



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

August 4, 1980

Dockets Nos. ~~50-30~~  
and 50-185

LICENSEE: National Aeronautics and Space Administration (NASA)  
FACILITY: Plum Brook Reactor and Mock-Up Reactor  
SUBJECT: PLUM BROOK REACTOR DISMANTLING - MEETING SUMMARY

Subject meeting was held on June 17, 1980, in Bethesda, Maryland. Those present are listed in Enclosure 1. The purpose of this meeting was to discuss the NASA application of March 17, 1980, to dismantle the 60 Mwt Plum Brook Test Reactor, Docket No. 50-30, and the 100 KW Plum Brook Mock-Up Reactor, Docket No. 50-185.

NASA personnel summarized their plans for dismantling the Plum Brook reactors including management, exposure control, environmental effects, dismantling procedures and proposed radiation release criteria.

NASA will dismantle the Plum Brook reactors by removal of radioactive materials only. Non-radioactive structures will be left intact as much as possible in the removal of radioactive material. The wooden cooling tower for the 60 MW test reactor will, however, be removed although it is not expected to be radioactively contaminated.

In addition to the two reactors at the Plum Brook facility, NASA possesses a retired hot cell facility. The hot cell facility will be decontaminated at the same time that the reactors are being dismantled. The hot cell facility is licensed under Byproduct Material License No. 34-06706-03. The review of the decontamination of the hot cell facility is being handled by Mr. Paul Guinn of NMSS.

A major topic discussed at the meeting was the need for an NRC decision on what level radioactivity will be acceptable for release of the Plum Brook facility to unrestricted access. NASA has proposed criteria in their March 17, 1980 submittal (Enclosure 2).

*Peter B. Erickson*  
Peter B. Erickson, Project Manager  
Operating Reactors Branch #4  
Division of Licensing

Enclosures:  
1. List of Attendees  
2. NASA Proposed Criteria

cc w/enclosures:  
See next page

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LIST OF ATTENDEES

MEETING WITH NASA

June 17, 1980

NRC

Peter B. Erickson, ORB#4  
Frank Cardile, SD  
Carl Feldman, SD  
Frank Witt, CEB  
P. R. Matthews, CEB  
Lew Battist, SD  
Sy Block  
Victor Benaroya, CEB  
Don Solberg, RES

NASA

Earl Boitel  
Thomas L. Junod  
John Minderman  
Don Benedict

G. Radioactive Limits Acceptable After Dismantling

In all dismantling and decontamination efforts, NASA will make a reasonable effort to eliminate or reduce radioactive residual contamination to the maximum practicable extent technically and economically feasible.

Radioactivity on any surface will not be covered by paint, plating or other covering unless the level of contamination is less than the applicable limits specified below prior to applying the covering. The measured levels will be documented in detail. A reasonable effort will be made to minimize contamination levels prior to covering and, when required, to postpone the covering until after the NRC periodic or final inspection and review of the final PBRF survey report. In any event, thorough documentation of radioactivity levels will be maintained.

The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided

that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.

All remaining equipment, materials, structures, and surfaces of PBRF will be decontaminated to the levels of radioactivity specified below before the site is considered to be qualified for release from the NRC licenses and controls.

1. Residual Surface Contamination

There are two sets of limits established for residual surface contamination at PBRF subsequent to decontamination efforts. These are based upon two considerations: (1) some equipment and structures have value for re-use in their present form at some time in the future or otherwise subject to transfer to the public domain (Table 8) while (2) other materials and structures will be left standing pending final disposition by dismantling and scrapping or are immediately disposed of as waste material either at PBS fill site or a public landfill (or in the case of scrap metal by recycling). (Table 9)

Where the material may be removed from the site and placed into use by anyone, whether a government agency or the general public, for unrestricted, unlicensed use the more restrictive fixed and transferable level of contamination specified in Table 8 below must be met.

TABLE 8

CONTAMINATION LIMITS FOR REUSABLE ITEMS

<u>Condition</u>	<u>Average</u>	<u>Maximum</u>
Removable alpha	10 d/m/100cm <sup>2</sup>	30 d/m/100cm <sup>2</sup>
Non-removable (fixed)	425 d/m/100cm <sup>2</sup>	1275 d/m/100cm <sup>2</sup>
alpha	(250 d/m/probe area)	(750 d/m/probe area)
Removable beta-gamma	600 d/m/100cm <sup>2</sup>	1800 d/m/100cm <sup>2</sup>
Non-removable (fixed)	500 c/m/100cm <sup>2</sup>	1500 c/m/100cm <sup>2</sup>
beta-gamma	(300 c/m/probe area)	(900 c/m/probe area)

Where the material is to be placed into a landfill, whether public or on-Station, or otherwise disposed of as fill or waste, the limits specified in Table 9 apply.

TABLE 9

CONTAMINATION LIMITS FOR RUBBLE OR SCRAP

<u>Condition</u>	<u>Average</u>	<u>Maximum</u>
Removable alpha	100 d/m/100cm <sup>2</sup>	300 d/m/100cm <sup>2</sup>
Non-removable (fixed) alpha	850 d/m/100cm <sup>2</sup> (500 d/m/probe area)	2550 d/m/100cm <sup>2</sup> (1500 d/m/probe area)
Removable beta-gamma	1000 d/m/100cm <sup>2</sup>	3000 d/m/100cm <sup>2</sup>
Non-removable (fixed) beta-gamma	2500 c/m/100cm <sup>2</sup> (1500 c/m/probe area)	7500 c/m/100cm <sup>2</sup> (4500 c/m/probe area)

Notes for Tables 8 and 9:

- (1) Where surface contamination by both alpha and beta-gamma-emitting nuclides exists, the limits established for alpha and beta-gamma emitters apply independently.
- (2) Disintegrations per minute (d/m) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

- (3) The limits in Tables 8 and 9 refer to those values obtained after subtracting background levels indicated by the appropriate instrument used in making the measurement, in the same units of measurement.
- (4) Measurement of average concentration will not be averaged over more than one (1) square meter. For objects of less surface area, the average will be derived for each such object.
- (5) The maximum contamination level applies to an area of not more than 100 square centimeters.
- (6) The amount of removable radioactive material per 100 cm<sup>2</sup> of surface area will be determined by wiping the area with dry filter paper applying moderate pressure and assessing the amount of radioactive material transferred to the filter paper with an appropriate instrument of known efficiency. When wipes of objects of surface area less than 100cm<sup>2</sup> are made, the pertinent limits will be reduced proportionally and the entire surface of the object will be wiped.
- (7) Fixed contamination will be determined using appropriate portable radiation survey instruments with sensitivities comparable to the Eberline Model PAC-3G for alpha and the NMC Model GS-3W for beta-gamma.

(8) Beta radiation must be measured with an instrument capable of passing 95% of all beta particles with an energy greater than 0.1 Mev (7 mg/cm<sup>2</sup> window).

2. Direct Radiation

External direct radiation levels within buildings will not exceed an overall average of 0.05 mr/hr nor a maximum of 0.1 mr/hr at three feet from the surface of concern; the radiation levels outdoors of buildings will not exceed an overall average of 0.1 mr/hr nor a maximum of 0.2 mr/hr, except soil and rubble will not exceed 0.2 mr/hr at three feet under any conditions. These levels are exclusive of natural background.

3. Stream Bed Silt

Silt from the effluent ditches within PBS in the area downstream from PBS will not exceed  $1 \times 10^{-4}$  uCi/gram of material. These levels are exclusive of natural background.

4. Soil

Soil samples will not exceed  $10^{-5}$  uCi/gm above background for beta-gamma or alpha decay modes. These levels are exclusive of natural background.



MEETING SUMMARY DISTRIBUTION

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\* Copies also sent to those people on service (cc) list for subject plant(s).

Docket File

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