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Inter-Site SNF Shipment Preparation Plan

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Inter-Site SNF Shipment Preparation Plan

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Summary

The *Inter-Site SNF Shipment Preparation Plan* provides the information on the activities, times, description, schedule, and cost of a generic inter-site SNF shipment preparation and shipment campaign that can be used for the development of a specific inter-site SNF shipment campaign. It provides the basis and method for estimating site-specific activities, times, description, schedule, and costs. The schedule that is provided shows the interaction of the activities and with the provided set of blank inter-site SNF shipment preparation tables provides for the development of a specific SNF shipment case. The sum of these features provides the reader and user with a tool by which an inter-site SNF shipment campaign can be setup and successfully completed. The generic cost estimate and times were derived primarily from INEL experiences and detailed cost estimates for shipments and receipts, in particular from Russ Cottam, as well as the experiences, cost estimates and reviews from the Savannah River Site, Oak Ridge, and West Valley. Electronic versions of the tables and schedules are available by disk or E-mail to interested users.

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1. Introduction

The *Inter-Site SNF Shipment Preparation Plan* is based on generic numbers. The generic numbers are those reasonably expected time frames and costs for accomplishing the various tasks associated with preparing for and implementing a spent fuel shipping and receipt campaign.

The *Inter-Site SNF Shipment Preparation Plan* provides the information of the activities, times, description, schedule, and cost of a generic inter-site SNF shipment preparation and shipment campaign. It provides the basis and method for estimating site-specific activities, times, description, schedule, and costs. It also provides a set of blank inter-site SNF shipment preparation tables for the development of a specific SNF shipment case. The detailed schedule shows the interaction between the activities and allows for the critical path planning as well as identifying the impacts of a lengthened or shortened activity. The sum of these features provides the reader and user with a tool by which an inter-site SNF shipment campaign can be setup and successfully completed.

2. Inter-Site SNF Shipment Preparation Plan

The Preparation Plan is used by reviewing the generic numbers for the activities and then filling in the set of blank tables with the appropriate modifications of the generic numbers. The generic time numbers give the typical time required to perform the task as well as the range of times that could be expected for the activity. A few cases will fall out of the given range. Likewise, the costs given are for the typical case and are given in FY-96 dollars. For a specific shipping campaign, some items maybe easier or harder than the typical case and the generic cost and time numbers can be adjusted to improve the accuracy of the cost and schedule estimate. For instance, if the cask to be leased is a standard cask with the usual requirements and modifications, then Table S04 numbers would be used as is. If the shipper's facilities are up and running, then the Table S03 numbers would be greatly reduced or even zeroed out. By making the appropriate modification as presently understood, the first set of tables for a new set of shipments would be developed. Since the relationships and the tie points stay the same, the first schedule would be easily developed from the shipment tables. As more information is gathered and the process of planning develops further, then the tables and schedules can be updated to provide an even better estimate for budgeting, planning, and performing the SNF preparations and shipments. The generic cost estimate and times were derived primarily from INEL experiences and detailed cost estimates for shipments and receipts as well as the experiences and cost estimates from the Savannah River Site, Oak Ridge, and West Valley.

3. Generic SNF Shipment Tables and and Descriptions

The attached tables and schedules are generic, i.e., they cover all the activities that could be required to ship SNF. Table 1 summarizes all of the activities that could be required in SNF shipments. Tables J01 through R16 and, as applicable to the cask option selected, S5A or S5B that succeed Table 1 are the major activities and subactivities for preparation and shipment of the fuel. These tables are specifically intended to cover the generic or base SNF shipment case, the case in which all activities are included as detailed below. The tables break the activities down into three performing organizations that represent the responsibility for each table of actions: joint receiver and shipper, receiver, and shipper. Each responsible organization then has a sub-table of activities for each major set of activities/tables. Tables R02 to R16 cover the receiving site activities. Tables S02 to S16, S5A and S5B cover the shipping site activities. Table J01 covers the receiver and shipper activities. The tables proceed in chronological order, i.e., the joint activities are the first to occur, J01, followed by the shipper, S02, and the receiver, R02, general preparation activities, and so on. As is shown by the schedule, Section 5, the tables and activities have several internal and intra-table ties so the activities of one table typically start and stop before and after the preceding table and following tables have finished and started, respectively.

The base case covers the leasing of a cask. Three alternates to leasing are: using an existing DOE cask, buying a cask or a dual purpose cask (DPC), and buying a multi-purpose canister (MPC) or special purpose MPC. The tables are set up to be all inclusive with four major options: using an existing DOE cask (Tables S5A&B and item S04-01 not used), using/leasing an existing commercial cask (Tables S5A&B not used), buying a cask (Table S5B and items S04-01, -02, -03 not used), and buying a DPC, MPC or special purpose MPC (Table S5A and items S04-01, -02, -03 not used). These tables are all inclusive and thus cover SNF shipments from the initial steps through shipment and receipt.

The SNF Shipment Table and Schedules are for activities required from the beginning to the end of the SNF preparation and shipment. When specific cases are being modeled, items or even entire tables will be zeroed if the activities are not applicable or have already been completed. Many SNF types have been shipped and received, certain items have already been partially or totally completed for some fuel types. Therefore, when the schedules and tables are generated for each specific fuel type, the state of present preparedness will be entered into the tables and schedules to reflect the current conditions. For example: Full Operational Readiness Reviews (ORRs) (Tables S15 and R15) may not be required; for SNF that has already been shipped, the equipment for shipping and receiving may already be in existence; the shipping path may already be identified; casks may exist with current CofCs and SARPs for the SNF to be shipped, etc. This would lead to large reductions in the time, scope, and cost of other activities such as Project Management (S02-04 and R02-04), Plant and System Activation (S03-02, S03-03, R03-02, R03-03), the Transportation Plan (S04-04) and Material Procurement (R11-02). Therefore, the time and cost required to ship a particular SNF may be significantly less than is shown when the current state of conditions is considered.

Table 1 is the summary table showing the duration, sum of the weeks of the activities, and the costs for each table and the entire program. With parallel activities occurring and with the tie points between activities producing hold points, the duration may be different than the sum of the weeks of the activities given in the tables. In Table 1, the total duration for the program is less than the sum of the activity weeks, because the parallel nature of the activities overwhelms the adverse effects of the hold points.

The detailed tables (J01 to S5B) for this example are made up of five columns: table number/item number, descriptions, time, and cost. The total line for each table also lists the duration for that table. The table number/item number gives the table and the item number for the particular activity. This numbering system allows the user to easily tie the tables and the schedules together. The description column gives the description of the activity for each table entry.

The activities are divided into two classes: those that are typically required for all fuel shipments, and those that are not required or vary significantly from site to site or fuel type to fuel type. The typical activities generally have a narrow range of duration with the assumed value for the step close to the middle of the given range. The atypical activities have larger ranges with the assumed value of the activity often at one end of the range due to some atypical cases.

The time column has two sets of numbers. The first number is the assumed time for each activity. The range (given in the parenthesis) is the low and high ends of the times that the activity could require for any fuel type at any site. The attached tables and schedules were developed using these times.

Costs for each activity has been estimated based on past experience and the latest cost estimates. Costs for each table have been subtotaled so the costs for each group of activities can clearly be seen and understood. Both the time and cost numbers are based on the experience and data from performing SNF shipments and receipts at the INEL, the Hanford Site, the Savannah River Site, and the Oak Ridge National Engineering Laboratory.

The schedules show how all the items tie together. The summary schedule rolls up the detailed schedules for an easy and concise overview. Detailed schedules, including for the cask and dual purpose cask, and the MPC and the special purpose MPC purchase schedules, replicate the interval durations of the tables and show the dependant, consecutive, and concurrent relationships, and interrelationships of SNF shipping activities. Schedules are also a good visual tool for time and cost planning and other programs and tasks. Time is shown in the schedule in month and year-long increments and listed (per the tables) with durations in weeks. Electronic versions of the tables and schedules are available by disk or E-mail to interested users. Dates will not be established until detailed schedules are developed for each site, and agreements are reached with operations personnel that meet requirements of the agreement between the State of Idaho, the Navy, and DOE.

The MPC is a canister that is being considered by Office of Civilian Radioactive Waste Management (OCRWM) for transportation, interim storage and disposal of SNF in the Repository. DOE-EM will also dispose of the DOE owned fuel in approved disposal canisters, these will be the DPCs, MPCs or the special purpose MPCs. Making a special purpose MPC may be as simple as installing a different basket in a MPC or as complex as designing and procuring a canister(s)/cask(s) that would meet the repository SNF acceptance criteria.

Table 1. Generic SNF shipment summary table

Description	Table #	Duration (wk)	Sum of Activity Times (wk)	Cost (\$K)
Table J01. Joint shipper/receiver preparations		50	69	107
Table S02. General preparation, shipper		230	198	459
Table R02. General preparation, receiver		234	211	429
Table S03. Plant/system activation, shipper		45	88	776
Table R03. Plant/system activation, receiver		45	88	776
Table S04. Transportation issues, shipper		228	236	1,331
Table S06. ORR/RA preparations, shipper		27	44	205
Table R06. ORR/RA preparation, receiver		27	44	205
Table S07. CSEs & SAR upgrades, shipper		62	69	129
Table R07. CSEs and SAR upgrades, receiver		82	96	155
Table S08. Environmental, shipper		18	18	12
Table R08. Environmental, receiver		18	18	12
Table S09. SNF Preparation - canister fabrication & loading, shipper		204	116	120
Table S10. Canister to cask loading equipment design and fabrication, shipper		101	58	106
Table R10. Canister from cask loading equipment design and fabrication, receiver		101	58	106
Table S11. Cask handling equipment design and fabrication, shipper		102	59	205
Table R11. Cask handling equipment design and fabrication, receiver		97	59	205
Table S12. Procedure writing, shipper		43	42	45
Table R12. Procedure writing, receiver		43	42	45
Table S13. Operator training, shipper		10	10	30
Table R13. Operator training, receiver		10	10	30
Table S14. ORR/RA, shipper		24	23	248
Table R14. ORR/RA, receiver		24	23	248
Table S15. DOE ORR, facility fuel transfer, shipper		25	20	85
Table R15. DOE ORR, facility fuel transfer, receiver		25	20	85
Table S16. Joint efforts, shipper		61	7	27
Table R16. Joint efforts, receiver		2	2	18
TOTAL		288	1728 (949– 3526)	6,199
Table SSA. Cask procurement by DOE for SNF shipments		124	210	2,738
Table SSB. DPC/MPC or special purpose MPC procurement by DOE for SNF shipments		124	210	1,038

**TABLES J01–R16. GENERIC TABLES OF ACTIVITIES FOR PREPARING SNF
FOR INTER-SITE SHIPMENTS**

Joint Shipper/Receiver Preparations

Table J01 covers the initial activities that are required to start the shipment planning and preparations. Due to the nature of these activities both sites must work intimately together to insure that the program will start and continue on the path that will meet the requirements of both shipper and receiver.

Table J01. Joint shipper/receiver preparations.

Table # -Item #	Description	Time (wk)	Cost (\$K)
J01-01	DOE notification for planning for specific SNF shipments	0	0
J01-02	Develop responsibility assignment matrix	2 (1–4)	6
J01-03	Receiver prepare, update, and issue fuel acceptance Criteria (FAC) Based on the Intended Storage Facility	9 (0–52)	25
J01-04	Shipper characterizes SNF to be shipped and complete FAC for receiver approval	12 (4–104)	6
J01-05	Select cask & backup cask and facilities*	13 (8–26)	40
J01-06	Prepare joint shipping/receiving plan	18 (12–26)	10
J01-07	Joint agreement on shipping/receiving plan	5 (4–13)	5
J01-08	Cask selected	0	0
J01-09	DOE/lease/ or buy decision of cask	0	0
J01-10	Determine number of cask shipments	5 (4–13)	12
J01-11	Cask scheduling and availability	5 (4–13)	3
Table J01 Sum of activities and costs [<i>Duration</i> = 50 weeks]:		69 (37–251)	107

* The term cask also includes the dual purpose cask (DPC), the multi-purpose canister (MPC) or the special purpose MPC. Tables S5A describes the activities for the procurement of a cask, Table S5B describes the activities for the procurement of a DPC or a MPC (standard or special).

General Preparation, Shipper

Table S02, general preparations by the shipper, covers basic activities that are required for the shipper to start the SNF shipping task, i.e., the shipper's budget, change board approval, and project and management plans.

Table S02. General preparation, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S02-01	Revise schedule/budget plan request	3 (2-4)	3
S02-02	Change control board (CCB) approved - SNF transfers offsite	0	0
S02-03	Update project plan	4 (2-12)	3
S02-04	Project management	191 (52-208)	453
Table S02 Sum of activities and costs [<i>Table S02 Duration = 230 weeks</i>]:		198 (56-224)	459

General Preparation, Receiver

Table R02, general preparations by the receiver, covers basic activities that are required for the receiver to start the SNF shipping task, i.e., the receiver's budget, change board approval, and project and management plans.

Table R02. General preparation, receiver.

Table # - Item #	Description	Time (wk)	Cost (\$K)
R02-01	Revise schedule/budget plan request	3 (2-4)	3
R02-02	CCB approved - SNF transfers offsite	0	0
R02-03	Update project plan	4 (2-12)	3
R02-04	Project management	191 (52-208)	413
R02-05	Prepare inspection plan for fuel storage	13 (8-26)	10
Table R02 Sum of activities and costs [<i>Duration = 234 weeks</i>]:		211 (64-250)	429

Plant/System Activation, Shipper

Table S03, the plant and system reactivation table for the shipper, covers activities that are required to bring a wholly or partially deactivated or mothballed plant or system of the shipper back to the condition required for preparation of and shipment of SNF. This table is zeroed out for facilities that are not wholly or partially deactivated or mothballed.

Table S03. Plant/system activation, shipper.

Table # - Item #	Description	Time (wk)	Cost (\$K)
S03-01	Start staffing increase	0	0
S03-02	Increase staff and train for SNF transfers offsite	44 (26–52)	379
S03-03	Facility/equipment mods/upgrades/refurbish & tests	44 (26–52)	397
Table S03 Sum of activities and costs [<i>Duration = 45 weeks</i>] :		88 (52–104)	776

Plant/System Activation, Receiver

Table R03, the plant and system reactivation table for the receiver, covers the activities that are required to bring a wholly or partially deactivated or mothballed plant or system of the receiver back to the condition required for the preparation of and the receipt of SNF. This table is zeroed out for facilities that are not wholly or partially deactivated or mothballed.

Table R03. Plant/system activation, receiver.

Table # - Item #	Description	Time (wk)	Cost (\$K)
R03-01	Start staffing increase	0	0
R03-02	Increase staff & train for SNF transfers from offsite	44 (26–52)	379
R03-03	Facility/equipment mods/upgrades/refurbish and tests	44 (26–52)	397
Table R03 Sum of activities and costs [<i>Duration = 45 weeks</i>]:		88 (52–104)	776

Transportation Issues, Shipper

Table S04, the transportation issues table for the shipper, covers one of the main bodies of work and costs of preparing for a SNF shipment campaign. It covers leasing a cask, getting it permitted (SARP and CofC) for the SNF to be shipped, developing the transportation plan, determining shipping route, getting permits and approvals for shipment, making notification, and start of actual shipments.

Table S04. Transportation issues, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S04-01	Lease cask and commit funds	12 (2-13)	500
S04-02	Cask safety analysis report for packaging (SARP) amendment	50 (26-78)	150
S04-03	Cask certificate of compliance (CofC) amendment	31 (26-104)	72
S04-04	Transportation plan and related issues	100 (26-104)	500
S04-05	Crane and rail load test & PMs	5 (4-8)	6
S04-06	Cask shipment route determination & approval	18 (16-26)	50
S04-07	Fuel shipment permits	18 (12-26)	50
S04-08	Shipment notifications	1 (1-2)	3
S04-09	Fuel shipment approvals by DOE	1 (1-2)	0
S04-10	Initiate fuel shipment(s)	0	0
S04-11	Selected cask available for use (window of availability)	0	0
Table S04 Sum of activities and costs [<i>Duration = 228 weeks</i>]:		236 (114-363)	1331

ORR/RA Preparations, Shipper

Table S06 covers the paper work that certifies that the shipper's facilities are ready for SNF preparation and shipment. This is accomplished through the Operational Readiness Review/Readiness Assessment (RA) process and implemented by the Plan-of-Action, RA team, Implementation Plan and leads to the Certification of Readiness.

Table S06. ORR/RA preparations, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S06-01	Department self assessment for readiness assessment	13 (8-26)	48
S06-02	Prepare plan-of-action (POA)	5 (4-8)	17
S06-03	Appoint readiness assessment (RA) team	2 (1-3)	1
S06-04	DOE review POA	2 (1-3)	0
S06-05	Train RA team	2 (1-3)	29
S06-06	Prepare implementation plan (IP)	4 (2-8)	50
S06-07	DOE review IP	2 (1-3)	0
S06-08	Department certification of readiness	10 (4-26)	48
S06-09	RA resolution of comments	4 (2-5)	12
Table S06 Sum of activities and costs [<i>Duration</i> = 27 weeks]:		44 (24-85)	205

ORR/RA Preparation, Receiver

Table R06 covers the paper work that certifies that the receiver's facilities are ready for the SNF preparation and receipt. This is accomplished through the Operational Readiness Review/Readiness Assessment (RA) process and implemented by the Plan-of-Action, RA team, Implementation Plan and leads to the Certification of Readiness.

Table R06. ORR/RA preparation, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R06-01	Department self assessment for RA	13 (8-26)	48
R06-02	Prepare plan-of-action	5 (4-8)	17
R06-03	Appoint RA team	2 (1-3)	1
R06-04	DOE review POA	2 (1-3)	0
R06-05	Train RA team	2 (1-3)	29
R06-06	Prepare implementation plan	4 (2-8)	50
R06-07	DOE review IP	2 (1-3)	0
R06-08	Department certification of readiness	10 (4-26)	48
R06-09	RA resolution of comments	4 (2-5)	12
Table R06 Sum of activities and costs [<i>Duration</i> = 27 weeks]:		44 (24-85)	205

CSEs & SAR Upgrades, Shipper

Table S07 covers upgrades to criticality and safety documents for the shipper that will have to be upgraded and approved before fuel can be prepared and shipped. This activity requires DOE and independent approvals.

Table S07. CSEs and SAR upgrades, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S07-01	Prepare primary criticality safety evaluation (CSE)	13 (12-26)	40
S07-02	Update facility fuel list	3 (1-6)	3
S07-03	Prepare independent CSE	13 (12-26)	10
S07-04	Review CSEs/technical specification (TS) update	3 (2-4)	18
S07-05	Resolve CSEs/TS comments/technical review	5 (4-12)	15
S07-06	Radiation and environmental safety committee (RESC) review	2 (1-4)	6
S07-07	Resolve RESC comments	2 (1-4)	6
S07-08	Environmental safety and health (ES&H) review	1 (1-3)	6
S07-09	Resolve ES&H comments	3 (2-6)	10
S07-10	DOE review and comments for approval	13 (12-26)	0
S07-11	Resolve DOE comments for DOE approval	5 (4-8)	0
S07-12	Independent procedure validation	6 (4-8)	15
Table S07 Sum of activities and costs [<i>Duration = 62 weeks</i>]:		69 (56-133)	129

CSEs and SAR Upgrades, Receiver

Table R07 covers the upgrades to the criticality and safety documents for the receiver that will have to be upgraded and approved before the fuel can be received. This activity requires DOE and independent approvals.

Table R07. CSEs and SAR upgrades, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R07-01	Prepare primary criticality safety evaluation	13 (12-26)	40
R07-02	Update facility fuel list	30 (26-78)	29
R07-03	Prepare Independent CSE	13 (12-26)	10
R07-04	Review CSEs/technical specification update	3 (2-4)	18
R07-05	Resolve CSEs/TS comments/technical review	5 (4-12)	15
R07-06	Radiation and environmental safety committee review	2 (1-4)	6
R07-07	Resolve RESC comments	2 (1-4)	6
R07-08	Environmental safety and health review	1 (1-3)	6
R07-09	Resolve environmental safety and health comments	3 (2-6)	10
R07-10	DOE review and comments for approval	13 (12-26)	0
R07-11	Resolve DOE comments for DOE approval	5 (4-8)	0
R07-12	Independent procedure validation	6 (4-8)	15
Table R07 Sum of activities and costs [<i>Duration = 82 weeks</i>]:		96 (81-205)	155

Environmental, Shipper

Table S08 covers NEPA compliance issues the shipper needs to insure that all environmental issues are addressed and taken care of before the shipper can prepare and ship the fuel.

Table S08. Environmental, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S08-01	Review NEPA compliance issues	18 (12-52)	12
Table S08 Sum of activities and costs [<i>Duration = 18 weeks</i>]:		18 (12-52)	12

Environmental, Receiver

Table R08 covers the NEPA compliance issues the receiver needs to insure that all environmental issues are addressed and taken care of before the receiver can receive the fuel.

Table R08. Environmental, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R08-01	Review NEPA compliance issues	18 (12-52)	12
Table R08 Sum of activities and costs [<i>Duration = 18 weeks</i>]:		18 (12-52)	12

SNF Preparation – Canister Fabrication

Table S09 covers activities that prepare fuel for shipment. The first crucial step is obtaining sufficient data to meet the fuel receipt criteria of the receiver, then the equipment to fabricate the fuel canisters is designed, constructed, tested and turned over for use. This is the first table in which the material costs are significant. In the tables for which the material costs are significant, such as material procurement, the activity costs are broken into labor costs and material costs (Mat).

Table S09. SNF Preparation – canister fabrication & loading, shipper

Table # –Item #	Description	Time (wk)	Cost (\$K)
S09-01	SNF fuel handling and shipping characterization data	25 (12–104)	40
S09-02	Determine equipment requirements	12 (8–26)	5
S09-03	Identify/design equipment	13 (12–39)	20
S09-04	Procure material	13 (12–26)	10 Mat* 10
S09-05	Planning for equipment fabrication	9 (8–12)	6
S09-06	Equipment fabrication	25 (12–52)	10
S09-07	Equipment checkout	9 (2–26)	11
S09-08	Closeout for equipment fabrication	5 (1–8)	2
S09-09	As-Bilt for fabricated equipment	5 (2–16)	6
Table S09 Sum of activities and costs [<i>Duration = 204 weeks</i>]		116 (69–309)	120

* Mat – Raw material, specialized equipment, etc., cost in addition to labor cost.

Canister To Cask Loading Equipment Design and Fabrication, Shipper

Table S10 covers activities that prepare fuel for shipment. The first crucial step is using sufficient data to meet the fuel receipt criteria of the receiver to design, construct, test and turn over for use equipment to load the SNF canister into the shipping cask.

Table S10. Canister to cask loading equipment design and fabrication, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S10-01	Identify/design equipment	18 (12-52)	25
S10-02	Procure material	12 (8-26)	18 Mat 25
S10-03	Planning for equipment fabrication	4 (2-26)	3
S10-04	Equipment fabrication	13 (12-52)	20
S10-05	Equipment checkout	4 (2-26)	6
S10-06	Closeout for equipment fabrication	2 (2-8)	3
S10-07	As-Build for fabricated equipment	5 (4-16)	6
Table S10 Sum of activities and cost [<i>Duration = 101 weeks</i>]:		58 (42-206)	106

Canister From Cask Loading Equipment Design and Fabrication, Receiver

Table R10 covers activities that prepare fuel for shipment. The first crucial step is using the design of the canister which the shipper designed to meet the fuel receipt criteria of the receiver to design, construct, test and turn-over for use the equipment to unload the SNF canister into the shipping cask.

Table R10. Canister from cask loading equipment design and fabrication, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R10-01	Identify/design equipment	18 (12-52)	25
R10-02	Procure material	12 (8-26)	18 Mat 25
R10-03	Planning for equipment fabrication	4 (2-26)	3
R10-04	Equipment fabrication	13 (12-52)	20
R10-05	Equipment checkout	4 (2-26)	6
R10-06	Closeout for equipment fabrication	2 (2-8)	3
R10-07	As-Build for fabricated equipment	5 (4-16)	6
Table R10 Sum of Activities and costs [<i>Duration = 101 weeks</i>]:		58 (42-206)	106

Cask Handling Equipment Design and Fabrication, Shipper

Table S11 covers the activities that prepares the fuel for shipment. The first crucial step is using the data on the canister design and the cask that has been selected to ship the SNF to meet the fuel receipt criteria of the receiver to design, construct, test and turn-over for the equipment for the shipper to handle the shipping cask.

Table S11. Cask handling equipment design and fabrication, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S11-01	Identify/design equipment - cask handling/transport loading	18 (12-52)	14
S11-02	Procure material	13 (6-26)	10 Mat 145
S11-03	Planning for equipment fabrication	4 (2-26)	2
S11-04	Equipment fabrication	13 (12-52)	20
S11-05	Equipment checkout	4 (2-26)	5
S11-06	Closeout for equipment fabrication	2 (2-8)	3
S11-07	As-Build for fabricated equipment	5 (2-8)	6
Table S11 Sum of activities and costs [<i>Duration = 102 weeks</i>]:		59 (38-198)	205

Cask Handling Equipment Design and Fabrication, Receiver

Table R11 covers the activities that prepares the fuel for shipment. The first crucial step is using the data on the canister design and the cask that has been selected to ship the SNF to meet the fuel receipt criteria of the receiver to design, construct, test and turn-over for the equipment for the receiver to handle the shipping cask.

Table R11. Cask handling equipment design and fabrication, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R11-01	Identify/design equipment - cask handling/transport loading	18 (12-52)	14
R11-02	Procure material	13 (6-26)	10 Mat 145
R11-03	Planning for equipment fabrication	4 (2-26)	2
R11-04	Equipment fabrication	13 (12-52)	20
R11-05	Equipment checkout	4 (2-26)	5
R11-06	Closeout for equipment fabrication	2 (2-8)	3
R11-07	As-Build for fabricated equipment	5 (2-8)	6
Table R11 Sum of activities and costs [<i>Duration = 97 weeks</i>]:		59 (38-198)	205

Procedure Writing, Shipper

Table S12 covers the procedure writing, updates, validation and comment resolutions that will be required to ship the SNF.

Table S12. Procedure writing, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S12-01	Develop and update procedures	30 (26-104)	30
S12-02	Validate procedures	8 (4-26)	10
S12-03	Procedure reviews & resolution of comments	4 (2-8)	5
Table S12 Sum of activities and costs [<i>Duration = 43 weeks</i>]:		42 (32-138)	45

Procedure Writing, Receiver

Table R12 covers the procedure writing, updates, validation and comment resolutions that will be required to receive the SNF.

Table R12. Procedure writing, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R12-01	Develop and update procedures	30 (26-104)	30
R12-02	Validate procedures	8 (4-26)	10
R12-03	Procedure reviews & resolution of comments	4 (2-8)	5
Table R12 Sum of activities and costs [<i>Duration = 43 weeks</i>]:		42 (32-138)	45

Operator Training, Shipper

Table S13 cover the preparation for and the training of the operators that will be required for shipment of the SNF.

Table S13. Operator training, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S13-01	Preparations for training	4 (2-8)	12
S13-02	Training (20 hours for 2 Crews)	6 (2-8)	18
Table S13 Sum of activities and costs [<i>Duration = 10 weeks</i>]:		10 (4-16)	30

Operator Training, Receiver

Table R13 cover the preparation for and the training of the operators that will be required for receipt of the SNF.

Table R13. Operator training, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R13-01	Preparations for training	4 (2-8)	12
R13-02	Training (20 hours for 2 Crews)	6 (2-8)	18
Table R13 Sum of activities and costs [<i>Duration = 10 weeks</i>]:		10 (4-16)	30

ORR/RA, Shipper

Table S14 covers the shipper's dry run of the fuel handling and resulting readiness assessment, RA report, closure of the prestart findings, and the approval for the shipper to start operation.

Table S14. ORR/RA, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S14-01	Dry run for fuel handling	1 (1-8)	18
S14-02	Readiness assessment	8 (4-12)	140
S14-03	Prepare final report	4 (2-12)	66
S14-04	Closure of prestart findings	5 (4-12)	8
S14-05	Approval to start operation	5 (4-12)	16
S14-06	Ready for receipt/shipment of fuel	0	0
Table S14 Sum of Activities and Costs [<i>Duration = 24 weeks</i>]:		23 (15-56)	248

ORR/RA, Receiver

Table R14 covers the receiver's dry run of the fuel handling and resulting readiness assessment, RA report, closure of the prestart findings, and the approval for the receiver to start operation.

Table R14. ORR/RA, Receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R14-01	Dry run for fuel handling	1 (1-8)	18
R14-02	Readiness assessment	8 (4-12)	140
R14-03	Prepare final report	4 (2-12)	66
R14-04	Closure of prestart findings	5 (4-12)	8
R14-05	Approval to start operation	5 (4-12)	16
R14-06	Ready for receipt/shipment of fuel	0	0
Table R14 Sum of activities and costs [<i>Duration = 24 weeks</i>]:		23 (15-56)	248

DOE ORR, Facility Fuel Transfer, Shipper

Table S15 covers the DOE ORR for facility fuel transfer for the shipper. This includes the preparedness preparation and drill, the DOE ORR, the final report preparation, closure of the prestart findings, and the approval for the shipper to operate.

Table S15. DOE ORR, facility fuel transfer, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S15-01	Emergency preparedness preparation	4 (3-8)	12
S15-02	Emergency preparedness drill	1 (1-2)	18
S15-03	DOE ORR	6 (3-8)	10
S15-04	DOE final report preparation	4 (3-6)	12
S15-05	Closure of prestart findings	4 (3-6)	30
S15-06	Approval to operate	1 (1-2)	3
Table S15 Sum of activities and costs [<i>Duration = 25 weeks</i>]:		20 (14-32)	85

DOE ORR, Facility Fuel Transfer, Receiver

Table R15 covers the DOE ORR for facility fuel transfer for the receiver. This includes the preparedness preparation and drill, the DOE ORR, the final report preparation, closure of the prestart findings, and the approval for the receiver to operate.

Table R15. DOE ORR, facility fuel transfer, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R15-01	Emergency preparedness preparation	4 (3-8)	12
R15-02	Emergency preparedness drill	1 (1-2)	18
R15-03	DOE ORR	6 (3-8)	10
R15-04	DOE final report preparation	4 (3-6)	12
R15-05	Closure of prestart findings	4 (3-6)	30
R15-06	Approval to operate	1 (1-2)	3
Table R15 Sum of activities and costs [<i>Duration = 25 weeks</i>]:		20 (14-32)	85

Joint Efforts, Shipper

Table S16 covers the final shipper and receiver schedule agreement, the inspect and PM of the shipping cask, and the actual preparation of the fuel, loading of the cask, and shipment of the fuel.

Table S16. Joint efforts, shipper.

Table # -Item #	Description	Time (wk)	Cost (\$K)
S16-01	Shipper/receiver schedule agreement	3 (2-4)	9
S16-02	Inspect and PM cask	2 (1-3)	6
S16-03	Prepare fuel, load cask, and ship	2 (1-3)	12
Table S16 Sum of activities and costs [<i>Duration = 61 weeks</i>]:		7 (4-10)	27

Joint Efforts, Receiver

Table R16 covers the receipt of the shipping cask, off-loading of the fuel, and the cask decontamination and return to the shipper.

Table R16. Joint efforts, receiver.

Table # -Item #	Description	Time (wk)	Cost (\$K)
R16-01	Receive cask, off-load fuel, and store/process	1 (1-4)	9
R16-02	Decontaminate and return empty cask	1 (1-3)	9
Table R16 Sum of activities and costs [<i>Duration = 2 weeks</i>]:		2 (2-7)	18

TOTAL Sum of Activities and Costs:

Table 17 summarizes the sum of the activities times, costs, and the overall duration.

Table 17. TOTAL Sum of activities and costs:

Table # -Item #	Description	Time (wk)	Cost (\$K)
TOTAL Sum of activities and costs [<i>Total Duration = 288 weeks</i>]:		1685 (974-3598)	6405

Cask Procurement by DOE for SNF Shipments

When the choice is made to procure rather than lease a cask, table S5A is used. This table covers the procurement package, request for proposal, scope of work, design criteria preparation, developing the planning schedule, preparing of revising and the approval of the cask SARP and CofC, developing the inspection plan, bid and awarding the cask contract, and the fabrication and testing of the cask.

Table S5A. Cask procurement by DOE for SNF shipments.

Table # – Item #	Description	Time (wk)	Cost (\$K)
S5A-01	Prepare procurement package and request for proposal	4 (3–6)	12
S5A-02	Prepare scope of work	4 (3–6)	12
S5A-03	Prepare specifications	4 (3–6)	12
S5A-04	Prepare design criteria	4 (3–6)	12
S5A-05	Develop planning schedule	3 (2–4)	9
S5A-06	Prepare/revise SARP for cask	100 (52–230)	500
S5A-07	Develop inspection plan	7 (5–10)	21
S5A-08	Bid and award	4 (3–6)	24
S5A-09	Fabricate cask	26 (20–52)	2,000
S5A-10	Test cask	4 (3–6)	36
S5A-11	CofC for cask	50 (26–78)	100
S5A-12	SARP approval by regulatory agency	0	0
S5A-13	CofC approval by regulatory agency	0	0
Table S5A Sum of activities and costs [<i>Duration = 124 weeks</i>]:		210 (123–410)	2,738

DPC, MPC or Special Purpose MPC Procurement by DOE for SNF Shipments

When the choice is made to procure a dual purpose cask (DPC), multi-purpose cask (MPC), or a special purpose MPC rather than lease a cask, table S5B is used. This table covers the procurement package, request for proposal, scope of work, design criteria preparation, developing the planning schedule, preparing of revising and the approval of the cask SARP and CofC, developing the inspection plan, bid and awarding the DPC/MPC contract, and the fabrication and testing of the DPC/MPC and DPC/MPC overpack.

Table S5B. DPC/MPC or special purpose MPC procurement by DOE for SNF shipments.

Table # – Item #	Description	Time (wk)	Cost (\$K)
S5B-01	Prepare procurement package and request for proposal	4 (3–6)	12
S5B-02	Prepare scope of work	4 (3–6)	12
S5B-03	Prepare specifications	4 (3–6)	12
S5B-04	Prepare design criteria	4 (3–6)	12
S5B-05	Develop planning Schedule	3 (2–4)	9
S5B-06	Prepare/revise SARP for DPC/MPC/special purpose MPC	100 (52–230)	150
S5B-07	Develop inspection plan	7 (5–10)	21
S5B-08	Bid and award	4 (3–6)	24
S5B-09	Fabricate DPC/MPC/special purpose MPC and overpack	26 (20–52)	650
S5B-10	Test DPC/MPC/special purpose MPC	4 (3–6)	36
S5B-11	CofC for DPC/MPC/special purpose MPC	50 (26–78)	100
S5B-12	SARP approval by regulatory agency	0	0
S5B-13	CofC approval by regulatory agency	0	0
Table S5B Sum of activities and costs [<i>Duration = 124 weeks</i>]:		210 (123–410)	1,038

4. Blank Inter-Site SNF Preparation Plan Tables

Table 1. SNF shipment summary table.

Table #. Description	Duration (wk)	Sum of Activity Times (wk)	Cost (\$K)
Table J01. Joint shipper/receiver preparations.			
Table S02. General preparation, shipper.			
Table R02. General preparation, receiver.			
Table S03. Plant/system activation, shipper.			
Table R03. Plant/system activation, receiver.			
Table S04. Transportation issues, shipper .			
Table S06. ORR/RA preparations, shipper.			
Table R06. ORR/RA preparation, receiver.			
Table S07. CSEs & SAR upgrades, shipper.			
Table R07. CSEs and SAR upgrades, receiver.			
Table S08. Environmental, shipper.			
Table R08. Environmental, receiver.			
Table S09. SNF preparation – canister fabrication & loading, shipper.			
Table S10. Canister to cask loading equipment design and fabrication, shipper.			
Table R10. Canister from cask loading equipment design and fabrication, receiver.			
Table S11. Cask handling equipment design and fabrication, shipper.			
Table R11. Cask handling equipment design and fabrication, receiver.			
Table S12. Procedure writing, shipper.			
Table R12. Procedure writing, receiver.			
Table S13. Operator training, shipper.			
Table R13. Operator training, receiver.			
Table S14. ORR/RA, shipper.			
Table R14. ORR/RA, receiver.			
Table S15. DOE ORR, facility fuel transfer, shipper.			
Table R15. DOE ORR, facility fuel transfer, receiver.			
Table S16. Joint efforts, shipper .			
Table R16. Joint efforts, receiver.			
TOTAL			
Table S5A. Cask procurement by DOE for SNF shipments.			
Table S5B. DPC/MPC or special purpose MPC procurement by DOE for SNF shipments.			

**TABLES J01–R16. TABLES OF ACTIVITIES
FOR PREPARING _____ SNF FOR INTER–SITE SHIPMENTS**

Table # -Item #	Description	Time (wk)	Cost (\$K)
Table J01. Joint shipper/receiver preparations.			
J01-01	DOE notification for planning for specific SNF shipments		
J01-02	Develop responsibility assignment matrix		
J01-03	Receiver prepare, update, and issue fuel acceptance criteria (FAC) based on the intended storage facility		
J01-04	Shipper characterizes SNF to be shipped and complete FAC for receiver approval		
J01-05	Select cask & backup cask and facilities*		
J01-06	Prepare joint shipping/receiving plan		
J01-07	Joint agreement on shipping/receiving plan		
J01-08	Cask selected		
J01-09	DOE/lease/or buy decision of cask		
J01-10	Determine number of cask shipments		
J01-11	Cask scheduling and availability		
Table J01 Sum of activities and costs [<i>Duration = weeks</i>]:			

* The term cask could also includes the dual purpose cask (DPC), the multi–purpose canister (MPC) or the special purpose MPC. Tables S5A describes the activities for the procurement of a cask, Table S5B describes the activities for the procurement of a DPC or a MPC (standard or special).

Table S02. General preparation, shipper.

S02-01	Revise schedule/budget plan request		
S02-02	Change control board (CCB) approved - SNF transfers offsite		
S02-03	Update project plan		
S02-04	Project management		
Table S02 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table R02. General preparation, receiver.

R02-01	Revise schedule/budget plan request		
R02-02	CCB approved - SNF transfers offsite		
R02-03	Update project plan		
R02-04	Project management		
R02-05	Prepare inspection plan for fuel storage		
Table R02 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S03. Plant/system activation, shipper.

S03-01	Start staffing increase		
S03-02	Increase staff and train for SNF transfers offsite		
S03-03	Facility/equipment mods/upgrades/refurbish & tests		
Table S03 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table R03. Plant/system activation, receiver.

R03-01	Start staffing increase		
R03-02	Increase staff & train for SNF transfers from offsite		
R03-03	Facility/equipment mods/upgrades/refurbish and tests		
Table R03 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S04. Transportation issues, shipper.

S04-01	Lease cask and commit funds		
S04-02	Cask safety analysis report for packaging (SARP) amendment		
S04-03	Cask certificate of compliance (CofC) amendment		
S04-04	Transportation plan and related issues		
S04-05	Crane and rail load test & PM's		
S04-06	Cask shipment route determination & approval		
S04-07	Fuel shipment permits		
S04-08	Shipment notifications		
S04-09	Fuel shipment approvals by DOE		
S04-10	Initiate fuel shipment(s)		
S04-11	Selected cask available for use (window of availability)		
Table S04 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S06. ORR/RA preparations, shipper.

S06-01	Department self assessment for readiness assessment		
S06-02	Prepare plan-of-action (POA)		
S06-03	Appoint readiness assessment (RA) team		
S06-04	DOE review POA		
S06-05	Train RA team		
S06-06	Prepare implementation plan (IP)		
S06-07	DOE review IP		
S06-08	Department certification of readiness		
S06-09	RA resolution of comments		
Table S06 sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table R06. ORR/RA preparation, receiver.		
R06-01	Department self assessment for RA	
R06-02	Prepare plan-of-action	
R06-03	Appoint RA team	
R06-04	DOE review POA	
R06-05	Train RA team	
R06-06	Prepare implementation plan	
R06-07	DOE review IP	
R06-08	Department certification of readiness	
R06-09	RA resolution of comments	
Table R06 Sum of activities and costs: [<i>Duration</i> = <i>weeks</i>]:		
Table S07. CSEs & SAR upgrades, shipper.		
S07-01	Prepare primary criticality safety evaluation (CSE)	
S07-02	Update facility fuel list	
S07-03	Prepare independent CSE	
S07-04	Review CSEs/technical specification (TS) update	
S07-05	Resolve CSEs/TS comments/technical review	
S07-06	Radiation and environmental safety committee (RESC) review	
S07-07	Resolve RESC comments	
S07-08	Environmental safety and health (ES&H) review	
S07-09	Resolve ES&H comments	
S07-10	DOE review and comments for approval	
S07-11	Resolve DOE comments for DOE approval	
S07-12	Independent procedure validation	
Table S07 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:		

Table R07. CSEs and SAR upgrades, receiver.		
R07-01	Prepare primary criticality safety evaluation	
R07-02	Update facility fuel list	
R07-03	Prepare independent CSE	
R07-04	Review CSEs/technical specification update	
R07-05	Resolve CSEs/TS comments/technical review	
R07-06	Radiation and environmental safety committee review	
R07-07	Resolve RESC comments	
R07-08	Environmental safety and health review	
R07-09	Resolve environmental safety and health comments	
R07-10	DOE review and comments for approval	
R07-11	Resolve DOE comments for DOE approval	
R07-12	Independent procedure validation	
Table R07 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:		
Table S08. Environmental, shipper.		
S08-01	Review NEPA compliance issues	
Table S08 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:		
Table R08. Environmental, receiver.		
R08-01	Review NEPA compliance issues	
Table R08 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:		

Table S09. SNF preparation – canister fabrication & loading, shipper.

S09-01	SNF fuel handling and shipping characterization data		
S09-02	Determine equipment requirements		
S09-03	Identify/design equipment		
S09-04	Procure material		Mat*
S09-05	Planning for equipment fabrication		
S09-06	Equipment fabrication		
S09-07	Equipment checkout		
S09-08	Closeout for equipment fabrication		
S09-09	As-bilt for fabricated equipment		
Table S09 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S10. Canister to cask loading equipment design and fabrication, shipper.

S10-01	Identify/design equipment		
S10-02	Procure material		Mat*
S10-03	Planning for equipment fabrication		
S10-04	Equipment fabrication		
S10-05	Equipment checkout		
S10-06	Closeout for equipment fabrication		
S10-07	As-bilt for fabricated equipment		
Table S10 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

* Mat – Raw material, specialized equipment, etc., cost in addition to labor cost.

Table R10. Canister from cask loading equipment design and fabrication, receiver.

R10-01	Identify/design equipment		
R10-02	Procure material		Mat
R10-03	Planning for equipment fabrication		
R10-04	Equipment fabrication		
R10-05	Equipment checkout		
R10-06	Closeout for equipment fabrication		
R10-07	As-bilt for fabricated equipment		
Table R10 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S11. Cask handling equipment design and fabrication, shipper.

S11-01	Identify/design equipment - cask handling/transport loading		
S11-02	Procure material		Mat
S11-03	Planning for equipment fabrication		
S11-04	Equipment fabrication		
S11-05	Equipment checkout		
S11-06	Closeout for equipment fabrication		
S11-07	As-bilt for fabricated equipment		
Table S11 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table 11. Cask handling equipment design and fabrication, receiver.

R11-01	Identify/design equipment - cask handling/transport loading		
R11-02	Procure material		Mat
R11-03	Planning for equipment fabrication		
R11-04	Equipment fabrication		
R11-05	Equipment checkout		
R11-06	Closeout for equipment fabrication		
R11-07	As-bilt for fabricated equipment		
Table R11 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S12. Procedure writing, shipper.

S12-01	Develop and update procedures		
S12-02	Validate procedures		
S12-03	Procedure reviews & resolution of comments		
Table S12 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table R12. Procedure writing, receiver.

R12-01	Develop and update procedures		
R12-02	Validate procedures		
R12-03	Procedure reviews & resolution of comments		
Table R12 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S13. Operator training, shipper.

S13-01	Preparations for training		
S13-02	Training (20 hours for 2 Crews)		
Table S13 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table R13. Operator training, receiver.

R13-01	Preparations for training		
R13-02	Training (20 hours for 2 Crews)		
Table R13 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S14. ORR/RA, shipper.

S14-01 Dry run for fuel handling

S14-02 Readiness assessment

S14-03 Prepare final report

S14-04 Closure of prestart findings

S14-05 Approval to start operation

S14-06 Ready for receipt/shipment of fuel

Table S14 Sum of activities and costs [*Duration* = weeks]:**Table R14. ORR/RA, receiver.**

R14-01 Dry run for fuel handling

R14-02 Readiness assessment

R14-03 Prepare final report

R14-04 Closure of prestart findings

R14-05 Approval to start operation

R14-06 Ready for receipt/shipment of fuel

Table R14 Sum of activities and costs [*Duration* = weeks]:**Table S15. DOE ORR, facility fuel transfer, shipper.**

S15-01 Emergency preparedness preparation

S15-02 Emergency preparedness drill

S15-03 DOE ORR

S15-04 DOE final report preparation

S15-05 Closure of prestart findings

S15-06 Approval to operate

Table S15 Sum of activities and costs [*Duration* = weeks]:

Table R15. DOE ORR, facility fuel transfer, receiver.

R15-01	Emergency preparedness preparation		
R15-02	Emergency preparedness drill		
R15-03	DOE ORR		
R15-04	DOE final report preparation		
R15-05	Closure of prestart findings		
R15-06	Approval to operate		
Table R15 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S16. Joint efforts, shipper.

S16-01	Shipper/receiver schedule agreement		
S16-02	Inspect and PM cask		
S16-03	Prepare fuel, load cask, and ship		
Table S16 Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table R16. Joint efforts, receiver.

R16-01	Receive cask, off-load fuel, and store/process		
R16-02	Decontaminate and return empty cask		
Table R16 Sum of activities and costs [<i>Table R16 Duration</i> = <i>weeks</i>]:			
TOTAL Sum of activities and costs [<i>Total Duration</i> = <i>weeks</i>]:			

Table S5A. Cask procurement by DOE for SNF shipments.

Table # - Item #	Description	Time (wk)	Cost (\$K)
S5A-01	Prepare procurement package and request for proposal		
S5A-02	Prepare scope of work		
S5A-03	Prepare specifications		
S5A-04	Prepare design criteria		
S5A-05	Develop planning schedule		
S5A-06	Prepare/revise SARP for cask		
S5A-07	Develop inspection plan		
S5A-08	Bid and award		
S5A-09	Fabricate cask		
S5A-10	Test cask		
S5A-11	CofC for cask		
S5A-12	SARP approval by regulatory agency		
S5A-13	CofC approval by regulatory agency		
Table S5A Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

Table S5B. DPC/MPC or special purpose MPC procurement by DOE for SNF shipments.

Table # - Item #	Description	Time (wk)	Cost (\$K)
S5B-01	Prepare procurement package and request for proposal		
S5B-02	Prepare scope of work		
S5B-03	Prepare specifications		
S5B-04	Prepare design criteria		
S5B-05	Develop planning schedule		
S5B-06	Prepare/revise SARP for DPC/MPC/special purpose MPC		
S5B-07	Develop inspection plan		
S5B-08	Bid and award		
S5B-09	Fabricate DPC/MPC/special purpose MPC and overpack		
S5B-10	Test DPC/MPC/special purpose MPC		
S5B-11	CofC for DPC/MPC/special purpose MPC		
S5B-12	SARP approval by regulatory agency		
S5B-13	CofC approval by regulatory agency		
Table S5B Sum of activities and costs [<i>Duration</i> = <i>weeks</i>]:			

5. Generic Inter–Site SNF Shipment Preparation Plan Schedules

Using data from the generic cost tables, the following generic inter–site SNF preparation plan schedules were developed. These schedules clearly show the interrelationships between the various activities that are required for inter–site shipments of SNF. They are setup such that they can be initiated at any point in a year and the tie points are based on the “as late as” method.

**LOCKHEED
MARTIN IDAHO
TECHNOLOGIES**

J01	TABLE J01 JOINT SHIPPER/RECEIVER PREPARATIONS	
R02	TABLE R02 GENERAL PREPARATIONS, RECEIVER	
R03	TABLE R03 PLANT/SYSTEM ACTIVATION, RECEIVER	
R06	TABLE R06 ORR/RA PREPARATIONS, RECEIVER	
R07	TABLE R07 CSEs AND SAR UPGRADES, RECEIVER	
R08	TABLE R08 ENVIRONMENTAL, RECEIVER	
R10	TABLE R10 CANISTER FROM CASK LOADING EQUIP DSGN/FAB, RECV	
R11	TABLE R11 CASK HANDLING EQUIP DESIGN & FAB, RECEIVER	
R12	TABLE R12 PROCEDURE WRITING, RECEIVER	
R13	TABLE R13 OPERATOR TRAINING, RECEIVER	
R14	TABLE R14 ORR/RA RECEIVER	
R15	TABLE R15 DOE ORR, FACILITY FUEL TRANSFER, RECEIVER	
R16	TABLE R16 JOINT EFFORTS, RECEIVER	
S02	TABLE S02 GENERAL PREPARATIONS, SHIPPER	
S03	TABLE S03 PLANT/SYSTEM ACTIVATION, SHIPPER	
S04	TABLE S04 TRANSPORTATION ISSUES, SHIPPER	

Legend

- = Percent Complete
- XXX = Baseline
- ▲ = Actual Start
- ◇-- = Expected Finish
- ◆-- = Actual Finish

Early Dates / Time Span in Months

Signaturos

Prop: -----

Apr v: -----

SNF OFF SITE SHIPPING/RECEIVING SUMMARY BAR CHART

SNF OFF SITE SHIPPING/RECEIVING

■ Progress ☒ Critical ▨ Planned

JOINT SHIPPING AND RECEIVING TABLE

TABLE J01 JOINT SHIPPER/RECEIVER PREPERATIONS

J01-01	DDE Notification for Planning for Specific Fuel Shipments	Duration in Weeks = 0
J01-02	Develop Responsibility Assignment Matrix (RAM)	Duration in Weeks = 2
J01-03	Receiver Prepare, Update & Issue Fuel Acceptance Criteria	Duration in Weeks = 9
J01-04	Shipper Characterize SNF to be Shipped & Submit PAC	Duration in Weeks = 12
J01-05	Select Cask & Backup Cask / Facilities	Duration in Weeks = 13
J01-06	Prepare Joint Shipping/Receiving Plan	Duration in Weeks = 18
J01-07	Joint Agreement on Shipping/Receiving Plan	Duration in Weeks = 5
J01-08	Cask Selected	Duration in Weeks = 0
J01-09	DDE/Lease or Buy Decision of Cask	Duration in Weeks = 0
J01-10	Determine Number of Cask Shipments	Duration in Weeks = 5
J01-11	Cask Scheduling and Availability	Duration in Weeks = 5

RECEIVER'S TABLES

TABLE R02 GENERAL PREPARATIONS, RECEIVER

R02-01	Revise Schedule/Budget Plan Request	Duration in Weeks = 3
R02-02	Change Control Board (CCB) Approved - SNF Transfers Off Site	Duration in Weeks = 0
R02-03	Update Project Plan	Duration in Weeks = 4
R02-04	Project Management	Duration in Weeks = 181
R02-05	Prepare Inspection Plan for Fuel Storage	Duration in Weeks = 13

TABLE R03 PLANT/SYSTEM ACTIVATION, RECEIVER

R03-01	Start Staffing Increase	Duration in Weeks = 0
R03-02	Increase Staff and Train for SNF Transfers Off Site	Duration in Weeks = 44
R03-03	Facility and/or Equipment Move/Upgrade/Refurb and Tests	Duration in Weeks = 44

TABLE R06 ORR/RA PREPERATIONS, RECEIVER

R06-01	Department Self Assessment for Readiness Assessment (RA)	Duration in Weeks = 13
R06-02	Prepare Plan-of-Action (POA)	Duration in Weeks = 5

TABLE R07 CSEs AND SAR UPGRADES, RECEIVER

R07-01	Prepare Primary Criticality Safety Evaluation (CSE)	Duration in Weeks = 13
R07-02	Update Facility Fuel List	Duration in Weeks = 30
R07-03	Prepare Independent CSE	Duration in Weeks = 13
R07-04	Revise CSE/Tech Spec (TS) Update	Duration in Weeks = 5
R07-05	Resolve CSE/TS Comments / Technical Review	Duration in Weeks = 5
R07-06	Resolution and Environmental Safety Committee (RESCT) Review	Duration in Weeks = 2
R07-07	Resolve RESCT Comments	Duration in Weeks = 2
R07-08	Environmental Safety and Health (ESDH) Review	Duration in Weeks = 1
R07-09	Resolve ESDH Comments	Duration in Weeks = 3
R07-10	DOE Review and Comment for Approval	Duration in Weeks = 13
R07-11	Resolve DOE Comments for DOE Approval	Duration in Weeks = 5
R07-12	Independent Procedure Validation	Duration in Weeks = 5

TABLE R08 ENVIRONMENTAL, RECEIVER

R08-01	Review NEPA Compliance Issues	Duration in Weeks = 10
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TABLE R10 CANISTER FROM CASK LOADING EQUIP DSGN/FAB, RECV

R10-01	Identify/Design Equipment - Cask Unloading	Duration in Weeks = 10
R10-02	Procure Equipment	Duration in Weeks = 12
R10-03	Planning for Equipment Fabrication	Duration in Weeks = 4
R10-04	Equipment Fabrication	Duration in Weeks = 13
R10-05	Equipment Checkout	Duration in Weeks = 4

R10-08' Closure for Equipment Fabrication
Duration in Weeks = 2

R10-07' As-Building for Fabricated Equipment
Duration in Weeks = 5

TABLE R11 CASK HANDLING EQUIP DESIGN & FAB, RECEIVER

R11-01' Identify/Design Equipment - Cask Handling/Transport Loading
Duration in Weeks = 13

R11-02' Procure Material
Duration in Weeks = 13

R11-03' Planning for Equipment Fabrication
Duration in Weeks = 4

R11-04' Equipment Fabrication
Duration in Weeks = 13

R11-05' Equipment CheckOut
Duration in Weeks = 4

R11-06' Closure for Equipment Fabrication
Duration in Weeks = 2

R11-07' As-Building for Fabricated Equipment
Duration in Weeks = 5

TABLE R12 PROCEDURE WRITING, RECEIVER

R12-01' Develop & Update Procedures
Duration in Weeks = 30

R12-02' Validate Procedures
Duration in Weeks = 6

R12-03' Procedure Reviews & Association of Comments
Duration in Weeks = 4

TABLE R13 OPERATOR TRAINING, RECEIVER

R13-01' Preparations for Training
Duration in Weeks = 4

R13-02' Training (20 hours for 2 Crews)
Duration in Weeks = 8

TABLE R14 ORR/RA, RECEIVER

R14-01' Dry Run for Fuel Handling
Duration in Weeks = 1

R14-02' Readiness Assessment
Duration in Weeks = 6

R14-03' Prepare Final Report
Duration in Weeks = 4

R14-04' Closure of Prestate Findings
Duration in Weeks = 6

R14-05' Approval to Start Operation
Duration in Weeks = 6

R14-06' Ready for Receipt of Fuel
Duration in Weeks = 0

TABLE R15 DOE ORR, FACILITY FUEL TRANSFER, RECEIVER

R15-01' Emergency Preparedness Preparations
Duration in Weeks = 4

SNF OFF SITE SHIPPING/RECEIVING

Progress ☒ Critical ☒ Planned

R10-02	Emergency Preparedness Drill	Duration in Weeks = 1
R10-03	DOE OHR	Duration in Weeks = 0
R10-04	DOE Final Report Preparation	Duration in Weeks = 4
R10-05	Completion of Present Findings	Duration in Weeks = 4
R10-06	Ready to Operate	Duration in Weeks = 1

TABLE R10 JOINT EFFORTS, RECEIVER

R10-01	Receive Cask, Off-load Fuel, & Store/Process	Duration in Weeks = 1
R10-02	Decontaminate and Return Empty Cask	Duration in Weeks = 1

SHIPPER'S TABLES

TABLE S02 GENERAL PREPARATIONS, SHIPPER

S02-01	Review Schedule/Budget Plan Request	Duration in Weeks = 3
S02-02	DOE Approved - SNF Transfer Off Site	Duration in Weeks = 0
S02-03	Update Project Plan	Duration in Weeks = 4
S02-04	Project Management	Duration in Weeks = 181

TABLE S03 PLANT/SYSTEM ACTIVATION, SHIPPER

S03-01	Start Staffing Increase	Duration in Weeks = 0
S03-02	Transfer Staff and Train for SNF Transfer Off Site	Duration in Weeks = 44
S03-03	Facility and/or Equipment Made/Upgraded/Retuns and Tests	Duration in Weeks = 44

TABLE S04 TRANSPORTATION ISSUES, SHIPPER

S04-01	Lease Cask	Duration in Weeks = 12
S04-02	Cask Certificate of Compliance (COC) Amendment	Duration in Weeks = 31
S04-03	Cask Safety Analysis Report for Packaging (SARP) Amendment	Duration in Weeks = 60
S04-04	Transportation Plan and Related Issues	Duration in Weeks = 100
S04-05	Crane/Hill Load Test & PM's	Duration in Weeks = 0
S04-06	Cask Shipment Route Determination & Approval	Duration in Weeks = 18
S04-07	Fuel Shipment Permits	Duration in Weeks = 18
S04-08	Shipment Notifications	Duration in Weeks = 1

3904-09. Fuel Shipment Approvals
Duration in Weeks = 1

3904-10. Initiate Fuel Shipment(s)
Duration in Weeks = 0

3904-11. Selected Cask Viable for Use (Window of Availability)
Duration in Weeks = 0

TABLE S06 ORR/RA PREPERATIONS, SHIPPER

Department Self Assessment for Readiness Assessment (RA)	
808-01	Department Self Assessment for Readiness Assessment (RA) Duration in Weeks = 13
808-02	Prepare Plan-of-Action (POA) Duration in Weeks = 0
808-03	Appoint RA Team Duration in Weeks = 2
808-04	DOE Review POA Duration in Weeks = 2
808-05	Gain RA Team Duration in Weeks = 2
808-06	Prepare Implementation Plan (IP) Duration in Weeks = 4
808-07	DOE Review IP Duration in Weeks = 2
808-08	Department Certification of Readiness Duration in Weeks = 10
808-09	RA Resolution or Comments Duration in Weeks = 4

TABLE S07 CSEs AND SAR UPGRADES, SHIPPER

807-04	Passive Primary Criticality Safety Evaluation (CPE)
807-05	Duration in Weeks - 13
807-06	Update: "Activity Fuel List"
807-07	Duration in Weeks - 13
807-08	Update: "Independent DOE"
807-09	Duration in Weeks - 13
807-10	Update: "Independent DOE"
807-11	Duration in Weeks - 13
807-12	Update: "Independent DOE"
807-13	Duration in Weeks - 13
807-14	Update: "Independent DOE"
807-15	Duration in Weeks - 13
 
807-74	Update: "Independent DOE"
807-75	Duration in Weeks - 13
807-76	Update: "Independent DOE"
807-77	Duration in Weeks - 13
807-78	Update: "Independent DOE"
807-79	Duration in Weeks - 13
807-80	Update: "Independent DOE"
807-81	Duration in Weeks - 13
807-82	Update: "Independent DOE"
807-83	Duration in Weeks - 13
807-84	Update: "Independent DOE"
807-85	Duration in Weeks - 13
807-86	Update: "Independent DOE"
807-87	Duration in Weeks - 13
807-88	Update: "Independent DOE"
807-89	Duration in Weeks - 13
807-90	Update: "Independent DOE"
807-91	Duration in Weeks - 13
807-92	Update: "Independent DOE"
807-93	Duration in Weeks - 13
807-94	Update: "Independent DOE"
807-95	Duration in Weeks - 13
807-96	Update: "Independent DOE"
807-97	Duration in Weeks - 13
807-98	Update: "Independent DOE"
807-99	Duration in Weeks - 13
808-00	Update: "Independent DOE"

TABLE SOB ENVIRONMENTAL. SHIPPER

508-01 Review NEPA Compliance Issues
Duration in Weeks = 18

SNF OFF SITE SHIPPING/RECEIVING ■ Progress ■ Critical ■ Planned

TABLE S09 SNF PREPERATION - CANISTER FAB & LOADING, SHIP

S09-01	SNF Fuel Handling and Shipping Characterization Data	Duration in Weeks = 25
S09-02	Outstanding Equipment Requirements	Duration in Weeks = 12
S09-03	Verify/Design Equipment - Canisters	Duration in Weeks = 13
S09-04	Procure Materials	Duration in Weeks = 13
S09-05	Planning for Equipment Fabrication	Duration in Weeks = 8
S09-06	Equipment Fabrication	Duration in Weeks = 25
S09-07	Equipment CheckOut	Duration in Weeks = 9
S09-08	Closeout for Equipment Fabrication	Duration in Weeks = 5
S09-09	As-Build for Fabricated Equipment	Duration in Weeks = 8

TABLE S10 CANISTER TO CASK LOADING EQUIP DSGN & FAB, SHIP

S10-01	Identify/Design Equipment - Cask Loading	Duration in Weeks = 18
S10-02	Procure Materials	Duration in Weeks = 12
S10-03	Planning for Equipment Fabrication	Duration in Weeks = 4
S10-04	Equipment Fabrication	Duration in Weeks = 13
S10-05	Equipment CheckOut	Duration in Weeks = 4
S10-06	Closeout for Equipment Fabrication	Duration in Weeks = 2
S10-07	As-Build for Fabricated Equipment	Duration in Weeks = 8

TABLE S11 CASK HANDLING EQUIP DESIGN & FAB, SHIPPER

S11-01	Identify/Design Equipment - Cask Handling/Transport Loading	Duration in Weeks = 18
S11-02	Procure Materials	Duration in Weeks = 13
S11-03	Planning for Equipment Fabrication	Duration in Weeks = 4
S11-04	Equipment Fabrication	Duration in Weeks = 13
S11-05	Equipment CheckOut	Duration in Weeks = 4
S11-06	Closeout for Equipment Fabrication	Duration in Weeks = 2
S11-07	As-Build for Fabricated Equipment	Duration in Weeks = 8

TABLE S12 PROCEDURE WRITING, SHIPPER

☒ Progress ☒ Critical ☒ Planned

S12-01	Develop and Update Procedures	Duration in Weeks = 30
S12-02	Validate Procedures	Duration in Weeks = 8
S12-03	Procedure Reviews & Resolution of Comments	Duration in Weeks = 4
TABLE S13 OPERATOR TRAINING, SHIPPER		
S13-01	Preparations for Training	Duration in Weeks = 4
S13-02	Training (20 hours for 2 crews)	Duration in Weeks = 6
TABLE S14 ORR/RA, SHIPPER		
S14-01	Dry Run for Fuel Handling	Duration in Weeks = 1
S14-02	Headlines Assessment	Duration in Weeks = 8
S14-03	Prepare Final Report	Duration in Weeks = 4
S14-04	Closure of Prestart Findings	Duration in Weeks = 5
S14-05	Approval to Start Operation	Duration in Weeks = 5
S14-06	Ready for Shipment of Fuel	Duration in Weeks = 0
TABLE S15 DOE ORR, FACILITY FUEL TRANSFER, SHIPPER		
S15-01	Emergency Preparedness Preparations	Duration in Weeks = 4
S15-02	Emergency Preparedness Drill	Duration in Weeks = 1
S15-03	DOE ORR	Duration in Weeks = 6
S15-04	DOE Final Report Preparation	Duration in Weeks = 4
S15-05	Closure of Prestart Findings	Duration in Weeks = 4
S15-06	Approval to Operate	Duration in Weeks = 1
TABLE S16 JOINT EFFORTS, SHIPPER		
S16-01	Shipper/Receiver Schedule Agreement	Duration in Weeks = 3
S16-02	Inspect & PM Cask	Duration in Weeks = 2
S16-03	Prep Fuel, Load Cask & Ship	Duration in Weeks = 2

SNF OFF-SITE SHIPPING/RECEIVING NEW CASK

■ Progress ☒ Critical ☑ Planned

SHIPPER'S TABLES

TABLE SSA CASK PROCUREMENT, BY DOE FOR SNF SHIPMENTS

SSA-01 Prepare Cask Procurement Package & RFP
Duration in Weeks = 4

SSA-02 Prepare Scope of work
Duration in Weeks = 4

SSA-03 Prepare Performance Specifications
Duration in Weeks = 4

SSA-04 Prepare Design Criteria
Duration in Weeks = 4

SSA-05 Develop Planning Schedule
Duration in Weeks = 3

SSA-06 Develop Inspection Plan
Duration in Weeks = 7

SSA-07 Bid & Award Cask Procurement
Duration in Weeks = 4

SSA-08 Fabricate Cask
Duration in Weeks = 28

SSA-09 Test Cask
Duration in Weeks = 4

SSA-10 Prepare/Revise & Approve SARP
Duration in Weeks = 100

SSA-11 Cask for Cask
Duration in Weeks = 50

SSA-12 SARP by Regulatory Agency
Duration in Weeks = 0

SSA-13 Cask by Regulatory Agency
Duration in Weeks = 0

TABLE S5B DOE DUAL PURPOSE CASK (DPC)/MPC PROCUREMENT

**SBB-01 Prepare DPC/MPC Procurement Package & RFP
Duration in Weeks - 4**

98B-02 Prepare Scope of work
Discussion to Kasha on 4

500-03 Prepare performance specifications
duration in weeks = 4

30B-04 Prepare Design Criteria

388-05: "Develop Planning" Schedule

88B-06' Develop Inspection Plan
Duration in Weeks -

Bid # Award DPC/MPC Procurement

308-08 - Fabricate DPC/RPC AND OVERPACK

986-08 : Test DPC/MPG : :

98B-10 Prepense/Revision BARP for DPC/KPC

Cost for DPC/MPC _____

BBB-12' - BAPR Approval by Regulatory Agency

888-13' COTC Approval by Regulatory Agency

1. <https://doi.org/10.1016/j.jmb.2019.04.005>

1. **Introduction** 2. **Background** 3. **Methodology** 4. **Results** 5. **Conclusion**

Abstract

Figure 1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1

[illegible]

Figure 1

[illegible]

1. *What is the purpose of this study?*

100

S/N	OFF-SITE SHIPPING/RECEIVING DPC/MPC	☐ Progress	☒ Critical	☐ Planned
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	☐ Progress	☒ Critical	☒ Planned
1. Project Initiation			
2. Requirements Gathering			
3. System Design			
4. Development & Testing			
5. Deployment & Maintenance			

☒ Planned

6. Summary

The Preparation Plan can provide a useful tool in setting up and estimate the costs and schedule of inter-site SNF shipments. The Generic Tables and Schedules provide both a typical case with the common ranges for the time required for each of the activities and a good starting point from which a specific shipping campaign can be based upon and estimated.