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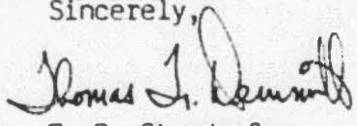
Dr. W. D. Travers -Director  
TMI-2 Cleanup Project Directorate  
US Nuclear Regulatory Commission  
c/o Three Mile Island Nuclear Station  
Middletown, PA 17057

Dear Dr. Travers:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)  
Operating License No. DPR-73  
Docket No. 50-320  
Special Nuclear Material Accountability Plan

At a meeting with the NRC TMICPD on Tuesday, December 23, 1986, GPU Nuclear committed to provide the NRC TMICPD with a docketed copy of the approved GPU Nuclear Special Nuclear Material (SNM) Accountability Plan. Accordingly, attached for your information is a copy of Procedure 4000-PLN-4420.02, Revision 0-00, SNM Accountability Plan," dated April 3, 1987.

Sincerely,

  
F. R. Standerfer  
Director, TMI-2

FRS/RDW/eml

Attachment

April 14

**GPU Nuclear**TMI-2 Unit  
Policy/PlanNumber  
400N-PLN-4420.02

Title

SNM Accountability Plan

Revision No.

0-00

Applicability/Scope

TMI-2 SNM Accountability Program

Responsible Office

4440

This document is important to safety ☒ Yes ☐ No

Effective Date

04/03/87

## List of Effective Pages

Page	Revision	Page	Revision	Page	Revision	Page	Revision
1.0	0-00	E1-9	0-00				
2.0	0-00	E1-10	0-00				
3.0	0-00	E1-11	0-00				
4.0	0-00						
5.0	0-00						
6.0	0-00						
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8.0	0-00						
9.0	0-00						
10.0	0-00						
11.0	0-00						
E1-1	0-00						
E1-2	0-00						
E1-3	0-00						
E1-4	0-00						
E1-5	0-00						
E1-6	0-00						
E1-7	0-00						
E1-8	0-00						



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Approved by	<i>W. Marshall</i>	Director, Licensing and Nuclear Safety	3-27-87
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1.0 PURPOSE

1.1 The purpose of this plan is to describe the Three Mile Island Unit 2 (TMI-2) Special Nuclear Material (SNM\*) Accountability Program. This plan identifies the methods and sequence of SNM accountability, the Quality Assurance Program that will be built into SNM measurement activities, the areas, systems and components that will undergo formal SNM measurement and the areas, systems and components that do not require SNM assessment. The plan identifies the TMI-2 organizations that will directly perform SNM assessment and the organizations that will provide significant support. The plan also describes how programmatic ALARA will be implemented in SNM assessment activities.

\*For the purposes of this plan, the term SNM will be utilized to describe the residual fissile material derived from the original enriched UO<sub>2</sub> fuel.

1.2 The post-defueling survey of the TMI-2 plant for residual special nuclear material will be performed by the implementation of this plan. As identified in this plan, the post-defueling survey is a process by which the entire TMI-2 plant will be reviewed to identify areas known to contain special nuclear material or that could contain SNM and the presence and quantity of special nuclear material (SNM) in each area will be determined. The accomplishment of the SNM measurements and associated engineering analysis will constitute completion of the post-defueling survey. This plan, the SNM Accountability Plan, describes the process by which the post-defueling survey will be conducted.

2.0 BACKGROUND

2.1 The March, 1979 accident resulted in significant damage to the core and in subsequent release of fuel and fission products into the Reactor Coolant System and other closely related systems. The TMI-2 core currently consists of loose fuel pellets, solidified fuel, structural metal components (e.g., end fittings), loose rubble and partial fuel assemblies. This collection of material is generically referred to as core debris. As a result of the core condition, fuel accountability by the normal method of counting individual fuel assemblies is not possible.

2.2 Core debris is presently being loaded in special canisters and shipped to the Department of Energy Idaho National Engineering Laboratory (DOE INEL) facility in Idaho. Each shipment is accompanied by a Nuclear Material Transaction Report (DOE/NRC Form 741) which shows the net weight of the contents of each canister and a best available physical description of the contents. A statement that quantification of the amount of SNM in each canister is not possible also accompanies each shipment as an annotation on the DOE/NRC Nuclear Material Transaction Report Form 741.



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2.3 The canister contents are a mixture of SNM and other core debris. There is no feasible method at TMI-2 to determine the exact content of fuel in each canister. Therefore, SNM accountability for TMI-2 will be based on the total measured SNM remaining in the plant after defueling is complete. A final plant inventory of residual SNM will be reported on the DOE/NRC Material Balance Report (DOE/NRC Form 742).

2.4 In October, 1985, GPU Nuclear, the U.S. Department of Energy (DOE) and the U.S. Nuclear Regulatory Commission (NRC) entered into an agreement (Reference 11.1 and 11.2) that final SNM accountability for TMI-2 would be performed after defueling was completed and would be based upon a thorough post-defueling survey of TMI-2. This post-defueling survey would quantify, as accurately as possible, the amount of residual SNM in plant systems and components. Implied in this agreement was the understanding that the post-defueling survey would involve all areas, structures, systems and components where SNM could possibly have been deposited as a result of the 1979 accident and subsequent recovery activities.

**3.0 SUMMARY**

3.1 Formal SNM assessment activities are currently scheduled to begin in 1987. A measurement schedule is presented in Appendix 1. In summary, the SNM assessment schedule is based upon the completion of defueling activities in the Reactor Building components and gross decontamination of the selected Auxiliary and Fuel Handling Building systems and associated cubicles. The current schedule calls for SNM accountability to be completed after Reactor Coolant System (RCS) draindown has occurred. The projected SNM accountability schedule is based on current defueling and decontamination schedules. The schedule will be adjusted as needed to reflect cleanup program progress.

3.2 SNM measurements will be performed as areas, systems and components are placed into an isolated configuration that ensures no fuel transport in or out after the SNM survey has been completed. The configuration will be selected to enhance SNM detection with due regard for system bounds, piping configuration and measurement requirements. Following SNM survey, the configuration will be administratively and physically controlled. If the configuration is modified in a manner that could result in SNM transport, suitable measurements will be performed to ensure accurate accountability.

3.3 The entire TMI-2 plant has been reviewed to determine where SNM may have been deposited as a result of the 1979 accident and subsequent recovery activities. Locations have been placed into three categories: Category 1 - locations where SNM is definitely deposited; Category 2 - locations where it can be reasonably postulated that SNM may be deposited; and Category 3 - locations where it can be shown that SNM was not deposited. Appendix 1 also identifies each area classification.

- 3.4 All Category 1 areas will undergo SNM survey. Category 2 areas will undergo SNM survey after surface decontamination and/or system flush activities are completed. Category 3 areas will be identified as not requiring SNM assessment based upon authoritative analyses of the TMI-2 accident (NSAC 80-1: Analysis of Three Mile Island - Unit 2 Accident; Rogovin Report: Three Mile Island, A Report to the Commissioners and the Public) and a review of recovery activities.

NOTE: Some areas of the plant may be reclassified as a result of ongoing or future recovery activities.

- 3.5 SNM accountability at TMI-2 will be a complex task. Inaccessibility of some systems and components, high area radiation backgrounds, complex geometries and the required indirect measurement of fuel will complicate physical measurement of SNM quantities. Also, selected TMI-2 systems cannot be surveyed until RCS draindown occurs. Therefore, several alternative techniques for performing measurement of SNM quantities will be useful. Reference 11.3 describes those techniques. Appendix 1, as noted above, classifies plant areas and, where possible, specifies the method(s) to be used to assess each listed area, system or component.
- 3.6 SNM assessment is an Important to Safety (ITS) activity. The TMI-2 Recovery QA Plan applies to SNM assessment activities. QA/QC will review and approve the SNM accountability plan and SNM measurements procedures and Unit Work Instructions. Measurement equipment will be maintained and calibrated in accordance with Quality Assurance/Quality Control (QA/QC) requirements. Individual SNM assessment activities will include QA/QC verification of essential parameters as deemed necessary. Records of SNM assessment activities and associated analyses will be subjected to QA/QC monitoring and auditing. Engineering calculations for SNM assessment will be performed in accordance with the TMI-2 Engineering Calculation Procedure 4000-ENG-7310.02 and will be independently audited.

#### 4.0 SNM ACCOUNTABILITY PROCESS

- 4.1 The SNM Accountability Process will establish the quantity of residual SNM at TMI-2 after defueling is completed. The quantity of residual SNM will be determined through measurements, sampling and engineering analysis. The determination of the quantity of SNM in a specific area, system or component will be documented in a SNM assessment package. The SNM assessment package, will contain, as a minimum: a detailed description of the area, system or component; its role in the accident and/or recovery activities; the rationale supporting a conclusion as to whether the possibility of contained residual SNM exists; and if so, a SNM measurement document or previous fuel characterization results and an appropriate engineering calculation. The purpose of each set of data contained in the SNM assessment package is detailed below:

- 4.1.1 Description - The purpose of this section will be to provide detailed information on the area, system or component being assayed. Included will be a description of each significant piping section, component and surface; a description of the

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<p>accident and recovery program history of the above; and available photographs and/or drawings. Finally, if an area, system or component is determined to have no possibility for containing residual fuel, it will be so stated, with supporting rationale, in the description section.</p> <p>4.1.2 <u>SNM Measurement</u> - Specific measurements of residual SNM quantities will be performed utilizing either QA approved procedures or Unit Work Instructions. All SNM measurement documents will contain data sheets which will record the measurement data, equipment calibration information and essential supporting information. All SNM measurements will be performed in accordance with appropriate industrial safety requirements.</p> <p>4.1.3 <u>Fuel Characterization Measurements for SNM Accountability</u> - Several plant areas and components were surveyed for residual SNM deposits prior to initiation of the formal SNM accountability program. In some cases, it will be advantageous to utilize the results of these previous measurements; personnel radiation exposure will be minimized. Previous fuel characterization measurements will be utilized for SNM accountability purposes at the discretion of the Manager, Post Defueling Survey and SNM Accountability under the following conditions:</p> <ol style="list-style-type: none"> <li>a. The area, system or component measured has been maintained in a fixed configuration, from the time of the measurement to the present, that precludes the possibility of transport of SNM into or out of the area, system or component.</li> <li>b. The area, system or component can continue throughout the duration of the SNM accountability measurement program to be maintained in a configuration that precludes the transport of SNM into or out of the area, system or component and appropriate controls are in place to ensure configuration controls.</li> <li>c. The previous fuel characterization SNM measurement package is accepted by Quality Assurance/Quality Control.</li> </ol> <p>4.1.4 <u>SNM Assessment Engineering Calculation</u> - The SNM assessment engineering calculation will be the documented engineering analysis which determines the quantity of residual SNM in an area, system or component based on the raw measurement data. SNM engineering calculations will be performed in accordance with Procedure 4000-ENG-7310.02, Engineering Calculations. The calculation will determine the quantity of SNM in a given location based upon the configuration of the object assayed, the analysis of the survey data and the measurement instrumentation performance capabilities. Also relevant to the determination of</p>		

the quantity of residual SNM will be the specific assumptions deriving from a review of the measurements made and an analysis of the accident history and recovery efforts relating to the area, system or component.

#### 4.2 Determination of SNM in Radioactive Waste and Sample Shipments

- 4.2.1 The total amount of SNM shipped off-site as radioactive waste and/or as samples will be determined in accordance with approved Important to Safety (ITS) procedures. The amount of SNM shipped will be recorded on the appropriate shipping forms and the NRC Form 741 Nuclear Material Transaction Report. The quantities of SNM reported as shipped will be summed for input into the final SNM accountability process.

#### 4.3 Final SNM Accountability

Final SNM accountability will be performed by summing the residual SNM quantities identified in the individual SNM measurements and reporting the sum quantity as the remaining plant inventory of special nuclear material. The amount of fuel shipped to the Department of Energy (DOE) Idaho National Engineering Laboratory (INEL) will be determined by subtracting the sum of the final plant inventory and the amount of SNM shipped as radioactive waste from the total plant inventory of SNM as reported on the most recent SNM Material Balance Report (NRC/DOE Form 742) as corrected for decay.

Last Reported Inventory

- Decay correction
- Final In-plant inventory
- SNM shipped as samples and Radwaste
- SNM shipped to INEL in fuel, filter and knockout canisters

#### 5.0 SNM MEASUREMENTS

- 5.1 SNM measurement will be performed on TMI-2 Category 1 and Category 2 structures, systems and components (Appendix 1). A SNM measurement will be performed on each individual location once it is placed in a configuration for Post-Defueling Monitored Storage. A determination of the residual SNM in each location will be based on individual SNM measurements performed using approved procedures or by examination and analysis of previously performed fuel characterization measurements.
- 5.2 SNM measurements will be performed in accordance with an approved procedure or Unit Work Instruction when existing data from previous fuel characterization measurements are insufficient for final SNM accountability. Individual SNM measurements will be performed in accordance with generic measurement procedures or a specific Unit Work Instruction. Generic procedures will be utilized for measurements performed utilizing a



standard technique (e.g., Gamma Spectroscopy). Unit Work Instructions will be utilized for measurements that require special, one of a kind, techniques (e.g., OTSG tube film SNM measurement). Data sheets attached to each SNM measurement document will be used to record the data required for post measurement analysis.

- 5.3 SNM measurement documents shall be reviewed and approved in accordance with TMI-2 Unit Procedure 4000-ADM-1218.02, TMI-2 Document Evaluation, Review and Approval. SNM measurement documents will require concurrence by the following organizations, as a minimum: Plant Operations, Quality Assurance/Quality Control, SRG and SNM Accountability. SNM measurement Unit Work Instructions will require the additional concurrence of Radiological Controls. In addition, each SNM measurement document will be reviewed by all organizations from whom support is required. The Site Operations Director shall be the approver of SNM Measurement documents.
- 5.4 SNM measurement documents shall be archived in CARIRS. Copies of all data sheets will be submitted to Data Management and Analysis for post measurement analysis.

#### 6.0 SNM MEASUREMENT TECHNIQUES

- 6.1 As stated in the introduction, the post-defueling SNM assessment at TMI-2 will be a complex task. Several different measurement techniques will be used. Technique selection for each measurement will depend upon the configuration of the component or area to assayed, physical access limitations, area radiation dose rates and the likely nature of the form of special nuclear material (fuel) deposits. Current plans are to make extensive use of gamma scintillation counting, visual inspections, scrape sampling of films deposited on metal surfaces and gas proportional detection of alpha radiation. Several areas may be surveyed utilizing two or more techniques. A detailed description of the measurement techniques and selection criteria can be found in Reference 11.3.

#### 7.0 QUALITY ASSURANCE FOR SNM ACCOUNTABILITY

- 7.1 The results of the SNM Accountability Program will be the basis for final SNM accountability at TMI-2. In addition, final SNM accountability may be a highly visible element of the completion of the TMI-2 Cleanup Program. Therefore, the SNM accountability activities are classified as "Important to Safety" and shall comply with the TMI-2 Recovery QA Plan.
- 7.2 SNM accountability will be based on a determination of the quantity of residual Special Nuclear Material (SNM) remaining in the TMI-2 areas, systems and components after defueling and water processing activities have been completed. The determination of the residual SNM quantities will be based upon measurements performed utilizing QA/QC approved procedures or upon measurement packages that contain previously performed fuel characterization measurements reviewed and approved by QA/QC on an after-the-fact basis.

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7.3 SNM measurement activities performed via approved procedures or Unit Work Instructions will be reviewed by QA/QC for inclusion of hold/witness points. Specific activities (e.g., critical items) may also be identified by the document preparer which require QA/QC verification. Activities requiring QA/QC observation will require adequate notification to ensure that QA/QC support is available for the specific activity.

7.4 SNM engineering calculations will be performed in accordance with procedure 4000-ENG-7310.02, Engineering Calculations. Data utilized in the engineering calculations will be obtained from the completed QA approved procedure or Unit Work Instructions data sheets or from QA reviewed and approved data acquisition measurement packages. The calculations will be independently verified in accordance with the procedure. SNM measurement packages that identify residual SNM deposits greater than 1 kilogram will be submitted for a separate independent review to an organization other than Data Management and Analysis.

7.5 Computer codes utilized to quantify residual special nuclear material will be verified by Data Management and Analysis by benchmarking with accepted industry codes. Verification will be documented. Only verified and approved computer codes will be utilized. Approved code versions will be controlled to preclude unauthorized modification. Code versions utilized in engineering calculations will be specifically identified.

7.6 Equipment utilized to quantify residual special nuclear material via QA approved procedure or Unit Work Instruction will be calibrated and operated in accordance with these procedures. Essential equipment identification information (e.g., type, size, configuration) and performance data (e.g., counts, duration of count, location of detector) will be recorded on the data sheets.

**8.0 CONFIGURATION CONTROL OF AREAS, SYSTEMS OR COMPONENTS CONTAINING RESIDUAL SNM**

8.1 In order to ensure that the SNM measurement process is accurate, controls must be established to ensure that special nuclear material (SNM) is not "double counted". Double counting could occur when SNM is relocated out of a component that has already been measured into a radioactive waste shipment or a component still requiring SNM assessment.

8.2 Administrative controls will be utilized to maintain physical isolation of areas, systems or components that have undergone SNM measurement so that transport of SNM into or out of the area, system or component is precluded. The type of administrative controls will depend upon the nature of the component.

8.3 Piping systems and components connected to piping systems (e.g., pumps, tanks) will be isolated utilizing "red" tags via the TMI-2 Switching and Tagging Procedure 4000-ADM-3020.04. Red tags prohibit the changing of position of a component (e.g., valves, electrical breakers). "Red tagged" components will be isolation barriers intended to prevent the transport of

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residual SNM into or out of areas, systems or components. If an isolation barrier is removed (i.e., a valve opened or other violation of configuration control), the need for repeat measurement of SNM in the affected piping will be evaluated.

8.4 Open areas (e.g., Reactor Building [RB] basement floors, Auxiliary Building sump) will be controlled by one of two methods to prevent fuel transport. Areas will be maintained in a dry condition so that liquid cannot displace residual SNM or, if subjected to liquid flow, liquid effluents will be sampled. Sampling of the liquid effluent for the presence of residual SNM will be performed in accordance with QA approved procedures.

**9.0 ALARA FOR SNM ACCOUNTABILITY**

9.1 The program for SNM accountability will be conducted in accordance with the "As Low As Reasonably Achievable" (ALARA) principle for radiation exposure. The SNM accountability program will result in the exposure of personnel to ionizing radiation when SNM measurements are performed in the Auxiliary, Fuel Handling or Reactor Building. Personnel radiation exposures will be maintained ALARA by limiting the number of measurements to those essential for SNM accountability and by planning each measurement to minimize personal exposure.

9.2 The number of required SNM measurements will be limited by utilizing, when possible, previously performed fuel characterization measurements. In addition, SNM measurements will be limited to those areas, systems or components which conceivably contain fuel.

9.3 The radiation exposure received by personnel performing SNM measurements will be kept ALARA by proper planning. Individual measurements will be designed to include efficient use of time in radiation areas, incorporate lessons learned on dose minimization from previous measurements and include the use of remote equipment when possible. Where possible, SNM measurements will be coordinated with radiological end point verification surveys in high radiation areas.

**10.0 RESPONSIBILITIES**

10.1 The SNM Accountability program will be directed and controlled by the Licensing and Nuclear Safety Department. Specifically, the Manager, Post-Defueling Survey and SNM Accountability is responsible to develop and implement the SNM Accountability Plan which will control the post-defueling survey of TMI-2.

10.2 The Data Management and Analysis Section of the Project Planning and Analysis Department will develop procedures and techniques for performing individual SNM measurements, perform SNM measurements and, based upon data obtained, determine residual SNM quantities through formal engineering calculations.



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- 10.3 The Licensing Section will provide major support to the SNM Accountability program. Licensing will develop the appropriate strategy for compliance with NRC and DOE regulatory requirements and will be the primary interface with the NRC in the review of the SNM accountability documents. Finally, Licensing will support submission of the final SNM accountability results and negotiate resolution of the final accountability/transfer of accountability of the TMI-2 Core to the DOE.
- 10.4 The Defueling Support Section will provide the major in-plant labor support for SNM accountability activities. Defueling Support will also provide scheduling and other administrative support.
- 10.5 The Radiological Controls Department will provide support to the SNM accountability program to ensure activities are conducted in a manner consistent with GPU Nuclear ALARA objectives.
- 10.6 Site Operations will provide support to SNM accountability by establishing and maintaining configuration control of the plant systems. The Site Operations Director shall be the approver of all SNM assessment procedures and Unit Work Instructions. In addition, the Radwaste Section of Site Operations will provide support for SNM measurements in the Auxiliary and Fuel Handling Buildings.
- 10.7 QA/QC will review SNM assessment documents and perform QA/QC inspection of SNM assessment activities.

#### 11.0 REFERENCES

- 11.1 DOE letter of October 8, 1985 from W. W. Bixby to H. M. Burton (EG&G). "Accountability for the TMI-2 Core - HNB-100-85"
- 11.2 NRC letter of October 17, 1985 from B. J. Snyder to F. R. Standerfer (GPUNC). "Approval of Exemption from 10CFR30.51, 40.61, 70.51(d), and 70.53"
- 11.3 Technical Planning Department. January 1987. Instrument Selection for Residual Fuel Measurements. TPO/TMI-187, Revision 0. Middletown, PA; GPU Nuclear Corporation
- 11.4 Technical Planning Department. August 1985. TMI-2 Core Accountability. TPO/TMI-035, Revision 1. Middletown, PA; GPU Nuclear Corporation

#### 12.0 Appendix 1



**GPU Nuclear**THI-2 Unit  
Policy/PlanNumber  
4000-PLN-4420.02

Title

SNM Accountability Plan

Revision No

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APPENDIX 1 - Area Classification and SNM Assessment Schedule

Area**	Description	SNM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
A1001	RM Emerg. Boos. Pump	3	2mR/h					
A1002	Access Corridor (Drains)	3	2mR/h					
A1003	Access Area (Drains)	3	2mR/h					
A1004	Seal Injection Valve Room	2	25mR/h (LHRA)	NaI Detector	3/87		5/87	Gamma Spectr. scheduled at later date
A1005	M.U. Pump - 1C	1	20mR/h (LHRA)	HpGe Detector	3/87	1/87	2/87	Pre-flush status: 0.41 grams fuel* (10-05-33)
A1006	M.U. Pump - 1B	1	100mR/h, 600mR/h (LHRA)	HpGe Detector	4/87	1/87	2/87	Pre-flush status: 23.4 grams fuel* (10-05-33)
A1007	M.U. Pump - 1A	1	50mR/h, 100mR/h (LHRA)	HpGe Detector	5/87	1/87	2/87	Pre-flush status: 10.8 grams fuel* (10-05-33)
A1008	Spent Resin Storage Tank - 1B	2	0mR/h	HpGe Detector			***	Pre-flush status: Gamma Spectr. shows 1.5 grams of fuel*. (10-05-28; 10L-44A, 48)
A1009	Spent Resin Storage Tank - 1A	2	0mR/h	HpGe Detector				
A1010	Spent Resin Storage Tank Pump	2	5mR/h	Documentation				
A1011	Aux. Sump Pump Valve Room	1	20mR/h	Documentation				
A1012	Aux. Bldg. Sump Tank Room	1	700mR/h, 400mR/h (LHRA)	NaI or HpGe Detector	4/87	5/87	6/87	Gamma Spectr. shows 202 grams* in sump, 1.4 grams* in sump tank and 1.5 grams* in pump (10-06-28)
A1013	Evap. Cond. Tanks, Pumps	3	4mR/h					

NOTES: \*Best estimate of SNM quantity; measurement uncertainty described in the referenced Technical Bulletin or GEND document.  
 \*\*Area designations defined in Technical Data Book, 1PQ/THI-009.  
 \*\*\*Will utilize existing documentation.

SNM CATEGORIES: 1. Room Fuel Present  
 2. Possible Fuel Present  
 3. No Fuel Present

LEGEND: LHRA - Locked High Radiation Area  
 100 - To be Determined

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APPENDIX 1 - Area Classification and SAM Assessment Schedule (Cont'd)

Area	Description	SAM Category	Current Radiation Levels (uR/hr)	Assessment Method	Surface Decon Date	Spillage Flush Date	SAM Measurement Date	Remarks
A2014	EC Comp. Room	3	10mR/hr (LHA)					
A2015a	Cleanup Filters Room	3	10mR/hr					
A2015b	Cleanup Filter After Room	3	10mR/hr					
A2016	Cleanup Decon. - 2A	3	5mR/hr (LHA)					
A2017	Cleanup Decon. - 2B	3	5mR/hr (LHA)					
A2018	Waste Transfer Pump Room	3	20mR/hr, 100mR/hr					
A2019	Waste Disposal (liquid valves)	1	5mR/hr	MoGe Detector or Documentation				
A2020	EC Bleed Tanks 1B, 1C	1	4mR/hr, 10mR/hr (LHA)	NaI Detector	5/87	12/87	1/88	Possible small amounts of fuel (MCL-718)
A2021	EC Bleed Tank 1A	1	12mR/hr	NaI Detector			1/88	Tank cleaned - presently contains no fuel
A2022	North Stairwell	3	4mR/hr					
A2023	Elevator Shaft	3	20mR/hr, 50mR/hr					
A2024	Ann. Bldg. Sump Filters	2	60mR/hr	MoGe Detector or Documentation	11/87	10/87	1988	Filter cartridges removed (no fuel in filters)
A2026	Seal Injection Filters (MCL-74, 48)	2	60mR/hr					Needs to be surveyed (filter cart. ridges removed, no fuel in filters)
A2027	South Stairwell	3	2.5mR/hr					
A2101	Radwaste Disposal Panel	3	2mR/hr					
A2102	SB Sump Pump Filters	2	300mR/hr					
A2103	MCC 2-11CB	3	42.5mR/hr	180		5/87	7/87	Not surveyed

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APPENDIX 1 - Area Classification and SNM Assessment Schedule (Cont'd)

Area**	Description	SNM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
AZ104	MEC 2-21EB	3	< 2.5mR/h					
AZ105	Substation 2-11E	3	< 2.5mR/h					
AZ106	Substation 2-21E	3	< 2.5mR/h					
AZ107	MEC 2-11EA	3	< 2.5mR/h					
AZ108	MEC 2-21EA	3	< 2.5mR/h					
AZ109	Muc. Services Coolers and Pumps	3	< 2.5mR/h					
AZ110	Intermediate Coolers	3	< 2.5mR/h					
AZ111	Intermediate Cooling Pumps and Filters	3	< 6mR/h					
AZ112	Seal Return Coolers and Filters (MU-F-3)	2	300mR/h (11MRA)	Ref or MFC or Documentation	4/87	1/87	8/87	Needs to be surveyed (Filter Cart - tags removed)
AZ113	Waste Gas Analyzer	3	< 100mR/h (11MRA)					
AZ114	MARP Dmlin. - 1A	1	2000 R/h (11MRA)	Ref Detector	9/87	7/87	9/87	Ref. CRD-1MF-413 (0.7 - 6.7 kg fuel)
AZ115	MARP Dmlin. - 1B	1	2000 R/h (11MRA)	Ref Detector	10/87	7/87	10/87	Ref. CRD-1MF-413 (0.7 kg fuel)
AZ116	MU Tank	1	300mR/h, 200mR/h (11MRA)	Ref or MFC or Detector	8/87	7/87	11/87	Ref. MU-25-48 (Tank: 102 grams fuel); Relief Valve Pipe: 146 grams fuel; Tank Discharge Pipe: 6 grams fuel)
AZ117	MARP Filters (MU-12A/B and MU-15A/B)	1	600mR/h	MFC Detector	9/87		12/87	MU-12A, 20 probably have fuel; MU-15A, 50 have been changed out and are being rechecked.
AZ118	Spent Fuel Coolers	3	5mR/h					
AZ119	Spent Fuel Dmlns	3	160mR/h					

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APPENDIX 1 - Area Classification and SMH Assessment Schedule (Cont'd)

Area	Description	SMH Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SMH Measurement Date	Remarks
AX120	Spent Fuel Filters	3	10mR/h					
AX121	Elevator Shaft	3	<0.2 mR/h					
AX122	North Stairwell	3	<2.5 mR/h					
AX123	Access Area	3	<2.5 mR/h					
AX124	Concent. Liquid Waste Pump	2	10mR/h	MpCo Detector or Documentation			...	
AX125	Waste Gas Decay Tank - 10	3	<2.5 mR/h				...	
AX126	Waste Gas Filter Room	3	<2.5 mR/h				...	
AX127	Waste Gas Decay Tank - 1A	3	<2.5 mR/h					
AX128	Valve and Instrument Room	3	<2.5 mR/h					
AX129	Debarating Dmain - 10	2	<2.5 mR/h	Documentation			...	Unitely
AX130	Debarating Dmain - 1A	2	<2.5 mR/h	Documentation			...	Unitely
AX131	Misc. Waste Tank (MDT-12)	2	200mR/h (1MCA)	MpCo or MpCo Detector	7/87	5/87	6/87	Not surveyed. Standpipe drained
AX132	Corridor between Unit 1 and Unit 2	3	<2.5mR/h					
AX133	South Stairwell	3	<2.5mR/h					
AX134	Misc. Waste Tank Pumps	2	20mR/h					
AX135	Radioactive Disposal Control Panel	3	<2.5mR/h	MpCo Detector			10/87	Not surveyed
AX201	North Stairwell	3	<2.5mR/h					



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Area**	Description	SNM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
AZ202	Elevator Shaft	3	0.2uR/h					
AZ203	416SV Switchgear - 2-1E	3	<2.5uR/h					
AZ204	416SV Switchgear - 2-2E	3	<2.5uR/h					
AZ205	BB Purge Air Supply and Hy. Cont. Enh.	3	<2.5uR/h					
AZ206	BB Purge Exhaust Unit B	3	2uR/h					
AZ207	BB Purge Exhaust Unit A	3	6uR/h					
AZ208	Aux. Bldg. Exhaust Unit B	3	5uR/h					
AZ209	Aux. Bldg. Exhaust Unit A	3	5uR/h					
AZ210	FM Bldg. Exhaust Unit B	3	5uR/h					
AZ211	FM Bldg. Exhaust Unit A	3	5uR/h					
AZ212	Decay Heat Surge Tank & Substation	3	<2.5uR/h					
AZ213	Unit Substations & Access Area	3	<2.5uR/h					
AZ214	Decon Facility	3	<2.5uR/h					
AZ215	FM Bldg. Supply Unit	3	<2.5uR/h					
AZ216	Aux. Bldg. Supply Unit	3	<2.5uR/h					
AZ217	Access Area	3	<2.5uR/h					
AZ218	Concent. Waste Storage Tank Room	2	20uR/h	WGA Detector	10/07		11/07	

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APPENDIX 1 - Area Classification and SNM Assessment Schedule (Cont'd)

Area	Description	SNM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
AR219	Inst. Backs & Atmosph. Monitor	3	<2.5mR/h					
AR220	Castile Liquids Mixing Area	3	10mR/h					
AR221	Castile Liquids Mixing Area Corr.	3	10mR/h					
AR222	South Stairwell	3	<2.5mR/h					
AR223	Air Handling Units General Area	3	<2.5mR/h					
AR301	Elevator Shaft and Elevator Machine Room	3	<0.2mR/h					
AR302	North Stairwell	3	<2.5mR/h					
AR303	Elevator and Stairwell Access	3	<2.5mR/h					
AR401	Boil	3	<2.5mR/h					
AR402	Cooling Water Surge Tanks	3	<2.5mR/h					
AR403	Damper Room	3	<2.5mR/h					
AR501	DB Spray Pump - 1A	3	10mR/h					
AR502	DB Spray Pump - 1B	3	200mR/h (1MRA)					
AR503	DB Embr. Cooler and Pump - 1A	3	25mR/h (1MRA)					
AR504	DB Embr. Cooler and Pump - 1B	3	60mR/h (1MRA)					

NDA for DB system piping is 1.5 grams  
(18-06-47)

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APPENDIX 1 - Area Classification and SNM Assessment Schedule (Cont'd)

Area**	Description	SNM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
RI001	Makeup Suction Valve Room	1	<55mR/h	NaI Detector	3/87	1/87	2/87	Pre-flush status: Gamma Spectr. measurement-264 grams in carrier (1B-06-00)
RI002	Access Corridor	3	20mR/h, 150mR/h					
RI001a	Makeup Discharge Valve Room	1	1.5mR/h, 50R/h (LHRA)	NaI or NaGe Detector	4/87	1/87	3/87	Pre-flush status: Gamma Spectr. measurement-0 grams (1B-06-07)
RI001b	Makeup Discharge Valve Room	1	50R/h, 700R/h (LHRA)	NaI or NaGe Detector	4/87	1/87	5/87	Pre-flush status: Gamma Spectr. measurement-30 grams (1B-06-07)
RI004	Wet/Dryhouse Valve Room (mini decay heat)	3	15mR/h					
RI005	Mini-Decay Heat Vault	3	3.2mR/h					
RI006	Decay Heat Service Coolers	3	40mR/h					
RI007	Neutral & Reclaimed Boric Acid	3	100mR/h, 30R/h					
RI008	Neutralizer Tank Pump Rm.	3	50mR/h					
RI009	Neutralizer Tank Room	3	400mR/h (LHRA)					
RI010	Reclaimed Boric Acid Tank	3	2mR/h					
RI011	Reclaimed Boric Acid Pump	3	10mR/h					
RI012	Neutralizer - Tank Filters	3	600mR/h					
RI013	Oil Drum Storage Area	3	<8.2mR/h					

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Area	Description	SNM Category	Current Radiation Levels (per hour) (uR/h)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
FH014	Annulus	2	250uR/h (1uRA)	NaI Detector			1986	Gamma Spectr. measurement scheduled
FH01	M&P Valve Room	1	400uR/h (1uRA)	NaI Detector	11/86		4/87	Pre-flush status: Block orifice removed - 125 grams in orifice; 575 grams in remainder of cubicle (1B-66-21)
FH02	East Corridor	3	20uR/h					
FH03	Sample Room	3	10uR/h					
FH04	West Corridor	3	42.5uR/h					
FH05	Model Room A	3	10uR/h					
FH06	Monitor Tanks & Sample Sink Area	2	10uR/h					Unlikely
FH07	Trash Compactor Area	3	42uR/h					
FH08	Truck Bay	3	42.5uR/h					Possible fuel fines from canisters.
FH09	Spent Fuel Pool A	2	42.5uR/h					Possible fuel fines from canisters.
FH10	SDS Spent Fuel Pool	2						Possible fuel fines from canisters.
FH11	Fuel Cask Storage	2						Gamma Spectr. scheduled
FH12	Annulus	2	50uR/h				12/87	
FH201	East Corridor	3	10uR/h					
FH202	West Corridor	3	41.0uR/h					
FH203	Surge Tank Area	3						
FH204	SPC Area	3	42.5uR/h					
FH205	Annulus	3	120uR/h					



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Area	Description	SNM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SNM Measurement Date	Remarks
FH101	Upper Spent Fuel Pool Area	3	5m 7	HeGe Detector or Documentation				
FH102	SDS Operating Area	2						
FH103	Upper SPC Area	3	<2.5m 7					
FH104	Annulus	3	2m 7					
FH105	Spent Fuel Pool Access	3	<2.5m 7					

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APPENDIX 1 - Area Classification and SNM Assessment Schedule (Cont'd)

Area**	Description	SNM Category	Assessment Method	Estimated Defueling Date	Estimated SNM Measurement Date	Controlling Factors	Remarks
RR01	Letdown Coolers Cubicle	1	NaI Detector	Not to be defueled	Utilize DPA measurements	OQA acceptance of previous DPA measurements	TR-06-26 (c2.3 kg of fuel*)
RR02	Reactor Building Sump	1	Sampling/NaI/ H <sub>2</sub> Co	Not to be defueled	GTB-042	OQA acceptance of previous DPA measurement	GTB-042
RR03	Reactor Coolant Drain Tank Cubicle	1	Video Insp.	Not to be defueled	GTB-042	OQA acceptance of previous DPA measurement	GTB-042 (Tank: c0.1 kg of fuel*)
RR04	Reactor Building Basement (floor)	1	Sampling/NaI/ H <sub>2</sub> Co	6/87 Desludging	Utilize previous DPA measurement	OQA acceptance of DPA measurement package	TR-06-03, TR-05-08, TR-06-30, TR-06-36 (c3.2 kg of fuel*)
RR05	Under Reactor Vessel	1	TBD	TBD	TBD	Severe access and dose rate problems	TR-06-25
RR06	Letdown Line	2	TBD	TBD	TBD	Severe access and dose rate problems	
RR11	Decay Heat Drop Line	2	Video Insp. & Sampling	TBD	2/87	Requires RCS visibility and defueling window for video inspection	
RR12	Drain Stubs (J-loops and Steam Generators)	1	Video Insp. & Sampling	Not to be defueled	TBD	Will be performed by extrapolating sample data to drain stub volumes	
RR21	Reactor Coolant Pumps	2	Video Insp. & Sampling	TBD	2/87	Requires RCS visibility and defueling window	
RR22	Horizontal RCS Piping	1	Video Insp. & Sampling	TBD	2/87	Requires RCS visibility and defueling window	

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## APPENDIX 1 - Area Classification and SNM Assessment Schedule (Cont'd)

Area**	Description	SNM Category	Assessment Method	Estimated Defueling Date	Estimated SNM Measurement Date	Controlling Factors	Remarks
0B23	Reactor Vessel	1	RaI/Video/ Sampling	12/87	6/88	Requires completion of RV defueling and completion of engineering for RV SNM measurement	
0B31	Pressurizer	1	Video Insp.	3/87	3/87		TS-05-09, TS-05-10a, TS-05-10 ( $<11.2$ kg of fuel*)
0B32	Steam Generators		Video/SSTB's/ or Detector				TS-04-05, TS-05-10, TS-06-10, TS-06-23 TS-06-24, TS-06-37, TS-06-38, TS-06-44
	Upper Tube Sheet and Tube Blockages	1		4/87	7/87	Only necessary if SNM is found in lower DTSG regions	(DTSG-A: $<43$ kg of fuel*; DTSG-B: $<74$ kg of fuel*)
	DTSG Tube Surfaces	1	Cylindrical Detector	N/A	4/87	Delivery of cylindrical alpha detector	
0B33	Core Flood Tanks - AAB and Drain Lines	2	"A": TBD "B": RaI	TBD	"A": TBD "B": Utilize previous DPA measurement	Possible access and dose rate problems	TS-05-07 ("B" - Core Flood Tank; Drain Line - $<120$ grams of fuel*; Check Valve - $<10$ grams of fuel*)
0B34	Incore Guide Tubes	2	RaI Detector				
0B35	Plenum	1	TBD	TBD	7/87	Dependent upon defueling decisions	TS-04-07
0B36	Reactor Vessel Head	1	RaI Detector	N/A	8/87		
0B37	Reactor Coolant Hot Legs	1	Documentation (films)	TBD	TBD		
0B38	Pressurizer Surge Line	1	RaI Detector				TS-05-09 ( $<200$ grams of fuel*)
0B39	Pressurizer Spray Line	2	RaI Detector	1/87	TBD	High Area Radiation Dose Rates	
0B40	Fuel Transfer Canal	2					

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