

# Nuclear

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4410-87-L-0059  
Document ID 0177P

April 14, 1987

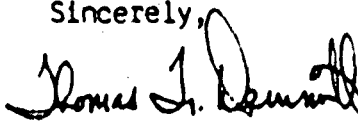
Dr. W. D. Travers -Director  
TMI-2 Cleanup Project Directorate  
US Nuclear Regulatory Commission  
c/o Three Mile Island Nuclear Station  
Middletown, PA 17057

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,

  
for F. R. Standerfer  
Director, TMI-2

FRS/RDW/eml

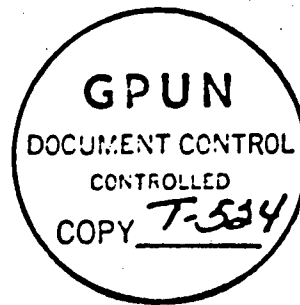
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**GPU Nuclear**TMI-2 Unit  
Policy/PlanNumber  
4000-PLN-4420.02Title  
SNM Accountability PlanRevision No.  
0-00Applicability/Scope  
TMI-2 SNM Accountability ProgramResponsible Office  
4440This document is important to safety  Yes  NoEffective 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						
7.0	0-00						
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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FORM-1000-ADM-1218 01-1 (11/87)

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Document ID: 00204

Title  
SNM Accountability PlanRevision No.  
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## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 PURPOSE	3.0
2.0 BACKGROUND	3.0
3.0 SUMMARY	4.0
4.0 SNM ACCOUNTABILITY PROCESS	5.0
5.0 SNM MEASUREMENTS	7.0
6.0 <u>SNM</u> TECHNIQUES	8.0
7.0 QUALITY ASSURANCE OF SNM ACCOUNTABILITY	8.0
8.0 CONFIGURATION CONTROL OF AREAS, SYSTEMS OR COMPONENTS CONTAINING RESIDUAL SNM	9.0
9.0 ALARA FOR SNM ACCOUNTABILITY	10.0
10.0 RESPONSIBILITIES	10.0
11.0 REFERENCES	11.0
12.0 APPENDIX 1 - Area Classification and SNM Assessment Schedule	E1-1

<b>GPU Nuclear</b>	<b>TMI-2 Unit Policy/Plan</b>	Number <b>4000-PLN-4420.02</b>
Title <b>SNM Accountability Plan</b>		Revision No. <b>0-00</b>
<b>1.0 PURPOSE</b>		
<p>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.</p>		
<p>*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.</p>		
<p>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.</p>		
<b>2.0 BACKGROUND</b>		
<p>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.</p>		
<p>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.</p>		

<b>GPU Nuclear</b>	TMI-2 Unit Policy/Plan	Number 4000-PLN-4420.02
Title SNM Accountability Plan		Revision No. 0-00
<p>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).</p> <p>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.</p> <p>3.0 <u>SUMMARY</u></p> <p>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 Auxilliary 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.</p> <p>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.</p> <p>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.</p>		

- 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

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.

- 4.1.2 SNM Measurement - 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.
- 4.1.3 Fuel Characterization Measurements for SNM Accountability - 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:
- 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.
  - 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.
  - c. The previous fuel characterization SNM measurement package is accepted by Quality Assurance/Quality Control.
- 4.1.4 SNM Assessment Engineering Calculation - 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

Title  
SNM Accountability PlanRevision No.  
0-00

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.

Title

SNM Accountability Plan

Revision No.

0-00

- 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

Title  
SNM Accountability PlanRevision No.  
0-00

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.

- 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 - HWB-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

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
AXB01	BB Emerg. Boos. Pump	3	2mR/h					
AXB02	Access Corridor (Drains)	3	2mR/h					
AXB03	Access Area (Drains)	3	2mR/h					
AXB04	Seal Injection Valve Room	2	25R/h (LHRA)	NaI Detector	3/87		5/87	Gamma Spectr. scheduled at later date
AXB05	H.U. Pump - 1C	1	20mR/h (LHRA)	NaGe Detector	3/87	1/87	2/87	Pre-flush status: 0.41 grams fuel* (TB-05-33)
AXB06	H.U. Pump - 1B	1	100mR/h, 600uR/h (LHRA)	NaGe Detector	4/87	1/87	2/87	Pre-flush status: 23.4 grams fuel* (TB-05-33)
AXB07	H.U. Pump - 1A	1	50mR/h, 100uR/h (LHRA)	NaGe Detector	5/87	1/87	2/87	Pre-flush status: 10.0 grams fuel* (TB-05-33)
AXB08	Spent Resin Storage Tank - 1B	2	0mR/h	NaGe Detector				
AXB09	Spent Resin Storage Tank - 1A	2	0mR/h	NaGe Detector				
AXB10	Spent Resin Storage Tank Pump	2	5mR/h	Documentation				
AXB11	Aux. Sump Pump Valve Room	1	20mR/h	Documentation			***	Pre-flush status: Gamma Spectr. shows 1.5 grams of fuel*. (TB-06-28; MDL-44A, 4B)
AXB12	Aux. Bldg. Sump Tank Room	1	700mR/h, 40uR/h (LHRA)	NaI or NaGe Detector	4/87	5/87	6/87	Gamma Spectr. shows 262 grams* in sump, 1.4 grams* in sump tank and 1.9 grams* in pump (TB-06-28)
AXB13	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, TPO/TMI-009.  
 \*\*\*Will utilize existing documentation.

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

LEGEND: LHRA - Labeled High Radiation Area  
 TBD - To be Determined

Title  
 SNM Accountability Plan

**GPU Nuclear**

TMI-2 Unit  
 Policy/Plan

Revision No.  
 0-00

Number  
 4000-PLN-4420.02

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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
A2D14	RC Evap. Room	3	100mR (LMRA)					
A2D15a	Cleanup Filters Room	3	10mR					NEL-F44B and NEL-P24B (c4.7 grams per filter) (TB-86-48)
A2D15b	Cleanup Filter After Room	3	10mR					
A2D16	Cleanup Dumb. - 2A	3	5R (LMRA)					
A2D17	Cleanup Dumb. - 2B	3	50R (LMRA)					
A2D18	Waste Transfer Pump Room	3	20mR, 100mR-					
A2D19	Waste Disposal Liquid Valves	1	5mR	NaI Detector or Documentation				
A2D20	RC Bleed Tanks 1B, 1C	1	5mR, 10mR- (LMRA)	NaI Detector	5/87	12/87	1/88	Possible small amounts of fuel (MCL-71B)
A2D21	RC Bleed Tank 1A	1	12mR	NaI Detector			1/88	Tank cleaned - presently contains no fuel
A2D22	North Stairwell	3	1mR					
A2D23	Elevator Shaft	3	20mR, 50mR-					
A2D24	Aux. Bldg. Sump Filters	2	60mR	NaI Detector or Documentation	11/87	10/87	1/88	Filter cartridges removed (no fuel in filters)
A2D26	Seal Injection Filters (MU-F4A, 4B)	2	60mR					Needs to be surveyed (filter cartridges removed, no fuel in filters)
A2D27	South Stairwell	3	2.5mR					
A2I01	Radioactive Disposal Panel	3	2mR					
A2I02	RB Sump Pump Filters	2	300mR	TBD		5/87	7/87	Not surveyed
A2I03	MCC 2-11EB	3	<2.5mR					

Title  
SNM Accountability Plan



THI-2 Unit  
POLICY/PLAN

Number  
4000-PLK-4420.02

Revision No.  
0-00

E1-2

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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 Bacon Date	System Flush Date	SNM Measurement Date	Remarks
AX104	MCC 2-21EB	3	< 2.5mR/h					
AX105	Substation 2-11E	3	< 2.5mR/h					
AX106	Substation 2-21E	3	< 2.5mR/h					
AX107	MCC 2-11EA	3	< 2.5mR/h					
AX108	MCC 2-21EA	3	< 2.5mR/h					
AX109	Mec. Services Coolers and Pumps	3	< 2.5mR/h					
AX110	Intermediate Coolers	3	< 2.5mR/h					
AX111	Intermediate Cooling Pumps and Filters	3	< 60mR/h					
AX112	Seal Return Coolers and Filters (MU-F-3)	2	300mR/h (LMRA)	NaI or NaCo or Documentation	4/87	1/87	8/87	Needs to be surveyed (Filter Cartridge removed)
AX113	Waste Gas Analyzer	3	<100mR/h (LMRA)					
AX114	MUBP Dmain. - 1A	1	200R/h (LMRA)	NaI Detector	9/87	7/87	9/87	Ref. GEND-INT-013 (0.7 - 6.7 kg fuel*)
AX115	MUBP Dmain. - 1B	1	200R/h (LMRA)	NaI Detector	10/87	7/87	10/87	Ref. GEND-INT-013 (0.7 kg fuel*)
AX116	MU Tank	1	300mR/h, 300mR/h (LMRA)	NaI or NaCo Detector	8/87	7/87	11/87	Ref. TD-05-00 (Tank: 102 grams fuel*; Relief Valve Pipe: 146 grams fuel*; Tank Discharge Pipe: 6 grams fuel*)
AX117	MUBP Filters (MU-F2ABB and MU-F5ABB)	1	800mR/h	NaCo Detector	9/87		12/87	MU-F2A, 2B probably have fuel; MU-F5A, 5B have been changed out and are being rechecked.
AX118	Spent Fuel Coolers	3	5mR/h					
AX119	Spent Fuel Dmain	3	160mR/h					

The  
SNM Accountability Plan



THI-2 Unit  
Policy/Plan

Number  
4000-PLN-4420.02

Revision No.  
0-00

E1-3

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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
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	HpGe Detector or Documentation			...	
AX125	Waste Gas Decay Tank - 1B	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	Deborating Demin - 1B	2	<2.5 mR/h	Documentation			...	Unlikely
AX130	Deborating Demin - 1A	2	<2.5 mR/h	Documentation			...	Unlikely
AX131	Misc. Waste Tank (MDL-72)	2	200mR/h (LHRA)	Hal or HpGe 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	HpGe Detector			18/87	Not surveyed
AX135	Radwaste Disposal Control Panel	3	<2.5mR/h					
AX201	North Stairwell	3	<2.5mR/h					

11-4

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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
AX202	Elevator Shaft	3	0.2mR/h					
AX203	4160V Switchgear - 2-1E	3	<2.5mR/h					
AX204	4160V Switchgear - 2-2E	3	<2.5mR/h					
AX205	RB Purge Air Supply and Hy. Cont. Exh.	3	<2.5mR/h					
AX206	RB Purge Exhaust Unit B	3	26mR/h					
AX207	RB Purge Exhaust Unit A	3	60mR/h					
AX208	Aux. Bldg. Exhaust Unit B	3	5mR/h					
AX209	Aux. Bldg. Exhaust Unit A	3	5mR/h					
AX210	FN Bldg. Exhaust Unit B	3	5mR/h					
AX211	FN Bldg. Exhaust Unit A	3	5mR/h					
AX212	Decay Heat Surge Tank & Substation	3	<2.5mR/h					
AX213	Unit Substations & Access Area	3	<2.5mR/h					
AX214	Decon Facility	3	<2.5mR/h					
AX215	FN Bldg. Supply Unit	3	<2.5mR/h					
AX216	Aux. Bldg. Supply Unit	3	<2.5mR/h					
AX217	Access Area	3	<2.5mR/h					
AX218	Concent. Waste Storage Tank Room	2	20mR/h	HeGe Detector	10/87		11/87	

Title  
SNM Accountability Plan



THI-2 Unit  
Policy/Plan

Number  
4000-PLN-4420.02

Revision No.  
0-00

5-5

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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
AX219	Inst. Racks & Atmosph. Monitor	3	<2.5mR/h					
AX220	Caustic Liquids Mixing Area	3	10mR/h					
AX221	Caustic Liquids Mixing Area Corr.	3	10mR/h					
AX222	South Stairwell	3	<2.5mR/h					
AX221	Air Handling Units General Area	3	<2.5mR/h					
AX301	Elevator Shaft and Elevator Machine Room	3	<0.2mR/h					
AX302	North Stairwell	3	<2.5mR/h					
AX401	Elevator and Stairwell Access	3	<2.5mR/h					
AX401	Roof	3	<2.5mR/h					
AX402	Cooling Water Surge Tanks	3	<2.5mR/h					
AX401	Damper Room	3	<2.5mR/h					
AX501	RB Spray Pump - 1A	3	10mR/h					MDL for DH system piping is 1.6 grams* (TB-86-47)
AX502	RB Spray Pump - 1B	3	200mR/h (LHRA)					
AX503	DH Remov. Cooler and Pump - 1A	3	25mR/h (LHRA)					
AX504	DH Remov. Cooler and Pump - 1B	3	60mR/h (LHRA)					

9-13

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

Area**	Description	SIM Category	Current Radiation Levels (per hour)	Assessment Method	Surface Decon Date	System Flush Date	SIM Measurement Date	Remarks
FH001	Makeup Section Valve Room	1	<55mR/h	NaI Detector	3/87	1/87	2/87	Pre-Flush status: Gamma Spectr. measurement-264 grams* in corridor (TB-06-06)
FH002	Access Corridor	3	20mR/h, 150mR/h					
FH007a	Makeup Discharge Valve Room	1	1.5mR/h, 500- (LURA)	NaI or HpGe Detector	4/87	1/87	3/87	Pre-Flush status: Gamma Spectr. measurement-8 grams* (TB-06-07)
FH007b	Makeup Discharge Valve Room	1	5R/h, 700R/h- (LURA)	NaI or HpGe Detector	4/87	1/87	5/87	Pre-Flush status: Gamma Spectr. measurement-30 grams* (TB-06-07)
FH004	Westinghouse Valve Room (mini decay heat)	3	15mR/h					
FH005	Mini-Decay Heat Vault	3	3.2mR/h					
FH006	Decay Heat Service Coolers	3	40mR/h					
FH007	Neutral & Reclaimed Boric Acid	3	100mR/h, 300-					
FH008	Neutralizer Tank Pump Rm.	3	50mR/h					
FH009	Neutralizer Tank Room	3	400mR/h (LURA)					
FH010	Reclaimed Boric Acid Tank	3	2mR/h					
FH011	Reclaimed Boric Acid Pump	3	10mR/h					
FH012	Neutralizer - Tank Fillers	3	800mR/h					
FH013	Oil Drum Storage Area	3	<0.2mR/h					

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Title  
**SIM Accountability Plan**

TRI-2 Unit  
Policy/Plan

Number  
4000-PLN-4420.02

Revision No.  
0-00

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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
FH114	Annulus	2	250mR, 300mR (LMRA)	NaI Detector			1988	Gamma Spectr. measurement scheduled
FH101	NDLP Valve Room	1	400mR (LMRA)	NaI Detector	11/86		4/87	Pre-Flush status: Block orifice removed - 125 grams <sup>m</sup> in orifice; 575 grams <sup>m</sup> in remainder of cubicle (TB-86-21)
FH102	East Corridor	3	20mR					
FH103	Sample Room	3	10mR					
FH104	West Corridor	3	<2.5mR					
FH105	Model Room A	3	10mR					
FH106	Monitor Banks & Sample Sink Area	2	10mR					Unlikely
FH107	Trash Compactor Area	3	<2mR					
FH108	Trash Bag	3	<2.5mR					
FH109	Spent Fuel Pool A	2	<2.5mR					Possible fuel fines from canisters.
FH110	SBS Spent Fuel Pool	2						Possible fuel fines from canisters.
FH111	Fuel Cash Storage	2						Possible fuel fines from canisters.
FH112	Annulus	2	50mR				12/87	Gamma Spectr. scheduled
FH201	East Corridor	3	10mR					
FH202	West Corridor	3	<1.0mR					
FH203	Surge Tank Area	3						
FH204	SPE Area	3	<2.5mR					
FH205	Annulus	3	120mR					

Title

SNM Accountability Plan

**GPW Nuclear**

TRU-2 Unit Policy/Plan

Number

4000-PLN-4420.02

Revision No.

0-00

8-13

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TMI-2 Unit  
Policy/Plan

Number  
4000-PLN-4420.02

Title

SNM Accountability Plan

Revision No.  
0-00

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
FH301	Upper Spent Fuel Pool Area	3						
FH302	SDS Operating Area	2	5mR/h	MoGe Detector or Documentation				
FH101	Upper SPC Area	3	<2.5mR/h					
FH104	Annulus	3	20mR/h					
FH105	Spent Fuel Pool Access	3	<2.5mR/h					

6-13

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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
RB01	Leddown Coolers Cubicle	1	NaI Detector	Not to be defueled	Utilize DPA measurements	OQA acceptance of previous DPA measurements	TB-86-26 (<2.3 kg of fuel*)
RB02	Reactor Building Sump	1	Sampling/NaI/HpGe	Not to be defueled	GENB-042	OQA acceptance of previous DPA measurement	GENB-042
RB03	Reactor Coolant Drain Tank Cubicle	1	Video Insp.	Not to be defueled	GENB-042	OQA acceptance of previous DPA measurement	GENB-042 (Tank: <0.1 kg of fuel*)
RB04	Reactor Building Basement (Floor)	1	Sampling/NaI/HpGe	6/87 Desludging	Utilize previous DPA measurement	OQA acceptance of DPA measurement package	TB-86-83, TB-85-88, TB-86-30, TB-86-36 (<3.2 kg of fuel*)
RB05	Under Reactor Vessel	1	TBD	TBD	TBD	Severe access and dose rate problems	TB-86-25
RB06	Leddown Line	2	TBD	TBD	TBD	Severe access and dose rate problems	
RB11	Decay Heat Drop Line	2	Video Insp. & Sampling	TBD	2/87	Requires RCS visibility and defueling window for video inspection	
RB12	Drain Stubs (J-Logs and Steam Generators)	1	Video Insp. & Sampling	Not to be defueled	TBD	Will be performed by extrapolating sample data to drain stub volumes	
RB21	Reactor Coolant Pumps	2	Video Insp. & Sampling	TBD	2/87	Requires RCS visibility and defueling window	
RB22	Horizontal RCS Piping	1	Video Insp. & Sampling	TBD	2/87	Requires RCS visibility and defueling window	

Title  
SNM Accountability Plan



TH-2 Unit  
Policy/Plan

Revision No.  
0-00

Number  
4000-PLN-4420.02

11-10

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Title

SNM Accountability Plan

Revision No.  
0-00

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
RB23	Reactor Vessel	1	NaI/Video/ Sampling	12/87	6/88	Requires comple- tion of RV defuel- ing and completion of engineering for RV SNM measurement	
RB31	Pressurizer	1	Video Insp.	3/87	3/87		TB-85-89, TB-85-18a, TB-86-02 (<1.2 kg of fuel*)
RB32	Steam Generators		Video/SSTR's/ or Detector				TB-84-85, TB-85-40, TB-86-10, TB-86-23, TB-86-24, TB-86-37, TB-86-38, TB-86-44
	Upper Tube Sheet and Tube Blockages	1		4/87	7/87	Only necessary if SNM is found in lower OTSG regions	(OTSG-A: <43 kg of fuel*; OTSG-B: <74 kg of fuel*)
	OTSG Tube Surfaces	1	Cylindrical Detector	N/A	4/87	Delivery of cylindrical alpha detector	
RB33	Core Flood Tanks - A&B and Drain Lines	2	"A": TBD "B": NaI	TBD	"A": TBD "B": Utilize previous DPA measurement	Possible access and dose rate problems	TB-85-87 ("B" - Core Flood Tank: Drain Line - <120 grams of fuel*; Check Valve - <10 grams of fuel*)
RB34	Incore Guide Tubes	2	NaI Detector				
RB35	Pipeman	1	TBD	TBD	7/87	Dependent upon defueling decisions	TB-84-87
RB36	Reactor Vessel Hood	1	NaI Detector	N/A	8/87		
RB37	Reactor Coolant Hot Legs	1	Documentation (films)	TBD	TBD		
RB38	Pressurizer Surge Line	1	NaI Detector				TB-85-89 (<200 grams of fuel*)
RB39	Pressurizer Spray Line	2	NaI Detector	1/87	TBD	High Area Radiation Dose Rates	
RB40	Fuel Transfer Canal	2					

11-11

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