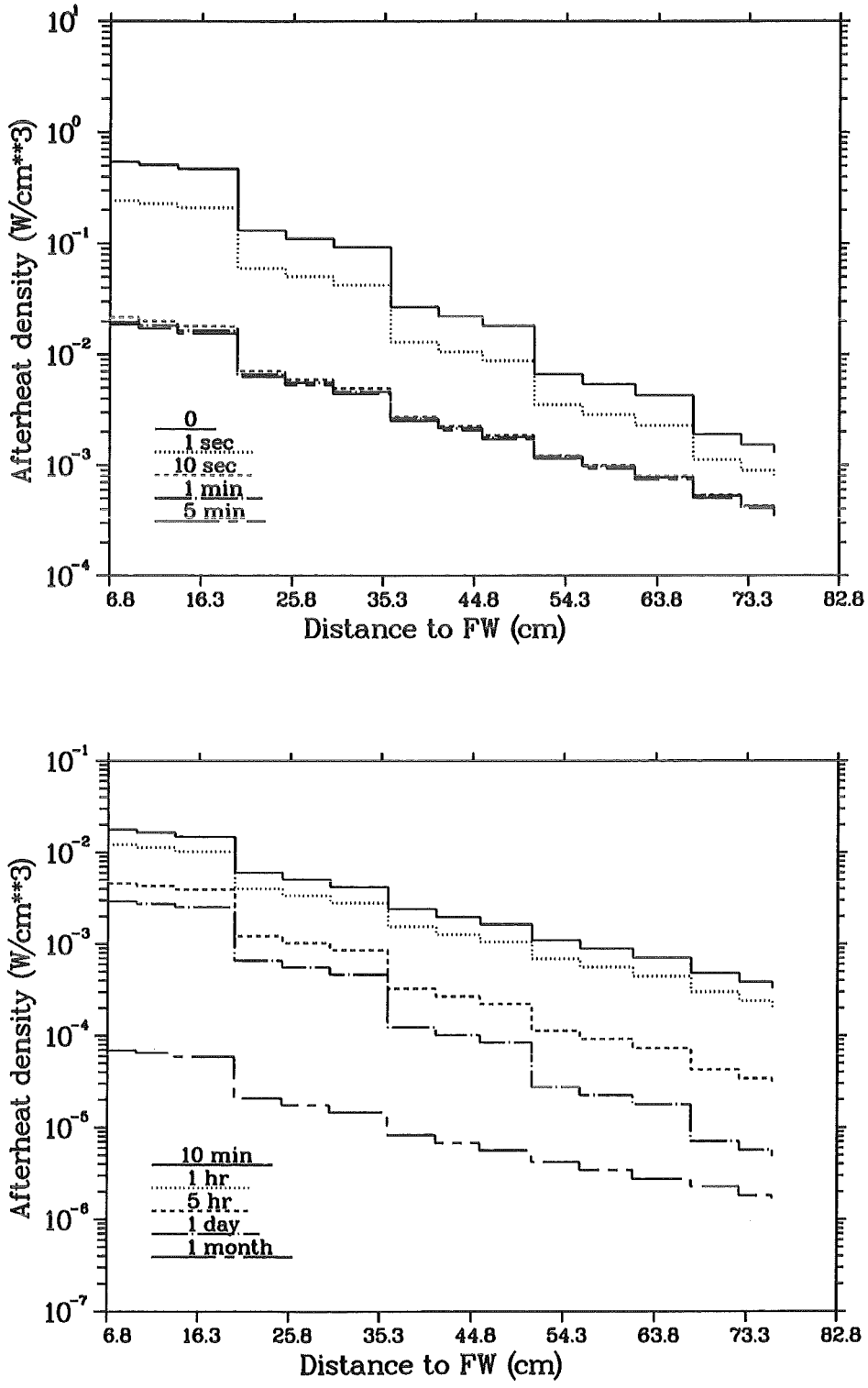

Figure 5.17: Pb-17Li: time dependent radial afterheat density distribution in the centeral part of the outboard blanket

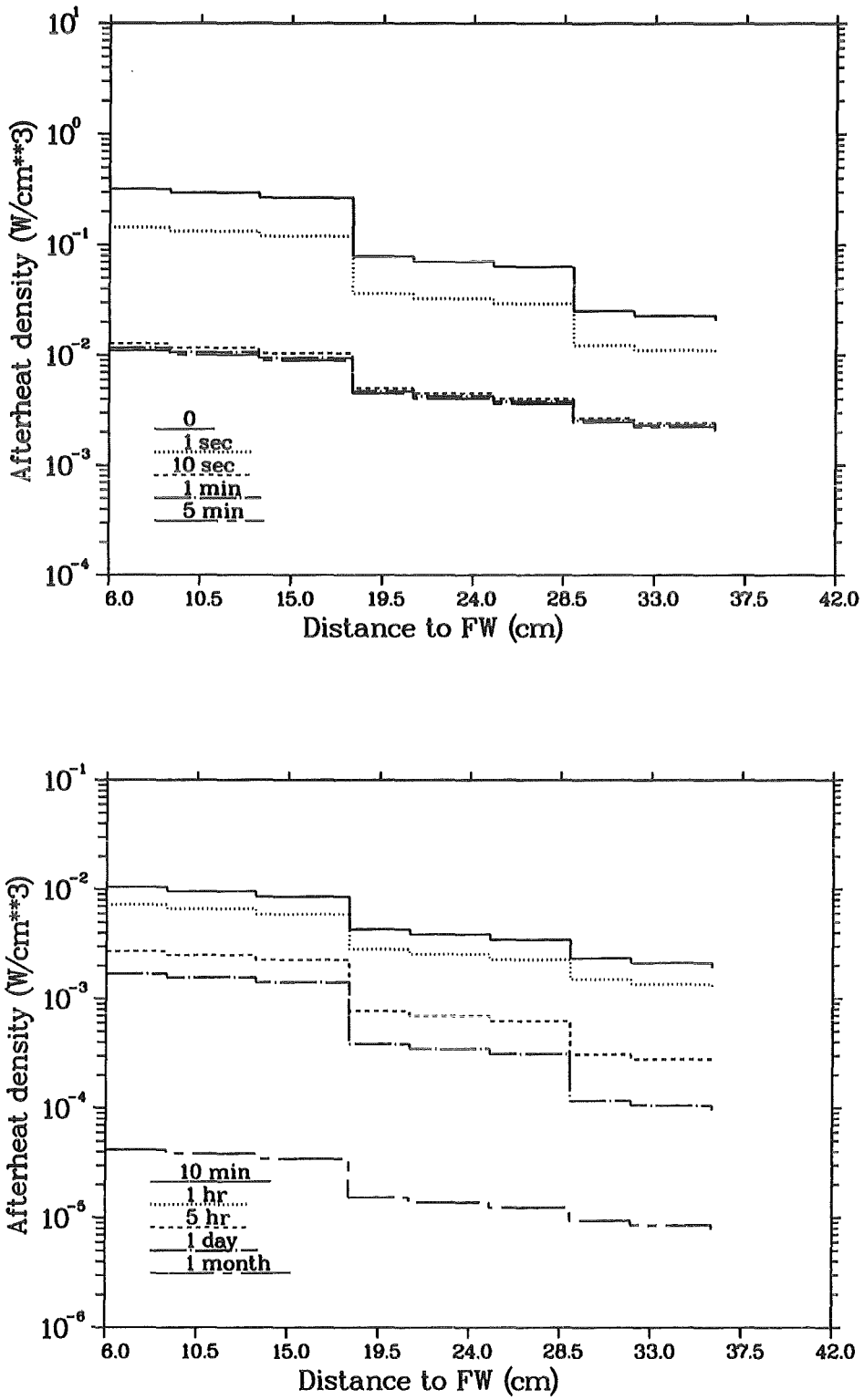

Figure 5.18: Pb-17Li: time dependent radial afterheat density distribution in central part of the inboard blanket

	MANET		Pb-17Li		Total	
Time after shutdown	Inboard 11.25^o segment	Outboard 7.5^o segment	Inboard 11.25^o segment	Outboard 7.5^o segment	Inboard 11.25^o segment	Outboard 7.5^o segment
0	1.953E-01	1.873E-01	2.806E-01	5.679E-01	4.759E-01	7.552E-01
1 sec	1.951E-01	1.869E-01	1.277E-01	2.577E-01	3.228E-01	4.446E-01
10 sec	1.944E-01	1.859E-01	1.459E-02	2.816E-02	2.090E-01	2.141E-01
1 min	1.913E-01	1.822E-01	1.360E-02	2.610E-02	2.049E-01	2.083E-01
5 min	1.819E-01	1.705E-01	1.295E-02	2.487E-02	1.948E-01	1.954E-01
10 min	1.749E-01	1.630E-01	1.232E-02	2.365E-02	1.872E-01	1.866E-01
1 hr	1.400E-01	1.311E-01	8.251E-03	1.590E-02	1.482E-01	1.470E-01
5 hr	5.789E-02	5.653E-02	2.573E-03	5.130E-03	6.047E-02	6.166E-02
1 day	1.527E-02	1.776E-02	1.439E-03	2.963E-03	1.671E-02	2.073E-02
1 month	1.134E-02	1.454E-02	4.880E-05	8.991E-05	1.139E-02	1.463E-02
1 y	5.456E-03	6.291E-03	1.015E-05	1.531E-05	5.466E-03	6.306E-03
5 y	1.475E-03	5.882E-04	3.197E-07	5.172E-07	1.475E-03	5.888E-04
10 y	6.885E-04	1.720E-04	1.157E-07	2.001E-07	6.886E-04	1.722E-04
20 y	1.813E-04	3.982E-05	8.567E-08	1.452E-07	1.813E-04	3.996E-05
40 y	1.374E-05	3.128E-06	6.498E-08	1.072E-07	1.381E-05	3.235E-06
50 y	4.286E-06	1.121E-06	6.013E-08	9.803E-08	4.346E-06	1.219E-06
100 y	7.634E-07	3.121E-07	4.952E-08	7.749E-08	8.129E-07	3.896E-07
200 y	7.267E-07	2.866E-07	4.083E-08	6.237E-08	7.676E-07	3.490E-07
300 y	7.130E-07	2.794E-07	3.471E-08	5.266E-08	7.477E-07	3.320E-07
500 y	6.990E-07	2.719E-07	2.531E-08	3.846E-08	7.243E-07	3.103E-07

Table 5.16: Volume integrated Afterheat generation [MW] in the blanket segments

6. Summary and Conclusions

Three-dimensional activation and afterheat calculations were performed for the self-cooled liquid metal breeder blanket with helium-cooled first wall ("Dual Coolant Blanket Concept") which has been developed for a Demo fusion power reactor at Forschungszentrum Karlsruhe within the European Fusion Technology Program.

An appropriate code system has been developed that allows three-dimensional activation and afterheat calculations by coupling the Monte Carlo transport code MCNP and the inventory code FISPACT. This approach permits a reliable assessment of the afterheat generation and the activation inventory in the blanket segments and the other reactor components.

Comprehensive numerical results including time-dependent radial-poloidal distribution of activation inventory and afterheat power density are presented to provide a sound data base for subsequent design, safety and environmental related analyses.

The applied three-dimensional approach in principle avoids model-related uncertainties of the calculated activation inventory thus imposing a clear advantage over the conventionally performed activation calculations that rely on one-dimensional models. Accordingly, uncertainties in the calculated activation inventories are mainly due to uncertainties in the calculated neutron spectra, fluxes, and in the activation cross-sections and/or decay data libraries, whereas statistical and model-related uncertainties are negligible.

I. References

[1] S.J. Booth (Ed.), Selection of European Reference Designs for the Demo Blanket - Criteria for the Comparison of Current Blanket Concepts -, Unpublished Report.

[2] S. Malang et al., Dual Coolant Blanket Concept, Report,KfK 5424, Nov. 1994.

[3] J.F. Briemeister (Ed), MCNP - A general Monte Carlo Code for Neutron and Photon Transport Version 3A, Report LA-7396-M,Rev.2, Sept. 1986.

[4] European Community/Fusion Technology Programme, Test Blanket Conceptual Design Status Report, Unpublished Report.

[5] S. Malang et al., Liquid Metal Cooled Blanket for NET, Proc. 14th SOFT, Avignon, France, 8-12 Sept. 1986, 1273-1280.

[6] S. Malang, K. Arheidt, U. Fischer, Test Module in NET for a Self-cooled Liquid Metal Cooled Blanket Concept, Proc. 15th SOFT, Utrecht, The Netherlands, 19-23 Sept. 1988, 1223-1228.

[7] M. Schirra et al., Untersuchungen zum Vergütungsverhalten, Umwandlungsverhalten und der mechanischen Eigenschaften am martensitischen Stahl 1.4914 (NET-Charge MANET-1), Report,KfK 4561, 1989.

[8] J-Ch Sublet, Elemental composition of structural materials including impurities and tramp elements, SEAFP/R-A6/2(93), June 1993.

[9] U. Fischer, Die neutronenphysikalische Behandlung eines (d,t)-Fusionsreaktors nach dem Tokamakprinzip (NET), Karlsruhe Report KfK 4790 , Okt. 1990.

[10] P. Vontobel, Generation of an EFF-1 based Monte Carlo neutron library for MCNP, Paul Scherrer Institut,Villingen,Swizerland,1990.

[11] K.A. Verschuur, Poloidal Variation of the NET Blanket Nuclear Response Functions, Report ECN-87-011, 1987.

[12] H. John, S. Malang, H. Sebening (ed.), DEMO-relevant test blanket for NET/ITER, Part 1: Self-cooled liquid metal breeder blanket, Report, KfK 4908, Dec. 1991.

[13] U. Fischer, Impact of ports on the breeding performance of liquid metal and solid breeder blanket in the DEMONET configuration, Fusion Engineering and Design 18 (1991),323-329.

[14] S. Malang et al., Dual Coolant Liquid Metal Breeder Blanket, Proc. 17th SOFT, Rome, Italy, 14-18 Sept. 1992, 1424-1428.

[15] R.A. Forrest and J-Ch Sublet, R.A. Forrest and l., Fispact3-User Mannual, Report, AEA Technology, AEA/FUS/227, April 1993.

[16] J. Kopecky et al., The European Activation File EAF-3 with neutron activation and transmutation cross-sections, Report, ECN-C-92-058, Sept. 1992.

[17] R.A. Forrest and J. Kopecky, The European Activation SYstem EASY, IAEA Advisory Group Meeting on FENDL-2, Nov. 1991.

[18] U. Fischer and E. Wiegner, Production of ^{210}Po in Pb-17Li, Assessment of Methodological and Data Related Uncertainties, 17th SOFT, Rome, Sept. 1992, 1719-1723.

[19] R.A. Forrest et al., The Data Library UKACT1 and the Inventory Code FISPACT, Int. Conf. Nuclear Data for Science and Technology, Mito, Japan, 1988, 1061-1064.

[20] N. Gardner and R.J. Howerton, ACTL: Evaluated Neutron Activation Cross-section Library, Evaluation Techniques and Reaction Index, UCRL-50400, Vol. 18, LLNL, Oct. 1978.

[21] F.M. Mann et al., REAC Nuclear Data Libraries, Int. Conf. Nuclear Data for Science and Technology, Sante Fe, New Mexico, 270, 1986.

[22] H. Feuerstein et al., Behaviour of ^{210}Po in molten Pb-17Li, J. Nucl. Mater. 191-194(1992)288-291.

II. Appendix

II.I Radial distribution of energy integrated fluxes

Total fluxes in the central part of the outboard blanket			
zone	radial distance to the FW	poloidal average flux	midplane flux
FW (steel wall)	5.000E-01	1.488E+15	1.602E+15
FW (He channel)	3.000E+00	1.484E+15	1.605E+15
FW (steel wall)	3.800E+00	1.485E+15	1.615E+15
LM-channel I/1	6.800E+00	1.444E+15	1.590E+15
LM-channel I/2	9.800E+00	1.362E+15	1.509E+15
LM-channel I/3	1.380E+01	1.255E+15	1.401E+15
Steel wall	1.540E+01	1.166E+15	1.317E+15
LM-channel II/1	2.000E+01	1.033E+15	1.174E+15
LM-channel II/2	2.500E+01	8.718E+14	9.958E+14
LM-channel II/3	3.000E+01	7.288E+14	8.320E+14
Steel wall	3.100E+01	6.559E+14	7.486E+14
LM-channel III/1	3.600E+01	5.743E+14	6.534E+14
LM-channel III/2	4.100E+01	4.703E+14	5.400E+14
LM-channel III/3	4.560E+01	3.900E+14	4.420E+14
Steel wall	4.660E+01	3.507E+14	3.985E+14
LM-channel IV/1	5.100E+01	3.066E+14	3.460E+14
LM-channel IV/2	5.600E+01	2.493E+14	2.814E+14
LM-channel IV/3	6.150E+01	1.983E+14	2.240E+14
Steel wall	6.250E+01	1.728E+14	1.935E+14
LM-channel V/1	6.750E+01	1.489E+14	1.672E+14
LM-channel V/2	7.250E+01	1.191E+14	1.319E+14
LM-channel V/3	7.600E+01	1.014E+14	1.133E+14
Steel wall	7.900E+01	9.050E+13	1.001E+14
Manifold	1.000E+02	6.612E+13	7.243E+13

Total fluxes in the upper part of the outboard blanket		
zone	radial distance to the FW	poloidal average flux
FW (steel wall)	5.000E-01	9.197E+14
FW (He-channel)	3.000E+00	8.783E+14
FW (steel wall)	3.800E+00	8.447E+14
LM-channel I	1.380E+01	6.566E+14
Steel wall	1.540E+01	5.146E+14
LM-channel II	3.000E+01	3.609E+14
Steel wall	3.100E+01	2.568E+14
LM-channel III	4.560E+01	1.821E+14
Steel wall	4.660E+01	1.279E+14
LM-channel IV	6.150E+01	8.763E+13
Steel wall	6.250E+01	5.952E+13
LM-channel V	7.600E+01	4.239E+13
steel wall	7.900E+01	3.016E+13
Manifold	1.000E+02	2.176E+13

Total fluxes in the lower part of the outboard blanket		
zone	radial distance to the FW	poloidal average flux
FW (steel wall)	5.000E-01	9.558E+14
FW (He-channel)	3.000E+00	9.243E+14
FW (steel wall)	3.800E+00	9.073E+14
LM-channel I	1.380E+01	7.208E+14
Steel wall	1.540E+01	5.858E+14
LM-channel II	3.000E+01	4.276E+14
Steel wall	3.100E+01	3.103E+14
LM-channel III	4.560E+01	2.267E+14
Steel wall	4.660E+01	1.623E+14
LM-channel IV	6.150E+01	1.168E+14
Steel wall	6.250E+01	8.550E+13
LM-channel V	7.600E+01	6.219E+13
Steel wall	7.900E+01	4.521E+13
Manifold	1.000E+02	3.314E+13

Total fluxes in the central part of the inboard blanket			
zone	radial distance to the FW	poloidal average flux	midplane flux
Shield	8.560E+01	1.845E+14	2.689E+14
Steel wall	5.860E+01	2.996E+14	4.414E+14
Manifold III	5.600E+01	3.375E+14	4.926E+14
Manifold II	4.900E+01	3.830E+14	5.550E+14
Manifold I	4.300E+01	4.274E+14	6.112E+14
Steel wall	3.700E+01	4.580E+14	6.556E+14
LM-channel III/3	3.600E+01	4.818E+14	6.887E+14
LM-channel III/2	3.200E+01	5.273E+14	7.513E+14
LM-channel III/1	2.900E+01	5.824E+14	8.222E+14
Steel wall	2.600E+01	6.307E+14	8.863E+14
LM-channel II/3	2.500E+01	6.842E+14	9.537E+14
LM-channel II/2	2.100E+01	7.653E+14	1.059E+15
LM-channel II/1	1.800E+01	8.478E+14	1.160E+15
Steel wall	1.500E+01	9.285E+14	1.251E+15
LM-channel I/3	1.340E+01	1.014E+15	1.350E+15
LM-channel I/2	9.000E+00	1.121E+15	1.449E+15
LM-channel I/1	6.000E+00	1.212E+15	1.521E+15
FW (steel wall)	3.300E+00	1.268E+15	1.541E+15
FW (He-channel)	2.500E+00	1.285E+15	1.538E+15
FW (steel wall)	5.000E-01	1.295E+15	1.539E+15

Total fluxes in the upper divertor region		
zone	radial distance to the FW	poloidal average flux
shield	8.560E+01	5.030E+13
Manifold II	5.860E+01	8.919E+13
Manifold I	5.600E+01	1.217E+14
Steel wall	3.700E+01	1.564E+14
LM-channel III	3.600E+01	1.889E+14
Steel wall	2.600E+01	2.431E+14
LM-channel II	2.500E+01	3.132E+14
Steel wall	1.500E+01	4.148E+14
LM-channel I	1.340E+01	5.314E+14
FW (steel wall)	3.300E+00	6.841E+14
FW (He-channel)	2.500E+00	7.015E+14
FW (steel wall)	5.000E-01	7.195E+14

Total fluxes in the lower divertor region		
zone	radial distance to the FW	poloidal average flux
shield	8.560E+01	4.721E+13
Manifold II	5.860E+01	8.426E+13
Manifold I	5.600E+01	1.141E+14
Steel wall	3.700E+01	1.464E+14
LM-channel III	3.600E+01	1.774E+14
Steel wall	2.600E+01	2.255E+14
LM-channel II	2.500E+01	2.906E+14
Steel wall	1.500E+01	3.868E+14
LM-channel I	1.340E+01	5.010E+14
FW (steel wall)	3.300E+00	6.454E+14
FW (He-channel)	2.500E+00	6.626E+14
FW (steel wall)	5.000E-01	6.816E+14

II.II Activity distribution in the poloidal segments

MANET					
Poloidal average specific activity (Bq/kg) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	1.419E+13	1.418E+13	1.414E+13	1.395E+13	1.334E+13
5.86E+01	1.543E+13	1.542E+13	1.537E+13	1.517E+13	1.448E+13
5.60E+01	1.738E+13	1.737E+13	1.732E+13	1.709E+13	1.631E+13
4.90E+01	1.973E+13	1.972E+13	1.965E+13	1.939E+13	1.851E+13
4.30E+01	2.202E+13	2.201E+13	2.193E+13	2.163E+13	2.065E+13
3.70E+01	1.644E+13	1.643E+13	1.638E+13	1.616E+13	1.543E+13
3.60E+01	1.712E+13	1.710E+13	1.704E+13	1.683E+13	1.613E+13
3.20E+01	1.874E+13	1.872E+13	1.865E+13	1.842E+13	1.766E+13
2.90E+01	2.070E+13	2.067E+13	2.060E+13	2.034E+13	1.950E+13
2.60E+01	2.593E+13	2.590E+13	2.582E+13	2.551E+13	2.453E+13
2.50E+01	3.961E+13	3.956E+13	3.944E+13	3.901E+13	3.765E+13
2.10E+01	4.431E+13	4.425E+13	4.412E+13	4.363E+13	4.211E+13
1.80E+01	4.909E+13	4.902E+13	4.887E+13	4.833E+13	4.665E+13
1.50E+01	7.612E+13	7.603E+13	7.581E+13	7.501E+13	7.255E+13
1.34E+01	1.539E+14	1.537E+14	1.533E+14	1.518E+14	1.472E+14
9.00E+00	1.701E+14	1.699E+14	1.695E+14	1.678E+14	1.627E+14
6.00E+00	1.839E+14	1.837E+14	1.832E+14	1.814E+14	1.759E+14
3.30E+00	3.794E+14	3.791E+14	3.782E+14	3.745E+14	3.635E+14
2.50E+00	3.845E+14	3.841E+14	3.832E+14	3.795E+14	3.684E+14
5.00E-01	3.874E+14	3.871E+14	3.862E+14	3.825E+14	3.712E+14
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	1.280E+13	1.052E+13	6.303E+12	3.958E+12	2.302E+12
5.86E+01	1.390E+13	1.157E+13	7.325E+12	4.942E+12	3.154E+12
5.60E+01	1.566E+13	1.303E+13	8.254E+12	5.571E+12	3.555E+12
4.90E+01	1.777E+13	1.479E+13	9.370E+12	6.327E+12	4.036E+12
4.30E+01	1.983E+13	1.650E+13	1.046E+13	7.065E+12	4.506E+12
3.70E+01	1.487E+13	1.286E+13	9.289E+12	7.236E+12	5.314E+12
3.60E+01	1.563E+13	1.394E+13	1.083E+13	9.033E+12	7.183E+12
3.20E+01	1.711E+13	1.526E+13	1.185E+13	9.886E+12	7.861E+12
2.90E+01	1.890E+13	1.685E+13	1.309E+13	1.092E+13	8.683E+12
2.60E+01	2.385E+13	2.157E+13	1.717E+13	1.463E+13	1.204E+13
2.50E+01	3.674E+13	3.356E+13	2.700E+13	2.328E+13	1.974E+13
2.10E+01	4.109E+13	3.753E+13	3.020E+13	2.604E+13	2.208E+13
1.80E+01	4.552E+13	4.158E+13	3.345E+13	2.884E+13	2.446E+13
1.50E+01	7.093E+13	6.506E+13	5.242E+13	4.533E+13	3.902E+13
1.34E+01	1.442E+14	1.329E+14	1.075E+14	9.343E+13	8.166E+13
9.00E+00	1.594E+14	1.469E+14	1.188E+14	1.033E+14	9.025E+13
6.00E+00	1.723E+14	1.589E+14	1.285E+14	1.116E+14	9.756E+13
3.30E+00	3.565E+14	3.293E+14	2.665E+14	2.320E+14	2.042E+14
2.50E+00	3.612E+14	3.337E+14	2.701E+14	2.351E+14	2.069E+14
5.00E-01	3.640E+14	3.362E+14	2.722E+14	2.370E+14	2.085E+14

MANET					
Poloidal average specific activity (Bq/kg) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	1.217E+12	4.782E+11	1.612E+11	2.485E+10	2.081E+09
5.86E+01	1.816E+12	6.550E+11	2.050E+11	2.667E+10	2.120E+09
5.60E+01	2.046E+12	7.377E+11	2.308E+11	3.002E+10	2.386E+09
4.90E+01	2.321E+12	8.368E+11	2.618E+11	3.404E+10	2.704E+09
4.30E+01	2.589E+12	9.335E+11	2.920E+11	3.795E+10	3.015E+09
3.70E+01	3.272E+12	1.083E+12	3.101E+11	3.074E+10	2.255E+09
3.60E+01	4.537E+12	1.451E+12	4.038E+11	3.593E+10	2.409E+09
3.20E+01	4.965E+12	1.588E+12	4.419E+11	3.931E+10	2.636E+09
2.90E+01	5.483E+12	1.754E+12	4.880E+11	4.341E+10	2.909E+09
2.60E+01	7.671E+12	2.423E+12	6.693E+11	5.761E+10	3.472E+09
2.50E+01	1.270E+13	3.993E+12	1.099E+12	9.252E+10	4.643E+09
2.10E+01	1.420E+13	4.466E+12	1.229E+12	1.035E+11	5.190E+09
1.80E+01	1.573E+13	4.947E+12	1.362E+12	1.146E+11	5.746E+09
1.50E+01	2.525E+13	7.940E+12	2.182E+12	1.805E+11	7.484E+09
1.34E+01	5.344E+13	1.693E+13	4.647E+12	3.762E+11	1.159E+10
9.00E+00	5.906E+13	1.871E+13	5.136E+12	4.158E+11	1.280E+10
6.00E+00	6.384E+13	2.022E+13	5.552E+12	4.494E+11	1.384E+10
3.30E+00	1.349E+14	4.320E+13	1.186E+13	9.436E+11	2.087E+10
2.50E+00	1.367E+14	4.377E+13	1.201E+13	9.562E+11	2.115E+10
5.00E-01	1.378E+14	4.411E+13	1.211E+13	9.636E+11	2.131E+10
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	1.133E+09	6.170E+08	3.905E+08	2.774E+08	1.904E+08
5.86E+01	1.224E+09	6.548E+08	4.323E+08	3.282E+08	2.466E+08
5.60E+01	1.377E+09	7.372E+08	4.867E+08	3.693E+08	2.775E+08
4.90E+01	1.562E+09	8.360E+08	5.518E+08	4.187E+08	3.144E+08
4.30E+01	1.741E+09	9.323E+08	6.152E+08	4.667E+08	3.504E+08
3.70E+01	1.505E+09	7.787E+08	5.119E+08	4.025E+08	3.150E+08
3.60E+01	1.672E+09	7.739E+08	4.924E+08	3.915E+08	3.098E+08
3.20E+01	1.829E+09	8.468E+08	5.388E+08	4.284E+08	3.389E+08
2.90E+01	2.019E+09	9.350E+08	5.949E+08	4.730E+08	3.742E+08
2.60E+01	2.388E+09	1.029E+09	6.412E+08	5.122E+08	4.063E+08
2.50E+01	3.078E+09	1.206E+09	7.337E+08	5.902E+08	4.694E+08
2.10E+01	3.441E+09	1.348E+09	8.203E+08	6.599E+08	5.248E+08
1.80E+01	3.809E+09	1.493E+09	9.084E+08	7.307E+08	5.812E+08
1.50E+01	4.796E+09	1.808E+09	1.097E+09	8.885E+08	7.078E+08
1.34E+01	6.974E+09	2.530E+09	1.547E+09	1.267E+09	1.008E+09
9.00E+00	7.705E+09	2.795E+09	1.709E+09	1.400E+09	1.114E+09
6.00E+00	8.326E+09	3.021E+09	1.847E+09	1.512E+09	1.204E+09
3.30E+00	1.159E+10	4.548E+09	2.946E+09	2.432E+09	1.925E+09
2.50E+00	1.174E+10	4.608E+09	2.985E+09	2.464E+09	1.951E+09
5.00E-01	1.183E+10	4.644E+09	3.008E+09	2.483E+09	1.966E+09

MANET					
Specific activity (Bq/kg) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	2.034E+13	2.033E+13	2.026E+13	1.999E+13	1.911E+13
5.86E+01	2.300E+13	2.298E+13	2.290E+13	2.260E+13	2.159E+13
5.60E+01	2.567E+13	2.565E+13	2.556E+13	2.521E+13	2.409E+13
4.90E+01	2.893E+13	2.891E+13	2.880E+13	2.840E+13	2.714E+13
4.30E+01	3.186E+13	3.184E+13	3.172E+13	3.127E+13	2.988E+13
3.70E+01	2.654E+13	2.651E+13	2.643E+13	2.609E+13	2.498E+13
3.60E+01	3.060E+13	3.056E+13	3.047E+13	3.011E+13	2.896E+13
3.20E+01	3.339E+13	3.334E+13	3.324E+13	3.284E+13	3.159E+13
2.90E+01	3.654E+13	3.649E+13	3.637E+13	3.594E+13	3.457E+13
2.60E+01	4.821E+13	4.814E+13	4.799E+13	4.746E+13	4.577E+13
2.50E+01	7.464E+13	7.455E+13	7.433E+13	7.355E+13	7.114E+13
2.10E+01	8.288E+13	8.278E+13	8.254E+13	8.166E+13	7.899E+13
1.80E+01	9.079E+13	9.067E+13	9.041E+13	8.945E+13	8.652E+13
1.50E+01	1.405E+14	1.403E+14	1.399E+14	1.385E+14	1.341E+14
1.34E+01	2.698E+14	2.696E+14	2.689E+14	2.663E+14	2.583E+14
9.00E+00	2.896E+14	2.893E+14	2.886E+14	2.858E+14	2.772E+14
6.00E+00	3.040E+14	3.036E+14	3.029E+14	2.999E+14	2.910E+14
3.30E+00	5.788E+14	5.784E+14	5.770E+14	5.715E+14	5.548E+14
2.50E+00	5.777E+14	5.772E+14	5.759E+14	5.704E+14	5.537E+14
5.00E-01	5.781E+14	5.776E+14	5.763E+14	5.707E+14	5.541E+14
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	1.835E+13	1.511E+13	9.099E+12	5.756E+12	3.379E+12
5.86E+01	2.076E+13	1.740E+13	1.127E+13	7.819E+12	5.205E+12
5.60E+01	2.316E+13	1.942E+13	1.258E+13	8.732E+12	5.811E+12
4.90E+01	2.609E+13	2.188E+13	1.418E+13	9.846E+12	6.551E+12
4.30E+01	2.873E+13	2.410E+13	1.562E+13	1.085E+13	7.218E+12
3.70E+01	2.415E+13	2.112E+13	1.555E+13	1.237E+13	9.480E+12
3.60E+01	2.815E+13	2.533E+13	1.987E+13	1.674E+13	1.372E+13
3.20E+01	3.071E+13	2.764E+13	2.167E+13	1.826E+13	1.497E+13
2.90E+01	3.361E+13	3.024E+13	2.372E+13	1.998E+13	1.638E+13
2.60E+01	4.464E+13	4.067E+13	3.257E+13	2.796E+13	2.359E+13
2.50E+01	6.955E+13	6.382E+13	5.148E+13	4.454E+13	3.834E+13
2.10E+01	7.723E+13	7.086E+13	5.715E+13	4.946E+13	4.257E+13
1.80E+01	8.459E+13	7.761E+13	6.260E+13	5.417E+13	4.662E+13
1.50E+01	1.313E+14	1.208E+14	9.745E+13	8.445E+13	7.343E+13
1.34E+01	2.533E+14	2.338E+14	1.894E+14	1.649E+14	1.448E+14
9.00E+00	2.718E+14	2.509E+14	2.032E+14	1.769E+14	1.554E+14
6.00E+00	2.852E+14	2.634E+14	2.133E+14	1.857E+14	1.630E+14
3.30E+00	5.442E+14	5.031E+14	4.078E+14	3.556E+14	3.136E+14
2.50E+00	5.431E+14	5.022E+14	4.070E+14	3.549E+14	3.130E+14
5.00E-01	5.435E+14	5.025E+14	4.073E+14	3.551E+14	3.132E+14

MANET					
Specific activity (Bq/kg) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	1.792E+12	6.983E+11	2.336E+11	3.544E+10	2.955E+09
5.86E+01	3.050E+12	1.073E+12	3.297E+11	4.090E+10	3.125E+09
5.60E+01	3.402E+12	1.197E+12	3.678E+11	4.560E+10	3.484E+09
4.90E+01	3.832E+12	1.348E+12	4.141E+11	5.133E+10	3.919E+09
4.30E+01	4.219E+12	1.484E+12	4.558E+11	5.647E+10	4.311E+09
3.70E+01	5.899E+12	1.915E+12	5.433E+11	5.208E+10	3.486E+09
3.60E+01	8.736E+12	2.765E+12	7.658E+11	6.657E+10	3.915E+09
3.20E+01	9.529E+12	3.016E+12	8.353E+11	7.261E+10	4.269E+09
2.90E+01	1.043E+13	3.301E+12	9.140E+11	7.944E+10	4.669E+09
2.60E+01	1.513E+13	4.754E+12	1.309E+12	1.108E+11	5.751E+09
2.50E+01	2.480E+13	7.793E+12	2.142E+12	1.779E+11	7.731E+09
2.10E+01	2.754E+13	8.651E+12	2.378E+12	1.975E+11	8.579E+09
1.80E+01	3.016E+13	9.474E+12	2.604E+12	2.162E+11	9.391E+09
1.50E+01	4.775E+13	1.502E+13	4.124E+12	3.374E+11	1.221E+10
1.34E+01	9.501E+13	3.015E+13	8.273E+12	6.656E+11	1.853E+10
9.00E+00	1.020E+14	3.235E+13	8.877E+12	7.142E+11	1.988E+10
6.00E+00	1.070E+14	3.395E+13	9.315E+12	7.495E+11	2.086E+10
3.30E+00	2.075E+14	6.651E+13	1.825E+13	1.448E+12	2.995E+10
2.50E+00	2.071E+14	6.638E+13	1.822E+13	1.445E+12	2.989E+10
5.00E-01	2.073E+14	6.643E+13	1.823E+13	1.446E+12	2.991E+10
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	1.619E+09	8.848E+08	5.592E+08	3.970E+08	2.721E+08
5.86E+01	1.811E+09	9.443E+08	6.205E+08	4.723E+08	3.560E+08
5.60E+01	2.019E+09	1.053E+09	6.918E+08	5.265E+08	3.967E+08
4.90E+01	2.272E+09	1.185E+09	7.785E+08	5.923E+08	4.461E+08
4.30E+01	2.500E+09	1.304E+09	8.564E+08	6.515E+08	4.905E+08
3.70E+01	2.289E+09	1.114E+09	7.244E+08	5.724E+08	4.499E+08
3.60E+01	2.651E+09	1.143E+09	7.158E+08	5.722E+08	4.541E+08
3.20E+01	2.891E+09	1.247E+09	7.806E+08	6.240E+08	4.952E+08
2.90E+01	3.161E+09	1.364E+09	8.540E+08	6.826E+08	5.417E+08
2.60E+01	3.832E+09	1.528E+09	9.347E+08	7.513E+08	5.978E+08
2.50E+01	4.969E+09	1.826E+09	1.095E+09	8.877E+08	7.081E+08
2.10E+01	5.514E+09	2.027E+09	1.216E+09	9.853E+08	7.859E+08
1.80E+01	6.036E+09	2.219E+09	1.331E+09	1.079E+09	8.604E+08
1.50E+01	7.583E+09	2.721E+09	1.639E+09	1.338E+09	1.068E+09
1.34E+01	1.086E+10	3.855E+09	2.364E+09	1.947E+09	1.550E+09
9.00E+00	1.165E+10	4.136E+09	2.536E+09	2.089E+09	1.663E+09
6.00E+00	1.222E+10	4.339E+09	2.661E+09	2.192E+09	1.745E+09
3.30E+00	1.626E+10	6.357E+09	4.154E+09	3.447E+09	2.732E+09
2.50E+00	1.623E+10	6.344E+09	4.146E+09	3.440E+09	2.726E+09
5.00E-01	1.624E+10	6.349E+09	4.149E+09	3.443E+09	2.728E+09

MANET					
Poloidal average specific activity (Bq/kg) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	5.392E+14	5.387E+14	5.375E+14	5.323E+14	5.167E+14
3.00E+00	5.377E+14	5.373E+14	5.360E+14	5.309E+14	5.153E+14
3.80E+00	5.381E+14	5.377E+14	5.364E+14	5.312E+14	5.157E+14
6.80E+00	3.075E+14	3.072E+14	3.064E+14	3.034E+14	2.944E+14
9.80E+00	2.901E+14	2.898E+14	2.891E+14	2.862E+14	2.777E+14
1.38E+01	2.673E+14	2.671E+14	2.664E+14	2.638E+14	2.560E+14
1.54E+01	1.419E+14	1.418E+14	1.414E+14	1.399E+14	1.356E+14
2.00E+01	7.776E+13	7.765E+13	7.743E+13	7.661E+13	7.410E+13
2.50E+01	6.562E+13	6.554E+13	6.535E+13	6.466E+13	6.255E+13
3.00E+01	5.486E+13	5.479E+13	5.463E+13	5.406E+13	5.229E+13
3.10E+01	2.842E+13	2.838E+13	2.829E+13	2.797E+13	2.694E+13
3.60E+01	1.867E+13	1.865E+13	1.858E+13	1.835E+13	1.763E+13
4.10E+01	1.529E+13	1.527E+13	1.522E+13	1.503E+13	1.443E+13
4.56E+01	1.268E+13	1.266E+13	1.262E+13	1.246E+13	1.197E+13
4.66E+01	8.391E+12	8.379E+12	8.349E+12	8.236E+12	7.863E+12
5.10E+01	6.327E+12	6.318E+12	6.295E+12	6.205E+12	5.902E+12
5.60E+01	5.144E+12	5.137E+12	5.118E+12	5.045E+12	4.799E+12
6.15E+01	4.091E+12	4.086E+12	4.071E+12	4.013E+12	3.817E+12
6.25E+01	3.219E+12	3.216E+12	3.204E+12	3.155E+12	2.986E+12
6.75E+01	3.025E+12	3.022E+12	3.012E+12	2.966E+12	2.807E+12
7.25E+01	2.419E+12	2.417E+12	2.409E+12	2.373E+12	2.245E+12
7.60E+01	2.060E+12	2.058E+12	2.051E+12	2.020E+12	1.911E+12
7.90E+01	3.087E+12	3.085E+12	3.076E+12	3.035E+12	2.882E+12
1.00E+02	4.362E+12	4.360E+12	4.349E+12	4.297E+12	4.105E+12
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	5.068E+14	4.682E+14	3.788E+14	3.298E+14	2.907E+14
3.00E+00	5.054E+14	4.669E+14	3.778E+14	3.289E+14	2.900E+14
3.80E+00	5.058E+14	4.673E+14	3.781E+14	3.292E+14	2.901E+14
6.80E+00	2.886E+14	2.665E+14	2.158E+14	1.878E+14	1.650E+14
9.80E+00	2.723E+14	2.514E+14	2.036E+14	1.772E+14	1.557E+14
1.38E+01	2.510E+14	2.317E+14	1.876E+14	1.633E+14	1.435E+14
1.54E+01	1.328E+14	1.223E+14	9.873E+13	8.564E+13	7.463E+13
2.00E+01	7.246E+13	6.654E+13	5.381E+13	4.664E+13	4.018E+13
2.50E+01	6.116E+13	5.617E+13	4.542E+13	3.937E+13	3.392E+13
3.00E+01	5.113E+13	4.696E+13	3.797E+13	3.292E+13	2.836E+13
3.10E+01	2.625E+13	2.394E+13	1.934E+13	1.670E+13	1.400E+13
3.60E+01	1.713E+13	1.553E+13	1.257E+13	1.083E+13	8.874E+12
4.10E+01	1.402E+13	1.272E+13	1.029E+13	8.873E+12	7.268E+12
4.56E+01	1.163E+13	1.055E+13	8.534E+12	7.359E+12	6.027E+12
4.66E+01	7.601E+12	6.818E+12	5.508E+12	4.723E+12	3.696E+12
5.10E+01	5.686E+12	5.064E+12	4.092E+12	3.500E+12	2.660E+12
5.60E+01	4.623E+12	4.118E+12	3.327E+12	2.846E+12	2.163E+12
6.15E+01	3.677E+12	3.275E+12	2.646E+12	2.263E+12	1.721E+12
6.25E+01	2.863E+12	2.516E+12	2.006E+12	1.692E+12	1.220E+12
6.75E+01	2.687E+12	2.325E+12	1.777E+12	1.446E+12	1.007E+12
7.25E+01	2.149E+12	1.860E+12	1.421E+12	1.156E+12	8.056E+11
7.60E+01	1.830E+12	1.583E+12	1.210E+12	9.843E+11	6.858E+11
7.90E+01	2.758E+12	2.298E+12	1.514E+12	1.065E+12	6.609E+11
1.00E+02	3.939E+12	3.247E+12	1.974E+12	1.266E+12	7.501E+11

MANET					
Poloidal average specific activity (Bq/kg) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	1.922E+14	6.150E+13	1.688E+13	1.340E+12	2.823E+10
3.00E+00	1.916E+14	6.134E+13	1.683E+13	1.337E+12	2.816E+10
3.80E+00	1.918E+14	6.138E+13	1.684E+13	1.338E+12	2.818E+10
6.80E+00	1.083E+14	3.440E+13	9.438E+12	7.583E+11	2.055E+10
9.80E+00	1.022E+14	3.245E+13	8.905E+12	7.155E+11	1.939E+10
1.38E+01	9.422E+13	2.992E+13	8.208E+12	6.595E+11	1.788E+10
1.54E+01	4.859E+13	1.530E+13	4.199E+12	3.427E+11	1.193E+10
2.00E+01	2.599E+13	8.153E+12	2.241E+12	1.864E+11	8.323E+09
2.50E+01	2.194E+13	6.883E+12	1.892E+12	1.574E+11	7.032E+09
3.00E+01	1.834E+13	5.756E+12	1.582E+12	1.316E+11	5.885E+09
3.10E+01	8.952E+12	2.811E+12	7.748E+11	6.627E+10	3.904E+09
3.60E+01	5.651E+12	1.790E+12	4.948E+11	4.305E+10	2.933E+09
4.10E+01	4.628E+12	1.466E+12	4.053E+11	3.527E+10	2.404E+09
4.56E+01	3.838E+12	1.216E+12	3.361E+11	2.925E+10	1.995E+09
4.66E+01	2.330E+12	7.519E+11	2.087E+11	1.847E+10	1.452E+09
5.10E+01	1.674E+12	5.500E+11	1.531E+11	1.368E+10	1.150E+09
5.60E+01	1.362E+12	4.472E+11	1.245E+11	1.112E+10	9.358E+08
6.15E+01	1.083E+12	3.558E+11	9.907E+10	8.848E+09	7.447E+08
6.25E+01	7.589E+11	2.560E+11	7.160E+10	6.429E+09	5.643E+08
6.75E+01	6.227E+11	2.141E+11	6.048E+10	5.614E+09	4.872E+08
7.25E+01	4.981E+11	1.712E+11	4.838E+10	4.491E+09	3.898E+08
7.60E+01	4.241E+11	1.458E+11	4.119E+10	3.824E+09	3.319E+08
7.90E+01	3.836E+11	1.397E+11	4.236E+10	5.006E+09	4.226E+08
1.00E+02	4.028E+11	1.554E+11	5.115E+10	7.499E+09	6.370E+08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	1.539E+10	6.011E+09	3.919E+09	3.248E+09	2.573E+09
3.00E+00	1.535E+10	5.995E+09	3.909E+09	3.239E+09	2.566E+09
3.80E+00	1.536E+10	6.000E+09	3.912E+09	3.241E+09	2.568E+09
6.80E+00	1.197E+10	4.268E+09	2.629E+09	2.167E+09	1.724E+09
9.80E+00	1.129E+10	4.028E+09	2.481E+09	2.045E+09	1.627E+09
1.38E+01	1.041E+10	3.713E+09	2.287E+09	1.886E+09	1.501E+09
1.54E+01	7.348E+09	2.620E+09	1.579E+09	1.290E+09	1.029E+09
2.00E+01	5.365E+09	1.947E+09	1.160E+09	9.397E+08	7.496E+08
2.50E+01	4.533E+09	1.644E+09	9.795E+08	7.936E+08	6.331E+08
3.00E+01	3.793E+09	1.375E+09	8.193E+08	6.638E+08	5.296E+08
3.10E+01	2.653E+09	1.062E+09	6.473E+08	5.192E+08	4.131E+08
3.60E+01	2.051E+09	8.796E+08	5.448E+08	4.344E+08	3.445E+08
4.10E+01	1.681E+09	7.206E+08	4.463E+08	3.559E+08	2.823E+08
4.56E+01	1.395E+09	5.978E+08	3.702E+08	2.952E+08	2.342E+08
4.66E+01	1.058E+09	5.151E+08	3.293E+08	2.608E+08	2.058E+08
5.10E+01	8.565E+08	4.443E+08	2.878E+08	2.270E+08	1.784E+08
5.60E+01	6.968E+08	3.613E+08	2.340E+08	1.846E+08	1.451E+08
6.15E+01	5.545E+08	2.875E+08	1.862E+08	1.469E+08	1.155E+08
6.25E+01	4.343E+08	2.518E+08	1.670E+08	1.312E+08	1.027E+08
6.75E+01	3.704E+08	2.231E+08	1.497E+08	1.176E+08	9.203E+07
7.25E+01	2.963E+08	1.785E+08	1.198E+08	9.405E+07	7.363E+07
7.60E+01	2.523E+08	1.520E+08	1.020E+08	8.008E+07	6.269E+07
7.90E+01	2.752E+08	1.668E+08	1.131E+08	8.745E+07	6.729E+07
1.00E+02	3.619E+08	2.028E+08	1.293E+08	9.287E+07	6.478E+07

MANET					
Specific activity (Bq/kg) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	6.544E+14	6.538E+14	6.523E+14	6.460E+14	6.272E+14
3.00E+00	6.556E+14	6.550E+14	6.535E+14	6.472E+14	6.283E+14
3.80E+00	6.596E+14	6.591E+14	6.576E+14	6.512E+14	6.323E+14
6.80E+00	3.749E+14	3.745E+14	3.736E+14	3.700E+14	3.590E+14
9.80E+00	3.559E+14	3.555E+14	3.546E+14	3.512E+14	3.408E+14
1.38E+01	3.304E+14	3.301E+14	3.293E+14	3.261E+14	3.165E+14
1.54E+01	1.779E+14	1.777E+14	1.772E+14	1.755E+14	1.701E+14
2.00E+01	9.679E+13	9.666E+13	9.638E+13	9.538E+13	9.231E+13
2.50E+01	8.210E+13	8.200E+13	8.176E+13	8.091E+13	7.831E+13
3.00E+01	6.860E+13	6.851E+13	6.831E+13	6.761E+13	6.543E+13
3.10E+01	3.439E+13	3.434E+13	3.423E+13	3.384E+13	3.263E+13
3.60E+01	2.237E+13	2.234E+13	2.226E+13	2.200E+13	2.114E+13
4.10E+01	1.849E+13	1.846E+13	1.840E+13	1.818E+13	1.748E+13
4.56E+01	1.513E+13	1.511E+13	1.506E+13	1.488E+13	1.430E+13
4.66E+01	9.856E+12	9.842E+12	9.807E+12	9.677E+12	9.250E+12
5.10E+01	7.360E+12	7.350E+12	7.323E+12	7.220E+12	6.877E+12
5.60E+01	5.985E+12	5.977E+12	5.955E+12	5.872E+12	5.593E+12
6.15E+01	4.764E+12	4.757E+12	4.740E+12	4.674E+12	4.452E+12
6.25E+01	3.818E+12	3.814E+12	3.800E+12	3.744E+12	3.551E+12
6.75E+01	3.538E+12	3.535E+12	3.523E+12	3.471E+12	3.289E+12
7.25E+01	2.791E+12	2.788E+12	2.779E+12	2.738E+12	2.595E+12
7.60E+01	2.397E+12	2.395E+12	2.387E+12	2.352E+12	2.229E+12
7.90E+01	3.560E+12	3.558E+12	3.549E+12	3.501E+12	3.330E+12
1.00E+02	4.836E+12	4.834E+12	4.822E+12	4.764E+12	4.552E+12
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	6.152E+14	5.686E+14	4.605E+14	4.013E+14	3.540E+14
3.00E+00	6.163E+14	5.697E+14	4.614E+14	4.020E+14	3.547E+14
3.80E+00	6.201E+14	5.732E+14	4.642E+14	4.045E+14	3.569E+14
6.80E+00	3.520E+14	3.252E+14	2.634E+14	2.294E+14	2.018E+14
9.80E+00	3.342E+14	3.087E+14	2.501E+14	2.178E+14	1.916E+14
1.38E+01	3.103E+14	2.867E+14	2.322E+14	2.022E+14	1.779E+14
1.54E+01	1.666E+14	1.535E+14	1.241E+14	1.078E+14	9.418E+13
2.00E+01	9.030E+13	8.302E+13	6.717E+13	5.828E+13	5.038E+13
2.50E+01	7.661E+13	7.043E+13	5.699E+13	4.944E+13	4.275E+13
3.00E+01	6.401E+13	5.885E+13	4.762E+13	4.132E+13	3.572E+13
3.10E+01	3.182E+13	2.908E+13	2.356E+13	2.039E+13	1.719E+13
3.60E+01	2.056E+13	1.869E+13	1.514E+13	1.307E+13	1.078E+13
4.10E+01	1.699E+13	1.544E+13	1.251E+13	1.080E+13	8.909E+12
4.56E+01	1.391E+13	1.264E+13	1.024E+13	8.841E+12	7.293E+12
4.66E+01	8.951E+12	8.046E+12	6.503E+12	5.583E+12	4.408E+12
5.10E+01	6.633E+12	5.926E+12	4.801E+12	4.118E+12	3.165E+12
5.60E+01	5.394E+12	4.819E+12	3.905E+12	3.349E+12	2.574E+12
6.15E+01	4.294E+12	3.836E+12	3.108E+12	2.666E+12	2.049E+12
6.25E+01	3.412E+12	3.014E+12	2.413E+12	2.044E+12	1.506E+12
6.75E+01	3.154E+12	2.737E+12	2.089E+12	1.700E+12	1.202E+12
7.25E+01	2.488E+12	2.159E+12	1.648E+12	1.341E+12	9.483E+11
7.60E+01	2.137E+12	1.855E+12	1.416E+12	1.152E+12	8.146E+11
7.90E+01	3.188E+12	2.660E+12	1.746E+12	1.223E+12	7.625E+11
1.00E+02	4.368E+12	3.600E+12	2.191E+12	1.406E+12	8.381E+11

MANET					
Specific activity (Bq/kg) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	2.342E+14	7.503E+13	2.059E+13	1.632E+12	3.323E+10
3.00E+00	2.347E+14	7.517E+13	2.062E+13	1.635E+12	3.329E+10
3.80E+00	2.361E+14	7.563E+13	2.075E+13	1.645E+12	3.350E+10
6.80E+00	1.326E+14	4.213E+13	1.156E+13	9.271E+11	2.436E+10
9.80E+00	1.259E+14	3.999E+13	1.097E+13	8.801E+11	2.313E+10
1.38E+01	1.169E+14	3.715E+13	1.019E+13	8.175E+11	2.148E+10
1.54E+01	6.144E+13	1.937E+13	5.316E+12	4.324E+11	1.441E+10
2.00E+01	3.263E+13	1.024E+13	2.814E+12	2.334E+11	1.005E+10
2.50E+01	2.769E+13	8.691E+12	2.388E+12	1.981E+11	8.533E+09
3.00E+01	2.314E+13	7.264E+12	1.996E+12	1.656E+11	7.137E+09
3.10E+01	1.101E+13	3.453E+12	9.513E+11	8.126E+10	4.721E+09
3.60E+01	6.872E+12	2.171E+12	5.998E+11	5.215E+10	3.511E+09
4.10E+01	5.681E+12	1.795E+12	4.958E+11	4.311E+10	2.904E+09
4.56E+01	4.650E+12	1.469E+12	4.059E+11	3.530E+10	2.379E+09
4.66E+01	2.784E+12	8.934E+11	2.477E+11	2.189E+10	1.698E+09
5.10E+01	1.995E+12	6.514E+11	1.812E+11	1.613E+10	1.332E+09
5.60E+01	1.623E+12	5.298E+11	1.474E+11	1.312E+10	1.084E+09
6.15E+01	1.292E+12	4.218E+11	1.173E+11	1.045E+10	8.636E+08
6.25E+01	9.448E+11	3.168E+11	8.843E+10	7.855E+09	6.533E+08
6.75E+01	7.463E+11	2.547E+11	7.180E+10	6.617E+09	5.634E+08
7.25E+01	5.888E+11	2.009E+11	5.665E+10	5.221E+09	4.446E+08
7.60E+01	5.058E+11	1.726E+11	4.866E+10	4.485E+09	3.820E+08
7.90E+01	4.448E+11	1.610E+11	4.870E+10	5.714E+09	4.757E+08
1.00E+02	4.529E+11	1.745E+11	5.757E+10	8.475E+09	7.115E+08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	1.791E+10	7.012E+09	4.596E+09	3.816E+09	3.023E+09
3.00E+00	1.794E+10	7.025E+09	4.605E+09	3.823E+09	3.028E+09
3.80E+00	1.805E+10	7.068E+09	4.633E+09	3.847E+09	3.047E+09
6.80E+00	1.404E+10	4.975E+09	3.068E+09	2.534E+09	2.016E+09
9.80E+00	1.333E+10	4.723E+09	2.913E+09	2.406E+09	1.915E+09
1.38E+01	1.239E+10	4.388E+09	2.706E+09	2.235E+09	1.779E+09
1.54E+01	8.780E+09	3.091E+09	1.861E+09	1.525E+09	1.218E+09
2.00E+01	6.419E+09	2.278E+09	1.350E+09	1.096E+09	8.754E+08
2.50E+01	5.451E+09	1.934E+09	1.146E+09	9.306E+08	7.431E+08
3.00E+01	4.559E+09	1.617E+09	9.578E+08	7.780E+08	6.214E+08
3.10E+01	3.183E+09	1.231E+09	7.415E+08	5.959E+08	4.749E+08
3.60E+01	2.434E+09	1.008E+09	6.178E+08	4.937E+08	3.923E+08
4.10E+01	2.013E+09	8.332E+08	5.108E+08	4.082E+08	3.244E+08
4.56E+01	1.649E+09	6.822E+08	4.182E+08	3.342E+08	2.656E+08
4.66E+01	1.228E+09	5.819E+08	3.697E+08	2.933E+08	2.318E+08
5.10E+01	9.854E+08	4.994E+08	3.218E+08	2.542E+08	2.001E+08
5.60E+01	8.018E+08	4.062E+08	2.618E+08	2.068E+08	1.628E+08
6.15E+01	6.385E+08	3.234E+08	2.084E+08	1.646E+08	1.296E+08
6.25E+01	4.985E+08	2.826E+08	1.865E+08	1.465E+08	1.147E+08
6.75E+01	4.258E+08	2.507E+08	1.677E+08	1.319E+08	1.035E+08
7.25E+01	3.360E+08	1.978E+08	1.323E+08	1.041E+08	8.165E+07
7.60E+01	2.887E+08	1.700E+08	1.137E+08	8.942E+07	7.015E+07
7.90E+01	3.081E+08	1.843E+08	1.249E+08	9.687E+07	7.477E+07
1.00E+02	3.991E+08	2.208E+08	1.409E+08	1.014E+08	7.084E+07

MANET					
Poloidal average specific activity (Bq/kg) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	4.273E+12	4.272E+12	4.262E+12	4.211E+12	4.026E+12
5.86E+01	5.224E+12	5.222E+12	5.209E+12	5.144E+12	4.907E+12
5.60E+01	7.130E+12	7.127E+12	7.108E+12	7.018E+12	6.695E+12
3.70E+01	5.516E+12	5.513E+12	5.497E+12	5.422E+12	5.157E+12
3.60E+01	5.370E+12	5.365E+12	5.348E+12	5.273E+12	5.016E+12
2.60E+01	6.858E+12	6.851E+12	6.828E+12	6.734E+12	6.415E+12
2.50E+01	1.034E+13	1.033E+13	1.029E+13	1.016E+13	9.719E+12
1.50E+01	1.653E+13	1.651E+13	1.646E+13	1.625E+13	1.559E+13
1.34E+01	3.011E+13	3.007E+13	2.999E+13	2.965E+13	2.856E+13
3.30E+00	5.375E+13	5.369E+13	5.355E+13	5.296E+13	5.112E+13
2.50E+00	5.511E+13	5.506E+13	5.491E+13	5.431E+13	5.243E+13
5.00E-01	5.653E+13	5.647E+13	5.632E+13	5.570E+13	5.377E+13
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	3.863E+12	3.168E+12	1.882E+12	1.168E+12	6.733E+11
5.86E+01	4.704E+12	3.871E+12	2.363E+12	1.519E+12	9.063E+11
5.60E+01	6.418E+12	5.282E+12	3.226E+12	2.074E+12	1.237E+12
3.70E+01	4.945E+12	4.172E+12	2.836E+12	2.069E+12	1.367E+12
3.60E+01	4.822E+12	4.187E+12	3.132E+12	2.512E+12	1.822E+12
2.60E+01	6.181E+12	5.442E+12	4.200E+12	3.468E+12	2.614E+12
2.50E+01	9.405E+12	8.398E+12	6.622E+12	5.584E+12	4.403E+12
1.50E+01	1.512E+13	1.357E+13	1.070E+13	9.037E+12	7.276E+12
1.34E+01	2.781E+13	2.519E+13	1.997E+13	1.700E+13	1.417E+13
3.30E+00	4.986E+13	4.524E+13	3.569E+13	3.033E+13	2.560E+13
2.50E+00	5.113E+13	4.639E+13	3.660E+13	3.110E+13	2.625E+13
5.00E-01	5.244E+13	4.758E+13	3.753E+13	3.189E+13	2.692E+13

MANET					
Poloidal average specific activity (Bq/kg) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	3.537E+11	1.405E+11	4.791E+10	7.564E+09	6.354E+08
5.86E+01	5.045E+11	1.904E+11	6.174E+10	8.735E+09	7.130E+08
5.60E+01	6.882E+11	2.598E+11	8.420E+10	1.191E+10	9.719E+08
3.70E+01	8.119E+11	2.823E+11	8.289E+10	8.881E+09	7.115E+08
3.60E+01	1.128E+12	3.767E+11	1.062E+11	9.813E+09	7.337E+08
2.60E+01	1.631E+12	5.346E+11	1.491E+11	1.324E+10	9.496E+08
2.50E+01	2.787E+12	9.008E+11	2.499E+11	2.163E+10	1.357E+09
1.50E+01	4.621E+12	1.479E+12	4.092E+11	3.492E+10	1.965E+09
1.34E+01	9.115E+12	2.904E+12	8.011E+11	6.705E+10	3.036E+09
3.30E+00	1.657E+13	5.286E+12	1.457E+12	1.206E+11	4.504E+09
2.50E+00	1.699E+13	5.420E+12	1.494E+12	1.236E+11	4.618E+09
5.00E-01	1.743E+13	5.559E+12	1.532E+12	1.268E+11	4.736E+09
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	3.415E+08	1.847E+08	1.165E+08	8.238E+07	5.612E+07
5.86E+01	4.008E+08	2.216E+08	1.466E+08	1.100E+08	8.145E+07
5.60E+01	5.465E+08	3.021E+08	1.999E+08	1.499E+08	1.110E+08
3.70E+01	4.804E+08	2.855E+08	1.927E+08	1.501E+08	1.164E+08
3.60E+01	5.345E+08	3.082E+08	2.055E+08	1.614E+08	1.263E+08
2.60E+01	6.997E+08	3.882E+08	2.561E+08	2.014E+08	1.577E+08
2.50E+01	9.749E+08	5.047E+08	3.281E+08	2.589E+08	2.030E+08
1.50E+01	1.384E+09	6.892E+08	4.459E+08	3.533E+08	2.779E+08
1.34E+01	2.036E+09	9.427E+08	6.046E+08	4.828E+08	3.812E+08
3.30E+00	2.895E+09	1.332E+09	8.642E+08	6.946E+08	5.499E+08
2.50E+00	2.968E+09	1.366E+09	8.861E+08	7.122E+08	5.638E+08
5.00E-01	3.044E+09	1.400E+09	9.087E+08	7.304E+08	5.782E+08

MANET					
Poloidal average specific activity (Bq/kg) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	2.071E+14	2.070E+14	2.065E+14	2.045E+14	1.983E+14
3.00E+00	2.003E+14	2.002E+14	1.997E+14	1.977E+14	1.918E+14
3.80E+00	1.966E+14	1.965E+14	1.960E+14	1.941E+14	1.883E+14
1.38E+01	6.303E+13	6.296E+13	6.278E+13	6.213E+13	6.009E+13
1.54E+01	2.658E+13	2.655E+13	2.647E+13	2.615E+13	2.517E+13
3.00E+01	1.433E+13	1.431E+13	1.427E+13	1.409E+13	1.351E+13
3.10E+01	7.528E+12	7.518E+12	7.492E+12	7.388E+12	7.039E+12
4.56E+01	4.935E+12	4.929E+12	4.912E+12	4.841E+12	4.598E+12
4.66E+01	3.056E+12	3.052E+12	3.041E+12	2.993E+12	2.827E+12
6.15E+01	2.311E+12	2.309E+12	2.301E+12	2.265E+12	2.141E+12
6.25E+01	1.747E+12	1.746E+12	1.740E+12	1.712E+12	1.615E+12
7.60E+01	1.395E+12	1.394E+12	1.390E+12	1.368E+12	1.290E+12
7.90E+01	1.795E+12	1.795E+12	1.790E+12	1.766E+12	1.677E+12
1.00E+02	2.474E+12	2.473E+12	2.467E+12	2.439E+12	2.331E+12
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	1.943E+14	1.790E+14	1.443E+14	1.251E+14	1.095E+14
3.00E+00	1.879E+14	1.731E+14	1.395E+14	1.210E+14	1.059E+14
3.80E+00	1.845E+14	1.699E+14	1.370E+14	1.188E+14	1.040E+14
1.38E+01	5.874E+13	5.377E+13	4.309E+13	3.711E+13	3.187E+13
1.54E+01	2.448E+13	2.211E+13	1.746E+13	1.481E+13	1.221E+13
3.00E+01	1.310E+13	1.174E+13	9.278E+12	7.844E+12	6.300E+12
3.10E+01	6.786E+12	6.007E+12	4.728E+12	3.966E+12	3.010E+12
4.56E+01	4.421E+12	3.893E+12	3.070E+12	2.572E+12	1.900E+12
4.66E+01	2.704E+12	2.354E+12	1.851E+12	1.541E+12	1.084E+12
6.15E+01	2.048E+12	1.779E+12	1.386E+12	1.147E+12	8.049E+11
6.25E+01	1.543E+12	1.334E+12	1.034E+12	8.499E+11	5.817E+11
7.60E+01	1.230E+12	1.047E+12	7.775E+11	6.153E+11	4.035E+11
7.90E+01	1.603E+12	1.328E+12	8.584E+11	5.912E+11	3.587E+11
1.00E+02	2.238E+12	1.843E+12	1.110E+12	7.034E+11	4.168E+11

MANET					
Poloidal average specific activity (Bq/kg) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	7.215E+13	2.309E+13	6.340E+12	5.070E+11	1.217E+10
3.00E+00	6.978E+13	2.233E+13	6.132E+12	4.904E+11	1.177E+10
3.80E+00	6.850E+13	2.192E+13	6.020E+12	4.814E+11	1.155E+10
1.38E+01	2.065E+13	6.518E+12	1.792E+12	1.479E+11	5.771E+09
1.54E+01	7.749E+12	2.437E+12	6.735E+11	5.819E+10	3.392E+09
3.00E+01	3.989E+12	1.273E+12	3.536E+11	3.133E+10	2.144E+09
3.10E+01	1.878E+12	6.130E+11	1.714E+11	1.562E+10	1.264E+09
4.56E+01	1.186E+12	3.944E+11	1.105E+11	1.010E+10	8.524E+08
4.66E+01	6.669E+11	2.277E+11	6.442E+10	6.068E+09	5.564E+08
6.15E+01	4.995E+11	1.727E+11	4.890E+10	4.561E+09	3.873E+08
6.25E+01	3.550E+11	1.228E+11	3.461E+10	3.143E+09	2.604E+08
7.60E+01	2.433E+11	8.633E+10	2.479E+10	2.416E+09	2.052E+08
7.90E+01	2.028E+11	7.578E+10	2.349E+10	2.945E+09	2.507E+08
1.00E+02	2.235E+11	8.656E+10	2.858E+10	4.208E+09	3.534E+08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	6.974E+09	2.869E+09	1.857E+09	1.518E+09	1.197E+09
3.00E+00	6.744E+09	2.775E+09	1.797E+09	1.468E+09	1.158E+09
3.80E+00	6.621E+09	2.724E+09	1.764E+09	1.441E+09	1.137E+09
1.38E+01	3.671E+09	1.443E+09	8.905E+08	7.197E+08	5.716E+08
1.54E+01	2.302E+09	9.820E+08	6.114E+08	4.884E+08	3.871E+08
3.00E+01	1.493E+09	6.759E+08	4.258E+08	3.382E+08	2.672E+08
3.10E+01	9.193E+08	4.712E+08	3.050E+08	2.404E+08	1.887E+08
4.56E+01	6.326E+08	3.422E+08	2.237E+08	1.757E+08	1.375E+08
4.66E+01	4.204E+08	2.453E+08	1.628E+08	1.273E+08	9.919E+07
6.15E+01	2.930E+08	1.780E+08	1.191E+08	9.302E+07	7.232E+07
6.25E+01	2.048E+08	1.352E+08	9.168E+07	7.139E+07	5.532E+07
7.60E+01	1.548E+08	1.018E+08	6.931E+07	5.395E+07	4.183E+07
7.90E+01	1.589E+08	9.706E+07	6.505E+07	4.942E+07	3.720E+07
1.00E+02	1.990E+08	1.115E+08	7.082E+07	5.057E+07	3.496E+07

MANET					
Poloidal average specific activity (Bq/kg) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	1.684E+14	1.683E+14	1.679E+14	1.662E+14	1.612E+14
3.00E+00	1.608E+14	1.607E+14	1.603E+14	1.587E+14	1.539E+14
3.80E+00	1.547E+14	1.546E+14	1.542E+14	1.527E+14	1.480E+14
1.38E+01	4.931E+13	4.926E+13	4.912E+13	4.859E+13	4.695E+13
1.54E+01	2.048E+13	2.045E+13	2.039E+13	2.014E+13	1.935E+13
3.00E+01	1.038E+13	1.036E+13	1.033E+13	1.019E+13	9.749E+12
3.10E+01	5.599E+12	5.592E+12	5.572E+12	5.491E+12	5.217E+12
4.56E+01	3.581E+12	3.577E+12	3.564E+12	3.510E+12	3.324E+12
4.66E+01	2.344E+12	2.342E+12	2.333E+12	2.295E+12	2.165E+12
6.15E+01	1.607E+12	1.605E+12	1.600E+12	1.574E+12	1.483E+12
6.25E+01	1.315E+12	1.314E+12	1.310E+12	1.290E+12	1.220E+12
7.60E+01	9.450E+11	9.444E+11	9.414E+11	9.268E+11	8.748E+11
7.90E+01	1.148E+12	1.147E+12	1.144E+12	1.129E+12	1.071E+12
1.00E+02	1.557E+12	1.557E+12	1.553E+12	1.535E+12	1.466E+12
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	1.579E+14	1.454E+14	1.172E+14	1.017E+14	8.878E+13
3.00E+00	1.508E+14	1.388E+14	1.119E+14	9.709E+13	8.479E+13
3.80E+00	1.450E+14	1.335E+14	1.077E+14	9.338E+13	8.156E+13
1.38E+01	4.586E+13	4.193E+13	3.366E+13	2.900E+13	2.477E+13
1.54E+01	1.880E+13	1.697E+13	1.352E+13	1.152E+13	9.421E+12
3.00E+01	9.437E+12	8.464E+12	6.771E+12	5.771E+12	4.576E+12
3.10E+01	5.020E+12	4.447E+12	3.555E+12	3.014E+12	2.256E+12
4.56E+01	3.189E+12	2.806E+12	2.239E+12	1.891E+12	1.379E+12
4.66E+01	2.068E+12	1.803E+12	1.431E+12	1.200E+12	8.380E+11
6.15E+01	1.416E+12	1.235E+12	9.853E+11	8.294E+11	5.760E+11
6.25E+01	1.168E+12	1.016E+12	7.886E+11	6.508E+11	4.570E+11
7.60E+01	8.348E+11	7.129E+11	5.294E+11	4.193E+11	2.784E+11
7.90E+01	1.024E+12	8.472E+11	5.463E+11	3.741E+11	2.210E+11
1.00E+02	1.406E+12	1.154E+12	6.911E+11	4.331E+11	2.495E+11

MANET					
Poloidal average specific activity (Bq/kg) in the outboard upper part					
Distance to FW (cm)	Time after shutdown				
	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	5.843E+13	1.869E+13	5.132E+12	4.105E+11	1.018E+10
3.00E+00	5.581E+13	1.785E+13	4.902E+12	3.920E+11	9.720E+09
3.80E+00	5.368E+13	1.717E+13	4.715E+12	3.771E+11	9.349E+09
1.38E+01	1.602E+13	5.062E+12	1.392E+12	1.149E+11	4.685E+09
1.54E+01	5.972E+12	1.884E+12	5.201E+11	4.468E+10	2.710E+09
3.00E+01	2.890E+12	9.258E+11	2.567E+11	2.255E+10	1.626E+09
3.10E+01	1.405E+12	4.626E+11	1.290E+11	1.154E+10	9.623E+08
4.56E+01	8.573E+11	2.872E+11	8.029E+10	7.215E+09	6.258E+08
4.66E+01	5.149E+11	1.765E+11	4.950E+10	4.463E+09	4.024E+08
6.15E+01	3.558E+11	1.232E+11	3.453E+10	3.076E+09	2.668E+08
6.25E+01	2.838E+11	9.821E+10	2.750E+10	2.405E+09	1.794E+08
7.60E+01	1.704E+11	6.043E+10	1.715E+10	1.583E+09	1.294E+08
7.90E+01	1.252E+11	4.669E+10	1.427E+10	1.710E+09	1.452E+08
1.00E+02	1.323E+11	5.178E+10	1.720E+10	2.568E+09	2.187E+08
Distance to FW (cm)	Time after shutdown				
	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	5.940E+09	2.492E+09	1.618E+09	1.321E+09	1.044E+09
3.00E+00	5.673E+09	2.380E+09	1.545E+09	1.262E+09	9.977E+08
3.80E+00	5.456E+09	2.290E+09	1.487E+09	1.214E+09	9.597E+08
1.38E+01	3.040E+09	1.250E+09	7.783E+08	6.262E+08	4.961E+08
1.54E+01	1.885E+09	8.447E+08	5.306E+08	4.222E+08	3.335E+08
3.00E+01	1.167E+09	5.577E+08	3.546E+08	2.805E+08	2.209E+08
3.10E+01	7.211E+08	3.875E+08	2.526E+08	1.985E+08	1.555E+08
4.56E+01	4.785E+08	2.730E+08	1.798E+08	1.408E+08	1.098E+08
4.66E+01	3.160E+08	1.945E+08	1.299E+08	1.013E+08	7.879E+07
6.15E+01	2.117E+08	1.342E+08	9.007E+07	7.020E+07	5.447E+07
6.25E+01	1.424E+08	9.466E+07	6.419E+07	5.000E+07	3.875E+07
7.60E+01	1.012E+08	6.840E+07	4.675E+07	3.648E+07	2.836E+07
7.90E+01	9.560E+07	6.118E+07	4.174E+07	3.215E+07	2.463E+07
1.00E+02	1.236E+08	7.015E+07	4.496E+07	3.237E+07	2.266E+07

MANET					
Poloidal average specific activity (Bq/kg) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	3.935E+12	3.934E+12	3.925E+12	3.878E+12	3.706E+12
5.86E+01	4.870E+12	4.868E+12	4.855E+12	4.795E+12	4.574E+12
5.60E+01	6.595E+12	6.593E+12	6.575E+12	6.492E+12	6.193E+12
3.70E+01	5.137E+12	5.134E+12	5.119E+12	5.049E+12	4.801E+12
3.60E+01	5.064E+12	5.059E+12	5.043E+12	4.973E+12	4.732E+12
2.60E+01	6.707E+12	6.700E+12	6.679E+12	6.589E+12	6.287E+12
2.50E+01	1.012E+13	1.011E+13	1.008E+13	9.952E+12	9.532E+12
1.50E+01	1.634E+13	1.632E+13	1.627E+13	1.607E+13	1.543E+13
1.34E+01	2.984E+13	2.980E+13	2.972E+13	2.938E+13	2.833E+13
3.30E+00	5.472E+13	5.467E+13	5.452E+13	5.393E+13	5.209E+13
2.50E+00	5.618E+13	5.612E+13	5.597E+13	5.537E+13	5.347E+13
5.00E-01	5.779E+13	5.773E+13	5.758E+13	5.696E+13	5.501E+13
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	3.556E+12	2.916E+12	1.735E+12	1.079E+12	6.214E+11
5.86E+01	4.385E+12	3.610E+12	2.207E+12	1.421E+12	8.525E+11
5.60E+01	5.937E+12	4.888E+12	2.989E+12	1.926E+12	1.155E+12
3.70E+01	4.603E+12	3.891E+12	2.676E+12	1.979E+12	1.330E+12
3.60E+01	4.550E+12	3.956E+12	2.964E+12	2.383E+12	1.737E+12
2.60E+01	6.067E+12	5.370E+12	4.189E+12	3.492E+12	2.671E+12
2.50E+01	9.233E+12	8.263E+12	6.521E+12	5.507E+12	4.384E+12
1.50E+01	1.498E+13	1.347E+13	1.061E+13	8.966E+12	7.270E+12
1.34E+01	2.760E+13	2.501E+13	1.984E+13	1.690E+13	1.413E+13
3.30E+00	5.082E+13	4.610E+13	3.626E+13	3.075E+13	2.600E+13
2.50E+00	5.217E+13	4.733E+13	3.723E+13	3.157E+13	2.669E+13
5.00E-01	5.367E+13	4.869E+13	3.829E+13	3.247E+13	2.746E+13

MANET					
Poloidal average specific activity (Bq/kg) in the lower divertor					
Distance to FW (cm)	Time after shutdown				
	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	3.271E+11	1.299E+11	4.429E+10	6.984E+09	5.856E+08
5.86E+01	4.769E+11	1.797E+11	5.816E+10	8.194E+09	6.659E+08
5.60E+01	6.456E+11	2.432E+11	7.872E+10	1.109E+10	9.010E+08
3.70E+01	7.977E+11	2.775E+11	8.158E+10	8.771E+09	6.863E+08
3.60E+01	1.079E+12	3.603E+11	1.017E+11	9.423E+09	7.048E+08
2.60E+01	1.677E+12	5.482E+11	1.528E+11	1.348E+10	9.170E+08
2.50E+01	2.784E+12	8.981E+11	2.489E+11	2.148E+10	1.313E+09
1.50E+01	4.626E+12	1.479E+12	4.090E+11	3.494E+10	1.916E+09
1.34E+01	9.100E+12	2.897E+12	7.991E+11	6.686E+10	2.977E+09
3.30E+00	1.683E+13	5.365E+12	1.480E+12	1.227E+11	4.518E+09
2.50E+00	1.728E+13	5.508E+12	1.519E+12	1.260E+11	4.638E+09
5.00E-01	1.778E+13	5.666E+12	1.563E+12	1.296E+11	4.770E+09
Distance to FW (cm)	Time after shutdown				
	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	3.145E+08	1.700E+08	1.076E+08	7.624E+07	5.218E+07
5.86E+01	3.739E+08	2.058E+08	1.363E+08	1.024E+08	7.602E+07
5.60E+01	5.059E+08	2.786E+08	1.844E+08	1.385E+08	1.028E+08
3.70E+01	4.556E+08	2.653E+08	1.787E+08	1.393E+08	1.081E+08
3.60E+01	5.095E+08	2.879E+08	1.913E+08	1.503E+08	1.177E+08
2.60E+01	6.674E+08	3.620E+08	2.377E+08	1.871E+08	1.465E+08
2.50E+01	9.352E+08	4.711E+08	3.048E+08	2.410E+08	1.893E+08
1.50E+01	1.332E+09	6.482E+08	4.181E+08	3.320E+08	2.616E+08
1.34E+01	1.979E+09	8.982E+08	5.744E+08	4.598E+08	3.638E+08
3.30E+00	2.867E+09	1.295E+09	8.372E+08	6.726E+08	5.318E+08
2.50E+00	2.943E+09	1.330E+09	8.594E+08	6.905E+08	5.459E+08
5.00E-01	3.027E+09	1.368E+09	8.840E+08	7.102E+08	5.614E+08

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	8.915E+12	4.582E+12	1.347E+12	1.294E+12	1.256E+12
3.20E+01	9.756E+12	5.014E+12	1.475E+12	1.417E+12	1.375E+12
2.90E+01	1.078E+13	5.538E+12	1.629E+12	1.565E+12	1.518E+12
2.50E+01	2.683E+13	1.304E+13	2.724E+12	2.562E+12	2.488E+12
2.10E+01	3.001E+13	1.458E+13	3.049E+12	2.869E+12	2.785E+12
1.80E+01	3.325E+13	1.615E+13	3.380E+12	3.180E+12	3.088E+12
1.34E+01	1.126E+14	5.264E+13	7.777E+12	7.068E+12	6.854E+12
9.00E+00	1.245E+14	5.822E+13	8.647E+12	7.863E+12	7.625E+12
6.00E+00	1.346E+14	6.297E+13	9.394E+12	8.547E+12	8.287E+12
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	1.216E+12	9.262E+11	4.025E+11	1.604E+11	5.925E+09
3.20E+01	1.331E+12	1.014E+12	4.405E+11	1.755E+11	6.515E+09
2.90E+01	1.470E+12	1.120E+12	4.866E+11	1.939E+11	7.236E+09
2.50E+01	2.414E+12	1.918E+12	1.019E+12	5.345E+11	1.390E+10
2.10E+01	2.702E+12	2.147E+12	1.140E+12	5.978E+11	1.567E+10
1.80E+01	2.996E+12	2.379E+12	1.262E+12	6.623E+11	1.749E+10
1.34E+01	6.664E+12	5.590E+12	3.722E+12	2.451E+12	5.789E+10
9.00E+00	7.412E+12	6.207E+12	4.116E+12	2.710E+12	6.497E+10
6.00E+00	8.055E+12	6.735E+12	4.453E+12	2.931E+12	7.113E+10

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	1.509E+09	2.446E+08	1.040E+08	3.435E+07	1.352E+07
3.20E+01	1.675E+09	2.782E+08	1.179E+08	3.823E+07	1.479E+07
2.90E+01	1.880E+09	3.214E+08	1.358E+08	4.307E+07	1.633E+07
2.50E+01	2.640E+09	6.143E+08	2.529E+08	6.584E+07	1.995E+07
2.10E+01	3.030E+09	7.231E+08	2.971E+08	7.597E+07	2.234E+07
1.80E+01	3.444E+09	8.415E+08	3.452E+08	8.669E+07	2.477E+07
1.34E+01	9.196E+09	3.168E+09	1.268E+09	2.519E+08	4.417E+07
9.00E+00	1.062E+10	3.716E+09	1.487E+09	2.924E+08	4.942E+07
6.00E+00	1.189E+10	4.214E+09	1.686E+09	3.289E+08	5.400E+07
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	1.075E+07	6.412E+06	4.915E+06	4.163E+06	3.131E+06
3.20E+01	1.175E+07	7.001E+06	5.366E+06	4.545E+06	3.418E+06
2.90E+01	1.295E+07	7.711E+06	5.908E+06	5.004E+06	3.764E+06
2.50E+01	1.551E+07	9.032E+06	6.940E+06	5.970E+06	4.688E+06
2.10E+01	1.733E+07	1.008E+07	7.740E+06	6.659E+06	5.230E+06
1.80E+01	1.917E+07	1.114E+07	8.550E+06	7.355E+06	5.778E+06
1.34E+01	3.272E+07	1.881E+07	1.440E+07	1.282E+07	1.092E+07
9.00E+00	3.644E+07	2.085E+07	1.588E+07	1.414E+07	1.205E+07
6.00E+00	3.965E+07	2.260E+07	1.724E+07	1.525E+07	1.300E+07

Pb-17Li					
Specific activity (Bq/kg) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	1.794E+13	8.943E+12	2.221E+12	2.114E+12	2.051E+12
3.20E+01	1.957E+13	9.756E+12	2.423E+12	2.306E+12	2.238E+12
2.90E+01	2.142E+13	1.068E+13	2.653E+12	2.525E+12	2.450E+12
2.50E+01	5.300E+13	2.533E+13	4.653E+12	4.330E+12	4.203E+12
2.10E+01	5.885E+13	2.814E+13	5.177E+12	4.818E+12	4.677E+12
1.80E+01	6.446E+13	3.082E+13	5.681E+12	5.288E+12	5.133E+12
1.34E+01	2.002E+14	9.338E+13	1.349E+13	1.222E+13	1.184E+13
9.00E+00	2.148E+14	1.003E+14	1.459E+13	1.323E+13	1.282E+13
6.00E+00	2.255E+14	1.053E+14	1.540E+13	1.397E+13	1.354E+13
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	1.988E+12	1.543E+12	7.383E+11	3.417E+11	1.076E+10
3.20E+01	2.169E+12	1.683E+12	8.054E+11	3.728E+11	1.183E+10
2.90E+01	2.374E+12	1.843E+12	8.814E+11	4.080E+11	1.305E+10
2.50E+01	4.082E+12	3.305E+12	1.904E+12	1.091E+12	2.676E+10
2.10E+01	4.542E+12	3.676E+12	2.114E+12	1.212E+12	3.004E+10
1.80E+01	4.984E+12	4.032E+12	2.316E+12	1.327E+12	3.324E+10
1.34E+01	1.151E+13	9.651E+12	6.528E+12	4.430E+12	1.089E+11
9.00E+00	1.245E+13	1.042E+13	7.013E+12	4.757E+12	1.186E+11
6.00E+00	1.315E+13	1.098E+13	7.366E+12	4.996E+12	1.258E+11

Pb-17Li					
Specific activity (Bq/kg) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	2.579E+09	5.566E+08	2.305E+08	6.234E+07	1.976E+07
3.20E+01	2.876E+09	6.369E+08	2.632E+08	6.983E+07	2.156E+07
2.90E+01	3.225E+09	7.337E+08	3.026E+08	7.868E+07	2.361E+07
2.50E+01	4.773E+09	1.351E+09	5.484E+08	1.250E+08	3.030E+07
2.10E+01	5.483E+09	1.586E+09	6.432E+08	1.443E+08	3.379E+07
1.80E+01	6.198E+09	1.828E+09	7.405E+08	1.638E+08	3.717E+07
1.34E+01	1.700E+10	6.327E+09	2.528E+09	4.811E+08	7.291E+07
9.00E+00	1.890E+10	7.102E+09	2.838E+09	5.371E+08	7.950E+07
6.00E+00	2.033E+10	7.692E+09	3.074E+09	5.797E+08	8.442E+07
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	1.543E+07	9.054E+06	6.938E+06	5.910E+06	4.519E+06
3.20E+01	1.681E+07	9.849E+06	7.545E+06	6.427E+06	4.915E+06
2.90E+01	1.836E+07	1.074E+07	8.228E+06	7.009E+06	5.361E+06
2.50E+01	2.308E+07	1.313E+07	1.012E+07	8.800E+06	7.112E+06
2.10E+01	2.565E+07	1.465E+07	1.120E+07	9.742E+06	7.875E+06
1.80E+01	2.812E+07	1.603E+07	1.223E+07	1.064E+07	8.603E+06
1.34E+01	5.306E+07	2.975E+07	2.213E+07	1.964E+07	1.715E+07
9.00E+00	5.765E+07	3.216E+07	2.375E+07	2.104E+07	1.837E+07
6.00E+00	6.107E+07	3.393E+07	2.492E+07	2.206E+07	1.926E+07

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
6.80E+00	2.281E+14	1.064E+14	1.535E+13	1.390E+13	1.346E+13
9.80E+00	2.152E+14	1.003E+14	1.438E+13	1.301E+13	1.261E+13
1.38E+01	1.983E+14	9.237E+13	1.313E+13	1.187E+13	1.150E+13
2.00E+01	5.572E+13	2.669E+13	4.989E+12	4.651E+12	4.515E+12
2.50E+01	4.703E+13	2.252E+13	4.199E+12	3.913E+12	3.799E+12
3.00E+01	3.931E+13	1.882E+13	3.502E+12	3.263E+12	3.168E+12
3.60E+01	1.152E+13	5.914E+12	1.729E+12	1.662E+12	1.614E+12
4.10E+01	9.434E+12	4.843E+12	1.416E+12	1.361E+12	1.322E+12
4.56E+01	7.823E+12	4.016E+12	1.174E+12	1.128E+12	1.096E+12
5.10E+01	2.888E+12	1.638E+12	7.062E+11	6.900E+11	6.698E+11
5.60E+01	2.348E+12	1.332E+12	5.742E+11	5.611E+11	5.446E+11
6.15E+01	1.868E+12	1.059E+12	4.568E+11	4.463E+11	4.332E+11
6.75E+01	8.268E+11	5.175E+11	2.875E+11	2.828E+11	2.741E+11
7.25E+01	6.613E+11	4.140E+11	2.300E+11	2.262E+11	2.193E+11
7.60E+01	5.630E+11	3.524E+11	1.958E+11	1.926E+11	1.867E+11
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
6.80E+00	1.308E+13	1.095E+13	7.414E+12	5.068E+12	1.270E+11
9.80E+00	1.225E+13	1.028E+13	6.988E+12	4.777E+12	1.183E+11
1.38E+01	1.118E+13	9.404E+12	6.432E+12	4.400E+12	1.072E+11
2.00E+01	4.384E+12	3.540E+12	2.015E+12	1.141E+12	2.786E+10
2.50E+01	3.689E+12	2.982E+12	1.700E+12	9.629E+11	2.317E+10
3.00E+01	3.076E+12	2.488E+12	1.421E+12	8.049E+11	1.911E+10
3.60E+01	1.564E+12	1.197E+12	5.272E+11	2.093E+11	6.783E+09
4.10E+01	1.280E+12	9.803E+11	4.317E+11	1.714E+11	5.517E+09
4.56E+01	1.062E+12	8.129E+11	3.580E+11	1.421E+11	4.551E+09
5.10E+01	6.475E+11	4.785E+11	1.727E+11	4.351E+10	2.453E+09
5.60E+01	5.265E+11	3.891E+11	1.404E+11	3.538E+10	1.990E+09
6.15E+01	4.188E+11	3.095E+11	1.117E+11	2.814E+10	1.579E+09
6.75E+01	2.645E+11	1.909E+11	6.026E+10	9.612E+09	1.107E+09
7.25E+01	2.116E+11	1.527E+11	4.820E+10	7.687E+09	8.847E+08
7.60E+01	1.802E+11	1.300E+11	4.104E+10	6.544E+09	7.527E+08

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
6.80E+00	2.019E+10	7.660E+09	3.060E+09	5.756E+08	8.336E+07
9.80E+00	1.848E+10	6.960E+09	2.780E+09	5.252E+08	7.753E+07
1.38E+01	1.636E+10	6.093E+09	2.433E+09	4.626E+08	7.015E+07
2.00E+01	4.852E+09	1.339E+09	5.447E+08	1.268E+08	3.194E+07
2.50E+01	3.908E+09	1.043E+09	4.250E+08	1.015E+08	2.681E+07
3.00E+01	3.128E+09	8.072E+08	3.295E+08	8.071E+07	2.231E+07
3.60E+01	1.540E+09	2.406E+08	1.034E+08	3.585E+07	1.463E+07
4.10E+01	1.238E+09	1.864E+08	8.049E+07	2.873E+07	1.199E+07
4.56E+01	1.011E+09	1.477E+08	6.407E+07	2.342E+07	9.950E+06
5.10E+01	7.133E+08	6.757E+07	3.108E+07	1.512E+07	7.680E+06
5.60E+01	5.768E+08	5.357E+07	2.475E+07	1.223E+07	6.252E+06
6.15E+01	4.565E+08	4.164E+07	1.932E+07	9.674E+06	4.979E+06
6.75E+01	3.704E+08	2.681E+07	1.280E+07	7.373E+06	4.050E+06
7.25E+01	2.957E+08	2.118E+07	1.015E+07	5.887E+06	3.243E+06
7.60E+01	2.514E+08	1.790E+07	8.590E+06	5.006E+06	2.763E+06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
6.80E+00	6.033E+07	3.363E+07	2.472E+07	2.192E+07	1.920E+07
9.80E+00	5.628E+07	3.151E+07	2.332E+07	2.071E+07	1.814E+07
1.38E+01	5.113E+07	2.880E+07	2.149E+07	1.912E+07	1.675E+07
2.00E+01	2.438E+07	1.389E+07	1.060E+07	9.215E+06	7.443E+06
2.50E+01	2.055E+07	1.169E+07	8.986E+06	7.811E+06	6.307E+06
3.00E+01	1.717E+07	9.795E+06	7.541E+06	6.556E+06	5.291E+06
3.60E+01	1.161E+07	6.820E+06	5.181E+06	4.387E+06	3.319E+06
4.10E+01	9.530E+06	5.605E+06	4.260E+06	3.607E+06	2.729E+06
4.56E+01	7.917E+06	4.661E+06	3.543E+06	3.000E+06	2.269E+06
5.10E+01	6.226E+06	3.791E+06	2.891E+06	2.427E+06	1.789E+06
5.60E+01	5.071E+06	3.090E+06	2.357E+06	1.979E+06	1.458E+06
6.15E+01	4.040E+06	2.463E+06	1.879E+06	1.578E+06	1.163E+06
6.75E+01	3.316E+06	2.067E+06	1.591E+06	1.335E+06	9.759E+05
7.25E+01	2.656E+06	1.656E+06	1.275E+06	1.070E+06	7.821E+05
7.60E+01	2.263E+06	1.412E+06	1.087E+06	9.119E+05	6.666E+05

Pb-17Li					
Specific activity (Bq/kg) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
6.80E+00	2.792E+14	1.303E+14	1.894E+13	1.715E+13	1.662E+13
9.80E+00	2.650E+14	1.236E+14	1.784E+13	1.615E+13	1.564E+13
1.38E+01	2.461E+14	1.147E+14	1.640E+13	1.483E+13	1.437E+13
2.00E+01	7.005E+13	3.344E+13	6.074E+12	5.646E+12	5.480E+12
2.50E+01	5.942E+13	2.835E+13	5.133E+12	4.770E+12	4.631E+12
3.00E+01	4.965E+13	2.368E+13	4.275E+12	3.971E+12	3.855E+12
3.60E+01	1.413E+13	7.211E+12	2.047E+12	1.964E+12	1.908E+12
4.10E+01	1.168E+13	5.959E+12	1.691E+12	1.623E+12	1.576E+12
4.56E+01	9.557E+12	4.878E+12	1.384E+12	1.328E+12	1.290E+12
5.10E+01	3.524E+12	1.974E+12	8.189E+11	7.992E+11	7.758E+11
5.60E+01	2.866E+12	1.606E+12	6.660E+11	6.500E+11	6.310E+11
6.15E+01	2.282E+12	1.278E+12	5.302E+11	5.174E+11	5.023E+11
6.75E+01	1.050E+12	6.404E+11	3.353E+11	3.292E+11	3.191E+11
7.25E+01	8.285E+11	5.052E+11	2.646E+11	2.597E+11	2.518E+11
7.60E+01	7.117E+11	4.340E+11	2.273E+11	2.231E+11	2.163E+11
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
6.80E+00	1.613E+13	1.345E+13	9.068E+12	6.246E+12	1.600E+11
9.80E+00	1.519E+13	1.269E+13	8.598E+12	5.924E+12	1.499E+11
1.38E+01	1.395E+13	1.169E+13	7.973E+12	5.496E+12	1.369E+11
2.00E+01	5.322E+12	4.316E+12	2.504E+12	1.449E+12	3.512E+10
2.50E+01	4.498E+12	3.651E+12	2.124E+12	1.229E+12	2.930E+10
3.00E+01	3.745E+12	3.043E+12	1.774E+12	1.027E+12	2.411E+10
3.60E+01	1.848E+12	1.420E+12	6.365E+11	2.600E+11	8.114E+09
4.10E+01	1.527E+12	1.174E+12	5.261E+11	2.149E+11	6.656E+09
4.56E+01	1.250E+12	9.604E+11	4.306E+11	1.759E+11	5.413E+09
5.10E+01	7.502E+11	5.563E+11	2.046E+11	5.414E+10	2.844E+09
5.60E+01	6.102E+11	4.525E+11	1.664E+11	4.403E+10	2.306E+09
6.15E+01	4.857E+11	3.602E+11	1.325E+11	3.504E+10	1.830E+09
6.75E+01	3.081E+11	2.238E+11	7.323E+10	1.346E+10	1.282E+09
7.25E+01	2.431E+11	1.765E+11	5.777E+10	1.062E+10	1.010E+09
7.60E+01	2.088E+11	1.516E+11	4.963E+10	9.117E+09	8.667E+08

Pb-17Li					
Specific activity (Bq/kg) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
6.80E+00	2.480E+10	9.570E+09	3.823E+09	7.154E+08	1.019E+08
9.80E+00	2.291E+10	8.780E+09	3.507E+09	6.584E+08	9.523E+07
1.38E+01	2.048E+10	7.777E+09	3.105E+09	5.859E+08	8.662E+07
2.00E+01	6.033E+09	1.757E+09	7.123E+08	1.599E+08	3.751E+07
2.50E+01	4.866E+09	1.373E+09	5.573E+08	1.282E+08	3.159E+07
3.00E+01	3.872E+09	1.056E+09	4.296E+08	1.013E+08	2.622E+07
3.60E+01	1.794E+09	2.995E+08	1.278E+08	4.242E+07	1.663E+07
4.10E+01	1.452E+09	2.335E+08	1.002E+08	3.422E+07	1.376E+07
4.56E+01	1.166E+09	1.812E+08	7.811E+07	2.742E+07	1.127E+07
5.10E+01	8.064E+08	8.066E+07	3.678E+07	1.726E+07	8.597E+06
5.60E+01	6.515E+08	6.370E+07	2.919E+07	1.394E+07	7.001E+06
6.15E+01	5.155E+08	4.937E+07	2.273E+07	1.102E+07	5.579E+06
6.75E+01	4.184E+08	3.191E+07	1.506E+07	8.354E+06	4.519E+06
7.25E+01	3.291E+08	2.474E+07	1.172E+07	6.571E+06	3.569E+06
7.60E+01	2.823E+08	2.105E+07	9.995E+06	5.635E+06	3.068E+06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
6.80E+00	7.366E+07	4.049E+07	2.902E+07	2.564E+07	2.263E+07
9.80E+00	6.901E+07	3.812E+07	2.753E+07	2.437E+07	2.151E+07
1.38E+01	6.298E+07	3.502E+07	2.555E+07	2.267E+07	2.002E+07
2.00E+01	2.841E+07	1.606E+07	1.222E+07	1.066E+07	8.695E+06
2.50E+01	2.404E+07	1.364E+07	1.041E+07	9.085E+06	7.406E+06
3.00E+01	2.004E+07	1.134E+07	8.735E+06	7.622E+06	6.211E+06
3.60E+01	1.314E+07	7.650E+06	5.803E+06	4.920E+06	3.738E+06
4.10E+01	1.088E+07	6.346E+06	4.815E+06	4.083E+06	3.102E+06
4.56E+01	8.928E+06	5.211E+06	3.956E+06	3.354E+06	2.548E+06
5.10E+01	6.953E+06	4.212E+06	3.208E+06	2.694E+06	1.989E+06
5.60E+01	5.665E+06	3.435E+06	2.616E+06	2.198E+06	1.622E+06
6.15E+01	4.517E+06	2.741E+06	2.088E+06	1.754E+06	1.295E+06
6.75E+01	3.693E+06	2.294E+06	1.764E+06	1.481E+06	1.084E+06
7.25E+01	2.918E+06	1.814E+06	1.395E+06	1.171E+06	8.574E+05
7.60E+01	2.508E+06	1.560E+06	1.200E+06	1.007E+06	7.374E+05

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	1.802E+12	9.977E+11	3.981E+11	3.874E+11	3.752E+11
2.50E+01	5.197E+12	2.680E+12	8.013E+11	7.706E+11	7.474E+11
1.34E+01	1.848E+13	8.959E+12	1.846E+12	1.733E+12	1.681E+12
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	3.624E+11	2.665E+11	9.696E+10	2.789E+10	1.801E+09
2.50E+01	7.232E+11	5.478E+11	2.343E+11	9.307E+10	3.637E+09
1.34E+01	1.630E+12	1.294E+12	6.913E+11	3.714E+11	1.052E+10

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	5.485E+08	5.104E+07	2.309E+07	1.109E+07	5.645E+06
2.50E+01	9.236E+08	1.208E+08	5.225E+07	1.986E+07	8.877E+06
1.34E+01	2.245E+09	5.027E+08	2.061E+08	5.352E+07	1.642E+07
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	4.601E+06	2.863E+06	2.216E+06	1.868E+06	1.377E+06
2.50E+01	7.178E+06	4.426E+06	3.418E+06	2.892E+06	2.163E+06
1.34E+01	1.293E+07	7.829E+06	6.083E+06	5.217E+06	4.038E+06

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
1.38E+01	4.357E+13	2.066E+13	3.538E+12	3.269E+12	3.172E+12
3.00E+01	7.844E+12	4.046E+12	1.211E+12	1.165E+12	1.130E+12
4.56E+01	1.896E+12	1.095E+12	4.979E+11	4.869E+11	4.722E+11
6.15E+01	6.272E+11	3.955E+11	2.233E+11	2.197E+11	2.129E+11
7.60E+01	2.372E+11	1.621E+11	1.064E+11	1.048E+11	1.012E+11
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
1.38E+01	3.081E+12	2.519E+12	1.513E+12	9.080E+11	2.255E+10
3.00E+01	1.094E+12	8.332E+11	3.598E+11	1.407E+11	5.028E+09
4.56E+01	4.563E+11	3.349E+11	1.169E+11	2.702E+10	1.850E+09
6.15E+01	2.054E+11	1.481E+11	4.629E+10	6.979E+09	8.748E+08
7.60E+01	9.755E+10	6.908E+10	1.961E+10	1.810E+09	5.091E+08

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
1.38E+01	4.273E+09	1.264E+09	5.105E+08	1.111E+08	2.460E+07
3.00E+01	1.232E+09	1.839E+08	7.895E+07	2.780E+07	1.155E+07
4.56E+01	5.663E+08	4.935E+07	2.280E+07	1.159E+07	6.023E+06
6.15E+01	2.947E+08	2.041E+07	9.759E+06	5.743E+06	3.200E+06
7.60E+01	1.833E+08	1.088E+07	5.218E+06	3.302E+06	1.893E+06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
1.38E+01	1.869E+07	1.089E+07	8.478E+06	7.388E+06	5.967E+06
3.00E+01	9.213E+06	5.501E+06	4.209E+06	3.562E+06	2.679E+06
4.56E+01	4.898E+06	3.009E+06	2.306E+06	1.937E+06	1.424E+06
6.15E+01	2.629E+06	1.654E+06	1.275E+06	1.070E+06	7.816E+05
7.60E+01	1.562E+06	9.955E+05	7.735E+05	6.500E+05	4.740E+05

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the lower divertor					
Distance to FW (cm)	Time after shutdown				
	0	1 sec	10 sec	1 min	5 min
3.60E+01	1.726E+12	9.549E+11	3.800E+11	3.695E+11	3.580E+11
2.50E+01	5.234E+12	2.680E+12	7.728E+11	7.418E+11	7.196E+11
1.34E+01	1.845E+13	8.918E+12	1.797E+12	1.684E+12	1.634E+12
Distance to FW (cm)	Time after shutdown				
	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	3.458E+11	2.547E+11	9.338E+10	2.719E+10	1.706E+09
2.50E+01	6.964E+11	5.301E+11	2.322E+11	9.557E+10	3.538E+09
1.34E+01	1.585E+12	1.261E+12	6.837E+11	3.728E+11	1.037E+10

Pb-17Li					
Poloidal average specific activity (Bq/kg) in the lower divertor					
Distance to FW (cm)	Time after shutdown				
	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	5.119E+08	4.776E+07	2.163E+07	1.037E+07	5.271E+06
2.50E+01	8.626E+08	1.168E+08	5.037E+07	1.877E+07	8.253E+06
1.34E+01	2.168E+09	4.996E+08	2.046E+08	5.229E+07	1.565E+07
Distance to FW (cm)	Time after shutdown				
	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	4.292E+06	2.664E+06	2.061E+06	1.737E+06	1.281E+06
2.50E+01	6.657E+06	4.084E+06	3.152E+06	2.670E+06	2.003E+06
1.34E+01	1.228E+07	7.400E+06	5.751E+06	4.939E+06	3.837E+06

II.III Contact γ -dose rate distribution in the poloidal segments

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	4.433E+03	4.432E+03	4.425E+03	4.391E+03	4.261E+03
5.86E+01	4.520E+03	4.517E+03	4.507E+03	4.468E+03	4.320E+03
5.60E+01	5.090E+03	5.086E+03	5.076E+03	5.031E+03	4.865E+03
4.90E+01	5.774E+03	5.770E+03	5.758E+03	5.707E+03	5.518E+03
4.30E+01	6.441E+03	6.437E+03	6.423E+03	6.366E+03	6.156E+03
3.70E+01	3.999E+03	3.991E+03	3.976E+03	3.926E+03	3.755E+03
3.60E+01	3.670E+03	3.657E+03	3.637E+03	3.581E+03	3.395E+03
3.20E+01	4.017E+03	4.003E+03	3.981E+03	3.919E+03	3.715E+03
2.90E+01	4.437E+03	4.421E+03	4.397E+03	4.329E+03	4.104E+03
2.60E+01	5.338E+03	5.316E+03	5.283E+03	5.196E+03	4.910E+03
2.50E+01	8.039E+03	8.007E+03	7.956E+03	7.821E+03	7.387E+03
2.10E+01	8.993E+03	8.957E+03	8.900E+03	8.749E+03	8.264E+03
1.80E+01	9.963E+03	9.923E+03	9.861E+03	9.693E+03	9.155E+03
1.50E+01	1.548E+04	1.542E+04	1.533E+04	1.507E+04	1.424E+04
1.34E+01	3.095E+04	3.085E+04	3.068E+04	3.015E+04	2.848E+04
9.00E+00	3.422E+04	3.411E+04	3.392E+04	3.334E+04	3.149E+04
6.00E+00	3.700E+04	3.688E+04	3.668E+04	3.605E+04	3.405E+04
3.30E+00	7.558E+04	7.541E+04	7.503E+04	7.373E+04	6.962E+04
2.50E+00	7.659E+04	7.642E+04	7.604E+04	7.472E+04	7.056E+04
5.00E-01	7.719E+04	7.702E+04	7.663E+04	7.530E+04	7.111E+04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	4.136E+03	3.315E+03	1.316E+03	2.848E+02	2.221E+02
5.86E+01	4.186E+03	3.351E+03	1.348E+03	3.139E+02	2.429E+02
5.60E+01	4.714E+03	3.773E+03	1.519E+03	3.542E+02	2.738E+02
4.90E+01	5.347E+03	4.281E+03	1.724E+03	4.026E+02	3.110E+02
4.30E+01	5.965E+03	4.775E+03	1.923E+03	4.501E+02	3.474E+02
3.70E+01	3.618E+03	2.897E+03	1.220E+03	3.527E+02	2.756E+02
3.60E+01	3.258E+03	2.625E+03	1.167E+03	4.115E+02	3.335E+02
3.20E+01	3.566E+03	2.873E+03	1.278E+03	4.505E+02	3.650E+02
2.90E+01	3.939E+03	3.173E+03	1.412E+03	4.977E+02	4.032E+02
2.60E+01	4.709E+03	3.814E+03	1.742E+03	6.667E+02	5.532E+02
2.50E+01	7.087E+03	5.766E+03	2.665E+03	1.053E+03	8.918E+02
2.10E+01	7.928E+03	6.450E+03	2.981E+03	1.178E+03	9.975E+02
1.80E+01	8.783E+03	7.146E+03	3.302E+03	1.306E+03	1.105E+03
1.50E+01	1.366E+04	1.113E+04	5.130E+03	2.011E+03	1.719E+03
1.34E+01	2.734E+04	2.229E+04	1.016E+04	3.857E+03	3.318E+03
9.00E+00	3.023E+04	2.464E+04	1.123E+04	4.265E+03	3.669E+03
6.00E+00	3.268E+04	2.664E+04	1.214E+04	4.612E+03	3.967E+03
3.30E+00	6.682E+04	5.437E+04	2.434E+04	8.731E+03	7.501E+03
2.50E+00	6.772E+04	5.510E+04	2.466E+04	8.849E+03	7.602E+03
5.00E-01	6.825E+04	5.552E+04	2.486E+04	8.918E+03	7.662E+03

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	1.418E+02	8.233E+01	4.261E+01	1.145E+01	8.480E-01
5.86E+01	1.373E+02	6.902E+01	3.535E+01	9.500E+00	7.127E-01
5.60E+01	1.545E+02	7.766E+01	3.977E+01	1.069E+01	8.018E-01
4.90E+01	1.752E+02	8.801E+01	4.507E+01	1.211E+01	9.086E-01
4.30E+01	1.952E+02	9.807E+01	5.022E+01	1.350E+01	1.012E+00
3.70E+01	1.220E+02	3.430E+01	1.646E+01	4.427E+00	3.483E-01
3.60E+01	1.334E+02	1.546E+01	5.800E+00	1.554E+00	1.357E-01
3.20E+01	1.461E+02	1.692E+01	6.348E+00	1.701E+00	1.485E-01
2.90E+01	1.613E+02	1.869E+01	7.012E+00	1.879E+00	1.640E-01
2.60E+01	2.210E+02	1.563E+01	4.082E+00	1.079E+00	1.047E-01
2.50E+01	3.646E+02	2.146E+01	4.326E+00	1.118E+00	1.068E-01
2.10E+01	4.078E+02	2.400E+01	4.839E+00	1.250E+00	1.194E-01
1.80E+01	4.518E+02	2.659E+01	5.361E+00	1.385E+00	1.323E-01
1.50E+01	7.139E+02	3.993E+01	7.306E+00	1.862E+00	1.683E-01
1.34E+01	1.400E+03	7.569E+01	1.285E+01	3.230E+00	2.675E-01
9.00E+00	1.548E+03	8.368E+01	1.421E+01	3.570E+00	2.956E-01
6.00E+00	1.673E+03	9.047E+01	1.536E+01	3.859E+00	3.195E-01
3.30E+00	3.202E+03	1.784E+02	3.226E+01	8.131E+00	6.309E-01
2.50E+00	3.245E+03	1.808E+02	3.270E+01	8.239E+00	6.393E-01
5.00E-01	3.271E+03	1.822E+02	3.295E+01	8.303E+00	6.443E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	2.466E-01	2.647E-02	2.608E-02	2.599E-02	2.581E-02
5.86E+01	2.141E-01	3.159E-02	3.122E-02	3.112E-02	3.091E-02
5.60E+01	2.409E-01	3.550E-02	3.509E-02	3.498E-02	3.474E-02
4.90E+01	2.729E-01	4.018E-02	3.972E-02	3.958E-02	3.931E-02
4.30E+01	3.041E-01	4.472E-02	4.420E-02	4.405E-02	4.375E-02
3.70E+01	1.170E-01	3.220E-02	3.197E-02	3.186E-02	3.165E-02
3.60E+01	5.525E-02	2.575E-02	2.562E-02	2.553E-02	2.536E-02
3.20E+01	6.044E-02	2.816E-02	2.802E-02	2.792E-02	2.773E-02
2.90E+01	6.674E-02	3.108E-02	3.092E-02	3.081E-02	3.060E-02
2.60E+01	4.941E-02	2.913E-02	2.900E-02	2.891E-02	2.871E-02
2.50E+01	4.944E-02	2.840E-02	2.827E-02	2.817E-02	2.797E-02
2.10E+01	5.528E-02	3.173E-02	3.159E-02	3.148E-02	3.126E-02
1.80E+01	6.120E-02	3.512E-02	3.496E-02	3.484E-02	3.459E-02
1.50E+01	7.217E-02	3.693E-02	3.675E-02	3.662E-02	3.636E-02
1.34E+01	9.945E-02	3.787E-02	3.764E-02	3.750E-02	3.722E-02
9.00E+00	1.099E-01	4.181E-02	4.155E-02	4.140E-02	4.109E-02
6.00E+00	1.187E-01	4.514E-02	4.487E-02	4.470E-02	4.437E-02
3.30E+00	2.054E-01	4.960E-02	4.918E-02	4.897E-02	4.858E-02
2.50E+00	2.082E-01	5.025E-02	4.982E-02	4.961E-02	4.921E-02
5.00E-01	2.098E-01	5.063E-02	5.020E-02	4.999E-02	4.959E-02

MANET					
Contact γ -dase rate (Sv/h) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	6.321E+03	6.319E+03	6.309E+03	6.261E+03	6.073E+03
5.86E+01	6.590E+03	6.584E+03	6.569E+03	6.508E+03	6.286E+03
5.60E+01	7.352E+03	7.345E+03	7.328E+03	7.261E+03	7.013E+03
4.90E+01	8.279E+03	8.272E+03	8.253E+03	8.177E+03	7.898E+03
4.30E+01	9.114E+03	9.106E+03	9.085E+03	9.001E+03	8.694E+03
3.70E+01	6.335E+03	6.319E+03	6.293E+03	6.211E+03	5.932E+03
3.60E+01	6.529E+03	6.505E+03	6.468E+03	6.366E+03	6.033E+03
3.20E+01	7.123E+03	7.097E+03	7.056E+03	6.945E+03	6.582E+03
2.90E+01	7.796E+03	7.768E+03	7.723E+03	7.601E+03	7.204E+03
2.60E+01	9.900E+03	9.860E+03	9.799E+03	9.634E+03	9.105E+03
2.50E+01	1.515E+04	1.509E+04	1.500E+04	1.474E+04	1.393E+04
2.10E+01	1.682E+04	1.676E+04	1.666E+04	1.637E+04	1.546E+04
1.80E+01	1.843E+04	1.836E+04	1.825E+04	1.793E+04	1.694E+04
1.50E+01	2.858E+04	2.848E+04	2.832E+04	2.783E+04	2.629E+04
1.34E+01	5.408E+04	5.392E+04	5.362E+04	5.270E+04	4.977E+04
9.00E+00	5.804E+04	5.788E+04	5.756E+04	5.656E+04	5.342E+04
6.00E+00	6.093E+04	6.075E+04	6.042E+04	5.937E+04	5.607E+04
3.30E+00	1.149E+05	1.146E+05	1.140E+05	1.121E+05	1.058E+05
2.50E+00	1.146E+05	1.144E+05	1.138E+05	1.118E+05	1.056E+05
5.00E-01	1.147E+05	1.145E+05	1.139E+05	1.119E+05	1.056E+05
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	5.896E+03	4.725E+03	1.879E+03	4.090E+02	3.179E+02
5.86E+01	6.090E+03	4.881E+03	1.984E+03	4.863E+02	3.801E+02
5.60E+01	6.793E+03	5.445E+03	2.214E+03	5.437E+02	4.246E+02
4.90E+01	7.650E+03	6.132E+03	2.494E+03	6.138E+02	4.789E+02
4.30E+01	8.421E+03	6.751E+03	2.747E+03	6.772E+02	5.279E+02
3.70E+01	5.715E+03	4.595E+03	1.975E+03	6.187E+02	4.965E+02
3.60E+01	5.794E+03	4.689E+03	2.112E+03	7.752E+02	6.422E+02
3.20E+01	6.321E+03	5.115E+03	2.305E+03	8.459E+02	7.006E+02
2.90E+01	6.918E+03	5.599E+03	2.522E+03	9.259E+02	7.669E+02
2.60E+01	8.736E+03	7.103E+03	3.272E+03	1.282E+03	1.083E+03
2.50E+01	1.336E+04	1.089E+04	5.036E+03	1.992E+03	1.703E+03
2.10E+01	1.484E+04	1.210E+04	5.592E+03	2.212E+03	1.891E+03
1.80E+01	1.626E+04	1.325E+04	6.126E+03	2.423E+03	2.071E+03
1.50E+01	2.524E+04	2.059E+04	9.464E+03	3.685E+03	3.168E+03
1.34E+01	4.777E+04	3.894E+04	1.771E+04	6.677E+03	5.754E+03
9.00E+00	5.128E+04	4.180E+04	1.901E+04	7.168E+03	6.177E+03
6.00E+00	5.382E+04	4.388E+04	1.996E+04	7.525E+03	6.484E+03
3.30E+00	1.015E+05	8.259E+04	3.695E+04	1.322E+04	1.136E+04
2.50E+00	1.013E+05	8.243E+04	3.688E+04	1.320E+04	1.134E+04
5.00E-01	1.014E+05	8.249E+04	3.690E+04	1.321E+04	1.134E+04

MANET					
Contact γ -dase rate (Sv/h) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	2.002E+02	1.153E+02	5.963E+01	1.602E+01	1.187E+00
5.86E+01	2.085E+02	9.738E+01	4.956E+01	1.332E+01	9.988E-01
5.60E+01	2.324E+02	1.085E+02	5.522E+01	1.484E+01	1.113E+00
4.90E+01	2.614E+02	1.220E+02	6.210E+01	1.669E+01	1.252E+00
4.30E+01	2.876E+02	1.342E+02	6.828E+01	1.835E+01	1.376E+00
3.70E+01	2.183E+02	5.060E+01	2.349E+01	6.307E+00	4.936E-01
3.60E+01	2.614E+02	2.439E+01	8.096E+00	2.155E+00	1.869E-01
3.20E+01	2.851E+02	2.661E+01	8.833E+00	2.350E+00	2.039E-01
2.90E+01	3.120E+02	2.912E+01	9.667E+00	2.572E+00	2.231E-01
2.60E+01	4.426E+02	2.798E+01	6.325E+00	1.648E+00	1.534E-01
2.50E+01	7.060E+02	3.904E+01	6.976E+00	1.774E+00	1.612E-01
2.10E+01	7.839E+02	4.335E+01	7.746E+00	1.970E+00	1.789E-01
1.80E+01	8.587E+02	4.748E+01	8.484E+00	2.158E+00	1.959E-01
1.50E+01	1.328E+03	7.082E+01	1.165E+01	2.926E+00	2.522E-01
1.34E+01	2.439E+03	1.280E+02	2.024E+01	5.035E+00	4.044E-01
9.00E+00	2.618E+03	1.374E+02	2.173E+01	5.402E+00	4.338E-01
6.00E+00	2.749E+03	1.442E+02	2.280E+01	5.670E+00	4.553E-01
3.30E+00	4.857E+03	2.611E+02	4.365E+01	1.090E+01	8.346E-01
2.50E+00	4.847E+03	2.606E+02	4.357E+01	1.088E+01	8.330E-01
5.00E-01	4.851E+03	2.607E+02	4.359E+01	1.088E+01	8.335E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	3.454E-01	3.727E-02	3.672E-02	3.660E-02	3.635E-02
5.86E+01	3.000E-01	4.407E-02	4.356E-02	4.341E-02	4.312E-02
5.60E+01	3.342E-01	4.904E-02	4.847E-02	4.831E-02	4.798E-02
4.90E+01	3.757E-01	5.505E-02	5.442E-02	5.423E-02	5.386E-02
4.30E+01	4.130E-01	6.043E-02	5.974E-02	5.953E-02	5.913E-02
3.70E+01	1.638E-01	4.302E-02	4.271E-02	4.256E-02	4.227E-02
3.60E+01	7.529E-02	3.437E-02	3.419E-02	3.408E-02	3.384E-02
3.20E+01	8.210E-02	3.746E-02	3.727E-02	3.714E-02	3.688E-02
2.90E+01	8.981E-02	4.095E-02	4.074E-02	4.060E-02	4.032E-02
2.60E+01	6.858E-02	3.748E-02	3.730E-02	3.717E-02	3.691E-02
2.50E+01	6.966E-02	3.610E-02	3.593E-02	3.580E-02	3.554E-02
2.10E+01	7.730E-02	4.004E-02	3.985E-02	3.970E-02	3.942E-02
1.80E+01	8.462E-02	4.381E-02	4.360E-02	4.344E-02	4.313E-02
1.50E+01	1.005E-01	4.494E-02	4.470E-02	4.453E-02	4.421E-02
1.34E+01	1.417E-01	4.545E-02	4.513E-02	4.495E-02	4.460E-02
9.00E+00	1.520E-01	4.871E-02	4.837E-02	4.818E-02	4.781E-02
6.00E+00	1.595E-01	5.108E-02	5.072E-02	5.052E-02	5.013E-02
3.30E+00	2.639E-01	5.482E-02	5.428E-02	5.404E-02	5.357E-02
2.50E+00	2.634E-01	5.471E-02	5.418E-02	5.393E-02	5.347E-02
5.00E-01	2.635E-01	5.475E-02	5.421E-02	5.397E-02	5.350E-02

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	1.077E+05	1.074E+05	1.069E+05	1.050E+05	9.918E+04
3.00E+00	1.074E+05	1.071E+05	1.066E+05	1.047E+05	9.891E+04
3.80E+00	1.074E+05	1.072E+05	1.067E+05	1.048E+05	9.898E+04
6.80E+00	6.167E+04	6.150E+04	6.116E+04	6.010E+04	5.676E+04
9.80E+00	5.816E+04	5.800E+04	5.769E+04	5.669E+04	5.354E+04
1.38E+01	5.359E+04	5.344E+04	5.315E+04	5.223E+04	4.933E+04
1.54E+01	2.880E+04	2.871E+04	2.854E+04	2.805E+04	2.650E+04
2.00E+01	1.571E+04	1.564E+04	1.554E+04	1.528E+04	1.443E+04
2.50E+01	1.325E+04	1.320E+04	1.312E+04	1.289E+04	1.217E+04
3.00E+01	1.108E+04	1.103E+04	1.096E+04	1.078E+04	1.018E+04
3.10E+01	5.689E+03	5.663E+03	5.625E+03	5.527E+03	5.215E+03
3.60E+01	3.664E+03	3.647E+03	3.621E+03	3.558E+03	3.352E+03
4.10E+01	3.001E+03	2.986E+03	2.965E+03	2.913E+03	2.745E+03
4.56E+01	2.488E+03	2.476E+03	2.459E+03	2.416E+03	2.276E+03
4.66E+01	1.603E+03	1.596E+03	1.585E+03	1.557E+03	1.463E+03
5.10E+01	1.181E+03	1.176E+03	1.168E+03	1.147E+03	1.076E+03
5.60E+01	9.605E+02	9.563E+02	9.500E+02	9.326E+02	8.752E+02
6.15E+01	7.639E+02	7.606E+02	7.556E+02	7.418E+02	6.961E+02
6.25E+01	6.032E+02	6.013E+02	5.978E+02	5.870E+02	5.506E+02
6.75E+01	6.234E+02	6.220E+02	6.192E+02	6.095E+02	5.762E+02
7.25E+01	4.986E+02	4.975E+02	4.952E+02	4.875E+02	4.609E+02
7.60E+01	4.245E+02	4.236E+02	4.216E+02	4.151E+02	3.924E+02
7.90E+01	8.368E+02	8.362E+02	8.343E+02	8.259E+02	7.948E+02
1.00E+02	1.338E+03	1.337E+03	1.335E+03	1.324E+03	1.283E+03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	9.519E+04	7.746E+04	3.467E+04	1.243E+04	1.068E+04
3.00E+00	9.493E+04	7.725E+04	3.458E+04	1.240E+04	1.065E+04
3.80E+00	9.500E+04	7.730E+04	3.460E+04	1.241E+04	1.066E+04
6.80E+00	5.449E+04	4.441E+04	2.017E+04	7.576E+03	6.529E+03
9.80E+00	5.139E+04	4.189E+04	1.903E+04	7.144E+03	6.157E+03
1.38E+01	4.735E+04	3.860E+04	1.753E+04	6.581E+03	5.673E+03
1.54E+01	2.544E+04	2.075E+04	9.536E+03	3.709E+03	3.193E+03
2.00E+01	1.384E+04	1.129E+04	5.244E+03	2.102E+03	1.798E+03
2.50E+01	1.168E+04	9.529E+03	4.426E+03	1.773E+03	1.518E+03
3.00E+01	9.765E+03	7.966E+03	3.699E+03	1.482E+03	1.269E+03
3.10E+01	4.998E+03	4.065E+03	1.897E+03	7.707E+02	6.483E+02
3.60E+01	3.209E+03	2.599E+03	1.210E+03	4.879E+02	4.027E+02
4.10E+01	2.627E+03	2.128E+03	9.906E+02	3.994E+02	3.297E+02
4.56E+01	2.179E+03	1.765E+03	8.214E+02	3.311E+02	2.734E+02
4.66E+01	1.397E+03	1.122E+03	5.139E+02	1.980E+02	1.570E+02
5.10E+01	1.026E+03	8.188E+02	3.701E+02	1.371E+02	1.049E+02
5.60E+01	8.343E+02	6.657E+02	3.009E+02	1.114E+02	8.524E+01
6.15E+01	6.636E+02	5.295E+02	2.393E+02	8.856E+01	6.778E+01
6.25E+01	5.242E+02	4.141E+02	1.804E+02	5.905E+01	4.222E+01
6.75E+01	5.508E+02	4.347E+02	1.817E+02	5.071E+01	3.519E+01
7.25E+01	4.406E+02	3.477E+02	1.454E+02	4.053E+01	2.813E+01
7.60E+01	3.751E+02	2.960E+02	1.237E+02	3.450E+01	2.394E+01
7.90E+01	7.676E+02	6.101E+02	2.427E+02	5.292E+01	3.828E+01
1.00E+02	1.245E+03	9.961E+02	3.942E+02	8.345E+01	6.465E+01

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	4.570E+03	2.519E+02	4.456E+01	1.119E+01	8.578E-01
3.00E+00	4.558E+03	2.513E+02	4.444E+01	1.116E+01	8.555E-01
3.80E+00	4.561E+03	2.514E+02	4.447E+01	1.117E+01	8.561E-01
6.80E+00	2.770E+03	1.462E+02	2.343E+01	5.834E+00	4.653E-01
9.80E+00	2.612E+03	1.379E+02	2.211E+01	5.504E+00	4.390E-01
1.38E+01	2.407E+03	1.271E+02	2.038E+01	5.073E+00	4.047E-01
1.54E+01	1.341E+03	7.123E+01	1.161E+01	2.908E+00	2.472E-01
2.00E+01	7.449E+02	4.012E+01	6.771E+00	1.712E+00	1.573E-01
2.50E+01	6.287E+02	3.386E+01	5.715E+00	1.445E+00	1.328E-01
3.00E+01	5.256E+02	2.831E+01	4.778E+00	1.208E+00	1.111E-01
3.10E+01	2.612E+02	1.508E+01	2.945E+00	7.631E-01	7.841E-02
3.60E+01	1.577E+02	9.887E+00	2.217E+00	5.844E-01	6.357E-02
4.10E+01	1.291E+02	8.097E+00	1.815E+00	4.786E-01	5.207E-02
4.56E+01	1.071E+02	6.714E+00	1.505E+00	3.968E-01	4.319E-02
4.66E+01	5.799E+01	4.331E+00	1.204E+00	3.247E-01	3.778E-02
5.10E+01	3.658E+01	3.255E+00	1.052E+00	2.867E-01	3.384E-02
5.60E+01	2.975E+01	2.647E+00	8.555E-01	2.331E-01	2.752E-02
6.15E+01	2.366E+01	2.105E+00	6.804E-01	1.854E-01	2.189E-02
6.25E+01	1.327E+01	1.756E+00	7.025E-01	1.930E-01	2.219E-02
6.75E+01	1.168E+01	3.001E+00	1.424E+00	3.871E-01	3.602E-02
7.25E+01	9.340E+00	2.400E+00	1.139E+00	3.096E-01	2.881E-02
7.60E+01	7.952E+00	2.043E+00	9.694E-01	2.636E-01	2.453E-02
7.90E+01	1.967E+01	1.031E+01	5.300E+00	1.427E+00	1.102E-01
1.00E+02	4.051E+01	2.319E+01	1.199E+01	3.223E+00	2.398E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	2.715E-01	5.672E-02	5.618E-02	5.593E-02	5.546E-02
3.00E+00	2.707E-01	5.658E-02	5.603E-02	5.579E-02	5.532E-02
3.80E+00	2.709E-01	5.661E-02	5.607E-02	5.582E-02	5.535E-02
6.80E+00	1.607E-01	4.914E-02	4.878E-02	4.859E-02	4.821E-02
9.80E+00	1.517E-01	4.640E-02	4.607E-02	4.589E-02	4.553E-02
1.38E+01	1.399E-01	4.283E-02	4.252E-02	4.235E-02	4.202E-02
1.54E+01	9.628E-02	4.096E-02	4.073E-02	4.058E-02	4.028E-02
2.00E+01	6.910E-02	3.675E-02	3.657E-02	3.644E-02	3.618E-02
2.50E+01	5.838E-02	3.107E-02	3.092E-02	3.081E-02	3.059E-02
3.00E+01	4.884E-02	2.601E-02	2.589E-02	2.579E-02	2.561E-02
3.10E+01	3.956E-02	2.530E-02	2.519E-02	2.510E-02	2.493E-02
3.60E+01	3.401E-02	2.315E-02	2.306E-02	2.298E-02	2.282E-02
4.10E+01	2.787E-02	1.898E-02	1.890E-02	1.884E-02	1.871E-02
4.56E+01	2.313E-02	1.576E-02	1.569E-02	1.564E-02	1.553E-02
4.66E+01	2.149E-02	1.551E-02	1.545E-02	1.540E-02	1.529E-02
5.10E+01	1.949E-02	1.421E-02	1.416E-02	1.411E-02	1.401E-02
5.60E+01	1.585E-02	1.156E-02	1.152E-02	1.148E-02	1.140E-02
6.15E+01	1.262E-02	9.205E-03	9.169E-03	9.137E-03	9.075E-03
6.25E+01	1.250E-02	8.938E-03	8.902E-03	8.872E-03	8.811E-03
6.75E+01	1.610E-02	8.794E-03	8.754E-03	8.724E-03	8.665E-03
7.25E+01	1.288E-02	7.038E-03	7.006E-03	6.982E-03	6.934E-03
7.60E+01	1.097E-02	5.994E-03	5.966E-03	5.946E-03	5.905E-03
7.90E+01	3.547E-02	8.109E-03	8.043E-03	8.016E-03	7.961E-03
1.00E+02	7.060E-02	8.631E-03	8.516E-03	8.487E-03	8.429E-03

MANET					
Contact γ -dase rate (Sv/h) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	1.303E+05	1.300E+05	1.294E+05	1.271E+05	1.200E+05
3.00E+00	1.305E+05	1.303E+05	1.296E+05	1.273E+05	1.202E+05
3.80E+00	1.313E+05	1.311E+05	1.304E+05	1.281E+05	1.210E+05
6.80E+00	7.509E+04	7.488E+04	7.448E+04	7.319E+04	6.912E+04
9.80E+00	7.127E+04	7.107E+04	7.068E+04	6.946E+04	6.559E+04
1.38E+01	6.616E+04	6.598E+04	6.562E+04	6.449E+04	6.090E+04
1.54E+01	3.599E+04	3.587E+04	3.566E+04	3.505E+04	3.311E+04
2.00E+01	1.954E+04	1.947E+04	1.934E+04	1.901E+04	1.795E+04
2.50E+01	1.657E+04	1.651E+04	1.640E+04	1.612E+04	1.523E+04
3.00E+01	1.385E+04	1.379E+04	1.370E+04	1.347E+04	1.272E+04
3.10E+01	6.854E+03	6.821E+03	6.775E+03	6.657E+03	6.281E+03
3.60E+01	4.401E+03	4.379E+03	4.348E+03	4.272E+03	4.026E+03
4.10E+01	3.637E+03	3.619E+03	3.593E+03	3.530E+03	3.327E+03
4.56E+01	2.977E+03	2.962E+03	2.941E+03	2.889E+03	2.723E+03
4.66E+01	1.895E+03	1.886E+03	1.873E+03	1.840E+03	1.730E+03
5.10E+01	1.374E+03	1.368E+03	1.359E+03	1.334E+03	1.252E+03
5.60E+01	1.117E+03	1.112E+03	1.105E+03	1.085E+03	1.018E+03
6.15E+01	8.893E+02	8.853E+02	8.794E+02	8.633E+02	8.104E+02
6.25E+01	7.141E+02	7.117E+02	7.075E+02	6.947E+02	6.519E+02
6.75E+01	7.365E+02	7.347E+02	7.313E+02	7.201E+02	6.813E+02
7.25E+01	5.810E+02	5.796E+02	5.769E+02	5.681E+02	5.375E+02
7.60E+01	4.990E+02	4.978E+02	4.956E+02	4.879E+02	4.617E+02
7.90E+01	9.740E+02	9.732E+02	9.710E+02	9.614E+02	9.257E+02
1.00E+02	1.483E+03	1.483E+03	1.480E+03	1.469E+03	1.423E+03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	1.152E+05	9.371E+04	4.192E+04	1.500E+04	1.288E+04
3.00E+00	1.154E+05	9.388E+04	4.200E+04	1.502E+04	1.291E+04
3.80E+00	1.161E+05	9.447E+04	4.226E+04	1.512E+04	1.299E+04
6.80E+00	6.634E+04	5.408E+04	2.455E+04	9.207E+03	7.938E+03
9.80E+00	6.296E+04	5.133E+04	2.330E+04	8.737E+03	7.533E+03
1.38E+01	5.846E+04	4.765E+04	2.163E+04	8.109E+03	6.992E+03
1.54E+01	3.178E+04	2.593E+04	1.190E+04	4.614E+03	3.975E+03
2.00E+01	1.723E+04	1.406E+04	6.524E+03	2.609E+03	2.237E+03
2.50E+01	1.461E+04	1.192E+04	5.533E+03	2.213E+03	1.897E+03
3.00E+01	1.221E+04	9.961E+03	4.623E+03	1.849E+03	1.585E+03
3.10E+01	6.021E+03	4.903E+03	2.297E+03	9.430E+02	7.965E+02
3.60E+01	3.856E+03	3.128E+03	1.461E+03	5.949E+02	4.939E+02
4.10E+01	3.186E+03	2.585E+03	1.207E+03	4.915E+02	4.081E+02
4.56E+01	2.608E+03	2.116E+03	9.881E+02	4.022E+02	3.340E+02
4.66E+01	1.653E+03	1.331E+03	6.134E+02	2.406E+02	1.926E+02
5.10E+01	1.194E+03	9.551E+02	4.354E+02	1.653E+02	1.282E+02
5.60E+01	9.710E+02	7.767E+02	3.540E+02	1.344E+02	1.042E+02
6.15E+01	7.729E+02	6.182E+02	2.817E+02	1.069E+02	8.293E+01
6.25E+01	6.209E+02	4.919E+02	2.152E+02	7.161E+01	5.215E+01
6.75E+01	6.518E+02	5.154E+02	2.158E+02	6.055E+01	4.271E+01
7.25E+01	5.142E+02	4.066E+02	1.702E+02	4.774E+01	3.367E+01
7.60E+01	4.416E+02	3.493E+02	1.462E+02	4.099E+01	2.891E+01
7.90E+01	8.944E+02	7.113E+02	2.826E+02	6.108E+01	4.424E+01
1.00E+02	1.381E+03	1.106E+03	4.386E+02	9.432E+01	7.346E+01

MANET					
Contact γ -dase rate (Sv/h) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	5.517E+03	3.012E+02	5.215E+01	1.307E+01	9.943E-01
3.00E+00	5.528E+03	3.018E+02	5.225E+01	1.309E+01	9.962E-01
3.80E+00	5.562E+03	3.037E+02	5.257E+01	1.317E+01	1.002E+00
6.80E+00	3.374E+03	1.773E+02	2.811E+01	6.985E+00	5.507E-01
9.80E+00	3.201E+03	1.683E+02	2.668E+01	6.631E+00	5.229E-01
1.38E+01	2.972E+03	1.562E+02	2.478E+01	6.159E+00	4.857E-01
1.54E+01	1.674E+03	8.803E+01	1.400E+01	3.494E+00	2.926E-01
2.00E+01	9.295E+02	4.935E+01	8.046E+00	2.024E+00	1.829E-01
2.50E+01	7.884E+02	4.186E+01	6.825E+00	1.717E+00	1.552E-01
3.00E+01	6.588E+02	3.498E+01	5.703E+00	1.435E+00	1.298E-01
3.10E+01	3.225E+02	1.814E+01	3.367E+00	8.674E-01	8.833E-02
3.60E+01	1.949E+02	1.189E+01	2.553E+00	6.698E-01	7.183E-02
4.10E+01	1.611E+02	9.825E+00	2.110E+00	5.535E-01	5.938E-02
4.56E+01	1.319E+02	8.042E+00	1.727E+00	4.530E-01	4.862E-02
4.66E+01	7.193E+01	5.043E+00	1.311E+00	3.519E-01	4.117E-02
5.10E+01	4.556E+01	3.724E+00	1.127E+00	3.061E-01	3.653E-02
5.60E+01	3.705E+01	3.029E+00	9.162E-01	2.489E-01	2.972E-02
6.15E+01	2.950E+01	2.411E+00	7.292E-01	1.981E-01	2.366E-02
6.25E+01	1.687E+01	1.909E+00	7.131E-01	1.958E-01	2.317E-02
6.75E+01	1.438E+01	3.271E+00	1.518E+00	4.125E-01	3.871E-02
7.25E+01	1.134E+01	2.580E+00	1.197E+00	3.254E-01	3.054E-02
7.60E+01	9.744E+00	2.216E+00	1.028E+00	2.795E-01	2.623E-02
7.90E+01	2.260E+01	1.159E+01	5.947E+00	1.601E+00	1.235E-01
1.00E+02	4.632E+01	2.643E+01	1.366E+01	3.671E+00	2.728E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	3.095E-01	5.875E-02	5.813E-02	5.787E-02	5.736E-02
3.00E+00	3.101E-01	5.885E-02	5.823E-02	5.797E-02	5.747E-02
3.80E+00	3.120E-01	5.921E-02	5.858E-02	5.832E-02	5.781E-02
6.80E+00	1.857E-01	5.203E-02	5.163E-02	5.142E-02	5.100E-02
9.80E+00	1.764E-01	4.944E-02	4.906E-02	4.886E-02	4.847E-02
1.38E+01	1.639E-01	4.597E-02	4.562E-02	4.543E-02	4.507E-02
1.54E+01	1.110E-01	4.446E-02	4.420E-02	4.403E-02	4.370E-02
2.00E+01	7.846E-02	4.015E-02	3.995E-02	3.981E-02	3.952E-02
2.50E+01	6.662E-02	3.412E-02	3.395E-02	3.383E-02	3.359E-02
3.00E+01	5.572E-02	2.856E-02	2.842E-02	2.832E-02	2.811E-02
3.10E+01	4.412E-02	2.790E-02	2.778E-02	2.768E-02	2.749E-02
3.60E+01	3.789E-02	2.543E-02	2.533E-02	2.524E-02	2.507E-02
4.10E+01	3.134E-02	2.104E-02	2.096E-02	2.088E-02	2.074E-02
4.56E+01	2.567E-02	1.724E-02	1.717E-02	1.711E-02	1.699E-02
4.66E+01	2.354E-02	1.706E-02	1.699E-02	1.693E-02	1.681E-02
5.10E+01	2.123E-02	1.561E-02	1.555E-02	1.549E-02	1.539E-02
5.60E+01	1.728E-02	1.270E-02	1.265E-02	1.261E-02	1.252E-02
6.15E+01	1.376E-02	1.012E-02	1.008E-02	1.004E-02	9.976E-03
6.25E+01	1.337E-02	9.768E-03	9.730E-03	9.696E-03	9.630E-03
6.75E+01	1.750E-02	9.721E-03	9.677E-03	9.644E-03	9.578E-03
7.25E+01	1.381E-02	7.673E-03	7.638E-03	7.612E-03	7.560E-03
7.60E+01	1.186E-02	6.593E-03	6.563E-03	6.541E-03	6.496E-03
7.90E+01	3.970E-02	8.997E-03	8.924E-03	8.893E-03	8.833E-03
1.00E+02	8.004E-02	9.452E-03	9.322E-03	9.290E-03	9.227E-03

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	1.349E+03	1.349E+03	1.347E+03	1.337E+03	1.298E+03
5.86E+01	1.589E+03	1.589E+03	1.586E+03	1.573E+03	1.523E+03
5.60E+01	2.168E+03	2.167E+03	2.163E+03	2.146E+03	2.078E+03
3.70E+01	1.444E+03	1.442E+03	1.438E+03	1.422E+03	1.365E+03
3.60E+01	1.195E+03	1.193E+03	1.188E+03	1.171E+03	1.112E+03
2.60E+01	1.443E+03	1.439E+03	1.432E+03	1.409E+03	1.333E+03
2.50E+01	2.109E+03	2.102E+03	2.090E+03	2.056E+03	1.942E+03
1.50E+01	3.420E+03	3.410E+03	3.391E+03	3.336E+03	3.153E+03
1.34E+01	6.237E+03	6.218E+03	6.185E+03	6.084E+03	5.755E+03
3.30E+00	1.133E+04	1.130E+04	1.125E+04	1.107E+04	1.048E+04
2.50E+00	1.162E+04	1.159E+04	1.153E+04	1.135E+04	1.075E+04
5.00E-01	1.192E+04	1.189E+04	1.183E+04	1.164E+04	1.102E+04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	1.260E+03	1.010E+03	4.004E+02	8.582E+01	6.746E+01
5.86E+01	1.477E+03	1.181E+03	4.691E+02	1.015E+02	7.788E+01
5.60E+01	2.015E+03	1.611E+03	6.401E+02	1.387E+02	1.064E+02
3.70E+01	1.317E+03	1.048E+03	4.221E+02	9.871E+01	7.234E+01
3.60E+01	1.067E+03	8.487E+02	3.574E+02	1.029E+02	7.686E+01
2.60E+01	1.276E+03	1.018E+03	4.404E+02	1.409E+02	1.083E+02
2.50E+01	1.859E+03	1.493E+03	6.630E+02	2.325E+02	1.852E+02
1.50E+01	3.023E+03	2.435E+03	1.086E+03	3.860E+02	3.135E+02
1.34E+01	5.523E+03	4.468E+03	2.004E+03	7.243E+02	6.025E+02
3.30E+00	1.007E+04	8.152E+03	3.621E+03	1.270E+03	1.065E+03
2.50E+00	1.032E+04	8.359E+03	3.713E+03	1.302E+03	1.092E+03
5.00E-01	1.059E+04	8.574E+03	3.809E+03	1.336E+03	1.120E+03

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	4.409E+01	2.578E+01	1.335E+01	3.586E+00	2.654E-01
5.86E+01	4.679E+01	2.591E+01	1.337E+01	3.593E+00	2.689E-01
5.60E+01	6.377E+01	3.531E+01	1.821E+01	4.896E+00	3.664E-01
3.70E+01	3.318E+01	1.381E+01	6.961E+00	1.875E+00	1.476E-01
3.60E+01	2.929E+01	6.429E+00	2.957E+00	7.991E-01	6.936E-02
2.60E+01	4.016E+01	5.347E+00	2.135E+00	5.775E-01	5.529E-02
2.50E+01	7.096E+01	6.901E+00	2.358E+00	6.339E-01	6.196E-02
1.50E+01	1.230E+02	1.035E+01	3.188E+00	8.517E-01	8.289E-02
1.34E+01	2.451E+02	1.895E+01	5.419E+00	1.434E+00	1.301E-01
3.30E+00	4.434E+02	3.671E+01	1.113E+01	2.942E+00	2.491E-01
2.50E+00	4.547E+02	3.764E+01	1.141E+01	3.017E+00	2.555E-01
5.00E-01	4.664E+02	3.861E+01	1.171E+01	3.094E+00	2.620E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	7.700E-02	8.026E-03	7.903E-03	7.876E-03	7.823E-03
5.86E+01	8.034E-02	1.129E-02	1.116E-02	1.112E-02	1.105E-02
5.60E+01	1.095E-01	1.537E-02	1.519E-02	1.514E-02	1.503E-02
3.70E+01	4.957E-02	1.367E-02	1.357E-02	1.352E-02	1.343E-02
3.60E+01	2.795E-02	1.278E-02	1.271E-02	1.267E-02	1.258E-02
2.60E+01	2.566E-02	1.479E-02	1.472E-02	1.467E-02	1.457E-02
2.50E+01	2.950E-02	1.760E-02	1.752E-02	1.746E-02	1.734E-02
1.50E+01	3.927E-02	2.326E-02	2.316E-02	2.308E-02	2.292E-02
1.34E+01	5.613E-02	2.901E-02	2.887E-02	2.877E-02	2.857E-02
3.30E+00	9.636E-02	4.037E-02	4.015E-02	4.001E-02	3.973E-02
2.50E+00	9.880E-02	4.139E-02	4.116E-02	4.102E-02	4.073E-02
5.00E-01	1.013E-01	4.244E-02	4.220E-02	4.206E-02	4.176E-02

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	4.170E+04	4.160E+04	4.139E+04	4.069E+04	3.845E+04
3.00E+00	4.032E+04	4.023E+04	4.003E+04	3.934E+04	3.718E+04
3.80E+00	3.958E+04	3.949E+04	3.929E+04	3.862E+04	3.649E+04
1.38E+01	1.295E+04	1.290E+04	1.283E+04	1.262E+04	1.193E+04
1.54E+01	5.604E+03	5.582E+03	5.549E+03	5.460E+03	5.168E+03
3.00E+01	2.964E+03	2.952E+03	2.934E+03	2.887E+03	2.730E+03
3.10E+01	1.519E+03	1.514E+03	1.505E+03	1.480E+03	1.398E+03
4.56E+01	9.730E+02	9.696E+02	9.641E+02	9.479E+02	8.934E+02
4.66E+01	5.889E+02	5.872E+02	5.840E+02	5.740E+02	5.398E+02
6.15E+01	4.532E+02	4.522E+02	4.501E+02	4.425E+02	4.167E+02
6.25E+01	3.446E+02	3.440E+02	3.425E+02	3.367E+02	3.168E+02
7.60E+01	3.012E+02	3.008E+02	2.998E+02	2.954E+02	2.798E+02
7.90E+01	4.990E+02	4.987E+02	4.977E+02	4.929E+02	4.748E+02
1.00E+02	7.682E+02	7.680E+02	7.668E+02	7.608E+02	7.376E+02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	3.691E+04	3.001E+04	1.340E+04	4.779E+03	4.096E+03
3.00E+00	3.569E+04	2.902E+04	1.296E+04	4.621E+03	3.961E+03
3.80E+00	3.503E+04	2.848E+04	1.272E+04	4.536E+03	3.888E+03
1.38E+01	1.146E+04	9.322E+03	4.252E+03	1.619E+03	1.379E+03
1.54E+01	4.961E+03	4.022E+03	1.835E+03	6.993E+02	5.832E+02
3.00E+01	2.617E+03	2.112E+03	9.569E+02	3.571E+02	2.913E+02
3.10E+01	1.337E+03	1.070E+03	4.768E+02	1.689E+02	1.315E+02
4.56E+01	8.534E+02	6.789E+02	2.987E+02	1.015E+02	7.597E+01
4.66E+01	5.144E+02	4.062E+02	1.755E+02	5.581E+01	3.984E+01
6.15E+01	3.975E+02	3.134E+02	1.330E+02	3.953E+01	2.753E+01
6.25E+01	3.018E+02	2.371E+02	9.954E+01	2.823E+01	1.905E+01
7.60E+01	2.676E+02	2.104E+02	8.624E+01	2.197E+01	1.460E+01
7.90E+01	4.588E+02	3.646E+02	1.440E+02	3.006E+01	2.199E+01
1.00E+02	7.157E+02	5.727E+02	2.257E+02	4.660E+01	3.612E+01

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	1.742E+03	1.040E+02	2.139E+01	5.467E+00	4.347E-01
3.00E+00	1.685E+03	1.006E+02	2.068E+01	5.288E+00	4.204E-01
3.80E+00	1.654E+03	9.870E+01	2.031E+01	5.191E+00	4.127E-01
1.38E+01	5.745E+02	3.584E+01	7.929E+00	2.051E+00	1.777E-01
1.54E+01	2.368E+02	1.930E+01	5.784E+00	1.533E+00	1.364E-01
3.00E+01	1.158E+02	1.178E+01	4.132E+00	1.105E+00	9.886E-02
3.10E+01	4.956E+01	6.752E+00	2.718E+00	7.336E-01	6.767E-02
4.56E+01	2.685E+01	4.156E+00	1.751E+00	4.746E-01	4.532E-02
4.66E+01	1.391E+01	3.405E+00	1.601E+00	4.347E-01	3.976E-02
6.15E+01	9.400E+00	2.714E+00	1.311E+00	3.557E-01	3.194E-02
6.25E+01	5.873E+00	1.547E+00	7.379E-01	2.013E-01	1.960E-02
7.60E+01	5.188E+00	2.261E+00	1.146E+00	3.104E-01	2.652E-02
7.90E+01	1.233E+01	6.976E+00	3.605E+00	9.704E-01	7.415E-02
1.00E+02	2.280E+01	1.315E+01	6.801E+00	1.828E+00	1.359E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	1.492E-01	4.460E-02	4.428E-02	4.411E-02	4.378E-02
3.00E+00	1.443E-01	4.316E-02	4.285E-02	4.269E-02	4.236E-02
3.80E+00	1.417E-01	4.238E-02	4.208E-02	4.192E-02	4.160E-02
1.38E+01	7.140E-02	3.243E-02	3.226E-02	3.215E-02	3.192E-02
1.54E+01	5.719E-02	2.814E-02	2.801E-02	2.791E-02	2.772E-02
3.00E+01	4.177E-02	2.084E-02	2.074E-02	2.067E-02	2.053E-02
3.10E+01	2.989E-02	1.603E-02	1.596E-02	1.590E-02	1.580E-02
4.56E+01	2.096E-02	1.203E-02	1.198E-02	1.193E-02	1.185E-02
4.66E+01	1.735E-02	9.135E-03	9.092E-03	9.061E-03	8.999E-03
6.15E+01	1.357E-02	6.832E-03	6.800E-03	6.776E-03	6.730E-03
6.25E+01	9.283E-03	5.500E-03	5.476E-03	5.457E-03	5.420E-03
7.60E+01	1.041E-02	4.505E-03	4.482E-03	4.466E-03	4.436E-03
7.90E+01	2.330E-02	4.683E-03	4.641E-03	4.626E-03	4.594E-03
1.00E+02	3.990E-02	4.757E-03	4.692E-03	4.676E-03	4.644E-03

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	3.384E+04	3.376E+04	3.359E+04	3.302E+04	3.119E+04
3.00E+00	3.231E+04	3.224E+04	3.208E+04	3.153E+04	2.978E+04
3.80E+00	3.108E+04	3.100E+04	3.085E+04	3.032E+04	2.864E+04
1.38E+01	1.005E+04	1.002E+04	9.959E+03	9.791E+03	9.252E+03
1.54E+01	4.199E+03	4.182E+03	4.157E+03	4.087E+03	3.861E+03
3.00E+01	2.056E+03	2.047E+03	2.034E+03	1.999E+03	1.884E+03
3.10E+01	1.070E+03	1.066E+03	1.059E+03	1.040E+03	9.771E+02
4.56E+01	6.749E+02	6.726E+02	6.686E+02	6.566E+02	6.162E+02
4.66E+01	4.360E+02	4.348E+02	4.324E+02	4.245E+02	3.976E+02
6.15E+01	2.924E+02	2.916E+02	2.901E+02	2.847E+02	2.662E+02
6.25E+01	2.587E+02	2.583E+02	2.572E+02	2.529E+02	2.381E+02
7.60E+01	2.028E+02	2.025E+02	2.018E+02	1.989E+02	1.884E+02
7.90E+01	3.181E+02	3.179E+02	3.173E+02	3.142E+02	3.025E+02
1.00E+02	4.849E+02	4.848E+02	4.841E+02	4.804E+02	4.657E+02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	2.994E+04	2.433E+04	1.088E+04	3.894E+03	3.332E+03
3.00E+00	2.859E+04	2.323E+04	1.039E+04	3.718E+03	3.182E+03
3.80E+00	2.749E+04	2.234E+04	9.992E+03	3.575E+03	3.060E+03
1.38E+01	8.879E+03	7.219E+03	3.297E+03	1.260E+03	1.069E+03
1.54E+01	3.701E+03	2.995E+03	1.371E+03	5.280E+02	4.370E+02
3.00E+01	1.803E+03	1.451E+03	6.618E+02	2.521E+02	2.028E+02
3.10E+01	9.319E+02	7.422E+02	3.313E+02	1.179E+02	8.950E+01
4.56E+01	5.868E+02	4.647E+02	2.044E+02	6.926E+01	5.053E+01
4.66E+01	3.779E+02	2.967E+02	1.271E+02	3.915E+01	2.677E+01
6.15E+01	2.527E+02	1.978E+02	8.434E+01	2.547E+01	1.681E+01
6.25E+01	2.270E+02	1.784E+02	7.371E+01	1.947E+01	1.289E+01
7.60E+01	1.802E+02	1.414E+02	5.670E+01	1.289E+01	8.128E+00
7.90E+01	2.922E+02	2.317E+02	9.068E+01	1.785E+01	1.246E+01
1.00E+02	4.519E+02	3.613E+02	1.421E+02	2.893E+01	2.219E+01

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	1.410E+03	8.065E+01	1.539E+01	3.915E+00	3.219E-01
3.00E+00	1.346E+03	7.702E+01	1.470E+01	3.739E+00	3.074E-01
3.80E+00	1.294E+03	7.407E+01	1.414E+01	3.597E+00	2.957E-01
1.38E+01	4.410E+02	2.644E+01	5.500E+00	1.421E+00	1.304E-01
1.54E+01	1.734E+02	1.190E+01	3.002E+00	7.940E-01	8.044E-02
3.00E+01	7.724E+01	6.187E+00	1.833E+00	4.916E-01	5.165E-02
3.10E+01	3.118E+01	3.241E+00	1.155E+00	3.148E-01	3.503E-02
4.56E+01	1.644E+01	2.101E+00	8.281E-01	2.268E-01	2.536E-02
4.66E+01	7.773E+00	1.360E+00	5.962E-01	1.643E-01	1.869E-02
6.15E+01	4.398E+00	8.329E-01	3.731E-01	1.033E-01	1.224E-02
6.25E+01	3.578E+00	7.479E-01	3.421E-01	9.416E-02	1.037E-02
7.60E+01	2.387E+00	9.722E-01	4.903E-01	1.336E-01	1.245E-02
7.90E+01	6.411E+00	3.686E+00	1.908E+00	5.140E-01	3.993E-02
1.00E+02	1.392E+01	8.143E+00	4.217E+00	1.133E+00	8.448E-02
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	1.180E-01	4.332E-02	4.305E-02	4.288E-02	4.257E-02
3.00E+00	1.127E-01	4.140E-02	4.114E-02	4.098E-02	4.068E-02
3.80E+00	1.084E-01	3.984E-02	3.959E-02	3.944E-02	3.915E-02
1.38E+01	5.722E-02	3.037E-02	3.022E-02	3.012E-02	2.990E-02
1.54E+01	3.995E-02	2.509E-02	2.498E-02	2.489E-02	2.472E-02
3.00E+01	2.669E-02	1.752E-02	1.745E-02	1.739E-02	1.727E-02
3.10E+01	1.916E-02	1.333E-02	1.327E-02	1.323E-02	1.314E-02
4.56E+01	1.393E-02	9.725E-03	9.686E-03	9.653E-03	9.588E-03
4.66E+01	1.043E-02	7.391E-03	7.362E-03	7.337E-03	7.287E-03
6.15E+01	7.070E-03	5.169E-03	5.149E-03	5.132E-03	5.097E-03
6.25E+01	5.609E-03	3.863E-03	3.847E-03	3.834E-03	3.808E-03
7.60E+01	5.578E-03	3.056E-03	3.042E-03	3.032E-03	3.011E-03
7.90E+01	1.303E-02	3.175E-03	3.151E-03	3.140E-03	3.119E-03
1.00E+02	2.497E-02	3.180E-03	3.139E-03	3.128E-03	3.107E-03

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	1.239E+03	1.239E+03	1.237E+03	1.228E+03	1.192E+03
5.86E+01	1.480E+03	1.479E+03	1.476E+03	1.464E+03	1.418E+03
5.60E+01	2.003E+03	2.002E+03	1.999E+03	1.982E+03	1.920E+03
3.70E+01	1.320E+03	1.319E+03	1.315E+03	1.300E+03	1.247E+03
3.60E+01	1.123E+03	1.121E+03	1.116E+03	1.100E+03	1.045E+03
2.60E+01	1.384E+03	1.380E+03	1.373E+03	1.351E+03	1.277E+03
2.50E+01	2.069E+03	2.062E+03	2.051E+03	2.017E+03	1.906E+03
1.50E+01	3.398E+03	3.387E+03	3.368E+03	3.314E+03	3.135E+03
1.34E+01	6.189E+03	6.170E+03	6.137E+03	6.037E+03	5.714E+03
3.30E+00	1.164E+04	1.161E+04	1.155E+04	1.137E+04	1.078E+04
2.50E+00	1.195E+04	1.192E+04	1.186E+04	1.168E+04	1.107E+04
5.00E-01	1.229E+04	1.226E+04	1.220E+04	1.201E+04	1.139E+04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	1.157E+03	9.273E+02	3.679E+02	7.913E+01	6.217E+01
5.86E+01	1.375E+03	1.100E+03	4.371E+02	9.485E+01	7.289E+01
5.60E+01	1.862E+03	1.489E+03	5.918E+02	1.286E+02	9.879E+01
3.70E+01	1.203E+03	9.574E+02	3.885E+02	9.435E+01	7.012E+01
3.60E+01	1.003E+03	7.980E+02	3.364E+02	9.726E+01	7.294E+01
2.60E+01	1.223E+03	9.775E+02	4.271E+02	1.416E+02	1.101E+02
2.50E+01	1.826E+03	1.468E+03	6.526E+02	2.296E+02	1.841E+02
1.50E+01	3.007E+03	2.425E+03	1.083E+03	3.871E+02	3.163E+02
1.34E+01	5.485E+03	4.441E+03	1.994E+03	7.236E+02	6.035E+02
3.30E+00	1.036E+04	8.392E+03	3.723E+03	1.300E+03	1.093E+03
2.50E+00	1.064E+04	8.616E+03	3.822E+03	1.334E+03	1.122E+03
5.00E-01	1.094E+04	8.864E+03	3.932E+03	1.373E+03	1.154E+03

MANET					
Poloidal average contact γ -dase rate (Sv/h) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	4.064E+01	2.377E+01	1.231E+01	3.307E+00	2.448E-01
5.86E+01	4.376E+01	2.417E+01	1.246E+01	3.351E+00	2.508E-01
5.60E+01	5.920E+01	3.268E+01	1.686E+01	4.532E+00	3.392E-01
3.70E+01	3.321E+01	1.394E+01	7.027E+00	1.892E+00	1.479E-01
3.60E+01	2.819E+01	6.287E+00	2.901E+00	7.834E-01	6.740E-02
2.60E+01	4.162E+01	5.343E+00	2.101E+00	5.672E-01	5.332E-02
2.50E+01	7.107E+01	6.560E+00	2.166E+00	5.812E-01	5.677E-02
1.50E+01	1.258E+02	1.105E+01	3.518E+00	9.387E-01	8.751E-02
1.34E+01	2.467E+02	1.925E+01	5.551E+00	1.468E+00	1.309E-01
3.30E+00	4.586E+02	4.030E+01	1.280E+01	3.387E+00	2.796E-01
2.50E+00	4.708E+02	4.137E+01	1.315E+01	3.478E+00	2.871E-01
5.00E-01	4.843E+02	4.256E+01	1.352E+01	3.577E+00	2.953E-01
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	7.110E-02	7.494E-03	7.381E-03	7.355E-03	7.305E-03
5.86E+01	7.492E-02	1.053E-02	1.041E-02	1.037E-02	1.030E-02
5.60E+01	1.013E-01	1.423E-02	1.406E-02	1.401E-02	1.391E-02
3.70E+01	4.897E-02	1.273E-02	1.263E-02	1.259E-02	1.250E-02
3.60E+01	2.677E-02	1.188E-02	1.182E-02	1.178E-02	1.170E-02
2.60E+01	2.416E-02	1.347E-02	1.341E-02	1.336E-02	1.327E-02
2.50E+01	2.701E-02	1.609E-02	1.602E-02	1.597E-02	1.586E-02
1.50E+01	3.921E-02	2.150E-02	2.140E-02	2.132E-02	2.118E-02
1.34E+01	5.504E-02	2.723E-02	2.710E-02	2.700E-02	2.682E-02
3.30E+00	1.033E-01	3.869E-02	3.847E-02	3.833E-02	3.806E-02
2.50E+00	1.060E-01	3.971E-02	3.948E-02	3.934E-02	3.906E-02
5.00E-01	1.091E-01	4.083E-02	4.059E-02	4.045E-02	4.017E-02

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	2.420E+03	1.071E+03	7.476E+01	6.813E+01	6.441E+01
3.20E+01	2.649E+03	1.172E+03	8.183E+01	7.457E+01	7.051E+01
2.90E+01	2.926E+03	1.295E+03	9.040E+01	8.238E+01	7.789E+01
2.50E+01	7.593E+03	3.307E+03	1.411E+02	1.194E+02	1.112E+02
2.10E+01	8.492E+03	3.699E+03	1.581E+02	1.339E+02	1.246E+02
1.80E+01	9.407E+03	4.097E+03	1.754E+02	1.486E+02	1.384E+02
1.34E+01	3.275E+04	1.414E+04	3.913E+02	2.939E+02	2.657E+02
9.00E+00	3.619E+04	1.563E+04	4.384E+02	3.308E+02	2.994E+02
6.00E+00	3.912E+04	1.690E+04	4.794E+02	3.630E+02	3.289E+02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	6.082E+01	3.707E+01	5.256E+00	2.041E+00	8.468E-01
3.20E+01	6.657E+01	4.058E+01	5.750E+00	2.231E+00	9.244E-01
2.90E+01	7.354E+01	4.482E+01	6.348E+00	2.461E+00	1.018E+00
2.50E+01	1.042E+02	6.414E+01	1.091E+01	4.987E+00	1.061E+00
2.10E+01	1.169E+02	7.191E+01	1.221E+01	5.578E+00	1.185E+00
1.80E+01	1.298E+02	7.985E+01	1.354E+01	6.179E+00	1.310E+00
1.34E+01	2.459E+02	1.547E+02	3.588E+01	2.012E+01	1.811E+00
9.00E+00	2.772E+02	1.742E+02	4.000E+01	2.231E+01	2.014E+00
6.00E+00	3.047E+02	1.913E+02	4.355E+01	2.419E+01	2.189E+00

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	3.264E-01	7.176E-03	1.414E-03	1.238E-03	1.168E-03
3.20E+01	3.563E-01	7.833E-03	1.544E-03	1.351E-03	1.275E-03
2.90E+01	3.922E-01	8.624E-03	1.700E-03	1.487E-03	1.403E-03
2.50E+01	3.920E-01	9.133E-03	1.997E-03	1.582E-03	1.436E-03
2.10E+01	4.372E-01	1.019E-02	2.232E-03	1.794E-03	1.600E-03
1.80E+01	4.829E-01	1.127E-02	2.471E-03	1.985E-03	1.766E-03
1.34E+01	5.490E-01	1.581E-02	4.695E-03	3.178E-03	2.495E-03
9.00E+00	6.048E-01	1.755E-02	5.287E-03	3.593E-03	2.810E-03
6.00E+00	6.519E-01	1.904E-02	5.808E-03	3.959E-03	3.087E-03
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	1.148E-03	1.059E-03	9.022E-04	7.688E-04	5.583E-04
3.20E+01	1.252E-03	1.155E-03	9.844E-04	8.389E-04	6.092E-04
2.90E+01	1.378E-03	1.272E-03	1.083E-03	9.232E-04	6.705E-04
2.50E+01	1.407E-03	1.296E-03	1.103E-03	9.404E-04	6.833E-04
2.10E+01	1.568E-03	1.444E-03	1.230E-03	1.048E-03	7.614E-04
1.80E+01	1.731E-03	1.593E-03	1.357E-03	1.156E-03	8.402E-04
1.34E+01	2.366E-03	1.988E-03	1.575E-03	1.341E-03	9.761E-04
9.00E+00	2.658E-03	2.209E-03	1.734E-03	1.475E-03	1.074E-03
6.00E+00	2.913E-03	2.398E-03	1.896E-03	1.589E-03	1.156E-03

Pb-17Li					
Contact γ -dase rate (Sv/h) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	4.985E+03	2.187E+03	1.197E+02	1.058E+02	9.937E+01
3.20E+01	5.438E+03	2.385E+03	1.307E+02	1.155E+02	1.085E+02
2.90E+01	5.951E+03	2.610E+03	1.431E+02	1.264E+02	1.188E+02
2.50E+01	1.517E+04	6.581E+03	2.361E+02	1.922E+02	1.774E+02
2.10E+01	1.684E+04	7.307E+03	2.633E+02	2.147E+02	1.981E+02
1.80E+01	1.845E+04	8.003E+03	2.897E+02	2.364E+02	2.183E+02
1.34E+01	5.831E+04	2.519E+04	7.092E+02	5.340E+02	4.831E+02
9.00E+00	6.256E+04	2.703E+04	7.739E+02	5.859E+02	5.308E+02
6.00E+00	6.564E+04	2.837E+04	8.221E+02	6.247E+02	5.665E+02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	9.356E+01	5.725E+01	8.774E+00	3.678E+00	1.157E+00
3.20E+01	1.021E+02	6.249E+01	9.571E+00	4.009E+00	1.258E+00
2.90E+01	1.119E+02	6.845E+01	1.047E+01	4.382E+00	1.372E+00
2.50E+01	1.656E+02	1.026E+02	1.926E+01	9.489E+00	1.451E+00
2.10E+01	1.851E+02	1.146E+02	2.146E+01	1.055E+01	1.609E+00
1.80E+01	2.039E+02	1.262E+02	2.357E+01	1.156E+01	1.762E+00
1.34E+01	4.472E+02	2.812E+02	6.512E+01	3.651E+01	2.728E+00
9.00E+00	4.917E+02	3.089E+02	7.064E+01	3.936E+01	2.961E+00
6.00E+00	5.250E+02	3.296E+02	7.472E+01	4.144E+01	3.134E+00

Pb-17Li					
Contact γ -dase rate (Sv/h) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	4.398E-01	9.842E-03	1.990E-03	1.685E-03	1.568E-03
3.20E+01	4.782E-01	1.070E-02	2.165E-03	1.831E-03	1.704E-03
2.90E+01	5.213E-01	1.167E-02	2.360E-03	1.996E-03	1.857E-03
2.50E+01	5.124E-01	1.258E-02	2.987E-03	2.254E-03	1.958E-03
2.10E+01	5.670E-01	1.395E-02	3.329E-03	2.512E-03	2.177E-03
1.80E+01	6.190E-01	1.526E-02	3.661E-03	2.761E-03	2.389E-03
1.34E+01	6.922E-01	2.353E-02	8.554E-03	5.700E-03	4.180E-03
9.00E+00	7.410E-01	2.550E-02	9.438E-03	6.330E-03	4.631E-03
6.00E+00	7.764E-01	2.696E-02	1.011E-02	6.812E-03	4.974E-03
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	1.539E-03	1.419E-03	1.209E-03	1.030E-03	7.484E-04
3.20E+01	1.673E-03	1.542E-03	1.314E-03	1.120E-03	8.133E-04
2.90E+01	1.823E-03	1.681E-03	1.432E-03	1.220E-03	8.863E-04
2.50E+01	1.903E-03	1.690E-03	1.438E-03	1.225E-03	8.906E-04
2.10E+01	2.114E-03	1.900E-03	1.589E-03	1.354E-03	9.844E-04
1.80E+01	2.318E-03	2.077E-03	1.733E-03	1.477E-03	1.074E-03
1.34E+01	3.841E-03	2.866E-03	2.091E-03	1.716E-03	1.251E-03
9.00E+00	4.241E-03	3.118E-03	2.243E-03	1.835E-03	1.337E-03
6.00E+00	4.544E-03	3.305E-03	2.354E-03	1.920E-03	1.399E-03

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
6.80E+00	6.646E+04	2.872E+04	8.200E+02	6.200E+02	5.615E+02
9.80E+00	6.271E+04	2.709E+04	7.622E+02	5.735E+02	5.187E+02
1.38E+01	5.781E+04	2.496E+04	6.887E+02	5.148E+02	4.649E+02
2.00E+01	1.592E+04	6.911E+03	2.538E+02	2.079E+02	1.921E+02
2.50E+01	1.344E+04	5.833E+03	2.128E+02	1.740E+02	1.607E+02
3.00E+01	1.124E+04	4.877E+03	1.768E+02	1.444E+02	1.334E+02
3.60E+01	3.125E+03	1.381E+03	9.322E+01	8.456E+01	7.987E+01
4.10E+01	2.559E+03	1.131E+03	7.630E+01	6.921E+01	6.537E+01
4.56E+01	2.122E+03	9.379E+02	6.326E+01	5.737E+01	5.419E+01
5.10E+01	7.201E+02	3.293E+02	4.081E+01	3.891E+01	3.711E+01
5.60E+01	5.855E+02	2.677E+02	3.319E+01	3.164E+01	3.018E+01
6.15E+01	4.657E+02	2.130E+02	2.640E+01	2.517E+01	2.401E+01
6.75E+01	1.876E+02	8.992E+01	1.783E+01	1.738E+01	1.664E+01
7.25E+01	1.501E+02	7.193E+01	1.427E+01	1.390E+01	1.331E+01
7.60E+01	1.278E+02	6.124E+01	1.215E+01	1.184E+01	1.133E+01
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
6.80E+00	5.200E+02	3.269E+02	7.512E+01	4.198E+01	3.083E+00
9.80E+00	4.801E+02	3.021E+02	7.019E+01	3.944E+01	2.878E+00
1.38E+01	4.300E+02	2.708E+02	6.388E+01	3.616E+01	2.616E+00
2.00E+01	1.796E+02	1.110E+02	2.047E+01	9.935E+00	1.527E+00
2.50E+01	1.502E+02	9.291E+01	1.720E+01	8.374E+00	1.290E+00
3.00E+01	1.246E+02	7.708E+01	1.432E+01	6.993E+00	1.079E+00
3.60E+01	7.538E+01	4.590E+01	6.416E+00	2.407E+00	8.629E-01
4.10E+01	6.169E+01	3.757E+01	5.255E+00	1.974E+00	7.090E-01
4.56E+01	5.114E+01	3.114E+01	4.358E+00	1.638E+00	5.894E-01
5.10E+01	3.516E+01	2.129E+01	2.619E+00	8.353E-01	5.021E-01
5.60E+01	2.860E+01	1.732E+01	2.131E+00	6.802E-01	4.092E-01
6.15E+01	2.275E+01	1.378E+01	1.696E+00	5.418E-01	3.262E-01
6.75E+01	1.580E+01	9.561E+00	1.149E+00	3.650E-01	2.832E-01
7.25E+01	1.264E+01	7.649E+00	9.195E-01	2.924E-01	2.269E-01
7.60E+01	1.076E+01	6.513E+00	7.831E-01	2.492E-01	1.934E-01

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
6.80E+00	7.465E-01	2.646E-02	1.008E-02	6.754E-03	4.899E-03
9.80E+00	7.057E-01	2.474E-02	9.282E-03	6.181E-03	4.492E-03
1.38E+01	6.521E-01	2.254E-02	8.286E-03	5.475E-03	3.989E-03
2.00E+01	5.390E-01	1.323E-02	3.139E-03	2.370E-03	2.057E-03
2.50E+01	4.572E-01	1.119E-02	2.635E-03	1.990E-03	1.732E-03
3.00E+01	3.839E-01	9.372E-03	2.193E-03	1.656E-03	1.446E-03
3.60E+01	3.304E-01	7.329E-03	1.479E-03	1.280E-03	1.201E-03
4.10E+01	2.715E-01	6.024E-03	1.216E-03	1.053E-03	9.877E-04
4.56E+01	2.258E-01	5.009E-03	1.012E-03	8.761E-04	8.220E-04
5.10E+01	1.959E-01	4.242E-03	8.298E-04	7.554E-04	7.227E-04
5.60E+01	1.597E-01	3.457E-03	6.766E-04	6.160E-04	5.894E-04
6.15E+01	1.273E-01	2.756E-03	5.395E-04	4.912E-04	4.700E-04
6.75E+01	1.112E-01	2.388E-03	4.597E-04	4.247E-04	4.089E-04
7.25E+01	8.910E-02	1.914E-03	3.684E-04	3.404E-04	3.278E-04
7.60E+01	7.594E-02	1.631E-03	3.140E-04	2.902E-04	2.794E-04
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
6.80E+00	4.467E-03	3.224E-03	2.281E-03	1.857E-03	1.353E-03
9.80E+00	4.107E-03	3.004E-03	2.151E-03	1.757E-03	1.281E-03
1.38E+01	3.661E-03	2.724E-03	1.983E-03	1.627E-03	1.185E-03
2.00E+01	1.999E-03	1.799E-03	1.506E-03	1.284E-03	9.333E-04
2.50E+01	1.685E-03	1.504E-03	1.280E-03	1.091E-03	7.929E-04
3.00E+01	1.408E-03	1.265E-03	1.076E-03	9.172E-04	6.667E-04
3.60E+01	1.179E-03	1.088E-03	9.268E-04	7.898E-04	5.736E-04
4.10E+01	9.703E-04	8.949E-04	7.626E-04	6.498E-04	4.720E-04
4.56E+01	8.075E-04	7.448E-04	6.347E-04	5.408E-04	3.928E-04
5.10E+01	7.108E-04	6.560E-04	5.589E-04	4.763E-04	3.458E-04
5.60E+01	5.796E-04	5.349E-04	4.558E-04	3.884E-04	2.820E-04
6.15E+01	4.623E-04	4.266E-04	3.635E-04	3.097E-04	2.249E-04
6.75E+01	4.023E-04	3.713E-04	3.164E-04	2.696E-04	1.958E-04
7.25E+01	3.225E-04	2.976E-04	2.536E-04	2.161E-04	1.569E-04
7.60E+01	2.749E-04	2.537E-04	2.162E-04	1.842E-04	1.337E-04

Pb-17Li					
Contact γ -dase rate (Sv/h) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
6.80E+00	8.134E+04	3.517E+04	1.040E+03	7.943E+02	7.212E+02
9.80E+00	7.723E+04	3.338E+04	9.720E+02	7.386E+02	6.698E+02
1.38E+01	7.174E+04	3.100E+04	8.834E+02	6.667E+02	6.036E+02
2.00E+01	2.007E+04	8.703E+03	3.086E+02	2.505E+02	2.309E+02
2.50E+01	1.702E+04	7.383E+03	2.595E+02	2.102E+02	1.937E+02
3.00E+01	1.423E+04	6.169E+03	2.151E+02	1.739E+02	1.601E+02
3.60E+01	3.849E+03	1.698E+03	1.095E+02	9.873E+01	9.315E+01
4.10E+01	3.181E+03	1.403E+03	9.041E+01	8.154E+01	7.693E+01
4.56E+01	2.604E+03	1.149E+03	7.396E+01	6.670E+01	6.293E+01
5.10E+01	8.884E+02	4.042E+02	4.685E+01	4.450E+01	4.241E+01
5.60E+01	7.226E+02	3.288E+02	3.811E+01	3.620E+01	3.449E+01
6.15E+01	5.752E+02	2.617E+02	3.034E+01	2.882E+01	2.746E+01
6.75E+01	2.447E+02	1.156E+02	2.038E+01	1.976E+01	1.890E+01
7.25E+01	1.931E+02	9.122E+01	1.608E+01	1.559E+01	1.491E+01
7.60E+01	1.658E+02	7.836E+01	1.381E+01	1.339E+01	1.281E+01
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
6.80E+00	6.687E+02	4.196E+02	9.442E+01	5.222E+01	3.693E+00
9.80E+00	6.206E+02	3.898E+02	8.870E+01	4.934E+01	3.462E+00
1.38E+01	5.589E+02	3.514E+02	8.123E+01	4.554E+01	3.162E+00
2.00E+01	2.156E+02	1.335E+02	2.521E+01	1.243E+01	1.727E+00
2.50E+01	1.808E+02	1.120E+02	2.126E+01	1.053E+01	1.465E+00
3.00E+01	1.495E+02	9.263E+01	1.767E+01	8.780E+00	1.224E+00
3.60E+01	8.786E+01	5.352E+01	7.574E+00	2.876E+00	9.611E-01
4.10E+01	7.256E+01	4.420E+01	6.260E+00	2.380E+00	7.970E-01
4.56E+01	5.935E+01	3.616E+01	5.124E+00	1.950E+00	6.543E-01
5.10E+01	4.017E+01	2.433E+01	3.014E+00	9.684E-01	5.569E-01
5.60E+01	3.268E+01	1.979E+01	2.453E+00	7.889E-01	4.541E-01
6.15E+01	2.601E+01	1.576E+01	1.953E+00	6.288E-01	3.622E-01
6.75E+01	1.794E+01	1.086E+01	1.322E+00	4.275E-01	3.167E-01
7.25E+01	1.415E+01	8.572E+00	1.043E+00	3.378E-01	2.503E-01
7.60E+01	1.216E+01	7.364E+00	8.966E-01	2.905E-01	2.153E-01

Pb-17Li					
Contact γ -dase rate (Sv/h) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
6.80E+00	8.087E-01	3.144E-02	1.312E-02	8.866E-03	6.304E-03
9.80E+00	7.690E-01	2.950E-02	1.212E-02	8.138E-03	5.794E-03
1.38E+01	7.158E-01	2.699E-02	1.085E-02	7.224E-03	5.153E-03
2.00E+01	5.969E-01	1.499E-02	3.691E-03	2.730E-03	2.328E-03
2.50E+01	5.089E-01	1.273E-02	3.102E-03	2.293E-03	1.963E-03
3.00E+01	4.273E-01	1.065E-02	2.571E-03	1.900E-03	1.632E-03
3.60E+01	3.665E-01	8.164E-03	1.655E-03	1.419E-03	1.326E-03
4.10E+01	3.041E-01	6.773E-03	1.374E-03	1.179E-03	1.102E-03
4.56E+01	2.497E-01	5.562E-03	1.128E-03	9.685E-04	9.054E-04
5.10E+01	2.170E-01	4.704E-03	9.205E-04	8.346E-04	7.974E-04
5.60E+01	1.769E-01	3.836E-03	7.508E-04	6.810E-04	6.506E-04
6.15E+01	1.412E-01	3.060E-03	5.993E-04	5.436E-04	5.194E-04
6.75E+01	1.242E-01	2.665E-03	5.092E-04	4.693E-04	4.513E-04
7.25E+01	9.821E-02	2.107E-03	4.026E-04	3.711E-04	3.569E-04
7.60E+01	8.446E-02	1.812E-03	3.463E-04	3.192E-04	3.070E-04
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
6.80E+00	5.666E-03	3.830E-03	2.534E-03	2.022E-03	1.474E-03
9.80E+00	5.221E-03	3.578E-03	2.402E-03	1.926E-03	1.404E-03
1.38E+01	4.661E-03	3.253E-03	2.227E-03	1.796E-03	1.309E-03
2.00E+01	2.253E-03	2.004E-03	1.664E-03	1.418E-03	1.031E-03
2.50E+01	1.903E-03	1.704E-03	1.421E-03	1.211E-03	8.807E-04
3.00E+01	1.585E-03	1.406E-03	1.195E-03	1.019E-03	7.406E-04
3.60E+01	1.303E-03	1.201E-03	1.023E-03	8.722E-04	6.335E-04
4.10E+01	1.082E-03	9.977E-04	8.501E-04	7.244E-04	5.262E-04
4.56E+01	8.893E-04	8.201E-04	6.988E-04	5.955E-04	4.325E-04
5.10E+01	7.842E-04	7.237E-04	6.166E-04	5.255E-04	3.815E-04
5.60E+01	6.398E-04	5.905E-04	5.031E-04	4.287E-04	3.113E-04
6.15E+01	5.108E-04	4.714E-04	4.016E-04	3.423E-04	2.485E-04
6.75E+01	4.440E-04	4.098E-04	3.492E-04	2.976E-04	2.161E-04
7.25E+01	3.511E-04	3.241E-04	2.761E-04	2.353E-04	1.709E-04
7.60E+01	3.020E-04	2.787E-04	2.375E-04	2.024E-04	1.469E-04

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	4.622E+02	2.102E+02	2.419E+01	2.300E+01	2.192E+01
2.50E+01	1.409E+03	6.248E+02	4.576E+01	4.190E+01	3.966E+01
1.34E+01	5.241E+03	2.283E+03	9.820E+01	8.320E+01	7.748E+01
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	2.078E+01	1.263E+01	1.668E+00	6.145E-01	3.945E-01
2.50E+01	3.746E+01	2.284E+01	3.247E+00	1.278E+00	5.795E-01
1.34E+01	7.267E+01	4.481E+01	7.818E+00	3.703E+00	9.654E-01

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	1.543E-01	3.331E-03	6.416E-04	5.843E-04	5.598E-04
2.50E+01	2.243E-01	4.918E-03	9.808E-04	8.725E-04	8.274E-04
1.34E+01	3.632E-01	8.254E-03	1.732E-03	1.442E-03	1.331E-03
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	5.507E-04	5.082E-04	4.330E-04	3.690E-04	2.679E-04
2.50E+01	8.133E-04	7.504E-04	6.394E-04	5.449E-04	3.957E-04
1.34E+01	1.306E-03	1.204E-03	1.026E-03	8.740E-04	6.349E-04

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
1.38E+01	1.254E+04	5.432E+03	1.796E+02	1.432E+02	1.315E+02
3.00E+01	2.123E+03	9.402E+02	6.690E+01	6.106E+01	5.775E+01
4.56E+01	4.658E+02	2.147E+02	2.941E+01	2.821E+01	2.694E+01
6.15E+01	1.412E+02	6.793E+01	1.388E+01	1.355E+01	1.297E+01
7.60E+01	4.901E+01	2.484E+01	7.027E+00	6.928E+00	6.647E+00
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
1.38E+01	1.226E+02	7.624E+01	1.529E+01	7.911E+00	1.228E+00
3.00E+01	5.453E+01	3.322E+01	4.648E+00	1.769E+00	7.225E-01
4.56E+01	2.554E+01	1.548E+01	1.914E+00	6.279E-01	4.156E-01
6.15E+01	1.232E+01	7.458E+00	9.004E-01	2.904E-01	2.298E-01
7.60E+01	6.318E+00	3.835E+00	4.800E-01	1.712E-01	1.506E-01

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
1.38E+01	4.367E-01	1.063E-02	2.476E-03	1.874E-03	1.636E-03
3.00E+01	2.783E-01	6.123E-03	1.209E-03	1.058E-03	9.978E-04
4.56E+01	1.626E-01	3.497E-03	6.663E-04	6.081E-04	5.831E-04
6.15E+01	9.025E-02	1.932E-03	3.683E-04	3.411E-04	3.286E-04
7.60E+01	5.926E-02	1.249E-03	2.244E-04	2.085E-04	2.012E-04
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
1.38E+01	1.593E-03	1.428E-03	1.215E-03	1.036E-03	7.528E-04
3.00E+01	9.805E-04	9.045E-04	7.707E-04	6.568E-04	4.770E-04
4.56E+01	5.736E-04	5.293E-04	4.511E-04	3.843E-04	2.791E-04
6.15E+01	3.233E-04	2.984E-04	2.542E-04	2.166E-04	1.573E-04
7.60E+01	1.980E-04	1.828E-04	1.558E-04	1.327E-04	9.635E-05

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
1.38E+01	9.643E+03	4.182E+03	1.482E+02	1.204E+02	1.110E+02
3.00E+01	1.470E+03	6.551E+02	5.357E+01	4.960E+01	4.704E+01
4.56E+01	3.071E+02	1.435E+02	2.285E+01	2.210E+01	2.113E+01
6.15E+01	9.071E+01	4.441E+01	1.028E+01	1.007E+01	9.656E+00
7.60E+01	3.561E+01	1.785E+01	4.764E+00	4.689E+00	4.497E+00
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
1.38E+01	1.037E+02	6.431E+01	1.234E+01	6.210E+00	1.117E+00
3.00E+01	4.448E+01	2.704E+01	3.634E+00	1.316E+00	6.086E-01
4.56E+01	2.004E+01	1.213E+01	1.466E+00	4.635E-01	3.299E-01
6.15E+01	9.171E+00	5.550E+00	6.604E-01	2.077E-01	1.701E-01
7.60E+01	4.274E+00	2.590E+00	3.173E-01	1.077E-01	9.282E-02

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
1.38E+01	4.056E-01	9.654E-03	2.183E-03	1.708E-03	1.495E-03
3.00E+01	2.355E-01	5.158E-03	1.025E-03	9.122E-04	8.653E-04
4.56E+01	1.292E-01	2.787E-03	5.438E-04	5.011E-04	4.816E-04
6.15E+01	6.685E-02	1.438E-03	2.815E-04	2.620E-04	2.527E-04
7.60E+01	3.652E-02	7.834E-04	1.517E-04	1.414E-04	1.365E-04
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
1.38E+01	1.463E-03	1.346E-03	1.146E-03	9.769E-04	7.099E-04
3.00E+01	8.506E-04	7.848E-04	6.687E-04	5.698E-04	4.138E-04
4.56E+01	4.737E-04	4.372E-04	3.726E-04	3.175E-04	2.305E-04
6.15E+01	2.486E-04	2.295E-04	1.955E-04	1.666E-04	1.210E-04
7.60E+01	1.343E-04	1.240E-04	1.056E-04	9.001E-05	6.535E-05

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the lower divertor					
Distance to FW (cm)	Time after shutdown				
	0	1 sec	10 sec	1 min	5 min
3.60E+01	4.426E+02	2.012E+02	2.294E+01	2.178E+01	2.076E+01
2.50E+01	1.427E+03	6.311E+02	4.365E+01	3.970E+01	3.751E+01
1.34E+01	5.242E+03	2.282E+03	9.515E+01	8.010E+01	7.448E+01
Distance to FW (cm)	Time after shutdown				
	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	1.967E+01	1.196E+01	1.580E+00	5.822E-01	3.685E-01
2.50E+01	3.541E+01	2.161E+01	3.118E+00	1.245E+00	5.305E-01
1.34E+01	6.980E+01	4.308E+01	7.628E+00	3.650E+00	9.047E-01

Pb-17Li					
Poloidal average contact γ -dase rate (Sv/h) in the lower divertor					
Distance to FW (cm)	Time after shutdown				
	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	1.441E-01	3.109E-03	5.965E-04	5.428E-04	5.199E-04
2.50E+01	2.048E-01	4.506E-03	9.038E-04	7.994E-04	7.564E-04
1.34E+01	3.392E-01	7.747E-03	1.637E-03	1.352E-03	1.243E-03
Distance to FW (cm)	Time after shutdown				
	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	5.114E-04	4.720E-04	4.022E-04	3.427E-04	2.488E-04
2.50E+01	7.434E-04	6.859E-04	5.844E-04	4.980E-04	3.617E-04
1.34E+01	1.220E-03	1.124E-03	9.577E-04	8.161E-04	5.929E-04

II.IV Afterheat density distribution in the poloidal segments

MANET					
Poloidal average afterheat power density (w/cm^3) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	2.903E-02	2.902E-02	2.895E-02	2.866E-02	2.771E-02
5.86E+01	2.967E-02	2.966E-02	2.957E-02	2.924E-02	2.815E-02
5.60E+01	3.343E-02	3.340E-02	3.331E-02	3.293E-02	3.170E-02
4.90E+01	3.793E-02	3.790E-02	3.779E-02	3.736E-02	3.596E-02
4.30E+01	4.232E-02	4.229E-02	4.216E-02	4.167E-02	4.011E-02
3.70E+01	2.636E-02	2.632E-02	2.621E-02	2.581E-02	2.450E-02
3.60E+01	2.409E-02	2.403E-02	2.390E-02	2.345E-02	2.201E-02
3.20E+01	2.637E-02	2.630E-02	2.616E-02	2.566E-02	2.409E-02
2.90E+01	2.913E-02	2.905E-02	2.889E-02	2.834E-02	2.661E-02
2.60E+01	3.485E-02	3.475E-02	3.454E-02	3.383E-02	3.163E-02
2.50E+01	5.216E-02	5.201E-02	5.169E-02	5.061E-02	4.727E-02
2.10E+01	5.835E-02	5.818E-02	5.782E-02	5.661E-02	5.288E-02
1.80E+01	6.465E-02	6.446E-02	6.406E-02	6.272E-02	5.858E-02
1.50E+01	1.002E-01	9.989E-02	9.929E-02	9.720E-02	9.082E-02
1.34E+01	1.999E-01	1.995E-01	1.983E-01	1.942E-01	1.814E-01
9.00E+00	2.211E-01	2.206E-01	2.193E-01	2.147E-01	2.005E-01
6.00E+00	2.390E-01	2.385E-01	2.371E-01	2.321E-01	2.168E-01
3.30E+00	4.890E-01	4.881E-01	4.854E-01	4.751E-01	4.438E-01
2.50E+00	4.955E-01	4.946E-01	4.919E-01	4.815E-01	4.498E-01
5.00E-01	4.994E-01	4.985E-01	4.958E-01	4.853E-01	4.533E-01
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	2.684E-02	2.139E-02	8.421E-03	1.689E-03	1.067E-03
5.86E+01	2.721E-02	2.164E-02	8.642E-03	1.885E-03	1.185E-03
5.60E+01	3.064E-02	2.437E-02	9.735E-03	2.126E-03	1.336E-03
4.90E+01	3.475E-02	2.765E-02	1.105E-02	2.417E-03	1.518E-03
4.30E+01	3.877E-02	3.084E-02	1.233E-02	2.703E-03	1.696E-03
3.70E+01	2.351E-02	1.867E-02	7.782E-03	2.107E-03	1.385E-03
3.60E+01	2.101E-02	1.676E-02	7.296E-03	2.360E-03	1.696E-03
3.20E+01	2.299E-02	1.834E-02	7.986E-03	2.584E-03	1.857E-03
2.90E+01	2.540E-02	2.026E-02	8.821E-03	2.855E-03	2.051E-03
2.60E+01	3.015E-02	2.416E-02	1.072E-02	3.715E-03	2.820E-03
2.50E+01	4.507E-02	3.628E-02	1.618E-02	5.718E-03	4.550E-03
2.10E+01	5.042E-02	4.058E-02	1.810E-02	6.396E-03	5.090E-03
1.80E+01	5.586E-02	4.496E-02	2.005E-02	7.087E-03	5.639E-03
1.50E+01	8.664E-02	6.986E-02	3.099E-02	1.078E-02	8.780E-03
1.34E+01	1.731E-01	1.397E-01	6.122E-02	2.045E-02	1.701E-02
9.00E+00	1.914E-01	1.544E-01	6.768E-02	2.262E-02	1.881E-02
6.00E+00	2.069E-01	1.670E-01	7.318E-02	2.446E-02	2.034E-02
3.30E+00	4.235E-01	3.413E-01	1.471E-01	4.623E-02	3.865E-02
2.50E+00	4.292E-01	3.459E-01	1.491E-01	4.686E-02	3.917E-02
5.00E-01	4.325E-01	3.486E-01	1.502E-01	4.722E-02	3.948E-02

MANET					
Poloidal average afterheat power density (w/cm^3) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	6.613E-04	3.817E-04	1.969E-04	5.280E-05	3.947E-06
5.86E+01	6.505E-04	3.222E-04	1.639E-04	4.389E-05	3.337E-06
5.60E+01	7.321E-04	3.625E-04	1.844E-04	4.938E-05	3.754E-06
4.90E+01	8.298E-04	4.108E-04	2.090E-04	5.596E-05	4.254E-06
4.30E+01	9.249E-04	4.578E-04	2.329E-04	6.236E-05	4.740E-06
3.70E+01	6.043E-04	1.664E-04	7.802E-05	2.065E-05	1.681E-06
3.60E+01	6.794E-04	8.306E-05	2.979E-05	7.517E-06	7.117E-07
3.20E+01	7.435E-04	9.090E-05	3.260E-05	8.227E-06	7.788E-07
2.90E+01	8.212E-04	1.004E-04	3.601E-05	9.087E-06	8.600E-07
2.60E+01	1.132E-03	9.208E-05	2.395E-05	5.549E-06	6.048E-07
2.50E+01	1.871E-03	1.320E-04	2.834E-05	6.041E-06	6.479E-07
2.10E+01	2.092E-03	1.477E-04	3.170E-05	6.757E-06	7.244E-07
1.80E+01	2.318E-03	1.636E-04	3.512E-05	7.485E-06	8.022E-07
1.50E+01	3.668E-03	2.498E-04	5.024E-05	1.023E-05	1.014E-06
1.34E+01	7.228E-03	4.877E-04	9.419E-05	1.810E-05	1.568E-06
9.00E+00	7.992E-03	5.391E-04	1.041E-04	2.000E-05	1.733E-06
6.00E+00	8.641E-03	5.829E-04	1.125E-04	2.162E-05	1.872E-06
3.30E+00	1.664E-02	1.172E-03	2.371E-04	4.501E-05	3.426E-06
2.50E+00	1.687E-02	1.188E-03	2.402E-04	4.561E-05	3.471E-06
5.00E-01	1.700E-02	1.197E-03	2.421E-04	4.596E-05	3.498E-06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	1.177E-06	1.592E-07	1.524E-07	1.495E-07	1.467E-07
5.86E+01	1.038E-06	1.888E-07	1.821E-07	1.792E-07	1.763E-07
5.60E+01	1.167E-06	2.123E-07	2.046E-07	2.015E-07	1.981E-07
4.90E+01	1.322E-06	2.403E-07	2.316E-07	2.280E-07	2.242E-07
4.30E+01	1.473E-06	2.675E-07	2.578E-07	2.538E-07	2.496E-07
3.70E+01	6.050E-07	1.964E-07	1.887E-07	1.857E-07	1.826E-07
3.60E+01	3.249E-07	1.617E-07	1.537E-07	1.510E-07	1.482E-07
3.20E+01	3.554E-07	1.769E-07	1.681E-07	1.651E-07	1.621E-07
2.90E+01	3.924E-07	1.952E-07	1.855E-07	1.823E-07	1.789E-07
2.60E+01	3.241E-07	1.877E-07	1.765E-07	1.731E-07	1.697E-07
2.50E+01	3.461E-07	1.889E-07	1.750E-07	1.713E-07	1.675E-07
2.10E+01	3.868E-07	2.111E-07	1.956E-07	1.914E-07	1.872E-07
1.80E+01	4.283E-07	2.337E-07	2.165E-07	2.119E-07	2.072E-07
1.50E+01	5.103E-07	2.523E-07	2.312E-07	2.258E-07	2.204E-07
1.34E+01	6.997E-07	2.763E-07	2.468E-07	2.398E-07	2.327E-07
9.00E+00	7.729E-07	3.050E-07	2.725E-07	2.648E-07	2.569E-07
6.00E+00	8.352E-07	3.295E-07	2.943E-07	2.860E-07	2.774E-07
3.30E+00	1.313E-06	3.895E-07	3.426E-07	3.303E-07	3.173E-07
2.50E+00	1.331E-06	3.946E-07	3.471E-07	3.346E-07	3.214E-07
5.00E-01	1.341E-06	3.976E-07	3.498E-07	3.372E-07	3.239E-07

MANET					
Afteheat power density (w/cm^3) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	4.143E-02	4.141E-02	4.130E-02	4.086E-02	3.949E-02
5.86E+01	4.325E-02	4.322E-02	4.308E-02	4.256E-02	4.091E-02
5.60E+01	4.826E-02	4.823E-02	4.807E-02	4.748E-02	4.564E-02
4.90E+01	5.437E-02	5.433E-02	5.414E-02	5.347E-02	5.140E-02
4.30E+01	5.988E-02	5.983E-02	5.961E-02	5.886E-02	5.658E-02
3.70E+01	4.157E-02	4.149E-02	4.130E-02	4.063E-02	3.851E-02
3.60E+01	4.261E-02	4.250E-02	4.226E-02	4.144E-02	3.888E-02
3.20E+01	4.649E-02	4.637E-02	4.611E-02	4.521E-02	4.242E-02
2.90E+01	5.089E-02	5.075E-02	5.046E-02	4.948E-02	4.642E-02
2.60E+01	6.429E-02	6.411E-02	6.371E-02	6.239E-02	5.832E-02
2.50E+01	9.799E-02	9.772E-02	9.712E-02	9.507E-02	8.881E-02
2.10E+01	1.088E-01	1.085E-01	1.079E-01	1.056E-01	9.862E-02
1.80E+01	1.192E-01	1.189E-01	1.182E-01	1.157E-01	1.080E-01
1.50E+01	1.846E-01	1.841E-01	1.830E-01	1.792E-01	1.674E-01
1.34E+01	3.492E-01	3.484E-01	3.464E-01	3.391E-01	3.167E-01
9.00E+00	3.748E-01	3.740E-01	3.719E-01	3.640E-01	3.399E-01
6.00E+00	3.935E-01	3.926E-01	3.904E-01	3.821E-01	3.568E-01
3.30E+00	7.431E-01	7.417E-01	7.377E-01	7.220E-01	6.741E-01
2.50E+00	7.416E-01	7.403E-01	7.362E-01	7.206E-01	6.728E-01
5.00E-01	7.421E-01	7.408E-01	7.367E-01	7.210E-01	6.732E-01
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	3.825E-02	3.049E-02	1.202E-02	2.426E-03	1.532E-03
5.86E+01	3.952E-02	3.147E-02	1.266E-02	2.884E-03	1.863E-03
5.60E+01	4.408E-02	3.511E-02	1.413E-02	3.224E-03	2.082E-03
4.90E+01	4.964E-02	3.954E-02	1.592E-02	3.640E-03	2.349E-03
4.30E+01	5.465E-02	4.353E-02	1.753E-02	4.016E-03	2.590E-03
3.70E+01	3.694E-02	2.944E-02	1.243E-02	3.578E-03	2.500E-03
3.60E+01	3.713E-02	2.975E-02	1.303E-02	4.326E-03	3.268E-03
3.20E+01	4.051E-02	3.245E-02	1.422E-02	4.720E-03	3.565E-03
2.90E+01	4.433E-02	3.552E-02	1.556E-02	5.167E-03	3.902E-03
2.60E+01	5.562E-02	4.474E-02	1.991E-02	6.986E-03	5.520E-03
2.50E+01	8.472E-02	6.833E-02	3.040E-02	1.067E-02	8.693E-03
2.10E+01	9.408E-02	7.588E-02	3.376E-02	1.185E-02	9.653E-03
1.80E+01	1.031E-01	8.312E-02	3.698E-02	1.298E-02	1.057E-02
1.50E+01	1.597E-01	1.290E-01	5.698E-02	1.957E-02	1.620E-02
1.34E+01	3.022E-01	2.440E-01	1.066E-01	3.527E-02	2.953E-02
9.00E+00	3.244E-01	2.619E-01	1.144E-01	3.786E-02	3.170E-02
6.00E+00	3.405E-01	2.749E-01	1.201E-01	3.975E-02	3.328E-02
3.30E+00	6.431E-01	5.184E-01	2.232E-01	6.988E-02	5.857E-02
2.50E+00	6.419E-01	5.174E-01	2.227E-01	6.974E-02	5.845E-02
5.00E-01	6.423E-01	5.177E-01	2.229E-01	6.979E-02	5.849E-02

MANET					
Afteheat power density (w/cm^3) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	9.345E-04	5.348E-04	2.757E-04	7.391E-05	5.527E-06
5.86E+01	9.936E-04	4.558E-04	2.302E-04	6.156E-05	4.681E-06
5.60E+01	1.108E-03	5.079E-04	2.565E-04	6.860E-05	5.216E-06
4.90E+01	1.246E-03	5.712E-04	2.885E-04	7.714E-05	5.865E-06
4.30E+01	1.371E-03	6.280E-04	3.171E-04	8.481E-05	6.448E-06
3.70E+01	1.087E-03	2.482E-04	1.121E-04	2.950E-05	2.389E-06
3.60E+01	1.333E-03	1.352E-04	4.313E-05	1.057E-05	9.971E-07
3.20E+01	1.454E-03	1.475E-04	4.705E-05	1.153E-05	1.087E-06
2.90E+01	1.591E-03	1.614E-04	5.149E-05	1.262E-05	1.190E-06
2.60E+01	2.267E-03	1.684E-04	3.916E-05	8.663E-06	9.007E-07
2.50E+01	3.626E-03	2.445E-04	4.846E-05	9.826E-06	9.908E-07
2.10E+01	4.026E-03	2.715E-04	5.380E-05	1.091E-05	1.100E-06
1.80E+01	4.410E-03	2.974E-04	5.893E-05	1.195E-05	1.204E-06
1.50E+01	6.833E-03	4.506E-04	8.491E-05	1.647E-05	1.534E-06
1.34E+01	1.261E-02	8.369E-04	1.554E-04	2.878E-05	2.376E-06
9.00E+00	1.354E-02	8.982E-04	1.668E-04	3.088E-05	2.549E-06
6.00E+00	1.421E-02	9.428E-04	1.750E-04	3.241E-05	2.675E-06
3.30E+00	2.527E-02	1.742E-03	3.371E-04	6.168E-05	4.561E-06
2.50E+00	2.522E-02	1.738E-03	3.365E-04	6.156E-05	4.552E-06
5.00E-01	2.524E-02	1.740E-03	3.367E-04	6.160E-05	4.555E-06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	1.650E-06	2.246E-07	2.149E-07	2.107E-07	2.066E-07
5.86E+01	1.456E-06	2.644E-07	2.545E-07	2.505E-07	2.463E-07
5.60E+01	1.623E-06	2.943E-07	2.832E-07	2.788E-07	2.741E-07
4.90E+01	1.824E-06	3.305E-07	3.180E-07	3.130E-07	3.077E-07
4.30E+01	2.005E-06	3.628E-07	3.492E-07	3.436E-07	3.378E-07
3.70E+01	8.519E-07	2.646E-07	2.533E-07	2.491E-07	2.448E-07
3.60E+01	4.545E-07	2.193E-07	2.068E-07	2.030E-07	1.991E-07
3.20E+01	4.956E-07	2.390E-07	2.255E-07	2.213E-07	2.170E-07
2.90E+01	5.421E-07	2.613E-07	2.465E-07	2.419E-07	2.373E-07
2.60E+01	4.644E-07	2.475E-07	2.301E-07	2.253E-07	2.205E-07
2.50E+01	5.047E-07	2.487E-07	2.268E-07	2.215E-07	2.162E-07
2.10E+01	5.600E-07	2.759E-07	2.516E-07	2.457E-07	2.397E-07
1.80E+01	6.130E-07	3.018E-07	2.753E-07	2.689E-07	2.623E-07
1.50E+01	7.333E-07	3.216E-07	2.891E-07	2.815E-07	2.738E-07
1.34E+01	1.015E-06	3.533E-07	3.084E-07	2.982E-07	2.877E-07
9.00E+00	1.089E-06	3.788E-07	3.306E-07	3.197E-07	3.084E-07
6.00E+00	1.143E-06	3.973E-07	3.467E-07	3.353E-07	3.234E-07
3.30E+00	1.714E-06	4.636E-07	3.993E-07	3.826E-07	3.648E-07
2.50E+00	1.711E-06	4.628E-07	3.986E-07	3.819E-07	3.641E-07
5.00E-01	1.712E-06	4.630E-07	3.988E-07	3.821E-07	3.643E-07

MANET					
Poloidal average afterheat power density (w/cm^3) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	6.963E-01	6.951E-01	6.913E-01	6.766E-01	6.319E-01
3.00E+00	6.945E-01	6.932E-01	6.894E-01	6.748E-01	6.302E-01
3.80E+00	6.949E-01	6.937E-01	6.899E-01	6.753E-01	6.307E-01
6.80E+00	3.983E-01	3.974E-01	3.951E-01	3.868E-01	3.612E-01
9.80E+00	3.756E-01	3.748E-01	3.727E-01	3.648E-01	3.407E-01
1.38E+01	3.461E-01	3.454E-01	3.434E-01	3.361E-01	3.140E-01
1.54E+01	1.860E-01	1.855E-01	1.844E-01	1.805E-01	1.686E-01
2.00E+01	1.015E-01	1.013E-01	1.006E-01	9.848E-02	9.195E-02
2.50E+01	8.568E-02	8.543E-02	8.490E-02	8.310E-02	7.759E-02
3.00E+01	7.161E-02	7.141E-02	7.096E-02	6.947E-02	6.486E-02
3.10E+01	3.699E-02	3.687E-02	3.663E-02	3.585E-02	3.343E-02
3.60E+01	2.398E-02	2.390E-02	2.374E-02	2.322E-02	2.162E-02
4.10E+01	1.963E-02	1.956E-02	1.944E-02	1.902E-02	1.770E-02
4.56E+01	1.628E-02	1.622E-02	1.611E-02	1.577E-02	1.468E-02
4.66E+01	1.062E-02	1.059E-02	1.052E-02	1.029E-02	9.553E-03
5.10E+01	7.894E-03	7.870E-03	7.820E-03	7.646E-03	7.090E-03
5.60E+01	6.417E-03	6.398E-03	6.358E-03	6.217E-03	5.764E-03
6.15E+01	5.104E-03	5.089E-03	5.057E-03	4.945E-03	4.585E-03
6.25E+01	4.075E-03	4.066E-03	4.043E-03	3.956E-03	3.669E-03
6.75E+01	4.201E-03	4.194E-03	4.175E-03	4.097E-03	3.837E-03
7.25E+01	3.360E-03	3.354E-03	3.339E-03	3.277E-03	3.069E-03
7.60E+01	2.860E-03	2.856E-03	2.843E-03	2.790E-03	2.613E-03
7.90E+01	5.543E-03	5.540E-03	5.525E-03	5.460E-03	5.227E-03
1.00E+02	8.758E-03	8.756E-03	8.738E-03	8.656E-03	8.358E-03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	6.030E-01	4.861E-01	2.094E-01	6.569E-02	5.504E-02
3.00E+00	6.014E-01	4.848E-01	2.088E-01	6.551E-02	5.489E-02
3.80E+00	6.018E-01	4.851E-01	2.089E-01	6.555E-02	5.493E-02
6.80E+00	3.447E-01	2.783E-01	1.214E-01	4.000E-02	3.351E-02
9.80E+00	3.252E-01	2.625E-01	1.145E-01	3.773E-02	3.161E-02
1.38E+01	2.996E-01	2.418E-01	1.055E-01	3.476E-02	2.912E-02
1.54E+01	1.609E-01	1.299E-01	5.737E-02	1.966E-02	1.633E-02
2.00E+01	8.770E-02	7.077E-02	3.161E-02	1.124E-02	9.179E-03
2.50E+01	7.401E-02	5.972E-02	2.668E-02	9.485E-03	7.746E-03
3.00E+01	6.186E-02	4.992E-02	2.230E-02	7.928E-03	6.475E-03
3.10E+01	3.184E-02	2.560E-02	1.155E-02	4.223E-03	3.305E-03
3.60E+01	2.056E-02	1.646E-02	7.447E-03	2.738E-03	2.055E-03
4.10E+01	1.683E-02	1.348E-02	6.097E-03	2.242E-03	1.682E-03
4.56E+01	1.396E-02	1.118E-02	5.056E-03	1.859E-03	1.395E-03
4.66E+01	9.059E-03	7.192E-03	3.238E-03	1.167E-03	8.037E-04
5.10E+01	6.710E-03	5.294E-03	2.373E-03	8.400E-04	5.387E-04
5.60E+01	5.456E-03	4.304E-03	1.929E-03	6.827E-04	4.379E-04
6.15E+01	4.339E-03	3.424E-03	1.534E-03	5.428E-04	3.482E-04
6.25E+01	3.468E-03	2.713E-03	1.188E-03	3.874E-04	2.184E-04
6.75E+01	3.647E-03	2.854E-03	1.205E-03	3.415E-04	1.811E-04
7.25E+01	2.917E-03	2.283E-03	9.639E-04	2.730E-04	1.448E-04
7.60E+01	2.483E-03	1.943E-03	8.206E-04	2.323E-04	1.232E-04
7.90E+01	5.032E-03	3.975E-03	1.586E-03	3.424E-04	1.887E-04
1.00E+02	8.089E-03	6.436E-03	2.529E-03	5.005E-04	3.117E-04

MANET					
Poloidal average afterheat power density (w/cm^3) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	2.375E-02	1.660E-03	3.310E-04	6.221E-05	4.632E-06
3.00E+00	2.369E-02	1.655E-03	3.301E-04	6.205E-05	4.620E-06
3.80E+00	2.370E-02	1.656E-03	3.304E-04	6.209E-05	4.623E-06
6.80E+00	1.433E-02	9.552E-04	1.788E-04	3.320E-05	2.706E-06
9.80E+00	1.351E-02	9.011E-04	1.687E-04	3.133E-05	2.554E-06
1.38E+01	1.245E-02	8.303E-04	1.555E-04	2.888E-05	2.354E-06
1.54E+01	6.904E-03	4.546E-04	8.522E-05	1.641E-05	1.497E-06
2.00E+01	3.824E-03	2.527E-04	4.830E-05	9.637E-06	9.926E-07
2.50E+01	3.228E-03	2.133E-04	4.077E-05	8.135E-06	8.383E-07
3.00E+01	2.699E-03	1.783E-04	3.408E-05	6.802E-06	7.012E-07
3.10E+01	1.338E-03	9.294E-05	1.955E-05	4.187E-06	4.958E-07
3.60E+01	8.092E-04	6.040E-05	1.405E-05	3.148E-06	3.974E-07
4.10E+01	6.627E-04	4.947E-05	1.151E-05	2.578E-06	3.255E-07
4.56E+01	5.496E-04	4.102E-05	9.543E-06	2.138E-06	2.701E-07
4.66E+01	2.990E-04	2.610E-05	7.173E-06	1.698E-06	2.282E-07
5.10E+01	1.899E-04	1.943E-05	6.040E-06	1.473E-06	1.999E-07
5.60E+01	1.544E-04	1.580E-05	4.911E-06	1.198E-06	1.626E-07
6.15E+01	1.228E-04	1.256E-05	3.906E-06	9.527E-07	1.293E-07
6.25E+01	6.967E-05	1.010E-05	3.789E-06	9.602E-07	1.247E-07
6.75E+01	6.024E-05	1.546E-05	7.012E-06	1.841E-06	1.853E-07
7.25E+01	4.819E-05	1.237E-05	5.609E-06	1.472E-06	1.482E-07
7.60E+01	4.103E-05	1.053E-05	4.775E-06	1.254E-06	1.262E-07
7.90E+01	9.388E-05	4.843E-05	2.467E-05	6.606E-06	5.211E-07
1.00E+02	1.894E-04	1.077E-04	5.548E-05	1.487E-05	1.119E-06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	1.726E-06	4.653E-07	4.041E-07	3.882E-07	3.711E-07
3.00E+00	1.722E-06	4.641E-07	4.031E-07	3.871E-07	3.702E-07
3.80E+00	1.723E-06	4.644E-07	4.033E-07	3.874E-07	3.704E-07
6.80E+00	1.137E-06	3.842E-07	3.349E-07	3.237E-07	3.120E-07
9.80E+00	1.073E-06	3.628E-07	3.162E-07	3.056E-07	2.946E-07
1.38E+01	9.898E-07	3.347E-07	2.918E-07	2.820E-07	2.719E-07
1.54E+01	7.026E-07	2.969E-07	2.655E-07	2.583E-07	2.510E-07
2.00E+01	5.158E-07	2.559E-07	2.323E-07	2.267E-07	2.211E-07
2.50E+01	4.358E-07	2.163E-07	1.964E-07	1.916E-07	1.869E-07
3.00E+01	3.646E-07	1.811E-07	1.644E-07	1.604E-07	1.565E-07
3.10E+01	2.853E-07	1.682E-07	1.561E-07	1.528E-07	1.495E-07
3.60E+01	2.386E-07	1.511E-07	1.415E-07	1.387E-07	1.358E-07
4.10E+01	1.956E-07	1.239E-07	1.160E-07	1.137E-07	1.113E-07
4.56E+01	1.623E-07	1.028E-07	9.629E-08	9.434E-08	9.238E-08
4.66E+01	1.433E-07	9.886E-08	9.373E-08	9.194E-08	9.013E-08
5.10E+01	1.265E-07	8.968E-08	8.543E-08	8.383E-08	8.222E-08
5.60E+01	1.029E-07	7.296E-08	6.951E-08	6.821E-08	6.690E-08
6.15E+01	8.192E-08	5.807E-08	5.533E-08	5.429E-08	5.325E-08
6.25E+01	7.716E-08	5.549E-08	5.326E-08	5.231E-08	5.135E-08
6.75E+01	9.145E-08	5.388E-08	5.193E-08	5.107E-08	5.017E-08
7.25E+01	7.317E-08	4.311E-08	4.156E-08	4.087E-08	4.015E-08
7.60E+01	6.231E-08	3.672E-08	3.539E-08	3.480E-08	3.419E-08
7.90E+01	1.763E-07	4.849E-08	4.697E-08	4.626E-08	4.552E-08
1.00E+02	3.389E-07	5.201E-08	4.986E-08	4.891E-08	4.798E-08

MANET					
Afteheat power density (w/cm^3) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	8.428E-01	8.412E-01	8.366E-01	8.188E-01	7.646E-01
3.00E+00	8.443E-01	8.429E-01	8.383E-01	8.204E-01	7.660E-01
3.80E+00	8.496E-01	8.481E-01	8.435E-01	8.255E-01	7.708E-01
6.80E+00	4.849E-01	4.839E-01	4.811E-01	4.709E-01	4.398E-01
9.80E+00	4.602E-01	4.592E-01	4.566E-01	4.469E-01	4.174E-01
1.38E+01	4.272E-01	4.263E-01	4.239E-01	4.149E-01	3.875E-01
1.54E+01	2.323E-01	2.317E-01	2.304E-01	2.255E-01	2.106E-01
2.00E+01	1.263E-01	1.259E-01	1.251E-01	1.225E-01	1.143E-01
2.50E+01	1.071E-01	1.068E-01	1.061E-01	1.039E-01	9.698E-02
3.00E+01	8.945E-02	8.919E-02	8.864E-02	8.677E-02	8.102E-02
3.10E+01	4.449E-02	4.435E-02	4.405E-02	4.311E-02	4.020E-02
3.60E+01	2.874E-02	2.864E-02	2.845E-02	2.783E-02	2.592E-02
4.10E+01	2.374E-02	2.366E-02	2.350E-02	2.300E-02	2.142E-02
4.56E+01	1.943E-02	1.937E-02	1.924E-02	1.882E-02	1.753E-02
4.66E+01	1.252E-02	1.248E-02	1.240E-02	1.213E-02	1.127E-02
5.10E+01	9.156E-03	9.128E-03	9.068E-03	8.866E-03	8.223E-03
5.60E+01	7.445E-03	7.422E-03	7.374E-03	7.210E-03	6.687E-03
6.15E+01	5.925E-03	5.907E-03	5.869E-03	5.739E-03	5.323E-03
6.25E+01	4.809E-03	4.798E-03	4.770E-03	4.667E-03	4.329E-03
6.75E+01	4.949E-03	4.941E-03	4.918E-03	4.827E-03	4.525E-03
7.25E+01	3.904E-03	3.897E-03	3.879E-03	3.808E-03	3.570E-03
7.60E+01	3.353E-03	3.347E-03	3.332E-03	3.271E-03	3.066E-03
7.90E+01	6.447E-03	6.443E-03	6.426E-03	6.351E-03	6.084E-03
1.00E+02	9.709E-03	9.706E-03	9.686E-03	9.595E-03	9.266E-03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	7.295E-01	5.881E-01	2.531E-01	7.918E-02	6.639E-02
3.00E+00	7.309E-01	5.892E-01	2.536E-01	7.933E-02	6.652E-02
3.80E+00	7.355E-01	5.928E-01	2.552E-01	7.983E-02	6.694E-02
6.80E+00	4.197E-01	3.388E-01	1.478E-01	4.856E-02	4.076E-02
9.80E+00	3.983E-01	3.215E-01	1.402E-01	4.608E-02	3.868E-02
1.38E+01	3.698E-01	2.985E-01	1.302E-01	4.277E-02	3.590E-02
1.54E+01	2.010E-01	1.623E-01	7.157E-02	2.442E-02	2.034E-02
2.00E+01	1.091E-01	8.805E-02	3.928E-02	1.392E-02	1.142E-02
2.50E+01	9.250E-02	7.468E-02	3.331E-02	1.180E-02	9.688E-03
3.00E+01	7.728E-02	6.239E-02	2.783E-02	9.859E-03	8.095E-03
3.10E+01	3.829E-02	3.083E-02	1.394E-02	5.139E-03	4.060E-03
3.60E+01	2.466E-02	1.978E-02	8.960E-03	3.314E-03	2.519E-03
4.10E+01	2.038E-02	1.634E-02	7.404E-03	2.738E-03	2.082E-03
4.56E+01	1.668E-02	1.337E-02	6.059E-03	2.241E-03	1.704E-03
4.66E+01	1.069E-02	8.507E-03	3.844E-03	1.403E-03	9.846E-04
5.10E+01	7.786E-03	6.157E-03	2.774E-03	9.993E-04	6.576E-04
5.60E+01	6.332E-03	5.007E-03	2.255E-03	8.123E-04	5.346E-04
6.15E+01	5.040E-03	3.985E-03	1.795E-03	6.463E-04	4.254E-04
6.25E+01	4.095E-03	3.211E-03	1.408E-03	4.616E-04	2.698E-04
6.75E+01	4.304E-03	3.376E-03	1.424E-03	4.018E-04	2.197E-04
7.25E+01	3.396E-03	2.663E-03	1.123E-03	3.168E-04	1.733E-04
7.60E+01	2.917E-03	2.287E-03	9.647E-04	2.720E-04	1.488E-04
7.90E+01	5.860E-03	4.633E-03	1.846E-03	3.950E-04	2.182E-04
1.00E+02	8.968E-03	7.138E-03	2.810E-03	5.628E-04	3.539E-04

MANET					
Afteheat power density (w/cm^3) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	2.869E-02	1.996E-03	3.936E-04	7.310E-05	5.364E-06
3.00E+00	2.875E-02	2.000E-03	3.943E-04	7.323E-05	5.374E-06
3.80E+00	2.893E-02	2.012E-03	3.968E-04	7.368E-05	5.407E-06
6.80E+00	1.746E-02	1.162E-03	2.162E-04	3.987E-05	3.193E-06
9.80E+00	1.657E-02	1.102E-03	2.052E-04	3.785E-05	3.032E-06
1.38E+01	1.538E-02	1.024E-03	1.906E-04	3.516E-05	2.817E-06
1.54E+01	8.623E-03	5.654E-04	1.047E-04	1.987E-05	1.774E-06
2.00E+01	4.775E-03	3.125E-04	5.852E-05	1.150E-05	1.162E-06
2.50E+01	4.050E-03	2.651E-04	4.965E-05	9.753E-06	9.865E-07
3.00E+01	3.384E-03	2.215E-04	4.149E-05	8.151E-06	8.248E-07
3.10E+01	1.652E-03	1.124E-04	2.286E-05	4.818E-06	5.683E-07
3.60E+01	9.996E-04	7.283E-05	1.642E-05	3.637E-06	4.549E-07
4.10E+01	8.262E-04	6.019E-05	1.357E-05	3.006E-06	3.761E-07
4.56E+01	6.763E-04	4.927E-05	1.111E-05	2.460E-06	3.080E-07
4.66E+01	3.703E-04	3.058E-05	7.969E-06	1.861E-06	2.525E-07
5.10E+01	2.359E-04	2.243E-05	6.602E-06	1.590E-06	2.188E-07
5.60E+01	1.919E-04	1.824E-05	5.369E-06	1.293E-06	1.780E-07
6.15E+01	1.527E-04	1.452E-05	4.274E-06	1.029E-06	1.417E-07
6.25E+01	8.867E-05	1.130E-05	3.968E-06	9.879E-07	1.324E-07
6.75E+01	7.427E-05	1.703E-05	7.533E-06	1.969E-06	2.006E-07
7.25E+01	5.859E-05	1.343E-05	5.942E-06	1.553E-06	1.583E-07
7.60E+01	5.033E-05	1.154E-05	5.104E-06	1.334E-06	1.360E-07
7.90E+01	1.080E-04	5.447E-05	2.769E-05	7.413E-06	5.843E-07
1.00E+02	2.166E-04	1.227E-04	6.319E-05	1.694E-05	1.272E-06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	1.970E-06	5.012E-07	4.307E-07	4.123E-07	3.926E-07
3.00E+00	1.974E-06	5.021E-07	4.315E-07	4.130E-07	3.933E-07
3.80E+00	1.986E-06	5.052E-07	4.341E-07	4.155E-07	3.957E-07
6.80E+00	1.316E-06	4.188E-07	3.613E-07	3.484E-07	3.350E-07
9.80E+00	1.249E-06	3.978E-07	3.433E-07	3.310E-07	3.183E-07
1.38E+01	1.161E-06	3.698E-07	3.192E-07	3.078E-07	2.959E-07
1.54E+01	8.169E-07	3.291E-07	2.919E-07	2.836E-07	2.750E-07
2.00E+01	5.950E-07	2.840E-07	2.561E-07	2.497E-07	2.432E-07
2.50E+01	5.053E-07	2.413E-07	2.176E-07	2.121E-07	2.067E-07
3.00E+01	4.226E-07	2.019E-07	1.821E-07	1.775E-07	1.729E-07
3.10E+01	3.256E-07	1.874E-07	1.730E-07	1.692E-07	1.654E-07
3.60E+01	2.708E-07	1.673E-07	1.561E-07	1.529E-07	1.496E-07
4.10E+01	2.240E-07	1.384E-07	1.291E-07	1.265E-07	1.238E-07
4.56E+01	1.834E-07	1.134E-07	1.058E-07	1.036E-07	1.014E-07
4.66E+01	1.593E-07	1.092E-07	1.033E-07	1.013E-07	9.930E-08
5.10E+01	1.397E-07	9.885E-08	9.401E-08	9.223E-08	9.044E-08
5.60E+01	1.137E-07	8.045E-08	7.651E-08	7.507E-08	7.361E-08
6.15E+01	9.053E-08	6.408E-08	6.094E-08	5.979E-08	5.863E-08
6.25E+01	8.376E-08	6.086E-08	5.832E-08	5.727E-08	5.619E-08
6.75E+01	1.003E-07	5.970E-08	5.749E-08	5.653E-08	5.553E-08
7.25E+01	7.916E-08	4.712E-08	4.537E-08	4.462E-08	4.383E-08
7.60E+01	6.801E-08	4.049E-08	3.899E-08	3.833E-08	3.766E-08
7.90E+01	1.973E-07	5.380E-08	5.210E-08	5.133E-08	5.051E-08
1.00E+02	3.837E-07	5.692E-08	5.456E-08	5.354E-08	5.253E-08

MANET					
Poloidal average afterheat power density (w/cm^3) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	8.816E-03	8.814E-03	8.798E-03	8.720E-03	8.436E-03
5.86E+01	1.042E-02	1.042E-02	1.040E-02	1.030E-02	9.936E-03
5.60E+01	1.422E-02	1.422E-02	1.419E-02	1.405E-02	1.355E-02
3.70E+01	9.561E-03	9.553E-03	9.524E-03	9.400E-03	8.970E-03
3.60E+01	7.953E-03	7.940E-03	7.906E-03	7.770E-03	7.319E-03
2.60E+01	9.586E-03	9.567E-03	9.519E-03	9.337E-03	8.745E-03
2.50E+01	1.392E-02	1.389E-02	1.381E-02	1.353E-02	1.265E-02
1.50E+01	2.246E-02	2.241E-02	2.229E-02	2.184E-02	2.044E-02
1.34E+01	4.070E-02	4.061E-02	4.038E-02	3.957E-02	3.705E-02
3.30E+00	7.376E-02	7.361E-02	7.322E-02	7.179E-02	6.733E-02
2.50E+00	7.564E-02	7.549E-02	7.509E-02	7.362E-02	6.905E-02
5.00E-01	7.758E-02	7.743E-02	7.702E-02	7.551E-02	7.082E-02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	8.173E-03	6.513E-03	2.559E-03	5.065E-04	3.231E-04
5.86E+01	9.612E-03	7.641E-03	3.018E-03	6.154E-04	3.765E-04
5.60E+01	1.311E-02	1.042E-02	4.117E-03	8.413E-04	5.143E-04
3.70E+01	8.623E-03	6.815E-03	2.748E-03	6.291E-04	3.608E-04
3.60E+01	6.986E-03	5.511E-03	2.315E-03	6.455E-04	3.914E-04
2.60E+01	8.327E-03	6.581E-03	2.823E-03	8.597E-04	5.537E-04
2.50E+01	1.204E-02	9.567E-03	4.176E-03	1.361E-03	9.475E-04
1.50E+01	1.948E-02	1.553E-02	6.776E-03	2.208E-03	1.602E-03
1.34E+01	3.535E-02	2.832E-02	1.234E-02	4.020E-03	3.081E-03
3.30E+00	6.432E-02	5.159E-02	2.223E-02	6.967E-03	5.450E-03
2.50E+00	6.596E-02	5.291E-02	2.280E-02	7.145E-03	5.589E-03
5.00E-01	6.765E-02	5.427E-02	2.339E-02	7.329E-03	5.733E-03

MANET					
Poloidal average afterheat power density (w/cm^3) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	2.053E-04	1.194E-04	6.167E-05	1.654E-05	1.235E-06
5.86E+01	2.196E-04	1.205E-04	6.187E-05	1.658E-05	1.256E-06
5.60E+01	2.992E-04	1.642E-04	8.430E-05	2.260E-05	1.711E-06
3.70E+01	1.614E-04	6.567E-05	3.262E-05	8.706E-06	7.045E-07
3.60E+01	1.485E-04	3.255E-05	1.441E-05	3.775E-06	3.477E-07
2.60E+01	2.060E-04	2.891E-05	1.097E-05	2.794E-06	2.915E-07
2.50E+01	3.648E-04	3.909E-05	1.276E-05	3.134E-06	3.360E-07
1.50E+01	6.316E-04	5.973E-05	1.779E-05	4.261E-06	4.536E-07
1.34E+01	1.260E-03	1.111E-04	3.101E-05	7.216E-06	7.031E-07
3.30E+00	2.280E-03	2.122E-04	6.218E-05	1.459E-05	1.293E-06
2.50E+00	2.338E-03	2.176E-04	6.377E-05	1.496E-05	1.326E-06
5.00E-01	2.398E-03	2.231E-04	6.540E-05	1.534E-05	1.360E-06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	3.670E-07	4.819E-08	4.614E-08	4.526E-08	4.439E-08
5.86E+01	3.869E-07	6.709E-08	6.479E-08	6.379E-08	6.275E-08
5.60E+01	5.272E-07	9.133E-08	8.820E-08	8.684E-08	8.543E-08
3.70E+01	2.512E-07	8.190E-08	7.929E-08	7.811E-08	7.686E-08
3.60E+01	1.537E-07	7.779E-08	7.500E-08	7.380E-08	7.255E-08
2.60E+01	1.499E-07	9.096E-08	8.738E-08	8.592E-08	8.440E-08
2.50E+01	1.783E-07	1.095E-07	1.047E-07	1.028E-07	1.009E-07
1.50E+01	2.401E-07	1.455E-07	1.387E-07	1.363E-07	1.337E-07
1.34E+01	3.418E-07	1.837E-07	1.741E-07	1.709E-07	1.676E-07
3.30E+00	5.597E-07	2.559E-07	2.426E-07	2.381E-07	2.334E-07
2.50E+00	5.739E-07	2.624E-07	2.487E-07	2.441E-07	2.392E-07
5.00E-01	5.885E-07	2.690E-07	2.550E-07	2.502E-07	2.453E-07

MANET					
Poloidal average afterheat power density (w/cm^3) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	2.700E-01	2.695E-01	2.680E-01	2.624E-01	2.454E-01
3.00E+00	2.611E-01	2.606E-01	2.592E-01	2.538E-01	2.373E-01
3.80E+00	2.563E-01	2.558E-01	2.544E-01	2.491E-01	2.329E-01
1.38E+01	8.383E-02	8.363E-02	8.315E-02	8.145E-02	7.621E-02
1.54E+01	3.651E-02	3.641E-02	3.620E-02	3.548E-02	3.324E-02
3.00E+01	1.944E-02	1.938E-02	1.927E-02	1.889E-02	1.767E-02
3.10E+01	1.008E-02	1.006E-02	1.000E-02	9.803E-03	9.160E-03
4.56E+01	6.507E-03	6.491E-03	6.455E-03	6.324E-03	5.898E-03
4.66E+01	3.979E-03	3.971E-03	3.950E-03	3.869E-03	3.599E-03
6.15E+01	3.063E-03	3.058E-03	3.043E-03	2.983E-03	2.780E-03
6.25E+01	2.337E-03	2.334E-03	2.323E-03	2.276E-03	2.120E-03
7.60E+01	2.033E-03	2.031E-03	2.024E-03	1.989E-03	1.868E-03
7.90E+01	3.299E-03	3.298E-03	3.290E-03	3.253E-03	3.118E-03
1.00E+02	5.025E-03	5.024E-03	5.015E-03	4.970E-03	4.802E-03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	2.342E-01	1.886E-01	8.121E-02	2.544E-02	2.108E-02
3.00E+00	2.265E-01	1.824E-01	7.853E-02	2.460E-02	2.039E-02
3.80E+00	2.223E-01	1.791E-01	7.709E-02	2.414E-02	2.001E-02
1.38E+01	7.275E-02	5.861E-02	2.578E-02	8.705E-03	7.049E-03
1.54E+01	3.172E-02	2.544E-02	1.126E-02	3.869E-03	2.966E-03
3.00E+01	1.684E-02	1.345E-02	5.947E-03	2.032E-03	1.483E-03
3.10E+01	8.709E-03	6.896E-03	3.036E-03	1.016E-03	6.706E-04
4.56E+01	5.597E-03	4.408E-03	1.932E-03	6.341E-04	3.891E-04
4.66E+01	3.408E-03	2.664E-03	1.159E-03	3.684E-04	2.045E-04
6.15E+01	2.635E-03	2.058E-03	8.820E-04	2.649E-04	1.416E-04
6.25E+01	2.008E-03	1.563E-03	6.657E-04	1.946E-04	9.851E-05
7.60E+01	1.777E-03	1.386E-03	5.765E-04	1.525E-04	7.449E-05
7.90E+01	3.004E-03	2.373E-03	9.388E-04	1.928E-04	1.076E-04
1.00E+02	4.649E-03	3.699E-03	1.448E-03	2.788E-04	1.740E-04

MANET					
Poloidal average afterheat power density (w/cm^3) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	9.041E-03	6.664E-04	1.458E-04	2.928E-05	2.322E-06
3.00E+00	8.743E-03	6.445E-04	1.410E-04	2.831E-05	2.245E-06
3.80E+00	8.582E-03	6.326E-04	1.384E-04	2.780E-05	2.204E-06
1.38E+01	2.952E-03	2.189E-04	5.008E-05	1.077E-05	1.001E-06
1.54E+01	1.207E-03	1.091E-04	3.179E-05	7.632E-06	7.461E-07
3.00E+01	5.908E-04	6.473E-05	2.174E-05	5.410E-06	5.320E-07
3.10E+01	2.531E-04	3.604E-05	1.383E-05	3.544E-06	3.590E-07
4.56E+01	1.381E-04	2.227E-05	8.911E-06	2.294E-06	2.414E-07
4.66E+01	7.125E-05	1.744E-05	7.862E-06	2.066E-06	2.048E-07
6.15E+01	4.833E-05	1.381E-05	6.403E-06	1.684E-06	1.622E-07
6.25E+01	3.058E-05	8.061E-06	3.658E-06	9.591E-07	1.010E-07
7.60E+01	2.603E-05	1.104E-05	5.456E-06	1.452E-06	1.303E-07
7.90E+01	5.829E-05	3.261E-05	1.674E-05	4.486E-06	3.490E-07
1.00E+02	1.065E-04	6.103E-05	3.146E-05	8.433E-06	6.334E-07
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	9.201E-07	3.185E-07	2.893E-07	2.809E-07	2.722E-07
3.00E+00	8.900E-07	3.082E-07	2.799E-07	2.718E-07	2.634E-07
3.80E+00	8.737E-07	3.026E-07	2.748E-07	2.669E-07	2.586E-07
1.38E+01	4.663E-07	2.168E-07	2.005E-07	1.961E-07	1.916E-07
1.54E+01	3.560E-07	1.809E-07	1.701E-07	1.669E-07	1.636E-07
3.00E+01	2.540E-07	1.324E-07	1.252E-07	1.229E-07	1.206E-07
3.10E+01	1.774E-07	1.003E-07	9.567E-08	9.396E-08	9.221E-08
4.56E+01	1.244E-07	7.482E-08	7.162E-08	7.035E-08	6.905E-08
4.66E+01	9.898E-08	5.635E-08	5.415E-08	5.321E-08	5.225E-08
6.15E+01	7.595E-08	4.194E-08	4.039E-08	3.969E-08	3.898E-08
6.25E+01	5.263E-08	3.349E-08	3.237E-08	3.183E-08	3.127E-08
7.60E+01	5.554E-08	2.719E-08	2.633E-08	2.591E-08	2.548E-08
7.90E+01	1.146E-07	2.797E-08	2.706E-08	2.664E-08	2.620E-08
1.00E+02	1.913E-07	2.864E-08	2.745E-08	2.692E-08	2.641E-08

MANET					
Poloidal average afterheat power density (w/cm^3) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
5.00E-01	2.192E-01	2.188E-01	2.176E-01	2.131E-01	1.991E-01
3.00E+00	2.093E-01	2.089E-01	2.078E-01	2.035E-01	1.902E-01
3.80E+00	2.013E-01	2.009E-01	1.998E-01	1.957E-01	1.829E-01
1.38E+01	6.519E-02	6.503E-02	6.466E-02	6.332E-02	5.919E-02
1.54E+01	2.744E-02	2.737E-02	2.720E-02	2.664E-02	2.489E-02
3.00E+01	1.355E-02	1.351E-02	1.343E-02	1.314E-02	1.225E-02
3.10E+01	7.153E-03	7.134E-03	7.092E-03	6.939E-03	6.445E-03
4.56E+01	4.546E-03	4.535E-03	4.509E-03	4.411E-03	4.093E-03
4.66E+01	2.965E-03	2.959E-03	2.943E-03	2.879E-03	2.666E-03
6.15E+01	1.996E-03	1.992E-03	1.982E-03	1.938E-03	1.792E-03
6.25E+01	1.752E-03	1.750E-03	1.742E-03	1.708E-03	1.592E-03
7.60E+01	1.371E-03	1.370E-03	1.365E-03	1.342E-03	1.260E-03
7.90E+01	2.110E-03	2.109E-03	2.104E-03	2.080E-03	1.994E-03
1.00E+02	3.176E-03	3.175E-03	3.169E-03	3.141E-03	3.035E-03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
5.00E-01	1.900E-01	1.530E-01	6.598E-02	2.078E-02	1.715E-02
3.00E+00	1.815E-01	1.461E-01	6.301E-02	1.984E-02	1.638E-02
3.80E+00	1.745E-01	1.405E-01	6.059E-02	1.908E-02	1.575E-02
1.38E+01	5.646E-02	4.544E-02	2.003E-02	6.816E-03	5.465E-03
1.54E+01	2.372E-02	1.899E-02	8.449E-03	2.954E-03	2.227E-03
3.00E+01	1.164E-02	9.269E-03	4.140E-03	1.459E-03	1.036E-03
3.10E+01	6.104E-03	4.809E-03	2.133E-03	7.293E-04	4.595E-04
4.56E+01	3.871E-03	3.033E-03	1.336E-03	4.448E-04	2.604E-04
4.66E+01	2.516E-03	1.957E-03	8.495E-04	2.675E-04	1.391E-04
6.15E+01	1.688E-03	1.309E-03	5.682E-04	1.782E-04	8.787E-05
6.25E+01	1.509E-03	1.176E-03	4.934E-04	1.358E-04	6.748E-05
7.60E+01	1.199E-03	9.342E-04	3.823E-04	9.338E-05	4.218E-05
7.90E+01	1.920E-03	1.514E-03	5.966E-04	1.192E-04	6.131E-05
1.00E+02	2.938E-03	2.337E-03	9.138E-04	1.751E-04	1.068E-04

MANET					
Poloidal average afterheat power density (w/cm^3) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
5.00E-01	7.316E-03	5.234E-04	1.093E-04	2.138E-05	1.759E-06
3.00E+00	6.986E-03	4.999E-04	1.043E-04	2.042E-05	1.680E-06
3.80E+00	6.719E-03	4.807E-04	1.004E-04	1.964E-05	1.616E-06
1.38E+01	2.268E-03	1.636E-04	3.588E-05	7.587E-06	7.531E-07
1.54E+01	8.876E-04	7.043E-05	1.783E-05	4.108E-06	4.677E-07
3.00E+01	3.965E-04	3.610E-05	1.043E-05	2.504E-06	2.982E-07
3.10E+01	1.614E-04	1.864E-05	6.321E-06	1.577E-06	1.988E-07
4.56E+01	8.573E-05	1.195E-05	4.435E-06	1.124E-06	1.416E-07
4.66E+01	4.114E-05	7.629E-06	3.126E-06	8.060E-07	1.026E-07
6.15E+01	2.373E-05	4.780E-06	1.983E-06	5.093E-07	6.747E-08
6.25E+01	1.926E-05	4.194E-06	1.783E-06	4.580E-07	5.529E-08
7.60E+01	1.246E-05	4.925E-06	2.385E-06	6.309E-07	6.282E-08
7.90E+01	3.043E-05	1.728E-05	8.873E-06	2.378E-06	1.887E-07
1.00E+02	6.497E-05	3.779E-05	1.950E-05	5.230E-06	3.940E-07
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
5.00E-01	7.474E-07	3.019E-07	2.767E-07	2.694E-07	2.616E-07
3.00E+00	7.140E-07	2.885E-07	2.645E-07	2.574E-07	2.500E-07
3.80E+00	6.868E-07	2.776E-07	2.545E-07	2.477E-07	2.406E-07
1.38E+01	3.799E-07	2.000E-07	1.863E-07	1.824E-07	1.783E-07
1.54E+01	2.614E-07	1.602E-07	1.512E-07	1.484E-07	1.455E-07
3.00E+01	1.721E-07	1.109E-07	1.052E-07	1.033E-07	1.013E-07
3.10E+01	1.200E-07	8.315E-08	7.951E-08	7.808E-08	7.663E-08
4.56E+01	8.564E-08	6.032E-08	5.786E-08	5.683E-08	5.577E-08
4.66E+01	6.278E-08	4.542E-08	4.375E-08	4.299E-08	4.221E-08
6.15E+01	4.256E-08	3.170E-08	3.057E-08	3.004E-08	2.950E-08
6.25E+01	3.277E-08	2.351E-08	2.273E-08	2.235E-08	2.196E-08
7.60E+01	3.079E-08	1.842E-08	1.786E-08	1.758E-08	1.729E-08
7.90E+01	6.469E-08	1.886E-08	1.831E-08	1.804E-08	1.776E-08
1.00E+02	1.198E-07	1.904E-08	1.830E-08	1.797E-08	1.764E-08

MANET					
Poloidal average afterheat power density (w/cm^3) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
8.56E+01	8.099E-03	8.096E-03	8.082E-03	8.011E-03	7.748E-03
5.86E+01	9.703E-03	9.699E-03	9.679E-03	9.586E-03	9.249E-03
5.60E+01	1.314E-02	1.313E-02	1.310E-02	1.298E-02	1.252E-02
3.70E+01	8.742E-03	8.734E-03	8.706E-03	8.591E-03	8.191E-03
3.60E+01	7.470E-03	7.458E-03	7.425E-03	7.298E-03	6.874E-03
2.60E+01	9.178E-03	9.160E-03	9.112E-03	8.936E-03	8.363E-03
2.50E+01	1.363E-02	1.360E-02	1.352E-02	1.325E-02	1.240E-02
1.50E+01	2.227E-02	2.222E-02	2.210E-02	2.166E-02	2.029E-02
1.34E+01	4.034E-02	4.025E-02	4.003E-02	3.924E-02	3.676E-02
3.30E+00	7.571E-02	7.556E-02	7.517E-02	7.372E-02	6.921E-02
2.50E+00	7.773E-02	7.758E-02	7.718E-02	7.569E-02	7.105E-02
5.00E-01	7.997E-02	7.981E-02	7.940E-02	7.786E-02	7.309E-02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
8.56E+01	7.507E-03	5.982E-03	2.352E-03	4.677E-04	2.978E-04
5.86E+01	8.947E-03	7.113E-03	2.810E-03	5.745E-04	3.524E-04
5.60E+01	1.211E-02	9.629E-03	3.805E-03	7.792E-04	4.777E-04
3.70E+01	7.869E-03	6.220E-03	2.521E-03	5.946E-04	3.494E-04
3.60E+01	6.563E-03	5.180E-03	2.176E-03	6.080E-04	3.715E-04
2.60E+01	7.961E-03	6.304E-03	2.724E-03	8.536E-04	5.631E-04
2.50E+01	1.180E-02	9.392E-03	4.096E-03	1.333E-03	9.419E-04
1.50E+01	1.934E-02	1.545E-02	6.737E-03	2.198E-03	1.616E-03
1.34E+01	3.509E-02	2.813E-02	1.226E-02	4.003E-03	3.085E-03
3.30E+00	6.615E-02	5.310E-02	2.284E-02	7.111E-03	5.587E-03
2.50E+00	6.792E-02	5.451E-02	2.345E-02	7.301E-03	5.736E-03
5.00E-01	6.987E-02	5.608E-02	2.412E-02	7.510E-03	5.901E-03

MANET					
Poloidal average afterheat power density (w/cm^3) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
8.56E+01	1.892E-04	1.102E-04	5.687E-05	1.525E-05	1.139E-06
5.86E+01	2.054E-04	1.124E-04	5.770E-05	1.547E-05	1.171E-06
5.60E+01	2.779E-04	1.520E-04	7.804E-05	2.092E-05	1.584E-06
3.70E+01	1.614E-04	6.619E-05	3.291E-05	8.781E-06	7.046E-07
3.60E+01	1.428E-04	3.177E-05	1.411E-05	3.699E-06	3.373E-07
2.60E+01	2.136E-04	2.900E-05	1.084E-05	2.747E-06	2.805E-07
2.50E+01	3.655E-04	3.751E-05	1.187E-05	2.890E-06	3.101E-07
1.50E+01	6.451E-04	6.298E-05	1.931E-05	4.658E-06	4.719E-07
1.34E+01	1.267E-03	1.124E-04	3.160E-05	7.368E-06	7.037E-07
3.30E+00	2.354E-03	2.294E-04	7.003E-05	1.665E-05	1.431E-06
2.50E+00	2.417E-03	2.355E-04	7.190E-05	1.709E-05	1.469E-06
5.00E-01	2.486E-03	2.422E-04	7.396E-05	1.758E-05	1.511E-06
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
8.56E+01	3.389E-07	4.494E-08	4.306E-08	4.225E-08	4.145E-08
5.86E+01	3.608E-07	6.253E-08	6.040E-08	5.947E-08	5.851E-08
5.60E+01	4.880E-07	8.451E-08	8.162E-08	8.036E-08	7.906E-08
3.70E+01	2.470E-07	7.625E-08	7.378E-08	7.269E-08	7.153E-08
3.60E+01	1.469E-07	7.242E-08	6.978E-08	6.866E-08	6.749E-08
2.60E+01	1.412E-07	8.309E-08	7.972E-08	7.836E-08	7.695E-08
2.50E+01	1.647E-07	1.005E-07	9.587E-08	9.418E-08	9.242E-08
1.50E+01	2.370E-07	1.348E-07	1.283E-07	1.261E-07	1.237E-07
1.34E+01	3.338E-07	1.729E-07	1.637E-07	1.607E-07	1.575E-07
3.30E+00	5.892E-07	2.458E-07	2.326E-07	2.282E-07	2.237E-07
2.50E+00	6.048E-07	2.523E-07	2.387E-07	2.342E-07	2.296E-07
5.00E-01	6.220E-07	2.594E-07	2.455E-07	2.409E-07	2.361E-07

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	2.087E-02	1.014E-02	2.197E-03	2.122E-03	2.032E-03
3.20E+01	2.284E-02	1.109E-02	2.404E-03	2.323E-03	2.224E-03
2.90E+01	2.522E-02	1.225E-02	2.656E-03	2.566E-03	2.457E-03
2.50E+01	6.317E-02	2.917E-02	4.014E-03	3.791E-03	3.620E-03
2.10E+01	7.066E-02	3.264E-02	4.498E-03	4.249E-03	4.058E-03
1.80E+01	7.828E-02	3.616E-02	4.993E-03	4.717E-03	4.505E-03
1.34E+01	2.670E-01	1.196E-01	1.041E-02	9.454E-03	8.973E-03
9.00E+00	2.952E-01	1.323E-01	1.167E-02	1.062E-02	1.008E-02
6.00E+00	3.192E-01	1.431E-01	1.278E-02	1.163E-02	1.104E-02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	1.935E-03	1.236E-03	2.549E-04	9.615E-05	7.774E-06
3.20E+01	2.118E-03	1.353E-03	2.789E-04	1.052E-04	8.491E-06
2.90E+01	2.340E-03	1.494E-03	3.080E-04	1.162E-04	9.355E-06
2.50E+01	3.447E-03	2.270E-03	6.202E-04	3.107E-04	1.233E-05
2.10E+01	3.863E-03	2.544E-03	6.940E-04	3.475E-04	1.378E-05
1.80E+01	4.289E-03	2.823E-03	7.692E-04	3.849E-04	1.526E-05
1.34E+01	8.536E-03	5.901E-03	2.254E-03	1.411E-03	3.439E-05
9.00E+00	9.588E-03	6.614E-03	2.499E-03	1.560E-03	3.829E-05
6.00E+00	1.050E-02	7.233E-03	2.709E-03	1.687E-03	4.166E-05

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the inboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	2.510E-06	7.055E-08	2.301E-08	1.830E-08	1.474E-08
3.20E+01	2.739E-06	7.707E-08	2.514E-08	1.999E-08	1.609E-08
2.90E+01	3.016E-06	8.493E-08	2.771E-08	2.202E-08	1.772E-08
2.50E+01	3.037E-06	9.189E-08	3.221E-08	2.420E-08	1.867E-08
2.10E+01	3.388E-06	1.027E-07	3.602E-08	2.724E-08	2.081E-08
1.80E+01	3.742E-06	1.136E-07	3.988E-08	3.013E-08	2.298E-08
1.34E+01	4.385E-06	1.639E-07	6.673E-08	4.552E-08	3.192E-08
9.00E+00	4.832E-06	1.821E-07	7.464E-08	5.093E-08	3.567E-08
6.00E+00	5.210E-06	1.978E-07	8.153E-08	5.565E-08	3.893E-08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	1.384E-08	1.182E-08	9.933E-09	8.450E-09	6.139E-09
3.20E+01	1.511E-08	1.290E-08	1.084E-08	9.221E-09	6.699E-09
2.90E+01	1.663E-08	1.420E-08	1.193E-08	1.015E-08	7.373E-09
2.50E+01	1.736E-08	1.458E-08	1.221E-08	1.039E-08	7.562E-09
2.10E+01	1.935E-08	1.625E-08	1.360E-08	1.158E-08	8.427E-09
1.80E+01	2.137E-08	1.793E-08	1.501E-08	1.277E-08	9.301E-09
1.34E+01	2.887E-08	2.234E-08	1.770E-08	1.507E-08	1.105E-08
9.00E+00	3.221E-08	2.476E-08	1.949E-08	1.659E-08	1.217E-08
6.00E+00	3.512E-08	2.684E-08	2.122E-08	1.786E-08	1.310E-08

Pb-17Li					
Afteheat power density (w/cm^3) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	4.214E-02	1.992E-02	3.469E-03	3.319E-03	3.175E-03
3.20E+01	4.597E-02	2.173E-02	3.787E-03	3.623E-03	3.466E-03
2.90E+01	5.031E-02	2.378E-02	4.147E-03	3.968E-03	3.796E-03
2.50E+01	1.251E-01	5.698E-02	6.587E-03	6.145E-03	5.859E-03
2.10E+01	1.389E-01	6.330E-02	7.349E-03	6.858E-03	6.539E-03
1.80E+01	1.521E-01	6.936E-02	8.086E-03	7.549E-03	7.197E-03
1.34E+01	4.755E-01	2.130E-01	1.871E-02	1.699E-02	1.613E-02
9.00E+00	5.104E-01	2.289E-01	2.045E-02	1.860E-02	1.765E-02
6.00E+00	5.358E-01	2.404E-01	2.174E-02	1.980E-02	1.879E-02
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	3.023E-03	1.956E-03	4.586E-04	2.011E-04	1.156E-05
3.20E+01	3.300E-03	2.135E-03	5.003E-04	2.194E-04	1.258E-05
2.90E+01	3.614E-03	2.338E-03	5.476E-04	2.400E-04	1.374E-05
2.50E+01	5.577E-03	3.732E-03	1.151E-03	6.306E-04	1.981E-05
2.10E+01	6.224E-03	4.163E-03	1.279E-03	7.001E-04	2.202E-05
1.80E+01	6.851E-03	4.579E-03	1.402E-03	7.668E-04	2.415E-05
1.34E+01	1.534E-02	1.057E-02	4.016E-03	2.550E-03	6.016E-05
9.00E+00	1.679E-02	1.154E-02	4.328E-03	2.739E-03	6.523E-05
6.00E+00	1.787E-02	1.226E-02	4.557E-03	2.876E-03	6.897E-05

Pb-17Li					
Afteheat power density (w/cm^3) at the mid-plane of the inboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	3.392E-06	9.803E-08	3.265E-08	2.536E-08	2.005E-08
3.20E+01	3.688E-06	1.067E-07	3.556E-08	2.759E-08	2.180E-08
2.90E+01	4.021E-06	1.165E-07	3.884E-08	3.010E-08	2.376E-08
2.50E+01	4.001E-06	1.287E-07	4.727E-08	3.442E-08	2.561E-08
2.10E+01	4.428E-06	1.429E-07	5.260E-08	3.826E-08	2.844E-08
1.80E+01	4.835E-06	1.566E-07	5.774E-08	4.195E-08	3.115E-08
1.34E+01	5.633E-06	2.451E-07	1.108E-07	7.425E-08	5.016E-08
9.00E+00	6.032E-06	2.656E-07	1.212E-07	8.140E-08	5.497E-08
6.00E+00	6.322E-06	2.808E-07	1.290E-07	8.678E-08	5.859E-08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	1.874E-08	1.589E-08	1.333E-08	1.134E-08	8.248E-09
3.20E+01	2.038E-08	1.727E-08	1.449E-08	1.233E-08	8.963E-09
2.90E+01	2.221E-08	1.882E-08	1.579E-08	1.344E-08	9.768E-09
2.50E+01	2.358E-08	1.913E-08	1.597E-08	1.359E-08	9.916E-09
2.10E+01	2.617E-08	2.140E-08	1.766E-08	1.503E-08	1.096E-08
1.80E+01	2.865E-08	2.338E-08	1.926E-08	1.639E-08	1.196E-08
1.34E+01	4.447E-08	3.155E-08	2.348E-08	1.950E-08	1.437E-08
9.00E+00	4.865E-08	3.417E-08	2.518E-08	2.086E-08	1.537E-08
6.00E+00	5.180E-08	3.612E-08	2.641E-08	2.184E-08	1.609E-08

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
6.80E+00	5.421E-01	2.431E-01	2.161E-02	1.965E-02	1.865E-02
9.80E+00	5.113E-01	2.290E-01	2.006E-02	1.821E-02	1.728E-02
1.38E+01	4.711E-01	2.108E-01	1.810E-02	1.640E-02	1.555E-02
2.00E+01	1.314E-01	5.999E-02	7.106E-03	6.642E-03	6.334E-03
2.50E+01	1.109E-01	5.060E-02	5.956E-03	5.565E-03	5.307E-03
3.00E+01	9.272E-02	4.228E-02	4.949E-03	4.622E-03	4.408E-03
3.60E+01	2.686E-02	1.300E-02	2.749E-03	2.653E-03	2.541E-03
4.10E+01	2.199E-02	1.065E-02	2.250E-03	2.171E-03	2.080E-03
4.56E+01	1.824E-02	8.828E-03	1.865E-03	1.800E-03	1.724E-03
5.10E+01	6.654E-03	3.534E-03	1.226E-03	1.201E-03	1.153E-03
5.60E+01	5.411E-03	2.874E-03	9.970E-04	9.767E-04	9.372E-04
6.15E+01	4.304E-03	2.286E-03	7.931E-04	7.769E-04	7.456E-04
6.75E+01	1.907E-03	1.119E-03	5.362E-04	5.285E-04	5.073E-04
7.25E+01	1.526E-03	8.954E-04	4.289E-04	4.228E-04	4.058E-04
7.60E+01	1.299E-03	7.623E-04	3.652E-04	3.600E-04	3.455E-04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
6.80E+00	1.773E-02	1.219E-02	4.589E-03	2.917E-03	6.930E-05
9.80E+00	1.643E-02	1.133E-02	4.313E-03	2.750E-03	6.478E-05
1.38E+01	1.479E-02	1.023E-02	3.956E-03	2.532E-03	5.899E-05
2.00E+01	6.030E-03	4.025E-03	1.219E-03	6.594E-04	2.079E-05
2.50E+01	5.052E-03	3.375E-03	1.027E-03	5.566E-04	1.751E-05
3.00E+01	4.196E-03	2.805E-03	8.572E-04	4.654E-04	1.461E-05
3.60E+01	2.420E-03	1.551E-03	3.269E-04	1.240E-04	8.263E-06
4.10E+01	1.981E-03	1.269E-03	2.677E-04	1.016E-04	6.782E-06
4.56E+01	1.642E-03	1.052E-03	2.220E-04	8.426E-05	5.634E-06
5.10E+01	1.097E-03	6.882E-04	1.130E-04	2.759E-05	4.224E-06
5.60E+01	8.924E-04	5.597E-04	9.193E-05	2.245E-05	3.441E-06
6.15E+01	7.099E-04	4.452E-04	7.313E-05	1.786E-05	2.742E-06
6.75E+01	4.829E-04	2.995E-04	4.259E-05	7.114E-06	2.274E-06
7.25E+01	3.863E-04	2.396E-04	3.407E-05	5.694E-06	1.822E-06
7.60E+01	3.289E-04	2.040E-04	2.901E-05	4.849E-06	1.553E-06

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the outboard central part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
6.80E+00	6.099E-06	2.753E-07	1.275E-07	8.543E-08	5.748E-08
9.80E+00	5.763E-06	2.575E-07	1.182E-07	7.907E-08	5.320E-08
1.38E+01	5.323E-06	2.346E-07	1.066E-07	7.109E-08	4.785E-08
2.00E+01	4.208E-06	1.354E-07	4.983E-08	3.630E-08	2.696E-08
2.50E+01	3.568E-06	1.143E-07	4.193E-08	3.059E-08	2.276E-08
3.00E+01	2.995E-06	9.562E-08	3.497E-08	2.555E-08	1.903E-08
3.60E+01	2.541E-06	7.261E-08	2.434E-08	1.924E-08	1.532E-08
4.10E+01	2.088E-06	5.962E-08	1.999E-08	1.581E-08	1.260E-08
4.56E+01	1.737E-06	4.954E-08	1.661E-08	1.315E-08	1.048E-08
5.10E+01	1.501E-06	4.117E-08	1.333E-08	1.094E-08	9.003E-09
5.60E+01	1.223E-06	3.353E-08	1.086E-08	8.913E-09	7.340E-09
6.15E+01	9.749E-07	2.672E-08	8.653E-09	7.104E-09	5.852E-09
6.75E+01	8.510E-07	2.293E-08	7.245E-09	6.021E-09	5.030E-09
7.25E+01	6.819E-07	1.837E-08	5.803E-09	4.824E-09	4.031E-09
7.60E+01	5.812E-07	1.565E-08	4.945E-09	4.111E-09	3.436E-09
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
6.80E+00	5.076E-08	3.520E-08	2.561E-08	2.114E-08	1.559E-08
9.80E+00	4.705E-08	3.291E-08	2.417E-08	2.000E-08	1.475E-08
1.38E+01	4.238E-08	3.000E-08	2.229E-08	1.851E-08	1.364E-08
2.00E+01	2.480E-08	2.028E-08	1.674E-08	1.425E-08	1.039E-08
2.50E+01	2.095E-08	1.704E-08	1.422E-08	1.210E-08	8.826E-09
3.00E+01	1.754E-08	1.432E-08	1.196E-08	1.017E-08	7.420E-09
3.60E+01	1.435E-08	1.218E-08	1.022E-08	8.689E-09	6.314E-09
4.10E+01	1.180E-08	1.002E-08	8.405E-09	7.148E-09	5.194E-09
4.56E+01	9.815E-09	8.337E-09	6.995E-09	5.949E-09	4.323E-09
5.10E+01	8.495E-09	7.309E-09	6.145E-09	5.227E-09	3.794E-09
5.60E+01	6.926E-09	5.960E-09	5.011E-09	4.262E-09	3.094E-09
6.15E+01	5.523E-09	4.753E-09	3.997E-09	3.399E-09	2.467E-09
6.75E+01	4.764E-09	4.127E-09	3.475E-09	2.956E-09	2.146E-09
7.25E+01	3.818E-09	3.307E-09	2.785E-09	2.370E-09	1.720E-09
7.60E+01	3.254E-09	2.819E-09	2.374E-09	2.020E-09	1.466E-09

Pb-17Li					
Afteheat power density (w/cm^3) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
6.80E+00	6.642E-01	2.983E-01	2.742E-02	2.500E-02	2.373E-02
9.80E+00	6.303E-01	2.828E-01	2.559E-02	2.329E-02	2.211E-02
1.38E+01	5.851E-01	2.623E-01	2.322E-02	2.109E-02	2.001E-02
2.00E+01	1.653E-01	7.526E-02	8.594E-03	8.009E-03	7.634E-03
2.50E+01	1.402E-01	6.380E-02	7.225E-03	6.729E-03	6.414E-03
3.00E+01	1.172E-01	5.327E-02	5.988E-03	5.573E-03	5.312E-03
3.60E+01	3.295E-02	1.586E-02	3.222E-03	3.104E-03	2.973E-03
4.10E+01	2.723E-02	1.311E-02	2.661E-03	2.563E-03	2.455E-03
4.56E+01	2.229E-02	1.073E-02	2.177E-03	2.097E-03	2.008E-03
5.10E+01	8.126E-03	4.264E-03	1.407E-03	1.376E-03	1.321E-03
5.60E+01	6.609E-03	3.468E-03	1.144E-03	1.120E-03	1.074E-03
6.15E+01	5.261E-03	2.761E-03	9.108E-04	8.913E-04	8.552E-04
6.75E+01	2.419E-03	1.381E-03	6.128E-04	6.031E-04	5.789E-04
7.25E+01	1.909E-03	1.090E-03	4.835E-04	4.759E-04	4.567E-04
7.60E+01	1.640E-03	9.360E-04	4.153E-04	4.088E-04	3.924E-04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
6.80E+00	2.257E-02	1.544E-02	5.672E-03	3.598E-03	8.629E-05
9.80E+00	2.102E-02	1.441E-02	5.361E-03	3.412E-03	8.109E-05
1.38E+01	1.903E-02	1.309E-02	4.951E-03	3.165E-03	7.429E-05
2.00E+01	7.267E-03	4.868E-03	1.514E-03	8.363E-04	2.489E-05
2.50E+01	6.106E-03	4.095E-03	1.282E-03	7.094E-04	2.104E-05
3.00E+01	5.056E-03	3.395E-03	1.069E-03	5.928E-04	1.752E-05
3.60E+01	2.831E-03	1.818E-03	3.928E-04	1.534E-04	9.414E-06
4.10E+01	2.338E-03	1.502E-03	3.246E-04	1.268E-04	7.798E-06
4.56E+01	1.913E-03	1.229E-03	2.657E-04	1.039E-04	6.396E-06
5.10E+01	1.258E-03	7.901E-04	1.327E-04	3.393E-05	4.732E-06
5.60E+01	1.023E-03	6.427E-04	1.079E-04	2.761E-05	3.857E-06
6.15E+01	8.143E-04	5.116E-04	8.594E-05	2.199E-05	3.076E-06
6.75E+01	5.511E-04	3.428E-04	5.062E-05	9.494E-06	2.561E-06
7.25E+01	4.348E-04	2.704E-04	3.994E-05	7.494E-06	2.025E-06
7.60E+01	3.735E-04	2.323E-04	3.431E-05	6.439E-06	1.741E-06

Pb-17Li					
Afteheat power density (w/cm^3) at the mid-plane of the outboard blanket					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
6.80E+00	6.666E-06	3.256E-07	1.586E-07	1.067E-07	7.114E-08
9.80E+00	6.336E-06	3.058E-07	1.476E-07	9.905E-08	6.601E-08
1.38E+01	5.895E-06	2.800E-07	1.336E-07	8.929E-08	5.949E-08
2.00E+01	4.674E-06	1.544E-07	5.796E-08	4.168E-08	3.054E-08
2.50E+01	3.984E-06	1.309E-07	4.891E-08	3.522E-08	2.585E-08
3.00E+01	3.344E-06	1.093E-07	4.069E-08	2.933E-08	2.157E-08
3.60E+01	2.822E-06	8.128E-08	2.743E-08	2.153E-08	1.703E-08
4.10E+01	2.341E-06	6.736E-08	2.273E-08	1.786E-08	1.413E-08
4.56E+01	1.922E-06	5.527E-08	1.865E-08	1.466E-08	1.161E-08
5.10E+01	1.663E-06	4.575E-08	1.485E-08	1.214E-08	9.961E-09
5.60E+01	1.356E-06	3.729E-08	1.210E-08	9.899E-09	8.125E-09
6.15E+01	1.082E-06	2.974E-08	9.652E-09	7.898E-09	6.484E-09
6.75E+01	9.510E-07	2.558E-08	8.049E-09	6.674E-09	5.562E-09
7.25E+01	7.518E-07	2.022E-08	6.360E-09	5.275E-09	4.398E-09
7.60E+01	6.466E-07	1.738E-08	5.468E-09	4.536E-09	3.782E-09
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
6.80E+00	6.227E-08	4.111E-08	2.842E-08	2.315E-08	1.711E-08
9.80E+00	5.787E-08	3.857E-08	2.696E-08	2.204E-08	1.628E-08
1.38E+01	5.224E-08	3.528E-08	2.503E-08	2.054E-08	1.517E-08
2.00E+01	2.797E-08	2.260E-08	1.853E-08	1.577E-08	1.151E-08
2.50E+01	2.370E-08	1.923E-08	1.582E-08	1.346E-08	9.829E-09
3.00E+01	1.979E-08	1.595E-08	1.330E-08	1.132E-08	8.262E-09
3.60E+01	1.591E-08	1.346E-08	1.129E-08	9.599E-09	6.977E-09
4.10E+01	1.321E-08	1.118E-08	9.374E-09	7.973E-09	5.794E-09
4.56E+01	1.085E-08	9.189E-09	7.705E-09	6.553E-09	4.763E-09
5.10E+01	9.391E-09	8.067E-09	6.781E-09	5.767E-09	4.187E-09
5.60E+01	7.660E-09	6.582E-09	5.533E-09	4.705E-09	3.416E-09
6.15E+01	6.114E-09	5.254E-09	4.417E-09	3.756E-09	2.727E-09
6.75E+01	5.265E-09	4.556E-09	3.836E-09	3.263E-09	2.369E-09
7.25E+01	4.163E-09	3.603E-09	3.033E-09	2.580E-09	1.873E-09
7.60E+01	3.580E-09	3.098E-09	2.609E-09	2.219E-09	1.611E-09

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	3.506E-03	1.833E-03	5.955E-04	5.823E-04	5.584E-04
2.50E+01	1.012E-02	4.943E-03	1.112E-03	1.076E-03	1.031E-03
1.34E+01	3.620E-02	1.672E-02	2.304E-03	2.175E-03	2.077E-03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	5.315E-04	3.330E-04	5.521E-05	1.512E-05	2.712E-06
2.50E+01	9.812E-04	6.248E-04	1.256E-04	4.681E-05	4.308E-06
1.34E+01	1.977E-03	1.300E-03	3.547E-04	1.804E-04	8.563E-06

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the upper divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	9.810E-07	2.659E-08	8.380E-09	6.893E-09	5.726E-09
2.50E+01	1.428E-06	3.953E-08	1.282E-08	1.040E-08	8.536E-09
1.34E+01	2.327E-06	6.751E-08	2.264E-08	1.759E-08	1.399E-08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	5.418E-09	4.687E-09	3.948E-09	3.359E-09	2.439E-09
2.50E+01	8.056E-09	6.938E-09	5.838E-09	4.966E-09	3.607E-09
1.34E+01	1.312E-08	1.118E-08	9.393E-09	7.993E-09	5.814E-09

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
1.38E+01	8.550E-02	3.873E-02	4.102E-03	3.800E-03	3.619E-03
3.00E+01	1.521E-02	7.408E-03	1.635E-03	1.580E-03	1.514E-03
4.56E+01	3.633E-03	1.966E-03	7.327E-04	7.188E-04	6.897E-04
6.15E+01	1.200E-03	7.096E-04	3.464E-04	3.416E-04	3.279E-04
7.60E+01	4.611E-04	2.964E-04	1.745E-04	1.724E-04	1.654E-04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
1.38E+01	3.444E-03	2.324E-03	7.610E-04	4.356E-04	1.379E-05
3.00E+01	1.441E-03	9.202E-04	1.884E-04	6.991E-05	5.524E-06
4.56E+01	6.567E-04	4.105E-04	6.495E-05	1.475E-05	2.848E-06
6.15E+01	3.121E-04	1.934E-04	2.728E-05	4.411E-06	1.527E-06
7.60E+01	1.574E-04	9.698E-05	1.263E-05	1.611E-06	9.821E-07

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the outboard lower part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
1.38E+01	2.829E-06	8.933E-08	3.199E-08	2.336E-08	1.760E-08
3.00E+01	1.776E-06	4.986E-08	1.629E-08	1.298E-08	1.046E-08
4.56E+01	1.034E-06	2.797E-08	8.815E-09	7.246E-09	5.996E-09
6.15E+01	5.731E-07	1.529E-08	4.771E-09	3.982E-09	3.342E-09
7.60E+01	3.763E-07	9.734E-09	2.873E-09	2.409E-09	2.034E-09
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
1.38E+01	1.628E-08	1.338E-08	1.120E-08	9.530E-09	6.950E-09
3.00E+01	9.819E-09	8.383E-09	7.042E-09	5.991E-09	4.352E-09
4.56E+01	5.666E-09	4.888E-09	4.113E-09	3.499E-09	2.540E-09
6.15E+01	3.169E-09	2.750E-09	2.317E-09	1.971E-09	1.431E-09
7.60E+01	1.932E-09	1.682E-09	1.419E-09	1.207E-09	8.761E-10

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
1.38E+01	6.594E-02	3.001E-02	3.415E-03	3.182E-03	3.032E-03
3.00E+01	1.068E-02	5.295E-03	1.315E-03	1.277E-03	1.224E-03
4.56E+01	2.463E-03	1.375E-03	5.699E-04	5.605E-04	5.381E-04
6.15E+01	7.972E-04	4.862E-04	2.561E-04	2.529E-04	2.428E-04
7.60E+01	3.278E-04	2.073E-04	1.181E-04	1.168E-04	1.121E-04
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
1.38E+01	2.886E-03	1.933E-03	6.005E-04	3.331E-04	1.163E-05
3.00E+01	1.166E-03	7.395E-04	1.412E-04	4.758E-05	4.500E-06
4.56E+01	5.122E-04	3.189E-04	4.784E-05	9.418E-06	2.229E-06
6.15E+01	2.311E-04	1.428E-04	1.939E-05	2.786E-06	1.123E-06
7.60E+01	1.066E-04	6.569E-05	8.586E-06	1.137E-06	6.080E-07

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the outboard upper part					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
1.38E+01	2.617E-06	8.027E-08	2.826E-08	2.112E-08	1.606E-08
3.00E+01	1.500E-06	4.175E-08	1.366E-08	1.104E-08	8.997E-09
4.56E+01	8.209E-07	2.224E-08	7.108E-09	5.904E-09	4.924E-09
6.15E+01	4.242E-07	1.139E-08	3.618E-09	3.038E-09	2.561E-09
7.60E+01	2.318E-07	6.186E-09	1.941E-09	1.632E-09	1.379E-09
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
1.38E+01	1.494E-08	1.258E-08	1.054E-08	8.969E-09	6.534E-09
3.00E+01	8.471E-09	7.264E-09	6.106E-09	5.194E-09	3.772E-09
4.56E+01	4.662E-09	4.034E-09	3.396E-09	2.889E-09	2.097E-09
6.15E+01	2.431E-09	2.114E-09	1.782E-09	1.516E-09	1.100E-09
7.60E+01	1.310E-09	1.141E-09	9.621E-10	8.187E-10	5.942E-10

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	0	1 sec	10 sec	1 min	5 min
3.60E+01	3.353E-03	1.751E-03	5.648E-04	5.521E-04	5.294E-04
2.50E+01	1.019E-02	4.943E-03	1.059E-03	1.022E-03	9.785E-04
1.34E+01	3.615E-02	1.665E-02	2.226E-03	2.097E-03	2.001E-03
Distance	Time after shutdown				
to FW (cm)	10 min	1 hr	5 hr	1 day	1 month
3.60E+01	5.039E-04	3.159E-04	5.286E-05	1.466E-05	2.544E-06
2.50E+01	9.315E-04	5.950E-04	1.234E-04	4.775E-05	4.016E-06
1.34E+01	1.905E-03	1.257E-03	3.500E-04	1.807E-04	8.195E-06

Pb-17Li					
Poloidal average afterheat power density (w/cm^3) in the lower divertor					
Distance	Time after shutdown				
to FW (cm)	1 yr	5 yr	10 yr	20 yr	40 yr
3.60E+01	9.163E-07	2.482E-08	7.809E-09	6.417E-09	5.324E-09
2.50E+01	1.305E-06	3.633E-08	1.186E-08	9.578E-09	7.827E-09
1.34E+01	2.175E-06	6.362E-08	2.147E-08	1.657E-08	1.311E-08
Distance	Time after shutdown				
to FW (cm)	50 yr	100 yr	200 yr	300 yr	500 yr
3.60E+01	5.035E-09	4.353E-09	3.667E-09	3.120E-09	2.265E-09
2.50E+01	7.379E-09	6.344E-09	5.337E-09	4.541E-09	3.298E-09
1.34E+01	1.228E-08	1.045E-08	8.774E-09	7.467E-09	5.432E-09