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SNF Startup Plan to Operations

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford

P.O. Box 1000

Richland, Washington

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J. R. Gregory
Duke Engineering Services

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SNF Startup Plan to Operations

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SNF Startup Plan to Operations

Table of Contents

1.0	Purpose	3
2.0	Introduction	3
3.0	Scope	3
4.0	General Control Methods	4
4.1.	Management Review Following First MCO Processing	4
5.0	Management Oversight.....	4
5.1.	SSW Responsibilities.....	4
6.0	Operator Performance.....	5
6.1.	Facility Operations.....	5
6.2.	Operator Performance Evaluation and Remediation.....	5
7.0	Procedure Viability	5
7.1.	Procedure Observation.....	6
7.2.	Procedure Changes	6
8.0	Equipment Operability.....	6
8.1	MCO Gas Sampling Portion of the Limited Monitoring Plan	6
8.1.1	Description.....	7
8.2	CVD Dual Bay Operation.....	7
8.2.1	Description.....	8
8.3	CVD Conditioned Water Shipping.....	8
8.3.1	Description.....	8
8.4	MKI Canister Processing	8
8.4.1	Description.....	9
8.5	Mark-4 Fuel Transfer in 105 KW Basin	9
8.5.1	Description.....	9
8.6	Scrap and Fines Handling and Shipping.....	9
8.6.1	Description.....	9
9.0	Duration of Management Review	10
	Attachment 1 - SNF Project Checklist Readiness to Proceed.....	11
	Attachment 2 - SNF Senior Supervisory Watch List.....	13
	Attachment 3 - SNF Minimum Observation Requirements.....	14

SNF Startup Plan to Operations

1.0 Purpose

This plan defines the approach that will be used to ensure the transition from initial startup to normal operations of the SNF operations ... are performed in a safe, controlled, and deliberate manner. It provides a phased approach that bridges the operations between the completion of the ORR and the return to normal operations. This plan includes management oversight and administrative controls to be implemented and then reduced in a controlled manner until normal operations are authorized by SNF Management.

2.0 Introduction

The SNF Operations Management Team, through this plan, is establishing the requirements that will promote and encourage safe, efficient, and incident-free operations.

This plan details implementation of management and facility activities necessary to achieve full and unrestricted hot operations with emphasis in four strategic areas:

- Management Oversight
- Operator Performance
- Procedure Viability
- Equipment Operability

It includes plans for additional controls and measures for activities that will not take place for some time after initial startup.

Management involvement and attention to detail are crucial to achieving a safe, efficient and incident free startup of MCO processing operations. The activities outlined in this plan will serve to communicate requirements and expectations to SNF Operations Personnel to ensure that operations are performed in a controlled and deliberate manner.

3.0 Scope

This plan addresses the KW Basin, C VD, and CSB approach to MCO processing operations. These new operations involve transferring SNF to the receiving door at the CVD facility, transporting the SNF to the receiving door at the CSB, and accepting vacuum dried SNF from the CVD. It also addresses operations activities that will not be conducted at initial startup (e.g., MCO gas sampling, CVD dual bay operations, Mark-4 fuel transfer, etc.).

This plan includes SNF Management's approach to verify that the new facilities, new systems, new equipment installations, and associated operations are:

- Operated safely
- Operated, maintained, and supported by trained and competent personnel
- Operated in conformance with applicable DOE Orders and regulatory requirements
- Operated so that no undue risk to employees, the public, or the environment results
- Properly documented

The existing KW Basin fuel handling storage and operations activities are outside the scope of this plan.

SNF Startup Plan to Operations

4.0 General Control Methods

Following a successful ORR and recommendation to proceed with operations, responsible SNF managers will be required to verify that required reviews, pre-start issues, and corrective actions are complete and their area of responsibility is ready for operations. A checklist is provided in Attachment 1 that will be used to formally document this verification by each responsible manager. Once Attachment 1 has been signed, SNF Facility Management may proceed to process the first MCO from 105KW to CSB. This checklist also will be completed by responsible SNF Management prior to initiation of activities identified in Section 8.0 to verify SNF Project readiness to proceed.

4.1. Management Review Following First MCO Processing

At the completion of processing at each facility, the Facility Manager will ensure a critique is held to address both positive issues and areas for improvement. There will also be a critique held at the end of the first MCO processing among all three facilities to ensure that any interface issues are identified and resolved. These critiques will be completed prior to beginning processing of subsequent MCOs.

4.2 Management Review of Future Activities

The future activities identified in Section 8.0 will not be conducted at initial startup. SNF management will verify that equipment, procedures, training, and qualification for these activities are current at the time of the evolution (approximately six months to a year after initial startup). The Attachment 1 checklist will be used to document SNF management's verification to proceed with these activities. In addition, management oversight, operator performance, and procedure viability described in Sections 5 – 7, respectively, will be applied in the initial conduct of these activities. The additional controls will remain in place until removed by SNF management following a determination that "normal operation" has been achieved.

5.0 Management Oversight

During initial startup of MCO operations, a group of managers from the SNF management team will be designated as Senior Supervisory Watch (SSW) and will be present in the facility to ensure adequate oversight and evaluation of initial operations.

The SSWs will remain a requirement for the first two MCOs to be processed at each facility. Following the second shipment, the SNF Management team will decide to continue the SSW, reduce the required observations or discontinue the SSW. The SNF Facility Managers can elect at anytime to reinstate the program at their individual facility. The SSW also will be implemented during the initial conduct of the future activities identified in Section 8.0. SNF management will determine when to discontinue the SSW for each of these activities.

The SNF members designated as SSWs are listed in Attachment 2, SNF Senior Supervisory Watch List. The SNF Operations Director may revise the list at any time by memo designating additional members or removing members from the list. Each designated SSW will receive a briefing by the SNF Operations Director or the Facility Manager on the expectations, roles and responsibility of the SSW.

5.1. SSW Responsibilities

The primary intent for having SSW is to allow them to mentor Operations personnel, monitor the operability of equipment, viability of procedures and the performance of personnel through direct observation of operational activities.

SNF Startup Plan to Operations

General responsibilities of the SSW are listed below. Some of these responsibilities are restated or explained in other sections of this plan.

- A SSW shall have no other duties or responsibilities.
- Attend the facility POD's and pre-job briefings during the time assigned as the SSW.
- Maintain a logbook documenting significant events and activities.
- Mentor and provide feedback to Operations personnel.
- Ensure the facility shift supervision is adequately controlling facility status during operation, placing special emphasis on the authorization basis and worker safety.
- Maintain cognizance of overall facility status during assigned shifts.
- Maintain awareness of SNF priorities for work to be performed during shift and provide advice when warranted concerning alternate priorities.
- Evaluate the readiness of facility personnel to proceed with operations by discussion/interviews with operators and other facility personnel, concentrating on recent changes in facility equipment or procedures, related to ongoing activities.
- Observing the interface communications between facilities and the effectiveness of the documentation to provide the necessary communication tool needed between facilities.

While providing management observation, the SSW are expected to divide their time among the management personnel, the field personnel and the control area personnel (if applicable) to ensure that the overall facility readiness is monitored.

6.0 Operator Performance

Personnel readiness will be evaluated by direct observation of fuel handling and MCO processing operations. Specific activities will be observed by the SSW to ensure that operational activities are performed successfully while operations personnel gain experience.

6.1. Facility Operations

The readiness of personnel to perform fuel handling and MCO processing operation is established by the individuals' completion of the required training for their position and the qualification/certification process. As further confirmation of the readiness of personnel, minimum operations requirements will be performed and monitored by the SSW. The minimum operations requirements are listed on Attachment 3, SNF Minimum Observation Requirements, for each of the facilities.

6.2. Operator Performance Evaluation and Remediation

The main goal of the SSW is to mentor Operations personnel to affect feedback and performance improvement. In addition, the SSW shall evaluate operations personnel. These observations and evaluations of personnel will be documented in the facility's SSW Logbook. Any deficiencies in personnel performance will also be documented. Significant or pervasive deficiencies will be identified, documented and tracked by the Deficiency Tracking System process. Minor performance issues should be discussed with the Operations personnel involved and facility management.

7.0 Procedure Viability

The procedure process as described in the Administrative Procedures fully supports the procedures, both administrative and technical, required for successful operation of SNF facilities.

SNF Startup Plan to Operations

7.1. Procedure Observation

The SSW will evaluate procedure viability, personnel understanding of procedures and procedure compliance through observation of actual performance of procedures.

During actual performance of a procedure, interruptions by observers should be minimized and it is the responsibility of the SSW to enforce this. At anytime, stop work authority may be invoked to ensure safe facility operation. After completion of the observed activity, follow-up discussions to answer questions raised during the performance of procedure by the observers or the performers is appropriate.

7.2. Procedure Changes

Procedure inadequacies identified during procedure performance will be resolved. Changes to procedures are controlled under the applicable SNF Administrative Procedures. Procedure personnel shall be available to make timely revisions to procedures as required.

8.0 Equipment Operability

SNF will begin MCO processing activities with actual fuel following startup approval from the Department of Energy (DOE). During the testing phase of the project, system Test Specifications were identified and tested as appropriate. These test were both component based and integrated system tests. Cold run operations will be performed at the CSB and CVD to demonstrate the operability of the equipment to perform the required operation. A mixture of cold and hot operations is to be performed in 105KW to validate the equipment operability. These operations will be performed as part of the training and qualification/certification process and as part of the Management Self Assessment (MSA). Further prestart operations will be performed during the time period from the MSA to the DOE Operational Readiness Review (ORR).

Use of the appropriate Operating and Surveillance Procedures will verify equipment operability. During periods of observation, the SSW will verify identification of equipment deficiencies and appropriate maintenance activities to support equipment repair and return to service.

There are some operations activities that will not be conducted for some time after initial startup. Operability of this equipment will be determined at the time of the evolution (approximately six months to a year after initial startup). These activities include MCO gas sampling, CVD dual bay operations, MKI canister processing, Mark-4 fuel transfer, PWC Tank offload, and scrap and fines handling and shipping. These activities are briefly discussed below.

8.1 MCO Gas Sampling Portion of the Limited Monitoring Plan

The MCO gas sampling portion of the Limited Monitoring Plan (SNF- 5536) is added to the Startup Plan to ensure that gas sampling activities are properly reviewed by responsible SNF managers prior to initiation of the activity. This will ensure that the equipment, procedures, training, and qualification are current at the time of the evolution. Additional oversight and controls will be implemented for these activities until normal operation is achieved.

SNF Startup Plan to Operations

8.1.1 Description

There are two separate monitoring programs: Limited Monitoring and Long Term Monitoring. Limited Monitoring includes pressure, temperature, and gas sampling for a limited number of MCOs (i.e., 4 to 6). The Long Term Monitoring includes only MCO pressure measurement capability.

Design of a special MCO sample cart to take gas samples from the MCOs that are part of the limited monitoring program has been completed. It interfaces with the MCO Sampling/Weld Station at the CSB. Using this system, MCO pressure and skin temperature can be checked and a sample of the internal gases taken for analysis with the cover cap off (not installed on) the MCO.

For the MCOs that are a part of the limited monitoring program, monitoring over the two-year period will be done at the weld station using the MCO Sampling/Weld (MSW) System. Several activities are involved: The MCO skin temperature is checked using an infrared pyrometer; the MCO gas pressure and temperature are checked; and the MCO gas stream is sampled for hydrogen, oxygen, and radiological gases. This operation is described in more detail in the MSW System Design Description (Fluor 1999).

There is an increased risk of leakage from a failure to seal of a process port valve every time the valve is cycled, (e.g. during the process of a gas sample). To minimize the risk, the number of samples will be limited to less than five. Therefore, unless unusual circumstances dictate otherwise, the following sampling schedule is proposed.

MCO Type	Approximate MCO Sequence Range	Proposed Sampling Schedule		
			1 year	2 years
The first MCO, good fuel, no scrap basket	1			
The first MCO with a scrap basket	3 to 10	4 months	1 year	2 years
Selected from K West Pu Blend	147 to 155	6 months	1 year	2 years
Selected K West Other Mk IV, with Al(OH) ₃	165 to 175	4 months	1 year	2 years
K East Pu Blend	205 to 215	6 months	1 year	2 years
SPR	204	4 months	1 year	2 years

The design and operation of the MSW system have already been analyzed in the current authorization basis as well as from an OCRWM standpoint. The necessary provisions were made in the design and fabrication of the system to support both.

8.2 CVD Dual Bay Operation

The CVD dual bay operation is added to the Startup Plan to ensure that dual bay operations are properly reviewed by responsible SNF managers prior to initiation of the activity. This will ensure that the equipment, procedures, training, and qualification are current at the time of the evolution. Additional oversight and controls will be implemented for these activities until normal operation is achieved.

SNF Startup Plan to Operations

8.2.1 Description

The CVD can process two MCOs concurrently in Bays 4 and 5. Operation of the bays is independent but the PWC, HVAC, chilled water and general service helium systems are shared support systems. The MCS is designed to perform multiple bay operations. Procedures for the two bays are the same, the operation of the two bays are the same, but the interface points with the shared systems play a larger role in the coordination efforts that are required. Operation of two bays at a time will not be required until after several MCOs have been processed. These operations will be addressed as a future activity and is an activity to be covered as part of the Startup Plan.

8.3 CVD Conditioned Water Shipping

Conditioned water shipping activity is added to the Startup Plan to ensure that the tank offloading activities are properly reviewed by responsible SNF managers prior to initiation of the activity. This will ensure that the equipment, procedures, training, and qualification are current at the time of the evolution. Additional oversight and controls will be implemented for these activities until normal operation is achieved.

8.3.1 Description

The function of the conditioned water shipping system is to provide transportation of purified process water from the CVDF to the K Basins integrated water treatment system or other location for appropriate dispositioning. The conditioned water shipping system consists of a pump located in the process water tank room, piping from the process water tank room to bay 1, and flex hose to connect to a tanker truck. After process water storage tank sample results are verified, a tanker truck is backed into bay 1 and a transfer line is connected to the tanker truck using a flex line and quick disconnect. The tanker truck has a HEPA-filtered vent. Water is pumped from the PWC storage tank to the tanker truck using the storage tank pump. The PWC storage tank has the capacity for greater than 10 MCOs, therefore this process evolution is not required to be performed for sometime (~3 months) after initial processing begins. These operations will be addressed as a future activity and is an activity to be covered as part of the Startup Plan.

8.4 MKI Canister Processing

Processing of MKI canisters is added to the Startup Plan to ensure that these activities are properly reviewed by responsible SNF managers prior to initiation of the activity. This will ensure that the equipment, procedures, training, and qualification are current at the time of the evolution. Additional oversight and controls will be implemented for these activities until normal operation is achieved.

SNF Startup Plan to Operations

8.4.1 Description

Processing of MKI canisters is scheduled to take place to support the loading of the 30th MCO. This is sequenced after the completion of Phase 3 and 4 testing. This activity will use a tool to cut the tube that is connected to the canister lid and the MKI portion of the canister decapper. All other FRS activities used for MKII canisters remain the same.

8.5 Mark-4 Fuel Transfer in 105 KW Basin

Mark-4 Fuel transfer activity is added to the Startup Plan to ensure that the activities are properly reviewed by responsible SNF managers prior to initiation of the activity. This will ensure that the equipment, procedures, training, and qualification are current at the time of the evolution. Additional oversight and controls will be implemented for these activities until normal operation is achieved.

8.5.1 Description

The fuel selection sequence for spent fuel removal activities is addressed in HNF-3635, *Spent Nuclear Fuel Removal Campaign Plan*. This plan provides for the sequencing of Mark-IV fuel after the initial campaign for the Mark-1A fuel. Different fuel and scrap basket designs have been developed for the Mark-IV and Mark 1A fuel based on criticality control criteria. Most Mark-IV fuel is longer than the Mark-1A fuel basket and will not fit in the alternate basket design. Since the Mark-IV fuel campaign will be sequenced some time after initial startup, the Mark-IV fuel handling, decapping, and MCO loading operations will be covered as a future activity as part of the Startup Plan.

8.6 Scrap and Fines Handling and Shipping

Scrap and fines handling and shipping activity will not be conducted at the time of initial startup. This activity is added to the Startup Plan to ensure that these activities are properly reviewed by responsible SNF managers prior to initiation of the activity. This will ensure that the equipment, procedures, training, and qualification are current at the time of the evolution. Additional oversight and controls will be implemented for these activities until normal operation is achieved.

8.6.1 Description

The spent fuel sorting, inspection, and MCO basket loading operations at K Basin include the separation of fuel elements or segments (whole or partial elements that contain intact circular sections) from fuel scrap and fines which are loaded into MCO scrap baskets. Fuel scrap between 1-3 inches long, and other elements that cannot be loaded into the assembly basket because of bloomed ends, are loaded into an MCO scrap basket. "Fine" fuel scrap at least 0.25-inch screen size and less than 1-inch long is placed only into the center "fines" section of the MCO scrap basket. This allows the amount of fine scrap loaded in the MCO to be controlled within the MCO loading safety requirements defined in HNF-SD-SNF-OCD-001, *Spent Nuclear Fuel Project Product Specification*. The loaded MCO scrap baskets (containing scrap and fines) will be moved to a staging area in the basin pool for later handling and loading into

SNF Startup Plan to Operations

the MCO for transfer. These operations will be addressed as a future activity and is an activity to be covered as part of the Startup Plan.

9.0 Duration of Management Review

Following completion of processing at least 2 MCOs (with the SSWs observing all activities outlined in Attachment 3), SNF Management will review their areas of responsibility to determine the health of the conduct of operations for the project. After determining that outstanding issues have been resolved, SNF Management will authorize continued MCO processing under normal controls. This startup plan will then no longer be necessary.

SNF Startup Plan to Operations

Attachment 1 - SNF Project Checklist Readiness to Proceed

Define Scope of Activity

1. The scope of the work is to be defined. Provide the definition of the project or activity. Include boundaries, exclusions, etc.

Responsible Facility Manager _____

SAFETY ENVELOPE AND TECHNICAL SAFETY REQUIREMENTS (TSRs)

2. The project/activity is adequately defined and included in the approved authorization basis.

Responsible Facility Manager _____

3. Surveillance has been performed in accordance with periodicity specified in TSRs to support the activity.

Responsible Facility Manager _____

4. Administrative controls required to ensure compliance with applicable TSR Limiting Conditions of Operations (LCO) Action Statements have been implemented.

Responsible Facility Manager _____

5. New/revised TSRs, PSs, and procedures (operating and technical) have completed USQ evaluations.

Responsible Facility Manager _____

CRITICALITY SAFETY APPROVALS

6. Applicable Process Standards have been approved and appropriate controls implemented.

Responsible Facility Manager _____

PROCEDURES

7. Project/activity procedures have been completed, approved, and issued.

Responsible Facility Manager _____

8. Procedures have been verified to be consistent with TSRs and Process Standards.

Responsible Facility Manager _____

9. Procedures have been validated against the equipment/systems (walk downs, dry runs, etc.).

Responsible Facility Manager _____

TRAINING

10. Training requirements have been identified for operations and support personnel for the project/activity.

Responsible Facility Manager _____

11. Required personnel have been trained to the procedures, Process Standards, and TSRs applicable to the project/activity.

Responsible Facility Manager _____

SNF Startup Plan to Operations

LEVEL OF KNOWLEDGE

12. Required personnel levels of knowledge have been demonstrated through simulations, evaluations, drills, etc.

Responsible Facility Manager _____

EQUIPMENT

13. Facility systems and equipment required for project/activity performance have been identified and verified operational.

Responsible Facility Manager _____

14. Required preventive/corrective maintenance and calibrations have been completed and are current.

Responsible Facility Manager _____

15. Appropriate personnel protective equipment (PPE) has been defined and is available.

Responsible Facility Manager _____

HEALTH AND SAFETY

16. Job hazard analysis (JHA) has been performed and the controls identified are implemented.

Responsible Facility Manager _____

17. Safety and health walk-downs have been completed in the operating areas required to support the project/activity; associated deficiencies have been corrected.

Responsible Facility Manager _____

18. Lifts performed to support the project have been classified and approved.

Responsible Facility Manager _____

RADIOLOGICAL CONTROLS

19. Radiological controls have been implemented, as necessary, to support the project/activity.

Responsible Facility Manager _____

20. Appropriate RWPs are in place for the activity.

Responsible Facility Manager _____

PRE-START ISSUES

21. All pre-start issues and ORR findings required for startup of the project/activity have been resolved and documentation completed.

Responsible Facility Manager _____

SNF Startup Plan to Operations

Attachment 2 - SNF Senior Supervisory Watch List

Name	Title	Experience
John Gregory	CVD Facility Manager	More than 16 years of Nuclear Power Plant and DOE Facility
Frank Choyeski	CVD Deputy Facility Manager	More than 20 Nuclear experience
James D Mathews	105KW Facility Manager	More than 28 years of complex facility operations, 18 of which are Nuclear Facility related.
John Kimbrough	105KW Deputy Facility Manager	More than 28 years Nuclear experience
Thomas J Ruane	105KE Facility Manager	More than 12 years Nuclear experience
James Gamin	105KE Deputy Facility Manager	More than 12 years Nuclear experience
Odilon Serrano	CSB Facility Manager	More than 18 years of Nuclear experience.
Thomas Orgill	CSB Deputy Facility Manager	More than 20 years Operations and Maintenance experience at DOE facilities.
James H Wicks	SNF Operations Director	More than 20 years Nuclear experience
John Truax	SNF Deputy Operations Director	More than 20 years Nuclear experience
James J Klos	Startup and ORR Manager	More than 15 years Nuclear experience

SNF Startup Plan to Operations**Attachment 3 - SNF Minimum Observation Requirements****Operator Performance****105 KW Basin**

- Fuel handling and washing operations
- Fuel loading into MCO baskets
- Loading of MCO with fuel baskets
- Loading of MCO/Cask on transporter

Cold Vacuum Drying Facility

- Connection of process hood to MCO
- Drying of MCO
- Proof of Dryness testing
- MCO leak testing

Canister Storage Building

- Unloading of MCO/Cask
- MCO Handling Machine Operation with MCO
- MCO Sampling

Procedure Viability

- Verify Technical Procedure Change Requests generated during an activity are incorporated as required prior to subsequent performance of that activity

Equipment Operability

- Verify required equipment deficiencies are resolved prior to subsequent operation.