<u>Appendix D1-1</u> - <u>Pad Seismic Analysis Files</u>

REFUND vpad.out REFUND hpad.out Output listing of REFUND analysis which generates frequency dependent impedance functions - 6x6 stiffness matrices calculated at each surface node over pad model rectangular area, for a given range of frequencies - used in characterizing soil behavior in a subsequent time history dynamic analysis of a mass-stiffness model of a representative portion of a vertical storage pad. FRIDAY vpad.out FRIDAY hpad.out F	REFUND Soil Profile.xlsx	Spreadsheet with soil properties for each different layer in subgrade model for input to REFUND program
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Reactions at tabulated for soil bearing pressure evaluations.		
Vpad Seismic Restraints.xlsx	Vpad Seismic Restraints.xlsx	
	•	moments for lateral and uplift accelerations associated with 0.75G EQ.
Complete inventory of Pilot ISF vertical casks considered.		
Pad Seismic Results.xlsx	Pad Seismic Results.xlsx	
bending moment demands for both 0.25G and 0.75G earthquakes.		
Also, verify vertical and horizontal soil bearing pressures against		,
allowable values, and design micropiles as required.		

<u>Appendix D1-2</u> - <u>Vault Seismic Analysis Files</u>

REFUND Soil Profile.xlsx	Spreadsheet with soil properties for each different layer in subgrade model for input to REFUND program
REFUND vault.out	Output listing of REFUND analysis which generates frequency dependent impedance used in characterizing soil behavior in a subsequent time history dynamic analysis of a mass-stiffness model of a representative portion of the above grade vault.
MODEL VAULT.pdf	Simplified stick model of vault generated using FRIDAY geometry and connectivity data.
FRIDAY vault.out	Output listing of FRIDAY time history dynamic analysis of model of a representative portion of the above ground vault. Geometry, material properties, mass properties, damping, and boundary conditions of vault input in STRUDL format. Vault dynamic model coupled to soil impedance functions generated in REFUND analysis. Time history accelerations in 3D applied at vault/soil interface. Solution yields displacement and acceleration time histories for 0.25G earthquake, from which maximum values extracted and output.
Vault Accelerations.xlsx	Spreadsheet used to multiply max accelerations from 0.25G FRIDAY analysis by vault nodal masses to generate static forces to be applied to vault model for static structural integrity evaluation.
Vault Beam Properties.xlsx	Spreadsheet to calculate vault stick model beam properties and masses for input to structural integrity calculation.
Vault Structure-0.25G.gto	GTSTRUDL analyses of vault stick model used to evaluate vault for structural integrity. Vertical soil spring boundary conditions coded at base of pad to allow bending moments to develop. Deadweight and X, Y, and Z direction seismic loads solved individually. Seismic spatial results combined by SRSS, and absolutely summed with deadweight results to yield Extreme combination. Forces and moments in pad and at base of casks output for subsequent pad and seismic restraint sizing. Reactions at tabulated for soil bearing pressure evaluations.
Vault Concrete Results.xlsx	Spreadsheet to calculate max shear and bending moment demands in stack and operating floor for 0.75G EQ based on 0.25G EQ results.
Vault Op Floor Results.xls	Spreadsheet to design reinforcing for one-way slab "beams" between shield plug perforations in vault operating floor based on 0.25G and 0.75G maximum shear and bending moment demands.
Vault Stack Calcs – 0.25G.xls	Hand calculations of maximum capacities of vault stack cross-section
Vault Stack Calcs – 0.75G.xls	at operating floor interface.
Vault Soil Results.xls	Spreadsheet to verify soil bearing pressures in vertical and horizontal directions. Includes bearing capacity calc using Meyerhof method and comparison between MOX and vault. Also includes micropile design parameters for 0.75G AGV lateral and longitudinal directions.

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PRELIMINARY USED NUCLEAR FUEL STORAGE DESIGN CONCEPT - ABOVEGROUND VERTICAL SCOPING THERMAL ANALYSIS

FOR

CB&I FEDERAL SERVICES

Holtec Report No: HI-2156437

Holtec Project No: 2427

Sponsoring Holtec Division: NPD

Report Class: SAFETY RELATED

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3.0	Input Data and Assumptions	3
4.0	Calculations and Results	5
5.0	References	6
	es (2 tables on 4 pages) es (13 figures on 13 pages)	
Apper	ndix A: Canister Surface Heat Flux Calculations (2 pages) ndix B: Original CB&I Thermal Study Description (4 pages) ndix C: Modifications to Preliminary Design for Thermal Analysis	(3 pages)

SUMMARY OF REVISION

Revision 0: Original issue.

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1.0 INTRODUCTION

On 4 April 2014, CB&I Federal Services, along with subcontractors including Holtec, submitted a proposal to the U.S. Department of Energy to provide services requested by the so-called Task Order 16. In support of Task Order 16, CB&I developed a preliminary design concept for an aboveground ventilated storage building where sealed canisters of used nuclear fuel would be stored in a vertical orientation. The preliminary design concept (see Figure 1) called for a structure with canisters of used nuclear fuel placed in a large storage "hall" in parallel rows of eight canisters per row. Air is drawn into the storage hall, via natural draft, through a missile-protected and radiation-shielded inlet at one end of the storage hall and exhausted back to the atmosphere through a tall chimney at the other end. Air flow through the storage hall removes the decay heat from the outer surfaces of the canisters of used nuclear fuel.

Working together with Holtec, the preliminary design was modified to improve its canister cooling performance and to protect the concrete structure of the storage building from excessively-high temperatures, which would complicate the design of the building's reinforced concrete. The analysis described in this report is performed as a scoping study to demonstrate the following:

- 1. Substantial air will be drawn into and through the storage hall via natural draft alone, to provide a completely passive heat removal mechanism.
- 2. Canister surface temperatures will be low enough to provide confidence that acceptable canister and contained used nuclear fuel temperatures will be likely.
- 3. Building structure temperatures will be low enough to provide confidence that reinforced concrete design can be accomplished without recourse to extraordinary measures.

Due to the preliminary nature of the design concept and the significant assumptions needed to enable this scoping thermal analysis to be performed, this document is not suited to support nuclear safety related activities. Thus, this document is classified as "not safety related" and has not been subject to all the controls of Holtec's nuclear quality assurance program.

2.0 ANALYSIS METHODOLOGY AND ACCEPTANCE CRITERIA

Quantification of the coupled flow and temperature fields in the storage building is accomplished

through the use of a Computational Fluid Dynamics (CFD) analysis. The CFD analysis is

performed utilizing the Fluent [1] fluid flow and heat transfer modeling program. Navier-Stokes

equations of fluid motion, including full buoyancy effects, along with the energy conservation

equation are solved to obtain the steady-state flow and temperature fields in the building.

A three-dimensional model of a section through the storage hall is made using Fluent. The width

of the model encompasses one row of canisters. The sides of the model are symmetry planes.

The model explicitly includes the geometry of the air inlet and the outlet chimney within the

modeled section. The floor and ceiling of the storage hall are also explicitly included, including

shield plugs in the ceiling above each canister), with appropriate heat transfer boundary

conditions on the top of the ceiling (natural convection) and on the bottom of the floor

(conduction to constant temperature soil). Radiation shields on the undersides of the shield plugs

are modeled as conduction walls with the thermal conductivity of air and the emissivity of

aluminum. The used fuel canisters are modeled as right-circular cylinders sitting on the storage

hall floor. The canister internals are not modeled and the decay heat generated by the used fuel is

modeled as constant heat fluxes out of the canister surfaces. The cylindrical side and flat top

surfaces of the canisters are modeled as shell conduction walls.

Air flow within the building is in the turbulent regime, so turbulence is included and is modeled

using the k-\omega model in Fluent. Radiation heat transfer between canisters and between the

canisters and the building structure is included and is modeled using the Discrete Ordinates

model in Fluent. The temperature dependence of the density of air is modeled using the ideal gas

law.

The analyses performed in this report are intended only to estimate the thermal performance of

the design concept so its overall viability can be evaluated. As such, no acceptance criteria are

applied and no conclusions are drawn.

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3.0 INPUT DATA AND ASSUMPTIONS

The input data used to perform the analysis are presented in Table 1. Additionally, the following

necessary assumptions are made in performing the analysis:

• The decay heat inside each canister is emitted from the top and sides of the canisters,

with 15% being emitted from the top and 85% emitted from the sides. This distribution is

based on engineering judgment from our experience designing dry storage cask systems.

• The air inlet flow straightener is modeled be restricting air flow it to be in a horizontal

plane only. Given the preliminary nature of the design it is not possible to model in a

more realistic manner. The pressure drop through the flow straightener is not expected to

be a large portion of the total, so this assumption is expected to be negligible.

• The natural convection heat transfer coefficient on the top surface of the storage hall

ceiling is set to 1 W/(m²×K). This coefficient is based on engineering judgment from our

experience designing dry storage cask systems.

• The majority of surfaces outside the storage hall (i.e., in the air inlet, air outlet and

chimney) are modeled as adiabatic. The heat transfer through these surfaces is not

expected to significantly affect the maximum temperatures, which will occur in the

storage hall.

The shield plugs above each canister are modeled as the same diameter as the canisters.

The plugs would have to have a diameter larger than that of the canisters so the canisters

could pass through the holes in the ceiling during load/unloading of the storage hall, but

this geometric simplification is not expected to significantly affect the results.

• The thermal shields on the underside of the shield plugs above each canister are modeled

as a thin sheet of aluminum backed by a one-inch air gap. This is consistent with

mounting an aluminum sheet hanging below the underside of each plug. Similar thermal

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shields have been used by us in a dry storage cask system. The emissivity of the aluminum is assumed to be 0.05. Given the preliminary nature of the design, and therefore without knowledge of the surface condition (i.e., polished, dull, anodized, etc.) it is not possible to model in a more realistic manner.

4.0 CALCULATIONS AND RESULTS

Using the input data and assumptions in Section 5.0, the CFD model is constructed with the features described in Section 2.0. Figures 2 and 3 present views of the model geometry. To ensure the granularity of the model is fine enough to properly capture both the large-scale and small-scale effects, both of which are important to the accuracy of the solution, a relatively large model with 3,163,300 hexahedral cells and 3,264,123 nodes is built. A single scenario with each of the eight canisters containing used fuel with a decay heat load of 25 kW (200 kW total for the row) is evaluated. The canister top and side heat fluxes are computed in Appendix A. The following computer files are created in the performance of the CFD analysis:

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12/02/2014 10:25 AM 311,427,072 val96.dbs
12/05/2014 10:37 AM 331,852,192 val96-a.cas
12/05/2014 10:37 AM 4,422,360,814 val96-a.dat
```

The results of the calculations are summarized in Table 2 and in Figures 4 through 13. As stated in Section 3.0, no acceptance criteria are applied to these results.

- 5.0 REFERENCES¹
- [1] Fluent v14.5, Ansys Inc., Copyright 2012 SAS IP Inc.
- [2] "Final Safety analysis Report on the HI-STORM UMAX Canister Storage System," Holtec Report HI-2115090, Revision 2, Subsection 4.2.

-

¹ This revision status of Holtec documents cited above is subject to updates as the project progresses. This document will be revised if a revision to any of the above-referenced Holtec work products materially affects the instructions, results, conclusions or analyses contained in this document. Otherwise, a revision to this document will not be made and the latest revision of the referenced Holtec documents shall be assumed to supersede the revision numbers cited above. The Holtec Project Manager bears the undivided responsibility to ensure that there is no intra-document conflict with respect to the information contained in all Holtec-generated documents on a *safety-significant* project. The latest revision number of all documents produced by Holtec International in a *safety-significant* project is readily available from the company's Document Transmittal Form (DTF) database.

Table 1 – Input Data Summary			
Input Parameter	Value	Source(s)	
Storage Hall Height	16' 4" + 2' 8"	Appendix B + Appendix C	
Length from Ends of Storage Hall to Center of: First Canister from Inlet (Canister 8) Last Canister From Outlet (Canister 1)	10' 0'' 10' 0''	Figure 1	
Canister Center-to-Center Pitch	12' 0"	Figure 1	
Storage Hall Ceiling Thickness	5' 0''	Appendix C	
Storage Hall Floor Thickness	5' 0''	Appendix C	
Shield Plug Thickness	4' 0''	Appendix C	
Air Inlet Height	12' 0"	Appendix B	
Air Inlet Flow Straightener Height	14' 0"	Appendix B	
Air Inlet Flow Straightener Length	4' 0''	Appendix B	
Air Inlet Shield Wall Height	15' 0"	Appendix B	
Air Inlet Shield Wall Thickness	3' 0"	Appendix B	
Air Inlet Flow Path Around Shield Wall Width	3' 0"	Appendix B	
Exit from Storage Hall Height	14' 0"	Appendix B	
Chimney Height	87' 0"	Appendix B	
Chimney Length	5' 0"	Appendix B	
Canister Diameter	70"	Appendix B	
Canister Maximum Height	16' 4"	Appendix B	
Canister Decay Heat Load	25 kW	Appendix C	
Number of Canisters per Row	8	Figure 1	
Ambient Air Temperature	120°F	Appendix B	
Soil Temperature Below Floor	55°F	Appendix C	
(continued on no	ext page)	•	

Table 1 – Input Data Summary (continued from previous page)		
Input Parameter	Value	Source(s)
Thermal Conductivity of Concrete	1.05 Btu/(hr×ft×°F)	[2]
Emissivity of Concrete	0.88	[2]
Thermal Conductivity of Stainless Steel	8.4 Btu/(hr×ft×°F)	[2]
Emissivity of Stainless Steel	0.36	[2]
Emissivity of Aluminum	0.05	Assumed
Molecular Weight of Air	28.966 g/mol	Fluent Default
Thermal Conductivity of Air at 32°F at 200°F at 450°F at 700°F at 1000°F	0.0139 Btu/(hr×ft×°F) 0.0173 Btu/(hr×ft×°F) 0.0225 Btu/(hr×ft×°F) 0.0272 Btu/(hr×ft×°F) 0.0336 Btu/(hr×ft×°F)	[2]
Viscisity of Air at 32°F at 70.5°F at 338.4°F at 567.1°F at 701.6°F at 1078.2°F	172.0 μP 182.4 μP 229.4 μP 246.3 μP 316.7 μP 377.6 μP	[2]
Specific Heat Capacity of Air	0.24 Btu/lb×°F	[2]

Table 2 – Numeric Results			
Result Parameter	Value		
Air Flow Through Storage Hall			
Air Inlet Temperature	120°F		
Average Air Outlet Temperature	160°F		
Air Mass Flow Rate	68,175 lb/hr		
Canister 1 Surface Temperatures and Heat Transfer Coefficients			
Lid Maximum Temperature	517°F		
Lid Average Heat Transfer Coefficient	$0.994 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Side Maximum Temperature	470°F		
Side Average Heat Transfer Coefficient	0.949 Btu/(hr×ft ² ×°F)		
Whole-Surface Average Temperature	339°F		
Canister 2 Surface Temperatures and Heat Transfer Coefficients			
Lid Maximum Temperature	523°F		
Lid Average Heat Transfer Coefficient	$0.979 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Side Maximum Temperature	473°F		
Side Average Heat Transfer Coefficient	$0.936 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Whole-Surface Average Temperature	343°F		
Canister 3 Surface Temperatures and Heat T	Transfer Coefficients		
Lid Maximum Temperature	525°F		
Lid Average Heat Transfer Coefficient	$0.976 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Side Maximum Temperature	474°F		
Side Average Heat Transfer Coefficient	$0.943 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Whole-Surface Average Temperature	342°F		
Canister 4 Surface Temperatures and Heat T	Transfer Coefficients		
Lid Maximum Temperature	525°F		
Lid Average Heat Transfer Coefficient	$0.977 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Side Maximum Temperature	473°F		
Side Average Heat Transfer Coefficient	$0.959 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$		
Whole-Surface Average Temperature	339°F		
(continued on next page)			

Table 2 – Numeric Results (continued from previous page)		
Result Parameter	Value	
Canister 5 Surface Temperatures and Heat T	ransfer Coefficients	
Lid Maximum Temperature	521°F	
Lid Average Heat Transfer Coefficient	$0.980 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Side Maximum Temperature	471°F	
Side Average Heat Transfer Coefficient	$0.982 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Whole-Surface Average Temperature	334°F	
Canister 6 Surface Temperatures and Heat Transfer Coefficients		
Lid Maximum Temperature	519°F	
Lid Average Heat Transfer Coefficient	$0.985 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Side Maximum Temperature	466°F	
Side Average Heat Transfer Coefficient	$1.014 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Whole-Surface Average Temperature	328°F	
Canister 7 Surface Temperatures and Heat T	ransfer Coefficients	
Lid Maximum Temperature	516°F	
Lid Average Heat Transfer Coefficient	$0.993 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Side Maximum Temperature	460°F	
Side Average Heat Transfer Coefficient	$1.048 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Whole-Surface Average Temperature	319°F	
Canister 8 Surface Temperatures and Heat T	ransfer Coefficients	
Lid Maximum Temperature	505°F	
Lid Average Heat Transfer Coefficient	$1.015 \text{ Btu/(hr} \times \text{ft}^2 \times \text{°F)}$	
Side Maximum Temperature	456°F	
Side Average Heat Transfer Coefficient	$1.118 \text{ Btu/(hr} \times \text{ft}^2 \times {}^{\circ}\text{F)}$	
Whole-Surface Average Temperature	305°F	
Structure Temperatures		
Ceiling Maximum Temperature	330°F	
Ceiling Plugs Maximum Temperature	303°F	
Floor Maximum Temperature	278°F	

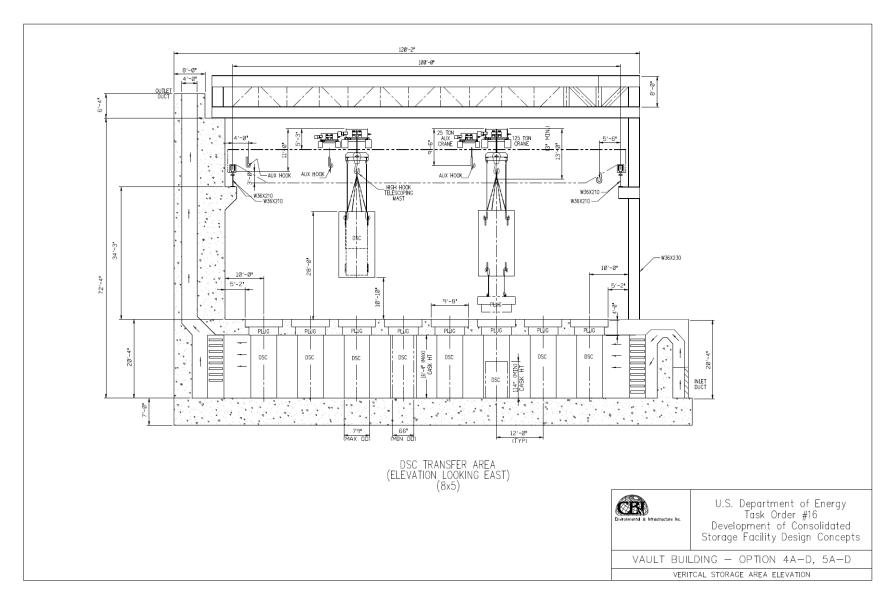


Figure 1 – Original CB&I Design Concept

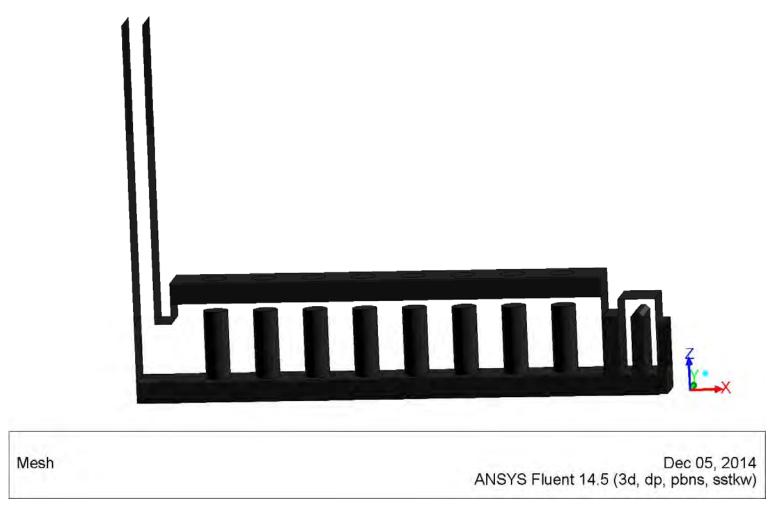


Figure 2 – Model Geometry – Symmetry Planes Hidden

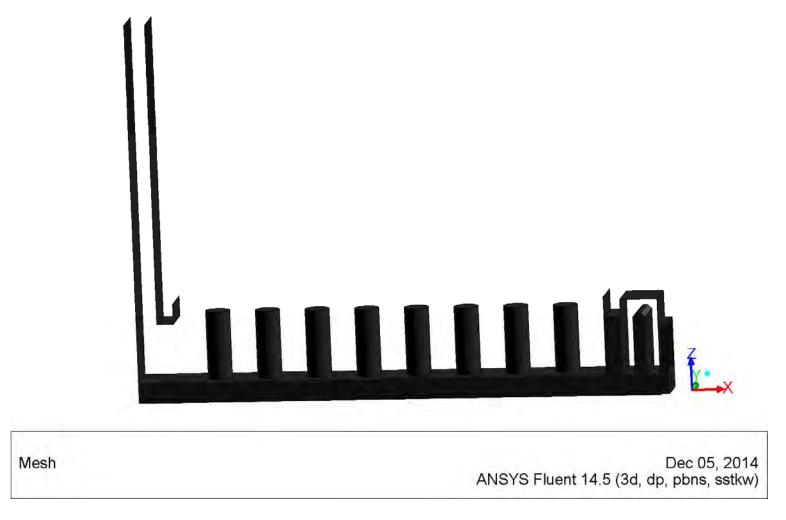


Figure 3 – Model Geometry – Symmetry Planes and Ceiling Hidden

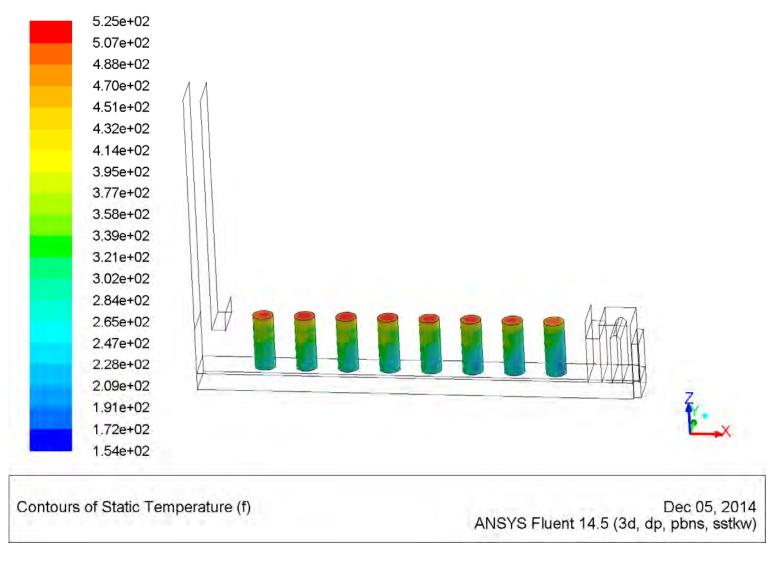


Figure 4 – Canisters Surface Temperature Contours

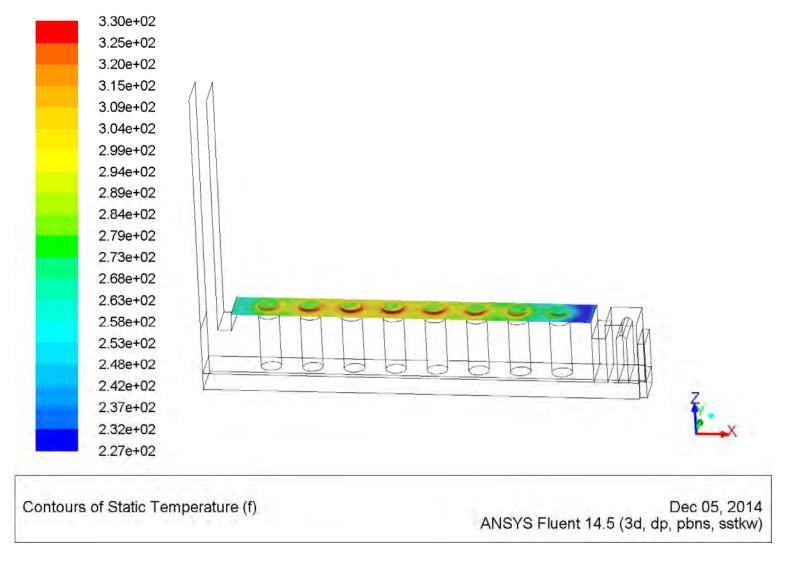


Figure 5 – Ceiling Temperature Contours

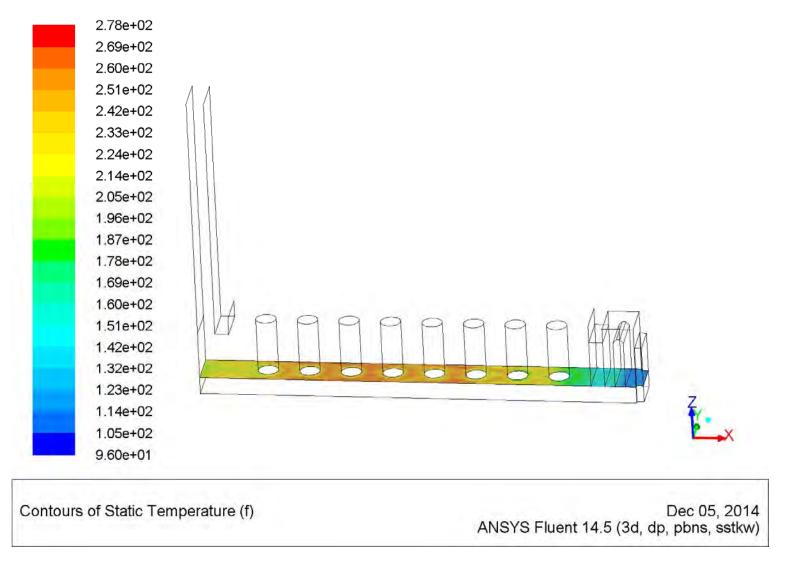


Figure 6 – Floor Temperature Contours

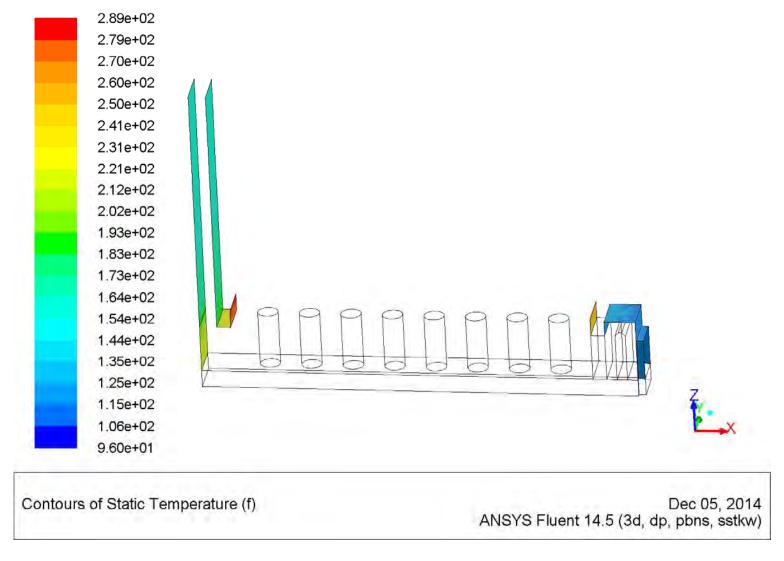


Figure 7 – Chimney Temperature Contours

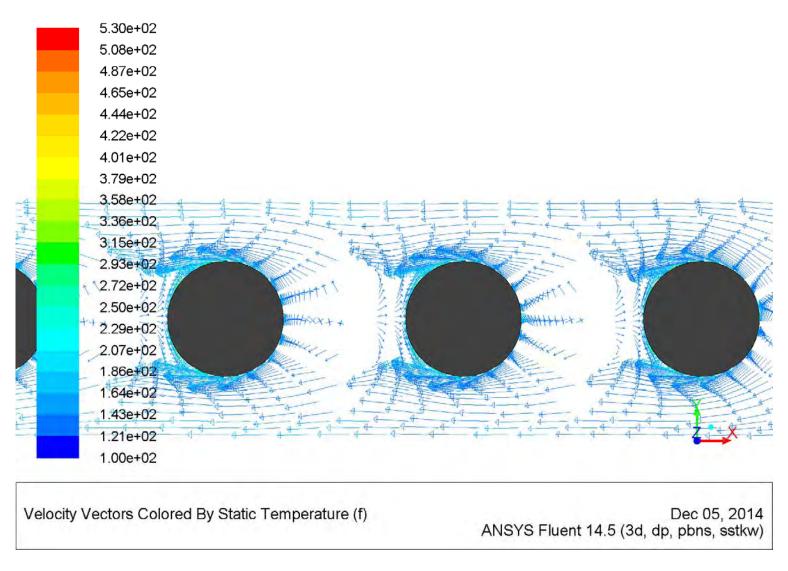


Figure 8 – Horizontal Velocity Vectors (colored by temperature) at Canisters Mid-Height

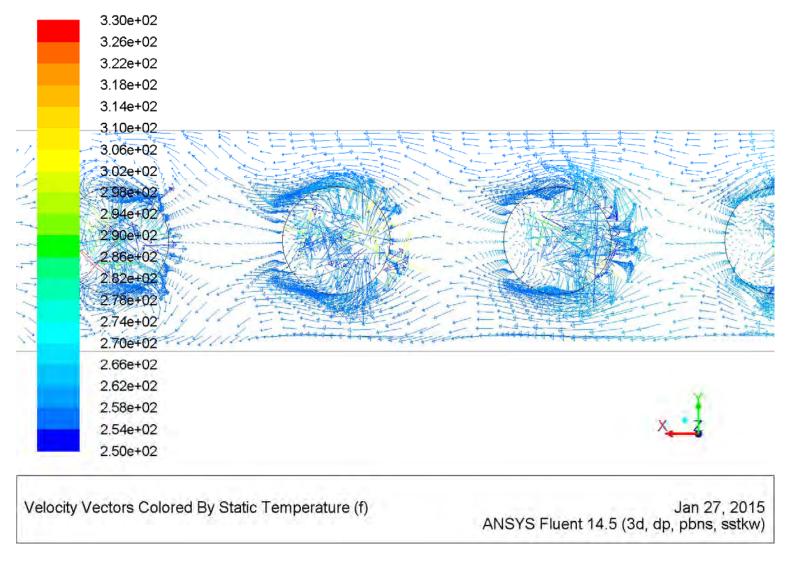


Figure 9 – Horizontal Velocity Vectors (colored by temperature) One Foot Above Canisters

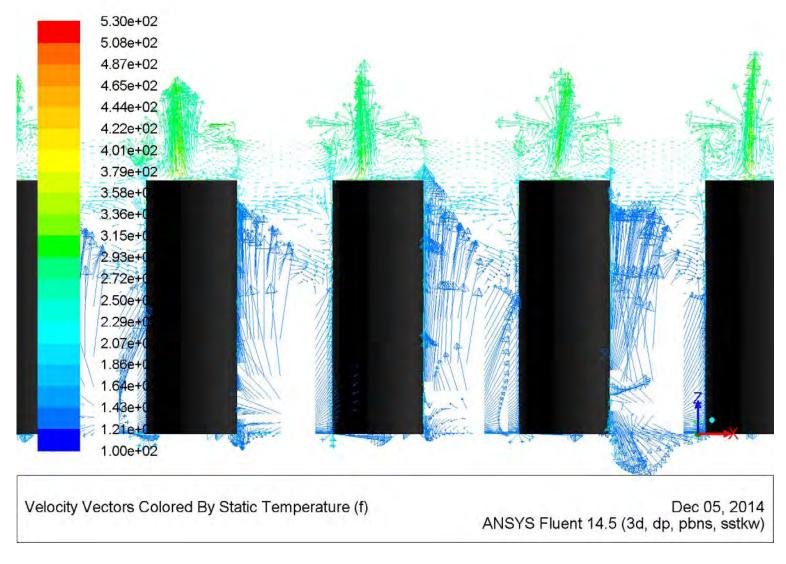


Figure 10 – Vertical Velocity Vectors (colored by temperature)

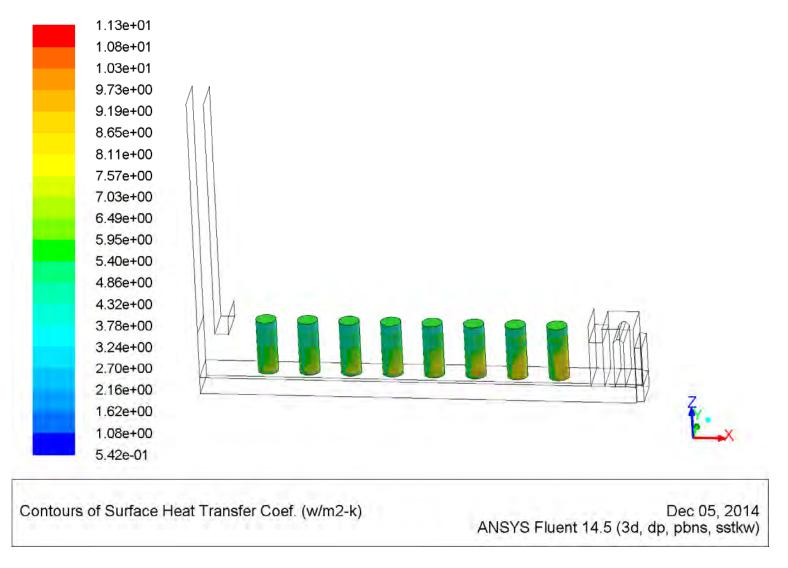


Figure 11 – Canisters Surface Heat Transfer Coefficient Contours

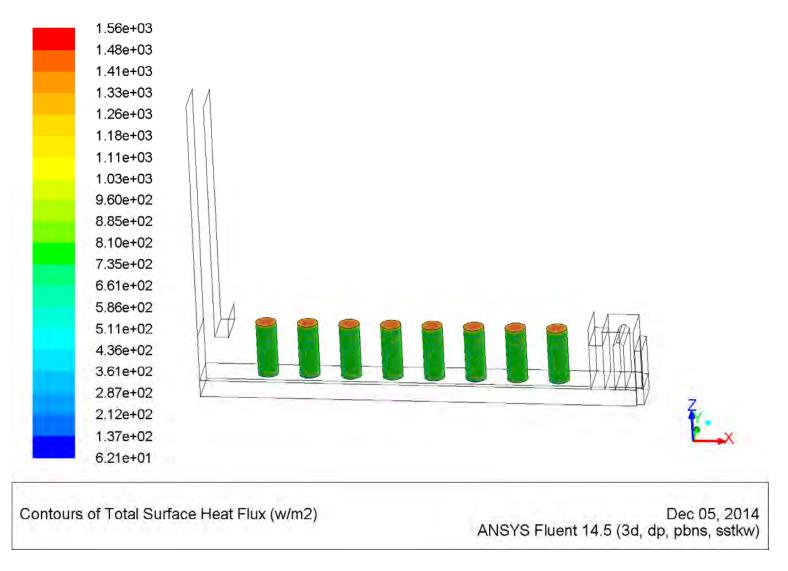


Figure 12 – Canisters Total Heat Flux Contours

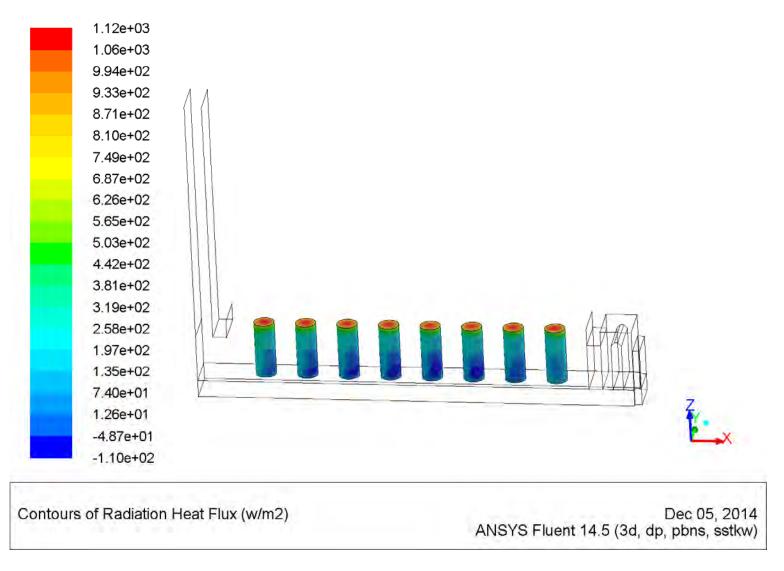


Figure 13 – Canisters Radiation Heat Flux Contours

Appendix A Canister Surface Heat Flux Calculations

INTRODUCTION

The calculations presented in this worksheet are performed to determine heat fluxes from the top and side surfaces of the canisters of used fuel in the storage hall.

WORKSHEET-SPECIFIC INPUT DATA

$OD := 70 \cdot in$	Canister Diameter, from Table 1
OD /0·III	Carnotor Blarriotor, from rabio r

$$Q_{can} := 25 \cdot kW$$
 Total Heat per Canister, from Table 1

$$F_{side} := 85.\%$$
 Fraction of Heat Emitted by Side, from Section 3.0

$$F_{top} := 15.\%$$
 Fraction of Heat Emitted by Top, from Section 3.0

CALCULATIONS

$$Q_{side} := Q_{can} \cdot F_{side} = 21.25 \text{ kW}$$

$$Q_{top} := Q_{can} \cdot F_{top} = 3.75 \text{ kW}$$

$$A_{\text{side}} := \pi \cdot \text{OD} \cdot H_{\text{can}} = 299.324 \cdot \text{ft}^2$$

$$A_{top} := \frac{\pi}{4} \cdot OD^2 = 26.725 \cdot ft^2$$

$$q_{side} := \frac{Q_{side}}{A_{side}} = 764.166 \cdot \frac{W}{m^2}$$

$$q_{top} := \frac{Q_{top}}{A_{top}} = 1510.351 \cdot \frac{W}{m^2}$$

Appendix B Original CB&I Thermal Study Description

Vertical DSC Vault Thermal Study Description

Purpose: To validate whether or not a vault module with up to 40 vertical dry storage canisters

will be able to maintain the external surface temperature(s) of the canisters below a

maximum temperature limit using passive cooling.

Vault Models: For vertical DSC's, either a 2D or a 3D vault module model may be used, as follows:

 $\underline{2D}$ – vertical-transverse section through the vault with a single row of up to (8) 70" diameter canisters at 12' c-c spacing. Flow area in vault (between inlet and outlet vanes) is 16.33' high x 104' long x 8.67' wide. Stack flue is 70' high (above vault ceiling) x 5' deep x 8.67' wide. Air inlet is shown in Sketch 1. Air outlet is shown in Sketch 2.

<u>3D</u> –vault module with up to (5) rows of up to (8) 70" diameter canisters at 12' c-c spacing, both ways. Flow area in vault (between inlet and outlet vanes) is 17.00' high x 104' long x 58' wide. Stack flue is 70' high (above vault ceiling) x 5' deep x 48' wide. Air inlet is shown in Sketch 1. Air outlet is shown in Sketch 2.

Ref Drwg: Vault Building – Option 4A-D, 5A-D – Vertical Storage Area Elevation

Thermal Boundary

Conditions: Vault floor* - conduction down through 6' of concrete with exterior temperature = 55°F

Vault walls and ceiling; stack flue surfaces – adiabatic Ambient Air - 120°F; 14.7 psia; dry; calm (no velocity)

*trial basis. If effect minimal, use adiabatic.

Canister

Parameters: O.D. – 70"

Height – (2) cases: 16.33' max, 9.5' min Thermal output – (2) cases: 15 kW, 25 kW Maximum Surface Temperature - 300°F

Film coefficients** - cylindrical surface, natural convection, h_{CYL-NC} = 0.18 (ΔT)^{0.33}

top surface, natural convection, h_{TOP-NC} = 0.22 (ΔT)^{0.33}

- cylindrical surface, forced convection, in-line tubes,

 $h_{CYL-FC} = (K/D) 0.26 (\rho V D / \mu)^{0.6} (\mu C_P / K)^{0.33}$

** or equivalent.

Analysis

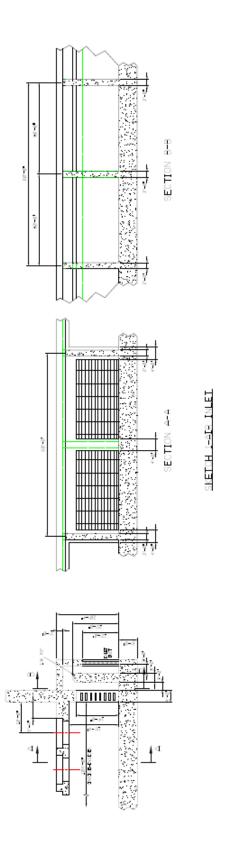
Parameters: Calculate steady-state air flow, air temperature distributions throughout vault and stack,

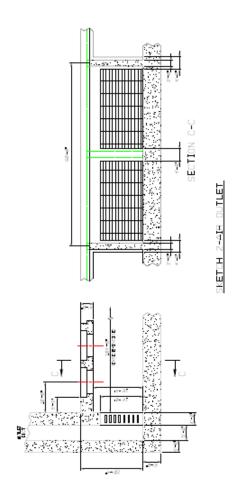
and maximum surface temperatures of canisters (if possible)***, based on the following

thermal inputs:

- (1) Fully loaded vault with 25 kW canisters
- (2) Fully loaded vault with 15 kW canisters
- (3) Single 15 kW canister, centered on last row (adjacent to stack)

*** if not possible, calculate max air temperature adjacent to canister.





Appendix C Modifications to Preliminary Design for Thermal Analysis

Evan Rosenbaum

From: Brunsdon, Bruce [Bruce.Brunsdon@CBIFederalServices.com]

Sent: Wednesday, November 19, 2014 12:29 PM

To: Steve Wright

Cc: Debu Majumdar; Evan Rosenbaum; Lewis, Donald Wayne (DEN); Clemmens, Jack

Subject: Holtec Thermal Study of Vault

Hi Steve:

The project has decided to proceed with modifying the CFD model of the vault as we discussed yesterday and re-running the analysis. We'd like to see the following changes incorporated:

- Increase the clearance between the top of the canisters and the underside of the operating floor from 8" to 2'-8"
- Include an insulating layer equivalent to a 2" air gap with a surface emissivity equal to a thin sheet of aluminum on the underside of the operating floor over the projected area of each canister
- Include surface conduction over the sides and top surfaces of each canister
- Delete the modeling of the flow straightener on the vault outlet

After making the changes above, please run the (8) canister, 25 kW per canister model to determine the steady state temperature distribution and produce the same table of maximum temperatures and the same temperature contour plots and velocity vector plots as were generated previously. If there is a way to have FLUENT automatically calculate effective surface film coefficients averaged over the canister lids and sides, we'd like to document those as well (suggest using a reference temperature of 120F for all canisters).

Your team is authorized to spend an additional 80 hours to make the modeling changes, re-run the (1) case, and generate the output plots. If at all possible, we'd like to have the results by December 5th, but we recognize that your computer resources are in high demand. Please contact me if you have any questions or issues.

Best Regards,

Bruce Brunsdon
PPL Mechanical Engineer III
Federal Services
MOX Offsite Support Services

Tel: +1 303 486 2566

Fax: +1 303 486 2570

bruce.brunsdon@CBIFederalServices.com

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Task Order 16 Report, Appendix D2 - Thermal Analysis THIS REPORT HAS NOT BEEN QA VALIDATED

Evan Rosenbaum

From: Steve Wright

Sent: Tuesday, November 04, 2014 8:29 PM To: Debu Majumdar; Evan Rosenbaum

Subject: Fw: Discuss Preliminary Results of Vault Thermal Model

Please see email below and let's talk soon.

Sent from my BlackBerry 10 smartphone on the Verizon Wireless 4G LTE network.

From: Brunsdon, Bruce <Bruce.Brunsdon@CBIFederalServices.com>

Sent: Tuesday, November 4, 2014 6:39 PM

To: Steve Wright

Subject: RE: Discuss Preliminary Results of Vault Thermal Model

Steve -

I haven't forgotten you. The seismic and thermal models both provided results at the same time, and neither one of them worked as is. We are modifying the stack geometry (increasing the flue width) to try and resist the rocking accelerations associated with 0.75G horizontal earthquake. We will let you know the final dimension when we settle on something that we can design rebar for. In the mean time, Evan can get going incorporating the following changes to the CFD model(s):

- Raise the concrete ceiling by 2 feet
- Eliminate the flow straightener at the exit
- Reduce the height of the missile shield wall in the inlet to ½ of its current value and double the thickness of the air passages at the inlet
- Stagger every other canister, ensuring that the canister nearest the stack is split
- Allow conduction heat transfer on the canister surfaces
- Code a layer of insulator/reflector in the ceiling above each canister with a diameter of 74" to knock down the radiation load on the concrete (the shield plugs are 4' thick; the ceiling is 5' thick, leaving a 1' recess for insulation)
- On the floor, code a 6' thick layer of concrete with a 55° constant temperature boundary condition on the lower surface to conduct away the radiation heat load from the upper surface (every little bit helps).

We're still working on the acceptance criteria and will forward you the results when ready. Please call Wayne to let him know about how many hours these changes will take, but don't hold up Evan waiting for a reply.

Thanks, Steve.

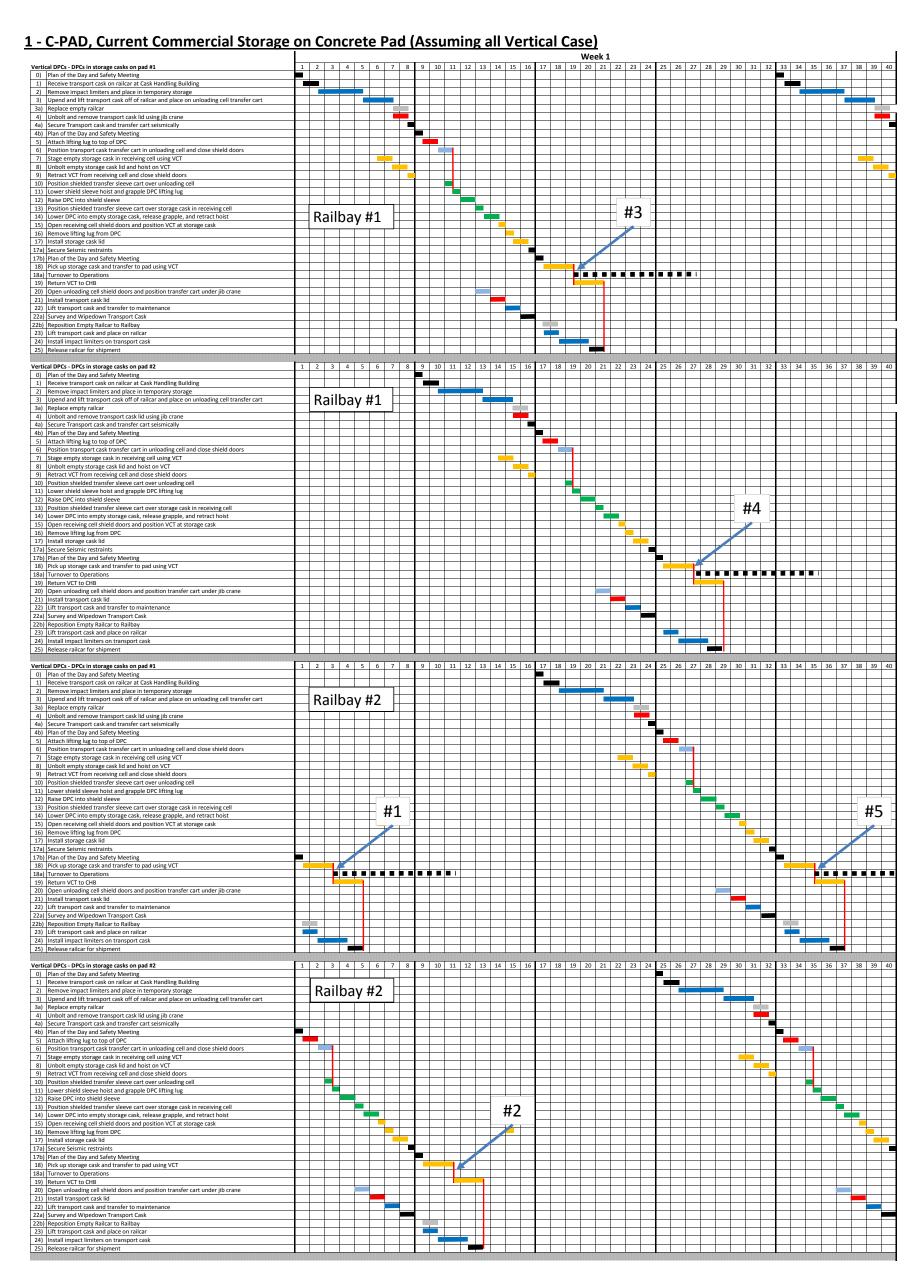
Bruce Brunsdon PPL Mechanical Engineer III Federal Services MOX Offsite Support Services

Tel: +1 303 486 2566

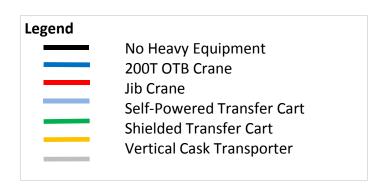
Fax: +1 303 486 2570

bruce.brunsdon@CBIFederalServices.com

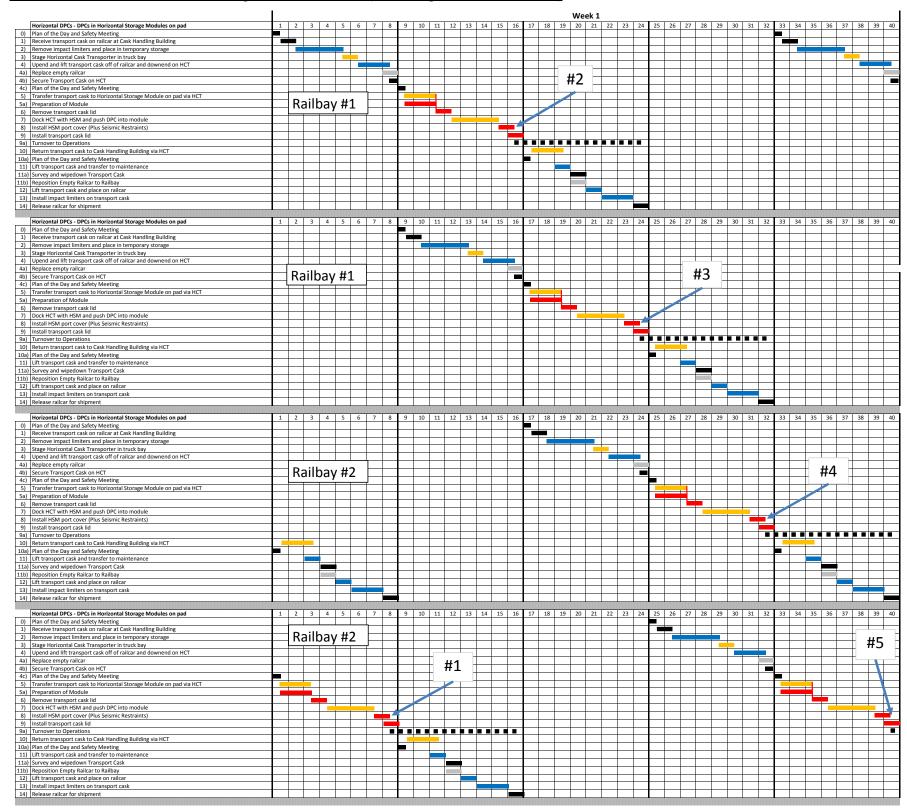
CB&I



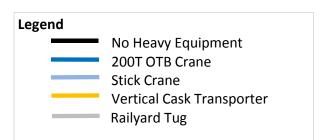
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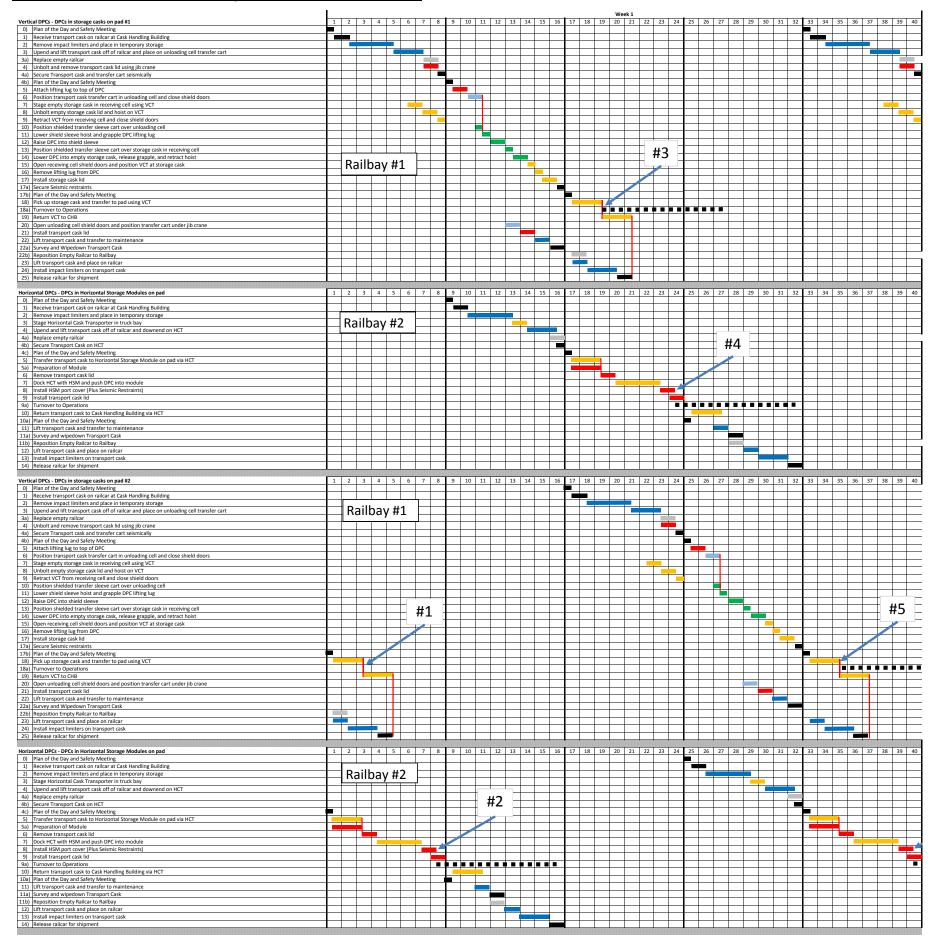
1 - C-PAD, Current Commercial Storage on Concrete Pad (Assuming all Horizontal Case)



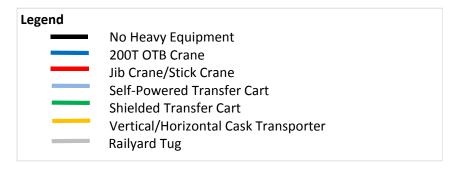
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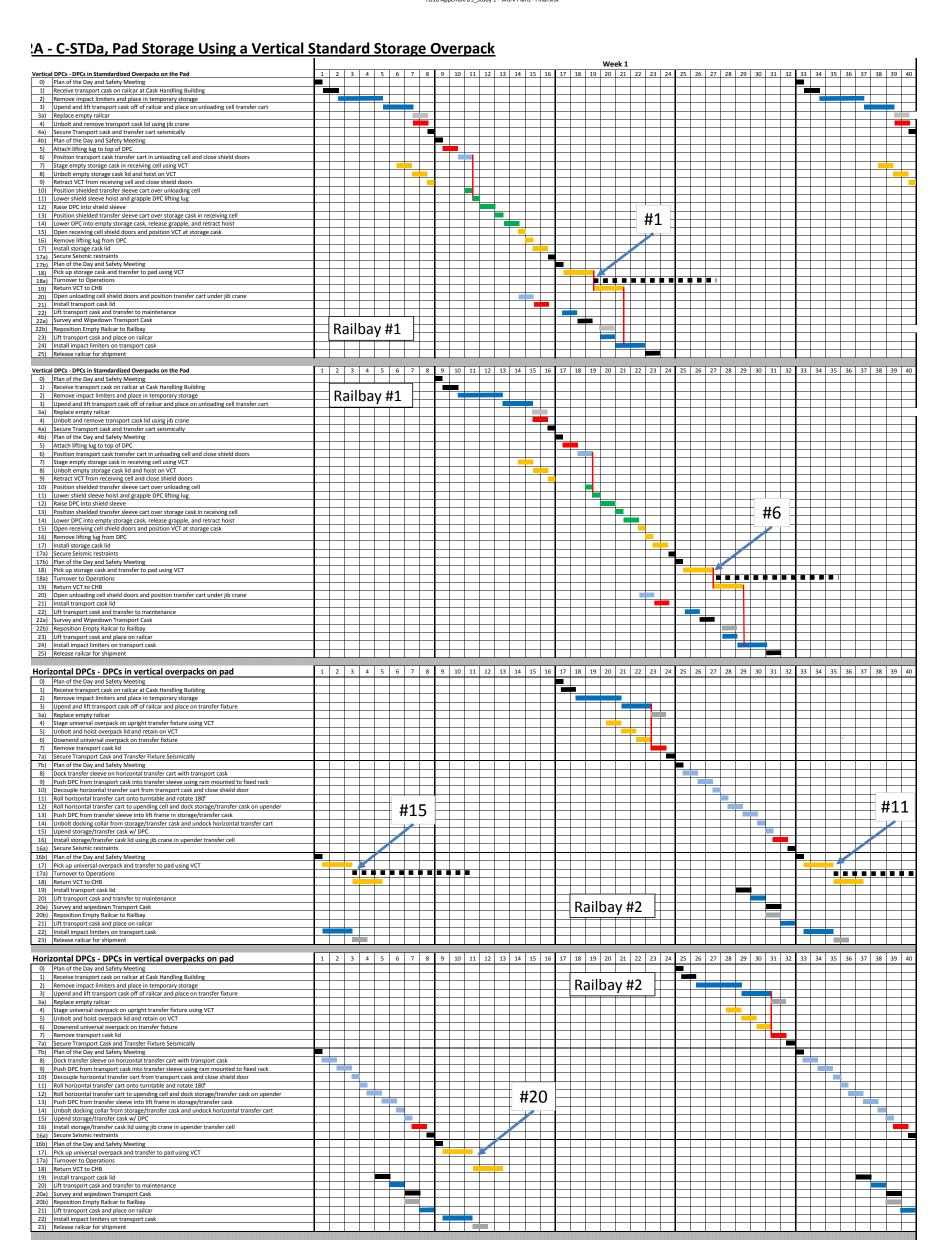


1 - C-PAD, Current Commercial Storage on Concrete Pad (Base Case)



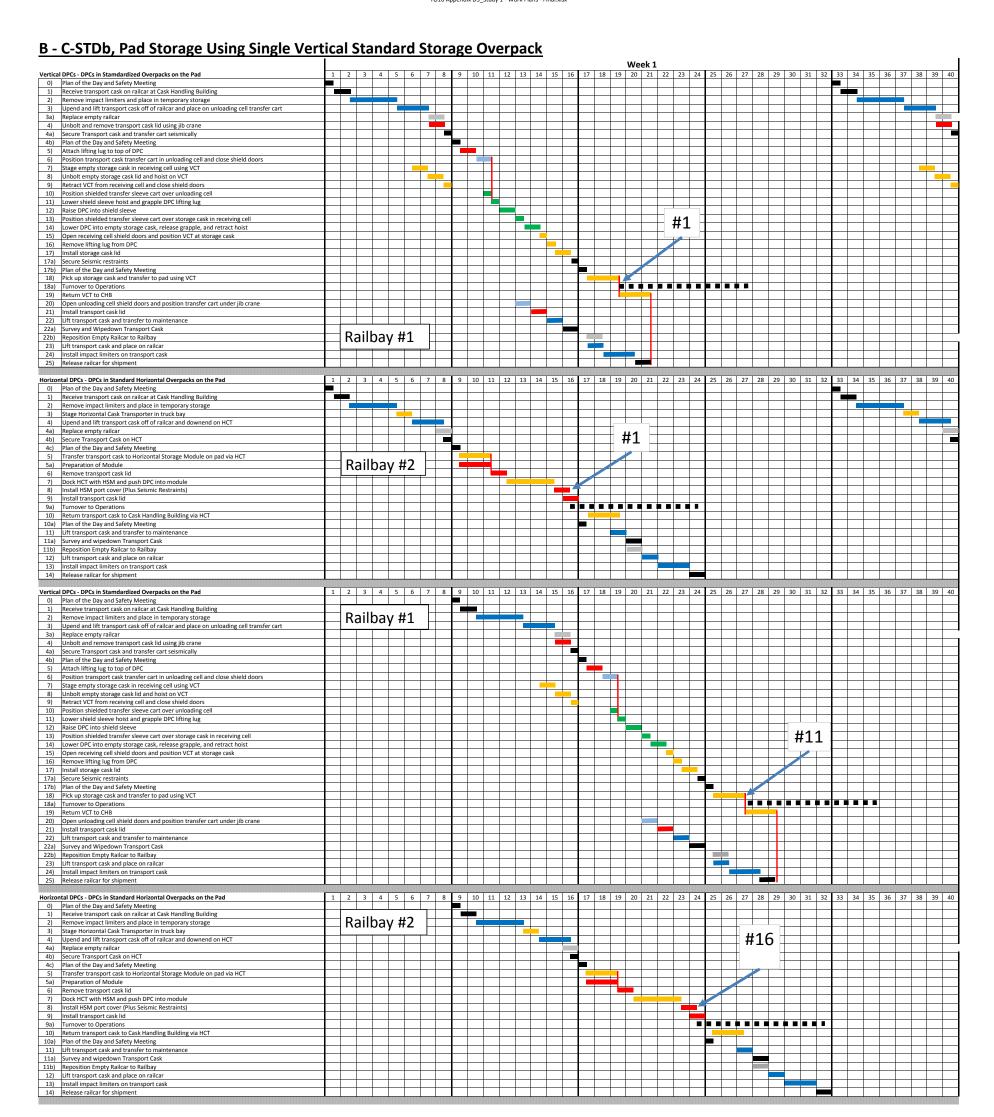
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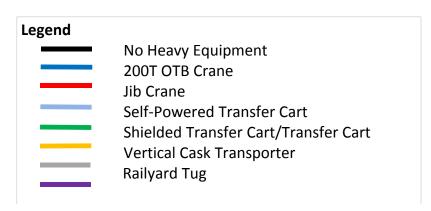


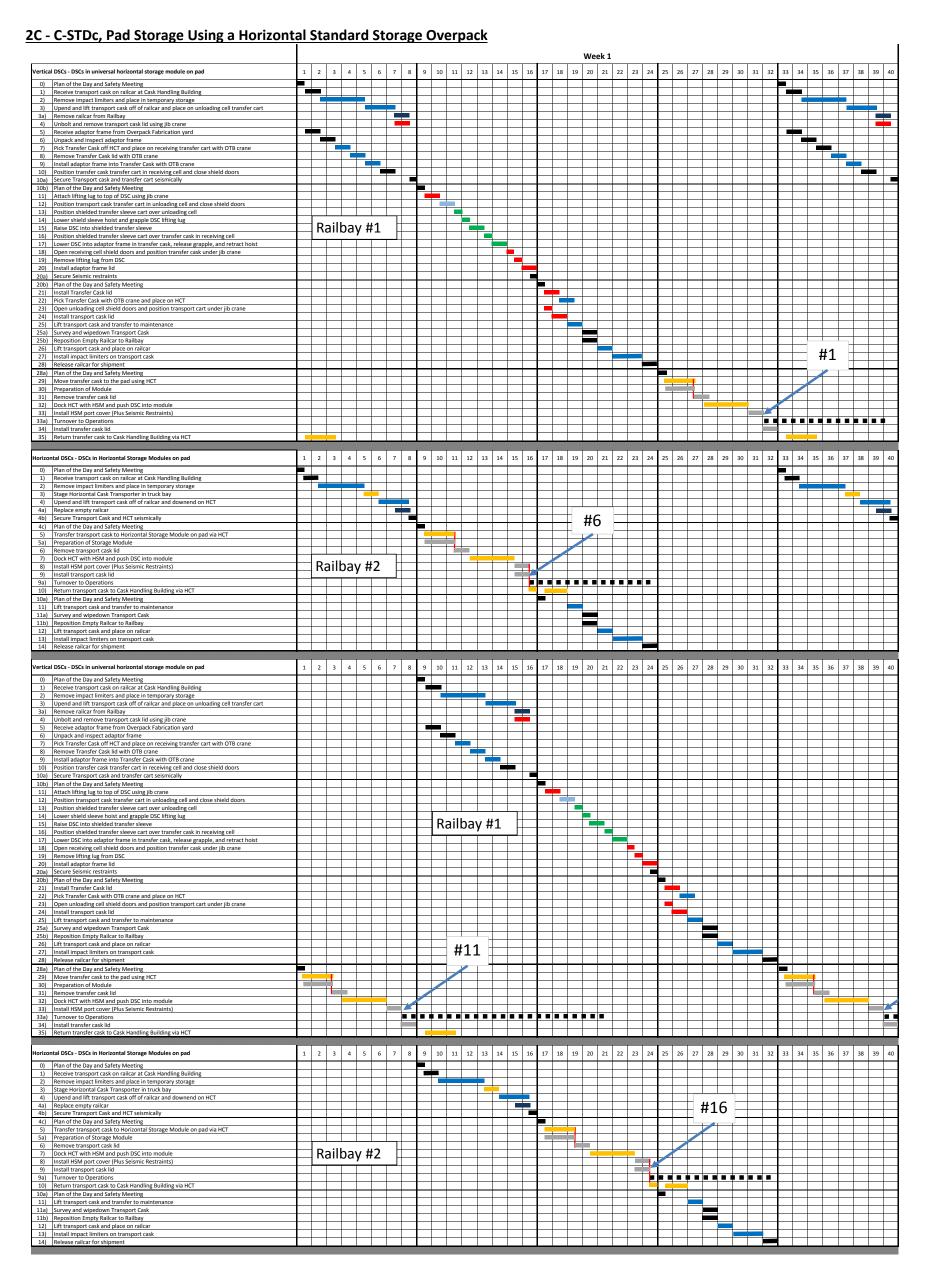
Throughput: 20 DPCs placed every four weeks, or an average of 5 per week



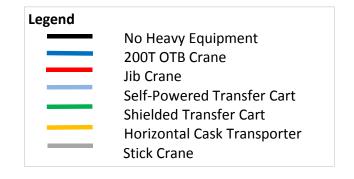


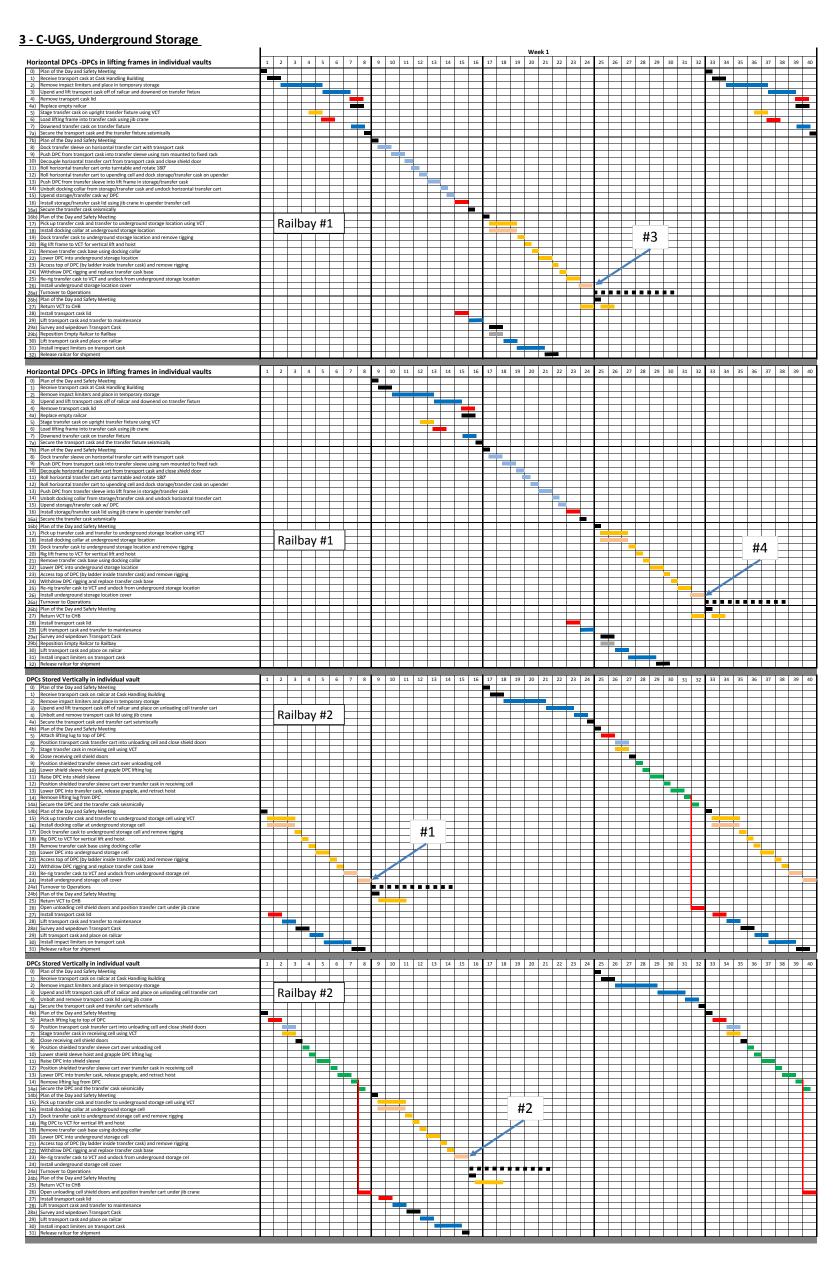
Throughput: 20 DPCs placed every four weeks, or an average of 5 DPCs per week.



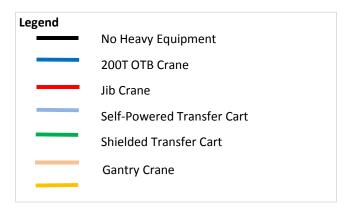


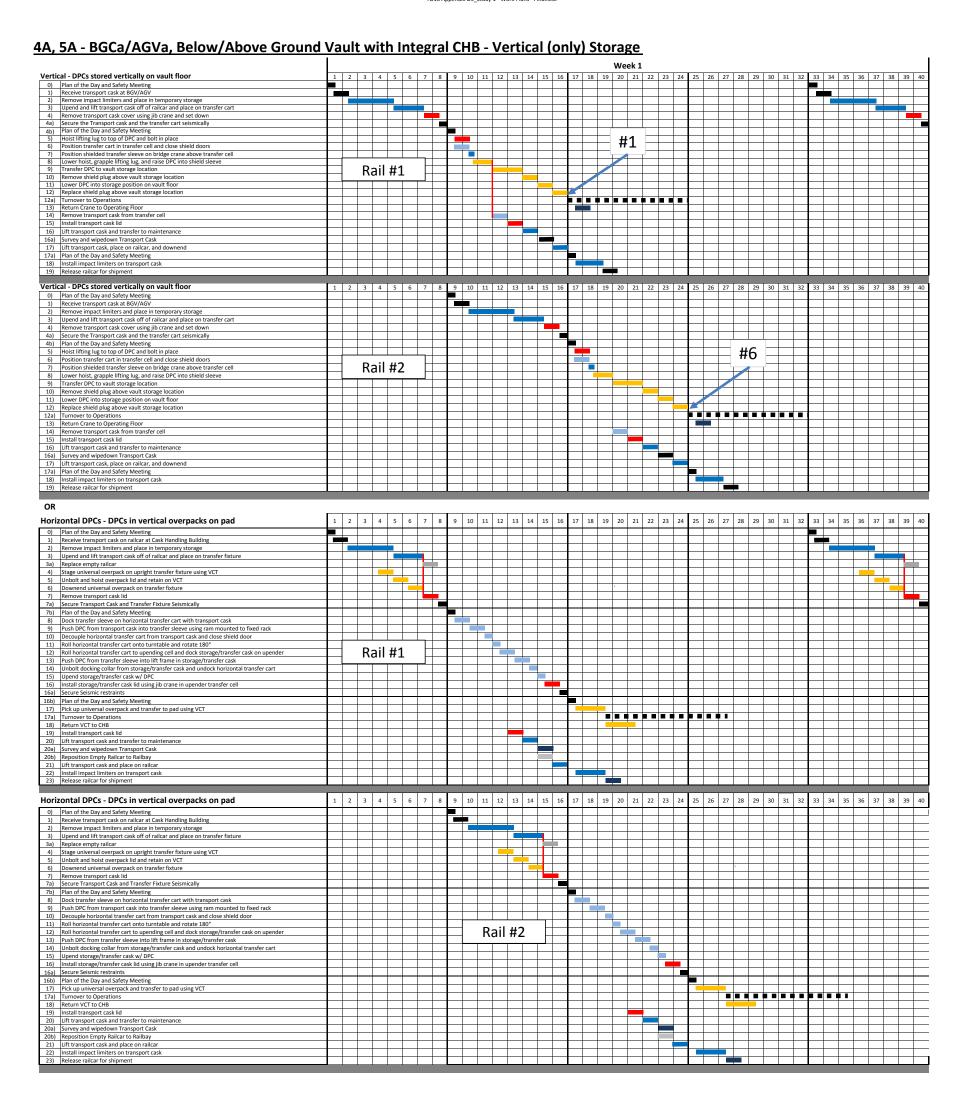
Throughput: 20 DSCs placed every four weeks, or an average of 5 per week



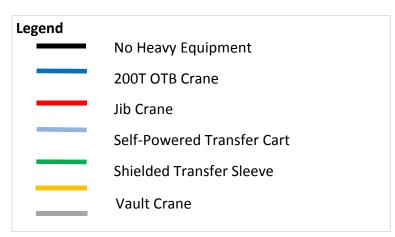


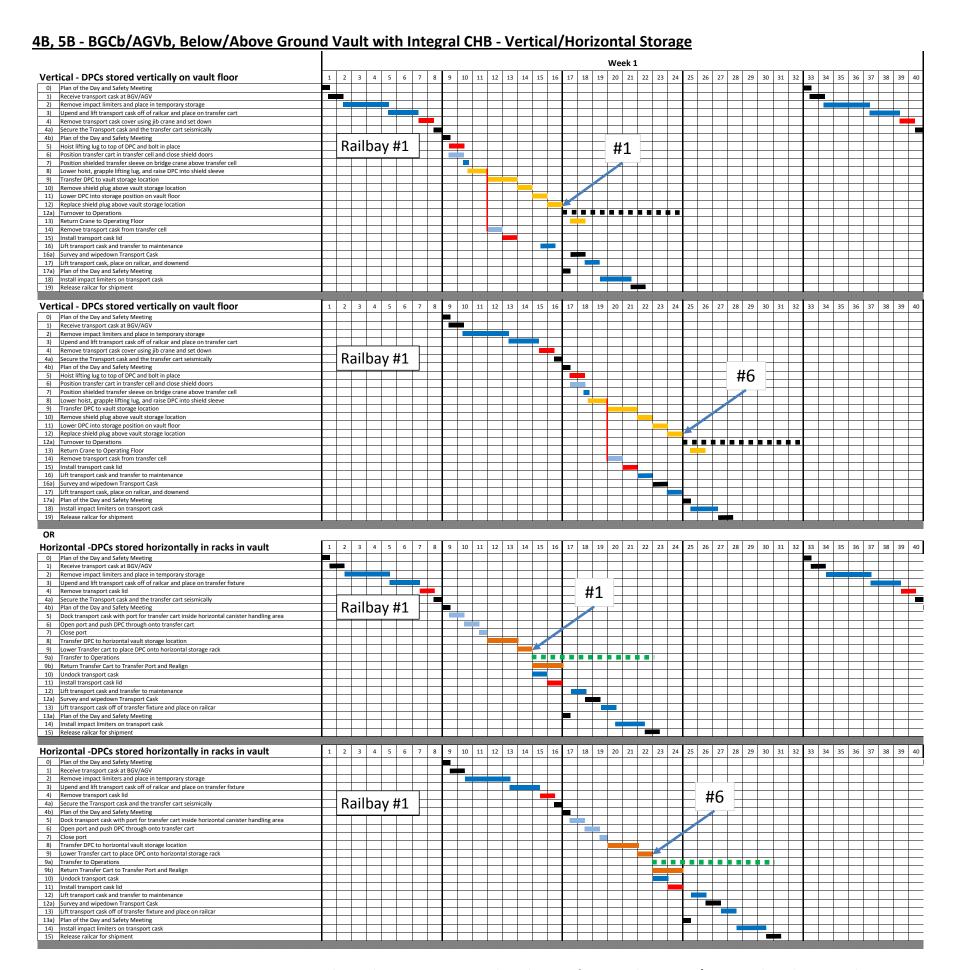
Throughput: 20 DPCs placed every four weeks, or an average of 5 DPCs per week.





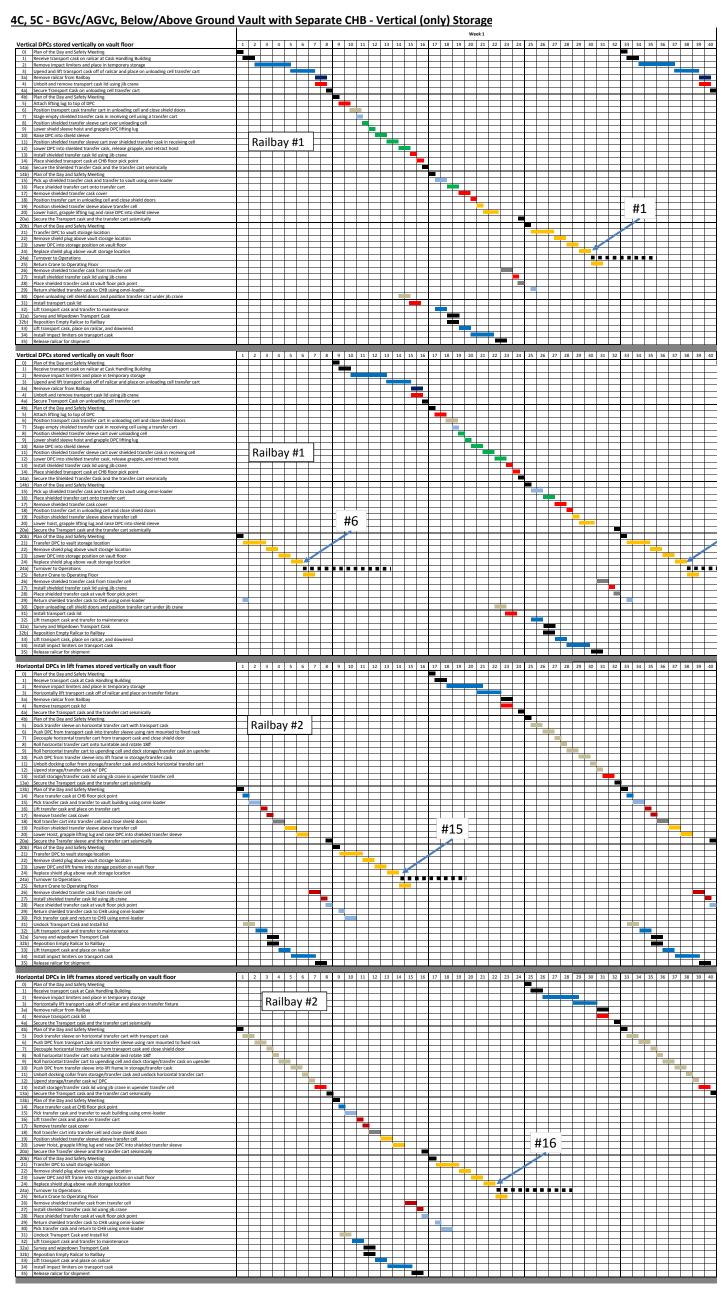
Throughput: 10 DPCs placed every four weeks, or an average of 2.5 DPCs per week.

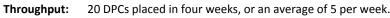




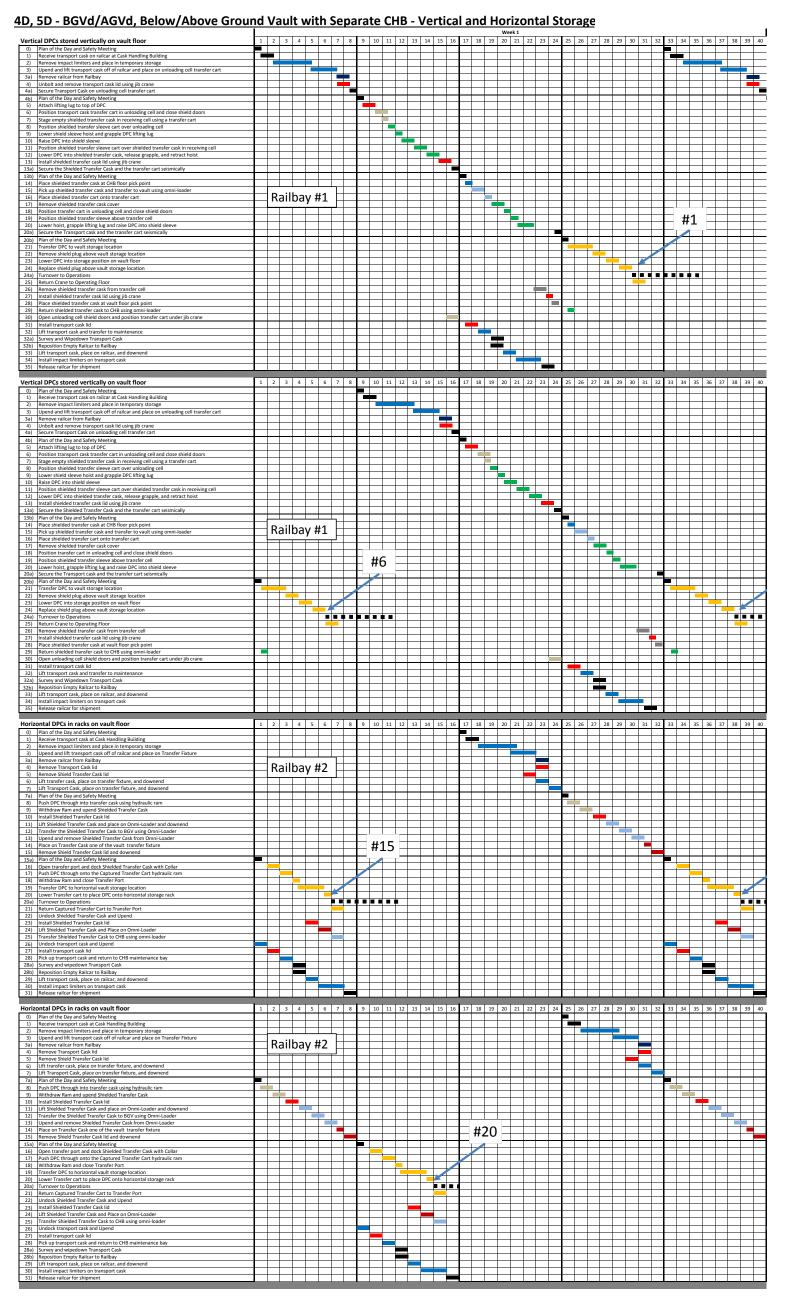
Throughput: 10 DPCs placed every four weeks, or 2 1/2 DPCs placed per week.





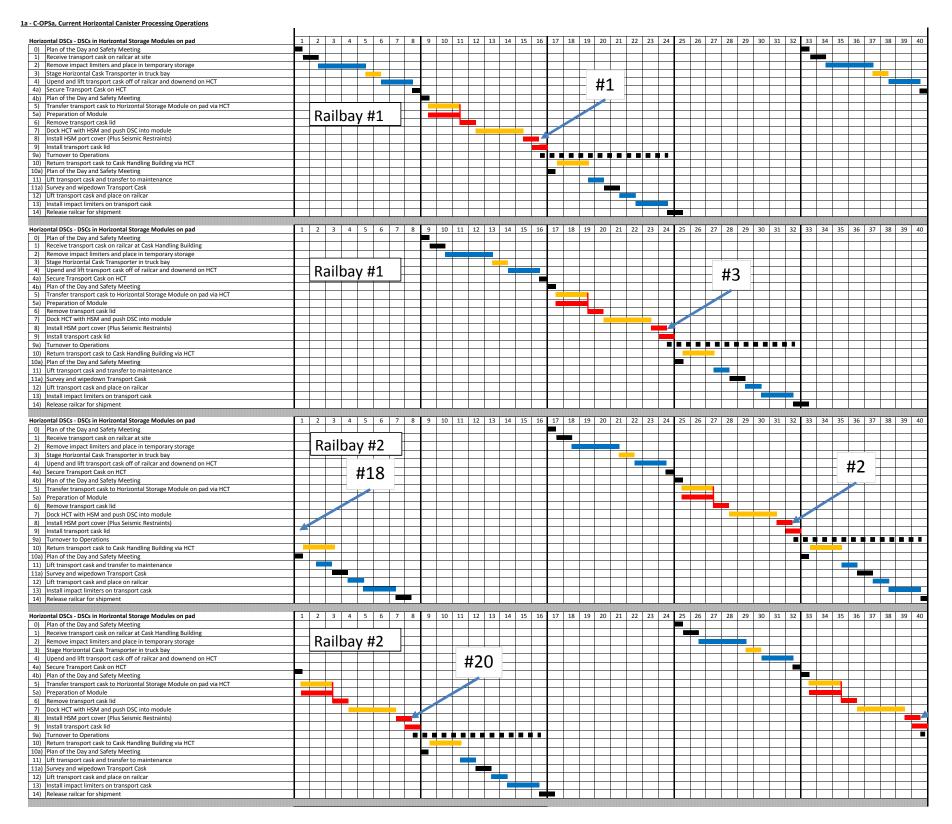






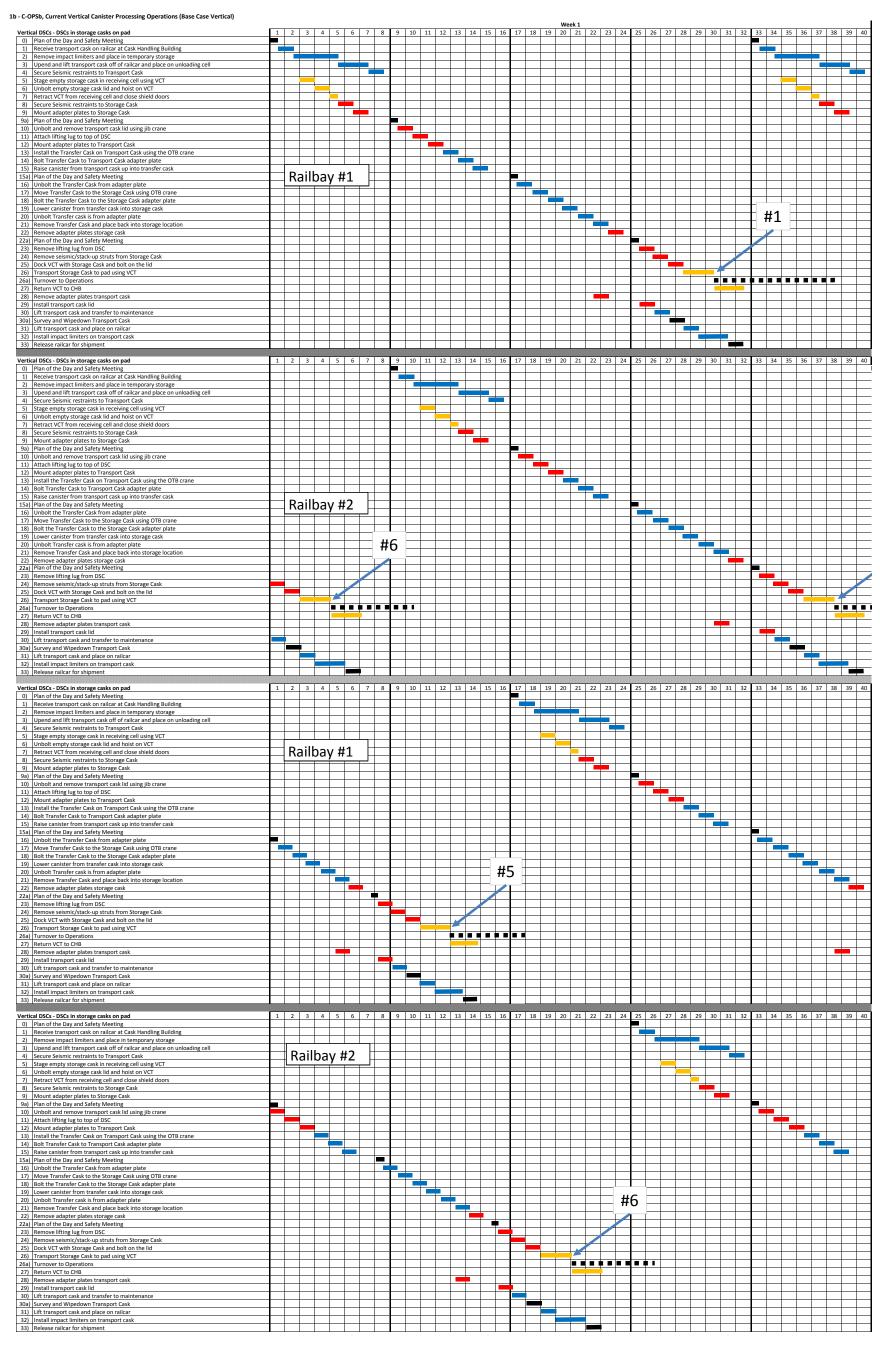
Throughput: 20 DPCs placed every four weeks, or 5 DPCs per week





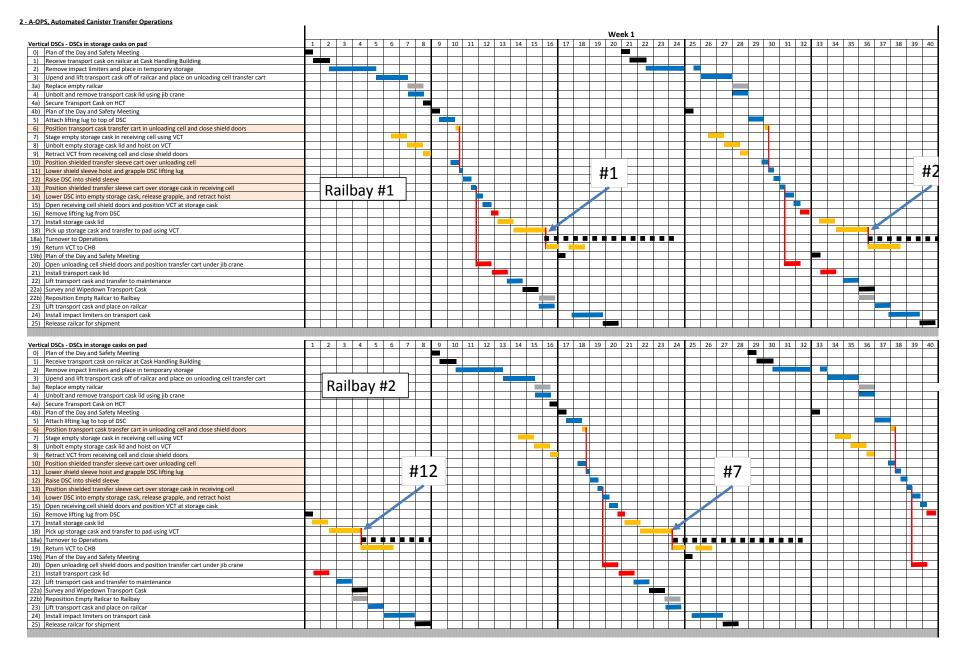
Throughput 20 every four weeks assuming 4 HCT machines, i.e., 5 per week average.

No Heavy Equipment
200 Ton Stick Crane
10 Ton Stick Crane
Horizontal Cask Transporter



Throughput 20 every four weeks assuming 2 OTB cranes and 4 VCTs. (5 DPCs per week)

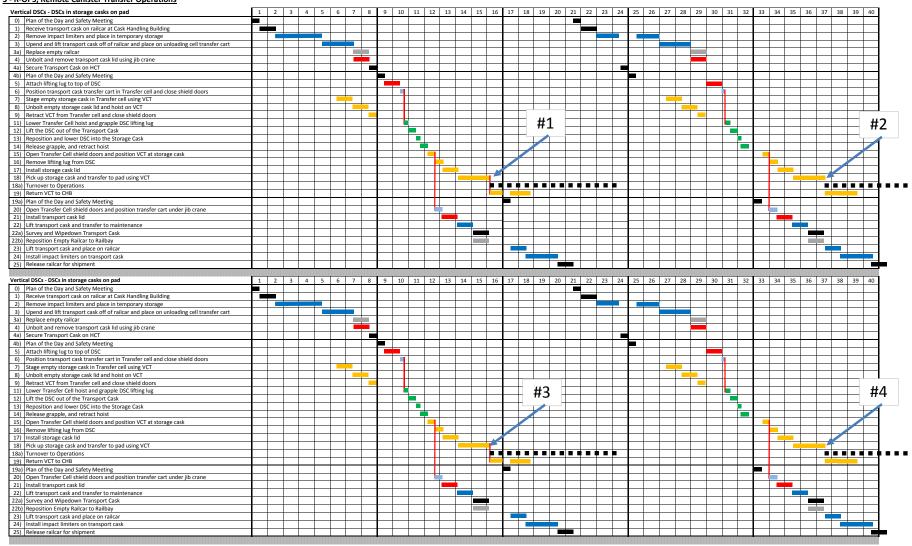




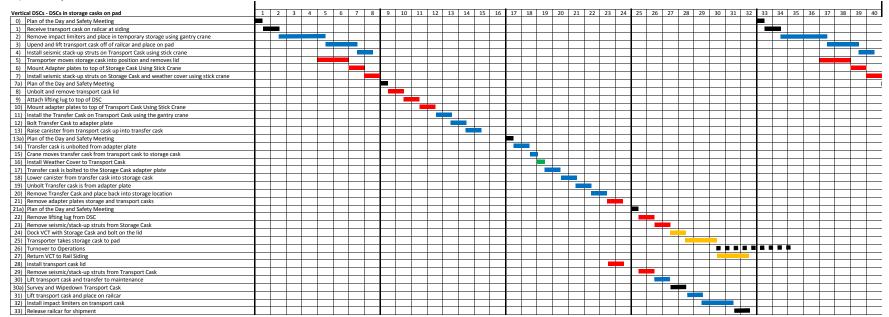
Throughput Four every week assuming only 2 VCT machines.



3 - R-OPS, Remote Canister Transfer Operations



S-OPS, Commercial Operations without CHB

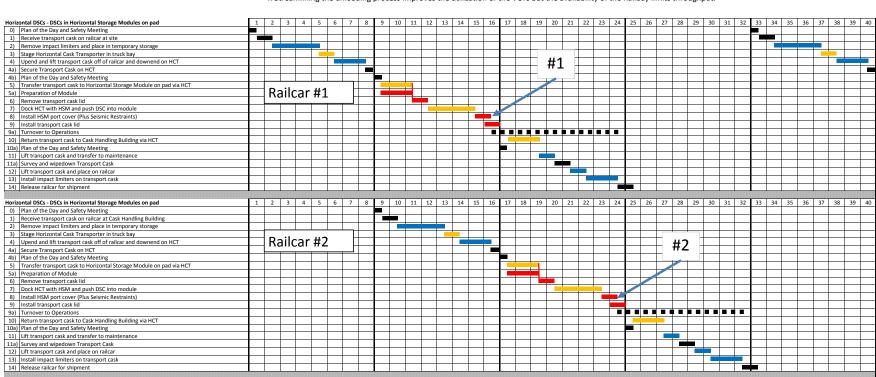


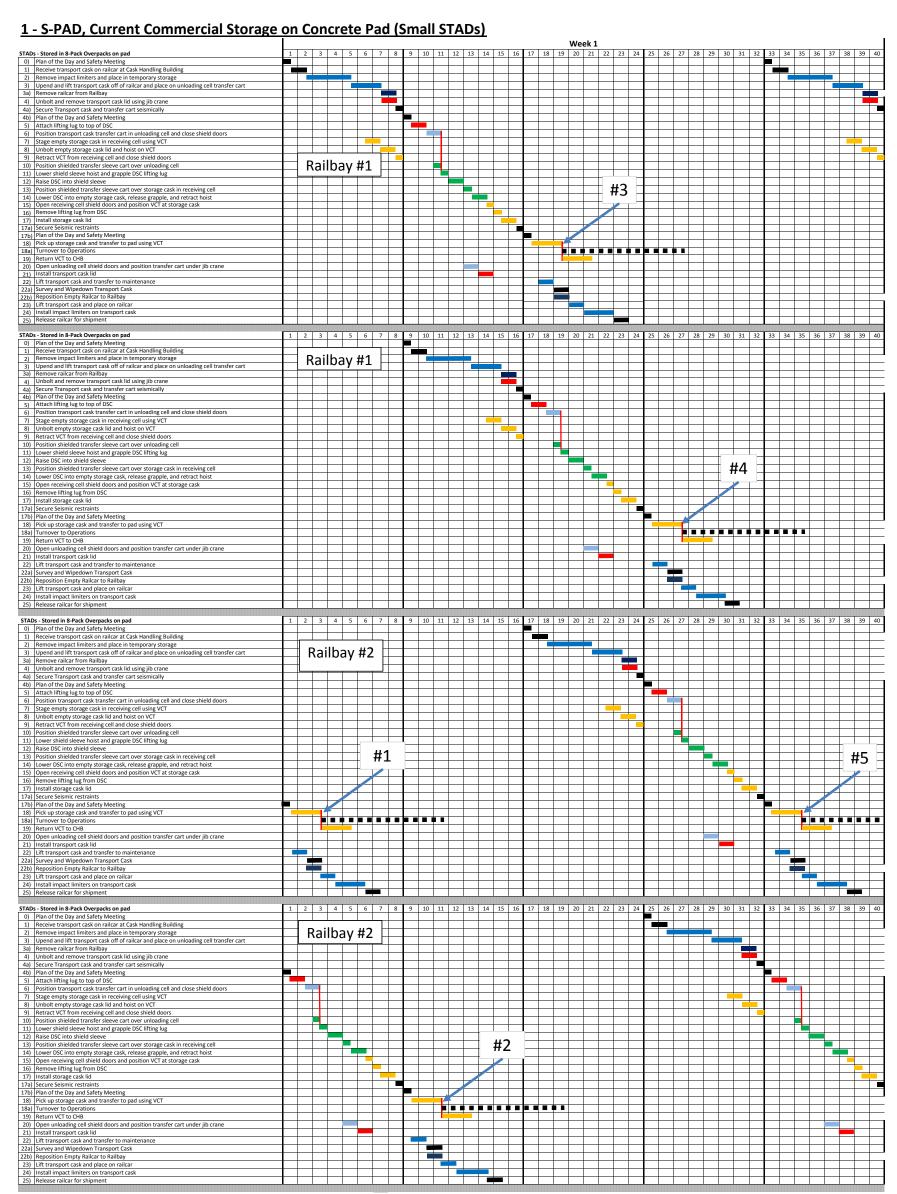
Throughput Five every four weeks assuming one Gantry Crane and VCT.



Notes

- 1. The rail bays need to accommodate two railcars with transportation casks on them
- 2. The facility needs two VCTs operational at all times.
- 3. The railbays are serviced by two OTB Cranes on the same rails.
- 4. Streamlining the unloading process improves the utilization of the VCTs but the availability of the Railbay limits throughput.





Throughput: 20 DSCs placed every four weeks, or an avaerage of 5 DSCs per week.

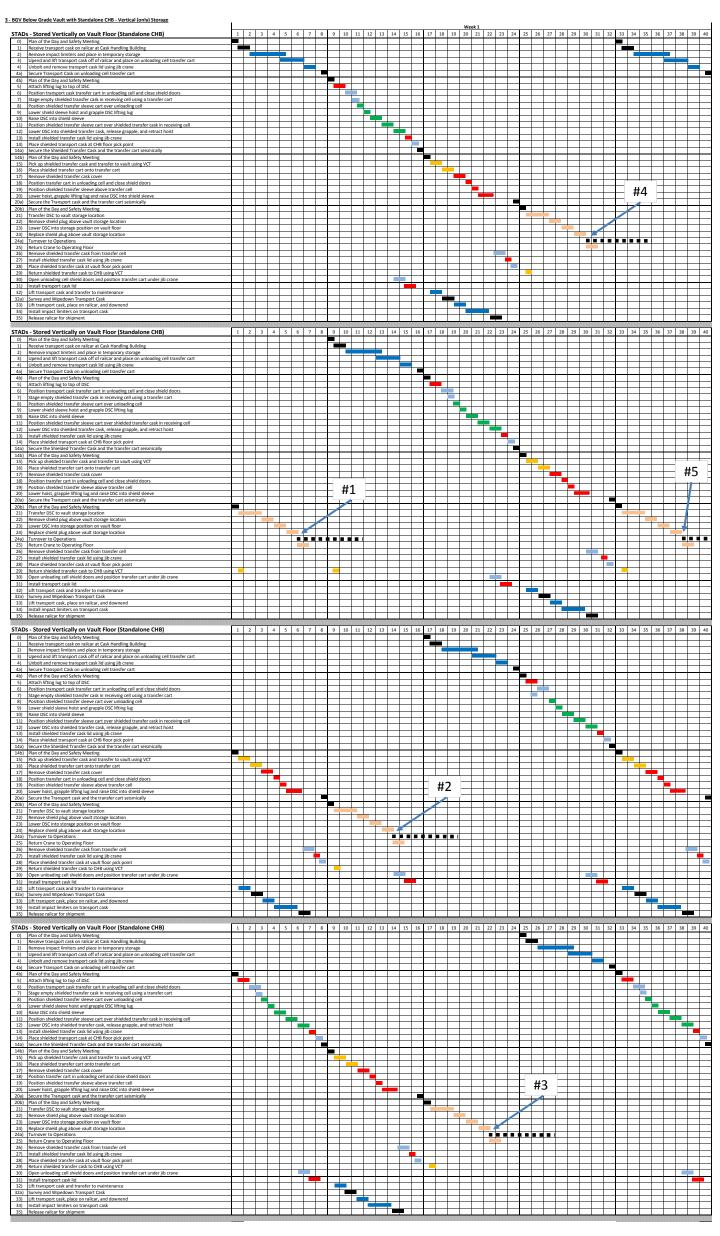
For small STADs, the transporter moves the overpack to the pad after every eighth STAD



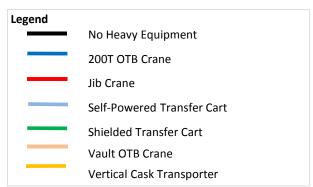
3 - S-UGS, Underground Storage Week 1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 STADs Stored Vertically in individual vault 0) Plan of the Day and Safety Meeting 1) Receive transport cask on railcar at Cask Handling Building 2) Remove impact limiters and place in temporary storage 3) Upend and lift transport cask off of railcar and place on unloading cell transfer card 3) | Opend and includisport cask on or ideal. Size | 3a) | Remove railcar from Railbay | 41 | Unbolt and remove transport cask lid using jib crane Unbot and remove transport cask lid using jib crane Secure the transport cask and transfer cart seismiscally Plan of the Day and Safety Meeting Attach lifting lug to top of STAD Position transport cask transfer cart into unloading cell and close shield doors Stage transfer cask in receiving cell using VCT Cose receiving cell shield doors Position shielded transfer sleeve cart over unloading cell Lower shield severe holts and grapped TAD lifting lug Raise STAD into shield sleeve Position shielded transfer sleeve cart over transfer cask in receiving cell Railbay #1 | Last | reviewed series | Last | Las sition shielded transfer sleeve cart over transfer cask in receiving cell wer STAD into transfer cask, release grapple, and retract hoist #3 25) Return VCT to CHB 26) Open unloading cell shield doors and position tra 27) Install transport cask lid 28) Lift transport cask and transfer to maintenance 28a) Survey and wipedown Transport Cask STADs Stored Vertically in individual vault Plan of the Day and Safety Meeting Receive transport cask on railcar at Cask Handling Building Remove impact limiters and place in temporary storage Upend and lift transport cask off of railcar and place on unlo Remove railcar from Railbay #4 3. Outer shall not validate that our or instant and pace of unaboung cell units and pace of the control of the Railbay #1 28) Lift ransport case and transer to maintenance 28a) Survey and wipedown Transport Cask 28b) Reposition Empty Ralicar to Railbay 29b) Reposition Carpty Railcar to Railbay 20 Lift transport cask and place or nailcar 30 Install impact limiters on transport cask 31) Release railcar for shipment 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 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 25 36 37 38 39 40 STADs Stored Vertically in individual vault Plan of the Day and Safety Meeting Receive transport cask on railcar at Cask Handling Building emove impact limiters and place in temporary storage lpend and lift transport cask off of railcar and place on unloading cell transfer cart #5 Railbay #2 #1 Withdraw STAD rigging and replace transfer cask base Re-rig transfer cask to VCT and undock from underground storage cel Install underground storage cell cover Open unloading cell shield doors and position transfer cart under jib crane Install transport cask lid 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 STADs Stored Vertically in individual vault | Plan of the Day and Safety Meeting | Receive transport cask on railcar at Cask Handling Building | Receive transport cask on railcar at Cask Handling Building | Remove impact limiters and place in temporary storage | Upend and lift transport cask of of railcar and place on unloading cell transfer cart | Unbots and remove transport cask lid using jib crane | Unbots and remove transport cask lid using jib crane | Unbots and remove transport cask and transfer cart setimiscally | Unbots and remove transport cask and transfer cart setimiscally | Unbots and transport cask transfer cart into unloading cell and close shield doors | Position transport cask transfer cart into unloading cell and close shield doors | Stage transfer cask in receiving cell using VCT | Close receiving cell shield doors | Position shielded transfer seleve cart over unloading cell | Lower shield sleeve host and grapple STAD lifting lug | Raise STAD into shielded transfer seleve cart over transfer cask in receiving cell | Position shielded transfer seleve cart over transfer cask in receiving cell | Remove lifting lug from STAD | | Plan of the Day and Safety Meeting | Railbay #2 #2 Plan of the Day and Safety Meeting Pick up transfer cask and transfer to underground storage cell using VCT rick by trainser cask and ut aimser to unloan ground storage cell install docking collar at funderground storage cell and remove rigging flag STAD to VTO revertical lift and hoist Remove transfer cask base using docking collar Lower STAD into underground storage cell and remove rigging lower stander cask base using docking collar Lower STAD into underground storage cell Access top of STAD (by ladder inside transfer cask) and remove rigging Withdraw STAD rigging and replace transfer cask base Re-rig transfer cask to VCT and undock from underground storage cell install underground storage cell stall underground storage cell install underground storage cell

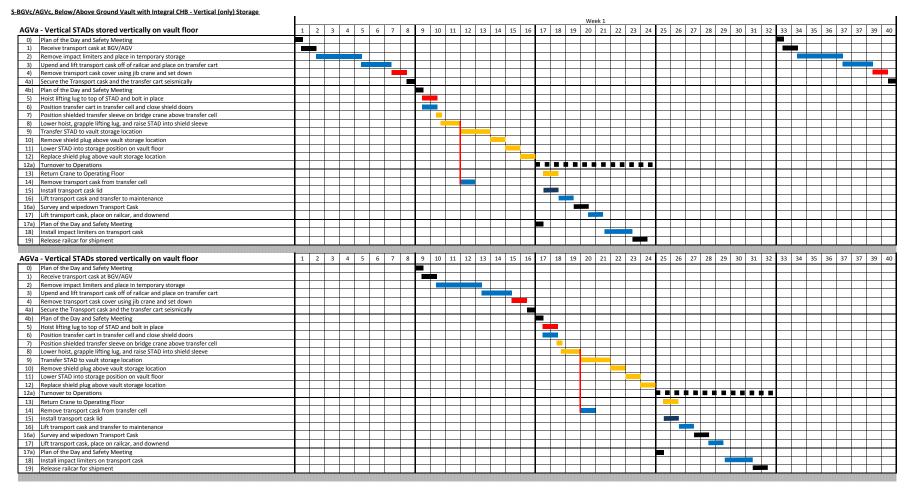
Throughput: 20 STADs placed every four weeks, or an average of 5 per week.





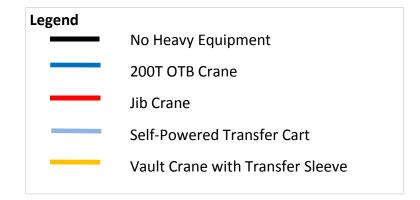
Throughput: 20 STADs placed every four weeks, or an average of 5 per week.





Throughput:

10 STADs placed every four weeks, or an average of 2.5 per week. (Note: If one rail becomes inoperative, the throughput drops to 2 per week with the acceleration of the repackaging effort)



NOTES AND ASSUMPTIONS:

- The data in these spreadsheets are approximate intended to support occupational exposure estimates only. They are neither definitive nor precise enough to support detailed operational decision.
- 2. The occupational exposure calculations only consider the scope of activities required to place SNF shipments into storage. Ongoing site monitoring activities are not included.
- 3. These crew sizes and durations are based on commercial nuclear plant ISFSI operations. Durations are based on real world experience, thus include real world worker efficiencies. Work scope is consistent with C-OPS and has been extrapolated to address the other alternates.
- 4. Duration fractions incorporate both the number of workers of each category performing the activity and the percentage of time that each worker is occupying the radiation zone.
- 5. Mechanics are responsible for bolting and unbolting connections to the various SNF containers, other than rigging.
- 6. Riggers are responsible for attaching and removing rigging to and from the various SNF containers. They are also responsible for observing and guiding heavy lift operations.
- 7. Health physicists are responsible for measuring the radiation fields and contamination associated with the SNF containers. They are also responsible for decontamination activities and for certifying equipment that enters the radiation zone for release.
- 8. Operators have overall responsibility for the entire facility. Their activities with respect to SNF processing include opening and closing facility doors, operating the machinery used in SNF container processing, and overseeing the acceptance of the SNF container into the facility.
- 9. Security personnel are responsible for keeping the facility secure while the CHB railbay doors are open and for verifying that no contraband is introduced to the facility inside of SNF containers.
- 10. Quality Assurance/Control personnel are responsible to assure that the chain of custody paperwork is properly filled out and for observing hold points in the process to assure proper fitment and placement of SNF containers.
- 11. Mechanics, riggers, and health physicists (i.e. radiation protection technicians, or radiation control technicians) are assumed to work in pairs. They typically are only near the waste package when needed. If remote monitoring is utilized, the number of health physicists can be reduced in the work area.
- 12. Duration fractions are only assigned to workers who are in the radiation zone adjacent to the SNF container. Other people may be in the vicinity, but they will remain outside of the radiation zone in accordance with ALARA principles.
- 13. Although all personnel in the vicinity are accumulating dose, the dose rate for the general area is low and accumulated doses to personnel in the vicinity are insignificant when determined on an individual DPC basis.

1 - (C-PA	D, C	Current Commercial storage on Concrete pad (Base Case)	1	T _	T _								
Ver	tical	DPC	s - DPCs in storage casks on pad	Duration (Minutes)	Dose	M R	tion Fraction	า Q	М	R	Task H	Dose O	S	Q
0)	Plar	n of	the Day and Safety Meeting	30		IVI IX		ζ	141	IX	• •	U	,	Q
	a	_	Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b	_	Safety briefing	10	-				0	0	0	0	0	0
1\	Rec	_	Transportation to work site transport cask on railcar at Cask Handling Building	5 145	-				0	0	0	0	0	0
-/	a		Identify SNF shipment brought from yard	5	-				0	0	0	0	0	0
	b	_	Security team sent to railbay door	15	-				0	0	0	0	0	0
	С	,	Send operators to railbay door	15	-				0	0	0	0	0	0
	d	-	Stage work team to railbay	15	-				0	0	0	0	0	0
	e f	_	Open railbay door Position SNF shipment in the railbay	5 15	-				0	0	0	0	0	0
	g	_	Security inspection of the SNF shipment and tug	15	3 V T		0.5		0	0	0	0	5.5	0
	h	_	HP survey of SNF shipment	15	3 V T		0.5		0	0	5.5	0	0	0
	i)	_	Inspection of tamper proof Seals	10	3 V T		0.1		0	0	0	0	0.7	0
	j)	_	Acceptance of SNF shipment	5	-				0	0	0	0	0	0
	k l'	_	Decoupling of railcar and removal of the tug from the railbay Secure the railbay doors	10 5	-				0	0	0	0	0	0
	m	_	Security team leaves	5	-				0	0	0	0	0	0
	n	_	Operator leaves	5	-				0	0	0	0	0	0
	0)	Completes paperwork for step #1	5	-				0	0	0	0	0	0
2)	Ren		impact limiters and place in temporary storage	195									<u> </u>	
	a	_	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-				0	0	0	0	0	0
	b c	_	Select and inspect rigging for impact limiters on the transport cask Rig the lifting devices to the first impact limiter	5 5	- 1A V T	2	2		0	0 2.5	0 2.5	0	0	0
	d	_	Position man lifts and temporary scaffolding near transport cask	5	1A V T	2	-		0	2.5	0	0	0	0
	e	_	Remove and store bolts holding on the first impact limiter	30	1A V T	2			15	0	0	0	0	0
	f	,	Remove first impact limiter and place on storage stand	10	1A V T	1			0	2.5	0	0	0	0
	g	_	Remove rigging and reposition on second impact limiter	5	1A V T	1			0	1.3	0	0	0	0
	h	_	Reposition manlift and scaffolding	5	1A V T	2			0	0	0	0	0	0
	i) j)	_	Remove and store bolts holding on the second impact limiter Remove second impact limiter and place on storage stand	30 10	1A V T 1A V T	2 1		-	15 0	0 2.5	0	0	0	0
	k	_	Remove and store bolts for personnel barrier	30	3 V T	0.2			4.4	0	0	0	0	0
	I)	_	Rig the personnel barrier	15	3 V T	1	1		0	11	11	0	0	0
	m		Lift personnel barrier and move to storage location	10	3 V T				0	0	0	0	0	0
	n	_	Remove tie-down straps from transport cask	10	3A V T	0.4			2.3	0	0	0	0	0
	o p	_	Rig tie-down straps and move to storage location Inspect transport cask for damage and conduct HP survey	5 15	3A V T 3 V T	1	2		0	2.8	0 22	0	0	0
3)		•	and lift transport cask off of railcar and place on unloading cell transfer cart	120	3 V I		2		U	0	2.2	0		
	a		Select the appropriate lifting block for the transport cask	5	-				0	0	0	0	0	0
	b	_	Secure lifting block to transport cask Trunnions	10	2A V T	2			0	6.7	0	0	0	0
	C	_	Upend transport cask	30	-				0	0	0	0	0	0
	d e		Lift transport cask off railcar	30 30	-				0	0	0	0	0	0
	f	_	Reposition transport cask Place transport cask on unloading cell transfer cart	15	-				0	0	0	0	0	0
3a)		_	e railcar from railbay	60										Ť
	а)	Open railbay door	5	-				0	0	0	0	0	0
	b		Railyard tug connects to railcar	10	-				0	0	0	0	0	0
	C		Railyard tug removes railcar from railbay	10 15	-				0	0	0	0	0	0
	d e	_	Railyard tug connects to next railcar Railyard tug repositions next railcar in railbay	10	-				0	0	0	0	0	0
	f	_	Railyard tug leaves railbay and railbay door is closed	10	-				0	0	0	0	0	0
4)	Unb	_	and remove transport cask lid using jib crane	85										
	a	_	Move tools to work platform	5	-				0	0	0	0	0	0
	b	_	HP survey of lid Including gas sampling	15	2A V T		1		0	0	5	0	0	0
	c d	,	Remove and store nuts Rig the lid for lifting using the local jib crane	30 15	2A V T 2A V T	1 1.5			10	7.5	0	0	0	0
	e	_	Lift the transport cask lid and move it to the storage stand	10	-	1.5			0	0	0	0	0	0
	f	_	Security inspection of the interior of the transport cask	10	2 V T		0.2		0	0	0	0	5	0
4a)	Seci		transport cask and transfer cart seismically	40										
	a	_	Reposition transfer cart near seismic restraint system	15	-				0	0	0	0	0	0
	b c	_	Secure transport cask and transfer cart QC Hold Point Inspection	15 10	-				0	0	0	0	0	0
4b)			the Day and Safety Meeting	30	_				U	J	U	J	<u> </u>	۳
	а		Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b	_	Safety briefing	10	-				0	0	0	0	0	0
-,	C	_	Transportation to work site	5	-				0	0	0	0	0	0
5)	Atta		ifting lug to top of DPC Rig lifting lug on storage rack	70 15	_				0	0	0	0	0	0
	a b		Use Jib crane to lift lifting lug into position	15	2A V T	0.5			0	2.5	0	0	0	0
	С	_	Bolt Lifting lug to canister	20		0.5			25	0	0	0	0	0
	d)	QC Hold Point Inspection	10	2 V T			0.1	0	0	0	0	0	2.5
	e	_	Clear workspace and remove all tools	10	-				0	0	0	0	0	0
6)		_	transport cask transfer cart in unloading cell and close shield doors	60					0	0	0	0	0	^
	a b	_	Move transport cask cart into the unloading cell Close the shield doors	50 10	-				0	0	0	0	0	0
7)		,	mpty storage cask on receiving cell transfer cart	90						Ť		Ť		Ť
	a		Prepare an empty storage cask for use	15	-				0	0	0	0	0	0
	b	_	Place the empty storage cask on the transfer cart using VCT	15	-				0	0	0	0	0	0
	C	_	Stage tools on top of the storage cask	10	-				0	0	0	0	0	0
	d	_	Unbolt storage cask lid Rig the cask lid to the VCT hoist	30 10	-				0	0	0	0	0	0
	e f	_	Hoist lid and retain on VCT	10	-				0	0	0	0	0	0
8)	_	,	empty storage cask in receiving cell using motorized cart	45						Ť		Ť	<u> </u>	Ť
	а)	Open receiving cellshield doors	15	-				0	0	0	0	0	0
	b	_	Transfer empty storage cask into receiving cell using motorized cart	15	-				0	0	0	0	0	0
	С	_	Close the shield doors	10	-				0	0	0	0	0	0
	d)	QC Hold Point Inspection	5	-				0	0	0	0	0	0

10)	Docitio	n shielded transfer sleeve cart over unloading cell	35									
10)	a)	Inspect transfer sleeve cart	10				0	0	0	0	0	0
	b)	Move shielded transfer sleeve cart over unloading cell	15	_			0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	_			0	0	0	0	0	0
11)		shield sleeve hoist and grapple DPC lifting lug	50				U	U	U	-	-	
,	a)	HP survey	0	-			0	0	0	0	0	0
	b)	Lower shield sleeve hoist and grapple DPC lifting lug	50	_			0	0	0	0	0	0
12)	- '	PC into shield sleeve	60							Ť		Ť
,	a)	Raise DPC into shield sleeve	60	-			0	0	0	0	0	0
	-,	HP survey	0	_			0	0	0	0	0	0
13)		n shielded transfer sleeve cart over storage cask in receiving cell	70					-				Ť
	a)	Position shielded transfer sleeve cart over storage cask in receiving cell	60	-			0	0	0	0	0	0
	b)	HP survey	0	-			0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-			0	0	0	0	0	0
14)		DPC into empty storage cask, release grapple, and retract hoist	60									
		Lower DPC into empty storage cask, release grapple, and retract hoist	60	-			0	0	0	0	0	0
		HP survey	0	-			0	0	0	0	0	0
15)	Remov	e lifting lug from DPC	35									
		HP survey	10	2 V T	0.2		0	0	5	0	0	0
	b)	Stage tools on top of the storage cask	5	-			0	0	0	0	0	0
	c)	Remove bolts and rig lifting lug	10	2 V T	0.3 0.2		7.5	5	0	0	0	0
	d)	Remove the lifting lug from the DPC using the jib crane	10	<u>-</u>			0	0	0	0	0	0
16)	Open r	eceiving cell shield doors and transfer storage cask out of receiving cell	35									
	a)	HP survey	10	-			0	0	0	0	0	0
	b)	Open receiving cell shield doors	10	-			0	0	0	0	0	0
	c)	Transfer storage cask out of receiving cell using motorized cart	15	-			0	0	0	0	0	0
17)		storage cask lid	60									
	a)	Position VCT with storage cask lid at storage cask	15	-			0	0	0	0	0	0
	b)	Lower storage cask lid into position	10	-								
	c)	Install bolts and torque	20	2A V T	1.5		10	0	0	0	0	0
	d)	QC Hold Point Inspection	10	2A V T		0.1	0	0	0	0	0	0.3
		Clean out tools and leave the top of the DPC	5	-			0	0	0	0	0	0
17a)	Secure	seismic restraints	40									L
	a)	Position seismic restraints	15	-			0	0	0	0	0	0
	b)	Secure seismic restraints	15	-			0	0	0	0	0	0
		QC Hold Point Inspection	10	-			0	0	0	0	0	0
17b)		the Day and Safety Meeting	30									_
	a)	Plan of the Day Meeting	15	-			0	0	0	0	0	0
	b)	Safety briefing	10	-			0	0	0	0	0	0
40)	c)	Transportation to work site	5	-			0	0	0	0	0	0
18)		storage cask and transfer to pad using VCT	120	241/7	2		_	6.7	_	_	0	
	a)	Rig VCT to lift storage cask	10	2A V T	2		0	6.7	0	0	0	0
	b)	Drive to storage pad location	60	-			0	0	0	0	0	0
	c)	Position the DPC on the pad	20	- 24 \/ T	2		0	0 6.7	0	0	0	0
	d)	De-rig storage cask from VCT Bolt DPC to the pad	10 20	2A V T 4 V S	1		37	0.7	0	0	0	0
	e)	Total Hours of Canister Handling Operations	26.2	4 V 3	1		37	U	U	U	U	-
192)	Turnov	er to Operations	1440									
		VCT to CHB	60	-			0	0	0	0	0	0
•		nloading cell shield doors and position transfer cart under jib crane	120	_			0	0	0	0	0	0
_	_	transport cask lid	60	_		H	0	0	0	0	0	0
		nsport cask in insport cask and transfer to maintenance	60	_		H	0	0	0	0	0	0
		tion the railcar to the railbay	60	_			0	0	0	0	0	0
		and wipedown transport cask	60	-		H	0	0	0	0	0	0
		nsport cask and place on railcar	60			H	0	0	0	0	0	0
		mpact limiters on transport cask	120	_			0	0	0	0	0	0
		e railcar for shipment	60	_			0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	61.2			1	126	60	51	0	11	2.8
		1 Star Hours of Air Cask Harraning Operations	U1.E	1	l		120	50	91	J		2.0

					,										
Hor	izontal [OPCs - DPCs in Horizontal Storage Modules on pad	Duration	Dose	[tion Fra					Task	Dose		
		<u> </u>	(Minutes)		М	R	H O	S	Q	M	R	Н	0	S	Q
0)	Plan of	the Day and Safety Meeting	30												
	a)	Plan of the Day Meeting	15	-						0	0	0	0	0	0
	b)	Safety briefing	10	-						0	0	0	0	0	0
	c)	Transportation to work site	5	-						0	0	0	0	0	0
1)	Receive	e transport cask on railcar at Cask Handling Building	145												<u>I</u>
	a)	Identify SNF shipment brought from yard	5	-						0	0	0	0	0	0
	b)	Security team sent to railbay door	15	-						0	0	0	0	0	0
	c)	Send operators to railbay door	15	-						0	0	0	0	0	0
	d)	Stage work team to railbay	15	-						0	0	0	0	0	0
	e)	Open railbay door	5	-						0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug	15	3 V T				0.5		0	0	0	0	3.7	0
	h)	HP survey of SNF shipment	15	3 V T			0.5			0	0	1.8	0	0	0
	i)	Inspection of tamper proof seals	10	3 V T				0.1		0	0	0	0	0.7	0
	j)	Acceptance of SNF shipment	5	-						0	0	0	0	0	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10	-						0	0	0	0	0	0
	l)	Secure the railbay doors	5	-						0	0	0	0	0	0
	m)	Security team leaves	5	-						0	0	0	0	0	0
	n)	Operator leaves	5	-						0	0	0	0	0	0
	0)	Completes paperwork for step #1	5	-						0	0	0	0	0	0
2)	Remov	e impact limiters and place in temporary storage	195												
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5	-						0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2			0	2.5	2.5	0	0	0
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2				0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2					15	0	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1				0	1.3	0	0	0	0
	h)	Reposition manlift and scaffolding	5	1A V T						0	0	0	0	0	0

	1)	Remove and store bolts holding on the second impact limiter	30	1A V T	2			15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T		1		0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30		0.2			4.4	0	0	0	0	0
\longrightarrow	I)	Rig the personnel barrier	15	3 V T		1 1		0	11	11	0	0	0
\longrightarrow	<u>m)</u>	Lift personnel barrier and move to storage location	10	3 V T				0	0	0	0	0	0
_	<u>n)</u>	Remove tie-down straps from SNF shipment	10		0.4			2.3	0	0	0	0	0
\longrightarrow	0)	Rig Tie-Down straps and move to storage location	5	3A V T		1 2		0	2.8	0	0	0	0
2) (p) Stage	Inspect transport cask for damage and conduct HP survey Horizontal Cask Transporter (HCT) in truck bay	15 60	3 V T		2		0	0	22	0	0	0
3) 3	а)	Open truck bay door	15	_				0	0	0	0	0	0
\dashv	a)_	Position HCT in truck bay	30					0	0	0	0	0	0
\dashv	c)	Close truck bay door	15					0	0	0	0	0	0
4)		d and lift transport cask off of railcar and downend on HCT	75					Ü	U	0	_	0	Н
	a)	Select the appropriate lifting block for the transport cask	5	-				0	0	0	0	0	0
\neg	b)	Secure lifting block to transport cask trunnions	5	2A V T		2		0	3.3	0	0	0	0
\neg	c)	Upend transport cask	30	-				0	0	0	0	0	0
\neg	d)	Lift transport cask off railcar	15	-				0	0	0	0	0	0
	e)	Move transport cask to HCT	10	-				0	0	0	0	0	0
	f)	Downend transport cask on HCT	10	-				0	0	0	0	0	0
4a) [Remo	ove railcar from railbay	60										
	a)	Open railbay door	5	-				0	0	0	0	0	0
	b)	Railyard tug connects to railcar	10	-				0	0	0	0	0	0
	c)	Railyard tug removes railcar from railbay	10	-				0	0	0	0	0	0
	d)	Railyard tug connects to next railcar	15	-				0	0	0	0	0	0
	e)	Railyard tug repositions next railcar in railbay	10	-				0	0	0	0	0	0
	f)	Railyard tug leaves railbay and railbay door is closed	10	-				0	0	0	0	0	0
4b) 5	Secur	re transport cask on HCT	40										
[a)	Position HCT near seismic restraint tie-downs	15	-				0	0	0	0	0	0
	b)	Install seismic restraint tie-downs	15	-				0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
4c) [of the Day and Safety Meeting	30										_
\dashv	a)	Plan of the Day Meeting	15	-				0	0	0	0	0	0
_	p)	Safety briefing	10	-				0	0	0	0	0	0
	c)	Transportation to work site	5	-				0	0	0	0	0	0
5) 1		Ger transport cask to HSM on pad via HCT QC Hold Point Inspection	120					_	_	^	_	•	-
			15	-				0	0	0	0	0	0
	b)	Open the truck bay door Transfer the transport cask to HSM on the pad via HCT	15 90	-				0	0	0	0	0	0
E 2 \ 1	c) Brons	aration of Horizontal Storage Module (HSM)	120	-				0	U	U	U	U	-
Sa) I	<u>гтера</u> а)	Stage equipment near HSM	15	-				0	0	0	0	0	0
	b)	Place and align Theodolite heads	30					0	0	0	0	0	0
-	c)	Rig crane to HSM port cover	15	2C H T L		2		0	0.8	0	0	0	0
-	<u>d)</u>	Use manlift to remove nuts on mounting studs	15	1AHTL	2	2		9.2	0.8	0	0	0	0
	e)	Post radiation zone signs and barriers	10	-	_			0	0	0	0	0	0
	f)	Remove HSM port cover and place in storage location	20	1A H T L		1		0	6.1	0	0	0	0
-+		Herriera Herri bart savar and piece in starage research									_	_	
	g)	HP survey to verify dose rates								_	0	0	0
6) I	g) Remo	HP survey to verify dose rates ove transport cask lid	15 90	1AHTL		1.5		0	0	6.9	0	0	_
6) I		HP survey to verify dose rates ove transport cask lid Move tools to work platform	15							_	0	0	_
6) I	Remo	ove transport cask lid	15 90					0	0	6.9			0
6) I	Remo a)	Move tools to work platform	15 90 15	1A H T L -		1.5		0	0	6.9	0	0	0
6) I	Remo a) b)	Move tools to work platform HP survey of lid including gas sampling	15 90 15 10	1A H T L -		1.5		0 0 0	0 0 0	6.9	0	0	0
6) 1	a) b) c)	Move transport cask lid Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts	15 90 15 10 15	1A H T L - 1A H T L -	2	2		0 0 0	0 0 0 0	6.9 0 6.1	0 0	0 0	
6)	a) b) c) d)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand	15 90 15 10 15 15 20 10	1A H T L - 1A H T L - 1A H T L 1A H T L - 1A H T L	2	2		0 0 0 0	0 0 0 0 9.2 0	6.9 0 6.1 0	0 0 0 0	0 0 0 0 0	
	a) b) c) d) e) f)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	15 90 15 10 15 15 20 10 5	1AHTL - 1AHTL - 1AHTL	2	2	5	0 0 0 0 0 0	0 0 0 0 9.2 0	6.9 0 6.1 0 0	0 0 0 0 0	0 0 0 0 0	
	a) b) c) d) e) f)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module	15 90 15 10 15 15 20 10 5 145	1A H T L - 1A H T L - 1A H T L 1A H T L - 1A H T L	2	2		0 0 0 0 0 12 0	0 0 0 0 9.2 0 0	6.9 0 6.1 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	
	(a) (b) (c) (d) (e) (f) (g) (Dock (a) (a)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters	15 90 15 10 15 15 20 10 5 145 10	1A H T L - 1A H T L - 1A H T L 1A H T L - 1A H T L	2	2	5	0 0 0 0 0 12 0 0	0 0 0 0 9.2 0 0	6.9 0 6.1 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	
	a) b) c) d) e) f) g) Dock a) b)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position	15 90 15 10 15 15 20 10 5 145 10 15	1AHTL - 1AHTL - 1AHTL 1AHTL 1AHTL - 1AHTL	2	2	5	0 0 0 0 0 12 0 0	0 0 0 9.2 0 0 0	6.9 0 6.1 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	
	a) b) c) d) e) f) pock a) b)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment	15 90 15 10 15 15 20 10 5 145 10 15 20	1AHTL - 1AHTL 1AHTL - 1AHTL - 1AHTL -	2	2	55	0 0 0 0 0 12 0 0 0	0 0 0 9.2 0 0 0	6.9 0 6.1 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	
	(a) (b) (c) (d) (e) (f) (g) (Dock (a) (b) (c) (d) (d)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM	15 90 15 10 15 15 20 10 5 145 10 15 20 30	1A H T L - 1A H T NL		2	55	0 0 0 0 0 12 0 0	0 0 0 9.2 0 0 0	6.9 0 6.1 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	
	(a) (b) (c) (d) (e) (d) (e) (d) (e) (d) (e) (e) (e)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask	15 90 15 10 15 15 20 10 5 145 10 15 20 10 5 145	1AHTL - 1AHTL 1AHTL - 1AHTL - 1AHTL -	2	2	5	0 0 0 0 0 12 0 0 0 0 0	0 0 0 9.2 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	
	a) b) c) d) e) f) pock a) b) c) d) e) f)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module	15 90 15 10 15 15 20 10 5 145 10 15 20 30 15 20	1A H T L - 1A H T NL		2	55	0 0 0 0 0 12 0 0 0 0 0 0 4.3	0 0 0 0 9.2 0 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8 0 0 0	
	a) b) c) d) e) f) g) Dock a) b) c) d) e f) g g g g	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram	15 90 15 10 15 15 20 10 5 145 10 15 20 30 15 20 30 15	1A H T L - 1A H T NL		2	55	0 0 0 0 0 12 0 0 0 0 0 0 4.3	0 0 0 9.2 0 0 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8 0 0 0 0 0	
	a) b) c) d) e) f) pock a) b) c) d) e) f)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module	15 90 15 10 15 15 20 10 5 145 10 15 20 30 15 20	1A H T L - 1A H T NL		2	0.2	0 0 0 0 0 12 0 0 0 0 0 0 4.3	0 0 0 0 9.2 0 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8 0 0 0	
7) [Remo a) b) c) d) e) f) g) Dock a) b) c) d) e) f) g)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection	15 90 15 10 15 15 20 10 5 145 10 15 20 30 15 20 30 15 20 30 15 10 10 10 10 10 10 10 10 10 10	1A H T L - 1A H T L - 1A H T L - 1A H T NL - 1A H T NL - 5 H H		2		0 0 0 0 0 12 0 0 0 0 0 0 4.3	0 0 0 9.2 0 0 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8 0 0 0 0 0	
7) [Remo a) b) c) d) e) f) g) Dock a) b) c) d) e) f) g)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module	15 90 15 10 15 15 20 10 5 145 10 15 20 30 15 20 30 15 20 30 15 10 10 10 10 10 10 10 10 10 10	1A H T L - 1A H T L - 1A H T L - 1A H T NL - 1A H T NL - 5 H H		2		0 0 0 0 0 12 0 0 0 0 0 0 4.3	0 0 0 9.2 0 0 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8 0 0 0 0 0	
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7) [Remo a) b) c) d) e) f) g) Dock a) b) c) d) e) f) g) h) i) Instal a) b) c)	Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Il seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover over the port in the module	15 90 15 10 15 15 20 10 5 145 10 15 20 30 15 20 10 5 10 5 10 10 5 10 10 10 10 10 10 10 10 10 10	1A H T L - 1A H T L - 1A H T L - 1A H T NL - 1A H T NL 1A H T NL 1A H T NL	2	2	0.2	0 0 0 0 0 12 0 0 0 0 0 0 4.3 0 0 0 0	0 0 0 9.2 0 0 0 0 0 0 0 0	6.9 0 6.1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	() () () () () () () () () () () () () (
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7) [] 8) [] 9) [] 10) [] 11) [] 12) [] 13) []	Remo a) b) c) d) e) f) g) Dock a) b) c) d) e) f) g) h) i) Instal a) b) c) d) e) f) gy h tip Instal a) b c) dd e Turno Retur Plan c Lift tr. surve Repos Lift tr. Instal	Nove transport cask lid Move tools to work platform HP survey of lid including gas sampling Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask HCT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Il seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials Il transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the	15 90 15 10 15 10 15 10 15 15 20 10 5 145 10 15 20 30 15 20 10 5 15 10 10 5 15 10 10 10 5 15 15 15 15 15 15 15 15 15 16 10 10 10 10 10 10 10 10 10 10 10 10 10	1A H T L - 1A H T NL 1A H T NL 1A H T NL - 1A H T N	2	1.5 2 2 2 3 3 3 3 3 3 3	0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 9.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

Vertic	al DP	Cs -	- DPCs in standardized overpacks on pad	Duration (Minutes)	Dose	Dur M R	ation H			Q	М	R	Task H	Dose O	S	Q
0)	Plan	of	the Day and Safety Meeting	30		IVI	П		3	ζ	IVI	N	П		3	
,	a)	_	Plan of the Day Meeting	15	-						0	0	0	0	0	0
	b)		Safety briefing	10	-						0	0	0	0	0	0
	c)	_	Transportation to work site	5	-						0	0	0	0	0	0
1)		_	transport cask on railcar at Cask Handling Building	145									<u> </u>			<u> </u>
	a)		Identify SNF shipment brought from yard	5	-						0	0	0	0	0	0
	b) c)		Security team sent to railbay door Send operators to railbay door	15 15	-						0	0	0	0	0	0
	d)		Stage work team to railbay	15	_						0	0	0	0	0	0
	e)		Open railbay door	5	-						0	0	0	0	0	0
	f)		Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
	g)		Security inspection of the SNF shipment and tug	15	3 V T				0.5		0	0	0	0	5.5	0
	h)		HP survey of SNF shipment	15	3 V T		0.5				0	0	5.5	0	0	0
	i)		Inspection of tamper proof Seals	10	3 V T				0.1		0	0	0	0	0.7	0
	j)		Acceptance of SNF shipment	5	-						0	0	0	0	0	0
	k) I)	_	Decoupling of railcar and removal of the tug from the railbay Secure the railbay doors	10 5	-						0	0	0	0	0	0
	m)	_	Security team leaves	5	_						0	0	0	0	0	0
	n)	_	Operator leaves	5	-						0	0	0	0	0	0
	0)	_	Completes paperwork for step #1	5	-						0	0	0	0	0	0
2)			e impact limiters and place in temporary storage	195												1
-	a)	_	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b)		Select and inspect rigging for impact limiters on the transport cask	5	-						0	0	0	0	0	0
	c)		Rig the lifting devices to the first impact limiter	5	1A V T	2	2				0	2.5	2.5	0	0	0
	d)		Position manlifts and temporary scaffolding near transport cask	5	1A V T	2					0	2.5	0	0	0	0
	e)		Remove and store bolts holding on the first impact limiter	30	1A V T	2					15	0	0	0	0	0
	f)		Remove first impact limiter and place on storage stand	10	1AVT	1					0	2.5	0	0	0	0
	g)		Remove rigging and reposition on second impact limiter	5	1A V T	1					0	1.3	0	0	0	0
	h) i\		Reposition manlift and scaffolding Remove and store bolts holding on the second impact limiter	5 30	1A V T 1A V T	2		\vdash			0 15	0	0	0	0	0
	i) j)		Remove and store bolts holding on the second impact limiter Remove second impact limiter and place on storage stand	10	1A V T	1		\vdash			0	2.5	0	0	0	0
	k)	_	Remove and store bolts for personnel barrier	30	3 V T	0.2					4.4	0	0	0	0	0
	l)		Rig the personnel barrier	15	3 V T	1	1				0	11	11	0	0	0
	m)		Lift personnel barrier and move to storage location	10	3 V T						0	0	0	0	0	0
	n)	_	Remove tie-down straps from transport cask	10	3A V T	0.4					2.3	0	0	0	0	0
	o)		Rig tie-down straps and move to storage location	5	3A V T	1					0	2.8	0	0	0	0
	p)		Inspect transport cask for damage and conduct HP survey	15	3 V T		2				0	0	22	0	0	0
3)	Uper		and lift transport cask off of railcar and place on unloading cell transfer cart	120									<u> </u>			
	a)		Select the appropriate lifting block for the transport cask	5	-						0	0	0	0	0	0
	b)		Secure lifting block to transport cask Trunnions	10	2A V T	2					0	6.7	0	0	0	0
	c)	_	Upend transport cask	30	-						0	0	0	0	0	0
	d)	_	Lift transport cask off railcar Reposition transport cask	30 30	-						0	0	0	0	0	0
	e) f)	_	Place transport cask Place transport cask on unloading cell transfer cart	15	_						0	0	0	0	0	0
3a)	,		e railcar from railbay	60							-	0				-
Juj	a)		Open railbay door	5	-						0	0	0	0	0	0
	b)	_	Railyard tug connects to railcar	10	-						0	0	0	0	0	0
	c)		Railyard tug removes railcar from railbay	10	-						0	0	0	0	0	0
	d)		Railyard tug connects to next railcar	15	-						0	0	0	0	0	0
	e)		Railyard tug repositions next railcar in railbay	10	-						0	0	0	0	0	0
	f)		Railyard tug leaves railbay and railbay door is closed	10	-						0	0	0	0	0	0
4)		_	and remove transport cask lid using jib crane	85									—			
	a)		Move tools to work platform	5	-						0	0	0	0	0	0
	b)		HP survey of lid Including gas sampling	15	2A V T	1	1				0	0	5	0	0	0
	c) d)	_	Remove and store nuts	30 15	2A V T 2A V T	1 1.5					10 0	7.5	0	0	0	0
	e)		Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand	10	ZAVI	1.5	,				0	0	0	0	0	0
	f)		Security inspection of the interior of the transport cask	10	2 V T				0.2		0	0	0	0	5	0
4a)	,	_	transport cask and transfer cart seismically	40	2 0 1				0.2			Ť	Ť			Ť
	a)	- 1	Reposition transfer cart near seismic restraint system	15	-						0	0	0	0	0	0
	b)		Secure transport cask and transfer cart	15	-						0	0	0	0	0	0
	c)		QC Hold Point Inspection	10	-						0	0	0	0	0	0
4b)	Plan		the Day and Safety Meeting	30												
	a)	_	Plan of the Day Meeting	15	-				\Box		0	0	0	0	0	0
	p)	_	Safety briefing	10	-						0	0	0	0	0	0
-,	c)		Transportation to work site	5	-						0	0	0	0	0	0
5)			lifting lug to top of DPC	70							^		_			<u> </u>
	a) b)	_	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position	15 15	- 2A V T	0.5	:		-		0	0 2.5	0	0	0	0
	c)		Bolt lifting lug to canister	20	2 V T	0.5	,				25	0	0	0	0	0
	d)	_	QC Hold Point Inspection	10	2 V T	0.5		\vdash	\dashv	0.1	0	0	0	0	0	2.5
	e)		Clear workspace and remove all tools	10	- L V I					J. I	0	0	0	0	0	0
6)	-,		n transport cask transfer cart in unloading cell and close shield doors	60									Ť	\vdash		Ť
	a)	_	Move transport cask cart into the unloading cell	50	-						0	0	0	0	0	0
	b)	_	Close the shield doors	10	-				1		0	0	0	0	0	0
7)	Stage		mpty vertical standardized overpack on receiving cell transfer cart	90												
	a)	_	Prepare an empty standardized overpack for use	15	-						0	0	0	0	0	0
	b)		Place the empty standardized overpack on the transfer cart using VCT	15	-			\coprod			0	0	0	0	0	0
	c)		Stage tools on top of the standardized overpack	10	-						0	0	0	0	0	0
	d)		Unbolt standardized overpack lid	30	-						0	0	0	0	0	0
	e)		Rig the cask lid to the VCT hoist	10	-	\vdash					0	0	0	0	0	0
۵)	f)	_	Hoist lid and retain on VCT	10	-						0	0	0	0	0	0
8)			n empty standardized overpack in receiving cell using motorized cart	45							^		_			<u> </u>
	a)		Open receiving cell shield doors Transfer omnty standardized everyook into receiving cell using meterized cart.	15	-	\vdash					0	0	0	0	0	0
	b)	_	Transfer empty standardized overpack into receiving cell using motorized cart	15	-	\vdash			-		0	0	0	0	0	0
	c) d)	_	Close the shield doors QC Hold Point Inspection	10 5	-	\vdash			-		0	0	0	0	0	0
	. (1)		n shielded transfer sleeve cart over unloading cell	3 5	-						U	U		U	U	۲
10\		io-													,	1
10)	Posit				-						Λ	n	n	n	n	n
10)			Inspect transfer sleeve cart	10	-						0	0	0	0	0	0
10)	Posit a)				- - -											1

			,				1					
	a) HP survey	0	-				0	0	0	0	0	0
	b) Lower shield sleeve hoist and grapple DPC lifting lug	50	-				0	0	0	0	0	0
12)	Raise DPC into shield sleeve	60										
	a) Raise DPC into shield sleeve	60	-				0	0	0	0	0	0
	b) HP survey	0	-				0	0	0	0	0	0
13)	Position shielded transfer sleeve cart over standardized overpack in receiving cell	70										
	a) Position shielded transfer sleeve over standardized overpack in receiving cell	60	-				0	0	0	0	0	0
	b) HP survey	0	-				0	0	0	0	0	0
	c) QC Hold Point Inspection	10	-				0	0	0	0	0	0
14)	Lower DPC into empty standardized overpack, release grapple, and retract hoist	60										
	a) Lower DPC into empty standardized overpack, release grapple, and retract hoist	60	-				0	0	0	0	0	0
	b) HP survey	0	-				0	0	0	0	0	0
15)	Remove lifting lug from DPC	35										<u> </u>
	a) HP survey	10	2 V T		0.2		0	0	5	0	0	0
	b) Stage tools on top of the standardized overpack	5	-				0	0	0	0	0	0
	c) Remove bolts and rig lifting lug	10	2 V T	0.3	.2		7.5	5	0	0	0	0
	d) Remove the lifting lug from the DPC using the jib crane	10	-				0	0	0	0	0	0
16)	Open receiving cell shield doors and transfer standardized overpack out of receiving cell	35										
	a) HP survey	10	-				0	0	0	0	0	0
	b) Open receiving cell shield doors	10	-				0	0	0	0	0	0
	c) Transfer standardized overpack out of receiving cell using motorized cart	15	-				0	0	0	0	0	0
17)	Install standardized overpack lid	60										
	a) Position VCT with standardized overpack lid at standardized overpack	15	-				0	0	0	0	0	0
	b) Lower standardized overpack lid into position	10	-									
	c) Install bolts and torque	20	2A V T	1.5			10	0	0	0	0	0
	d) QC Hold Point Inspection	10	2A V T			0.1	0	0	0	0	0	0.3
	e) Clean out tools and leave the top of the DPC	5	-				0	0	0	0	0	0
17a)	Secure seismic restraints	40										
	a) Position seismic restraints	15	-				0	0	0	0	0	0
	b) Secure seismic restraints	15	-				0	0	0	0	0	0
	c) QC Hold Point Inspection	10	-				0	0	0	0	0	0
17b)	Plan of the Day and Safety Meeting	30										
	a) Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b) Safety briefing	10	-				0	0	0	0	0	0
	c) Transportation to work site	5	-				0	0	0	0	0	0
18)	Pick up standardized overpack and transfer to pad using VCT	120										<u> </u>
	a) Rig VCT to lift standardized overpack	10	2A V T		2		0	6.7	0	0	0	0
	b) Drive to storage pad location	60	-				0	0	0	0	0	0
	c) Position the DPC on the pad	20	-				0	0	0	0	0	0
	d) De-rig standardized overpack from VCT	10	2A V T		2		0	6.7	0	0	0	0
	e) Bolt DPC to the pad	20	4 V S	1			37	0	0	0	0	0
	Total Hours of Canister Handling Operations	26.1										
	Turnover to Operations	1440										
_	Return VCT to CHB	60	-				0	0	0	0	0	0
	Open unloading cell shield doors and position transfer cart under jib crane	120	-				0	0	0	0	0	0
	Install transport cask lid	60	-				0	0	0	0	0	0
	Lift transport cask and transfer to maintenance	60	-				0	0	0	0	0	0
	Reposition the railcar to the railbay	60	-				0	0	0	0	0	0
	Survey and wipedown transport cask	60	-				0	0	0	0	0	0
	Lift transport cask and place on railcar	60	-				0	0	0	0	0	0
	Install impact limiters on transport cask	120	-				0	0	0	0	0	0
25)	Release railcar for shipment	60	-				0	0	0	0	0	0
	Total Hours of All Cask Handling Operations	61.1					126	60	51	0	11	2.8

			Duration	Dose		ura	tion	Frac	tion	1			Task	Dose	!	
Horiz	ontal DP	PCs - DPCs in vertical standardized overpacks on pad	(Minutes)		М	R	Н	0	S	Q	М	R	Н	0	S	Q
0)	Plan of	the Day and Safety Meeting	30													
	a)	Plan of the Day Meeting	15	-							0	0	0	0	0	C
	b)	Safety briefing	10	-							0	0	0	0	0	0
	c)	Transportation to work site	5	-							0	0	0	0	0	(
1)	Receive	e transport cask on railcar at Cask Handling Building	145													
	a)	Identify SNF shipment brought from yard	5	-							0	0	0	0	0	(
	b)	Security team sent to railbay door	15	-							0	0	0	0	0	(
	c)	Send operators to railbay door	15	-							0	0	0	0	0	(
	d)	Stage work team to railbay	15	-							0	0	0	0	0	(
	e)	Open railbay door	5	-							0	0	0	0	0	(
	f)	Position SNF shipment in the railbay	15	-							0	0	0	0	0	(
	g)	Security inspection of the SNF shipment and tug	15	3 V T					0.5		0	0	0	0	5.5	(
	h)	HP survey of SNF shipment	15	3 V T			0.5				0	0	5.5	0	0	(
	i)	Inspection of tamper proof seals	10	3 V T					0.1		0	0	0	0	0.7	(
	j)	Acceptance of SNF shipment	5	-							0	0	0	0	0	(
	k)	Decoupling of railcar and removal of the tug from the railbay	10	-							0	0	0	0	0	
	l)	Secure the railbay doors	5	-							0	0	0	0	0	
	m)	Security team leaves	5	-							0	0	0	0	0	
	n)	Operator leaves	5	-							0	0	0	0	0	
	o)	Completes paperwork for step #1	5	-							0	0	0	0	0	(
2)	Remov	re impact limiters and place in temporary storage	195													
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-							0	0	0	0	0	(
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5	-							0	0	0	0	0	(
	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2				0	2.5	2.5	0	0	(
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2					0	2.5	0	0	0	1
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2						15	0	0	0	0	
	f)	Remove first impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1					0	1.3	0	0	0	(
	h)	Reposition manlift and scaffolding	5	1A V T							0	0	0	0	0	
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2						15	0	0	0	0	
	j)	Remove second impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2						4.4	0	0	0	0	
	l)	Rig the personnel barrier	15	3 V T		1	1				0	11	11	0	0	
	m)	Lift personnel barrier and move to storage location	10	3 V T							0	0	0	0	0	
	n)	Remove tie-down straps from SNF shipment	10	3A V T	0.4						2.3	0	0	0	0	
	0)	Rig tie-down straps and move to storage location	5	3A V T		1					0	2.8	0	0	0	
	p)	Inspect transport cask for damage and conduct HP survey	15	3 V T			2				0	0	22	0	0	
3)	Unend	and lift transport cask off of railcar and place on transfer fixture	120								\Box				1	T

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8 Dock transfer sleeve on horizontal transfer cart with transport cask 75		b)	Safety briefing	10	-						0	0	0	0	0	0
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b) Move horizontal transfer cart into position 10 - 0 0 0 0 0 0 0	8)		·	+							_		_	_		
Align transport cask with transfer sleeve 15				+								_		_	_	
dock transfer sleeve to transport cask 15			·									_		_	_	
e Install retaining straps on transport cask trunnlons					-						_	_			_	
9 Pixh DPC into transfer sleeve				15	2A H T		1.5				0	12	0	0	0	0
a) Remove pushing port in base of transport cask 15 5 H H 2 4.3 0 0 0 0 0 0 0 0 0		,	•		-						0	0	0	0	0	0
b	9)															
C Withdraw the Fram					5 H H	2								_		
d) O.C. Hold Point Inspection 10 -				+	-						_	_				
10 Decouple horizontal transfer cart from transport cask and close shield door 20					-											
Book Disconting Discontin	10)			20												
11) Roll horizontal transfer cart to turntable and rotate 180° 30				10	2A H T		0.2				0	1.1	0	0	0	0
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Book Rotate turntable 180° Color Color	11)	_		+							_	_		0	0	
12 Roll Nortwortal transfer cart to upending cell and dock with standardized overpack 45					-	1										_
a	12)				_						J		0	J	J	J
b)	,				-						0	0	0	0	0	0
13 Push DPC from transfer sleeve into standardized overpack 65		b)	Dock transfer sleeve to standardized overpack on upender	20	-						0	0	0	0	0	0
a) Plug in hydraulic power pack on horizontal transfer cart 15 -					2A H T		0.5				0	4	0	0	0	0
b) Engage ram and push DPC into the standardized overpack 30 -	13)	<u> </u>	•								-	-	-	_	_	
c) Withdraw the ram 10 - Image: Company of the com						-									_	_
14 Undock horizontal transfer cart 50		<u> </u>				-					_	_				_
14 Undock horizontal transfer cart 30				+	-	1						_			_	_
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15 Upend standardized overpack 30		1			-	ļ								_	_	
a) Close shield door to upender cell 10	4 = 1		•		-						0	0	0	0	0	0
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16) Install id on standardized overpack 60 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <th< td=""><td></td><td></td><td>Upend the standardized overpack</td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td></th<>			Upend the standardized overpack		_								-			
b) Position VCT at standardized overpack on upender 15 - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		b)	·	5				<u> </u>					_			
c) Lower standardized overpack lid into place using the VCT 15 - 0 </td <td></td> <td>b) c) Install I</td> <td>Set locking mechanism on upender id on standardized overpack</td> <td>60</td> <td></td>		b) c) Install I	Set locking mechanism on upender id on standardized overpack	60												
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e) Install bolts and torque 20 2A H T 1.5 16 0		b) c) Install I a) b)	Set locking mechanism on upender id on standardized overpack Open outer shield doors to upender cell Position VCT at standardized overpack on upender	60 10 15	-						0	0	0	0	0	0
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TO16 Appendix D4 - Study 1 - Rad.xlsx

	b)	Safety briefing	10	-			0	0	0	0	0	0
	c)	Transportation to work site	5	-			0	0	0	0	0	0
17)	Pick up	standardized overpack and transfer to pad using VCT	130									
	a)	Rig VCT to lift standardized overpack	10	-			0	0	0	0	0	0
	b)	Open CHB Doors	10	-			0	0	0	0	0	0
	c)	Back the VCT out of the receiving cell	10	-			0	0	0	0	0	0
	d)	Drive to storage pad location	80	-			0	0	0	0	0	0
	e)	Position the DPC on the pad	20	-			0	0	0	0	0	0
		Total Hours of Canister Handling Operations	30.7									
17a)	Turnov	ver to Operations	1440									
18)	Return	VCT to CHB	120	-			0	0	0	0	0	0
19)	Install	transport cask lid	60	-			0	0	0	0	0	0
20)	Lift tra	nsport cask and transfer to maintenance	60	-			0	0	0	0	0	0
20a)	Survey	and wipedown transport cask	60	-			0	0	0	0	0	0
20b)	Reposi	tion empty railcar	60	-			0	0	0	0	0	0
21)	Lift tra	nsport cask and place on railcar	60	-			0	0	0	0	0	0
22)	Install	impact limiters on transport cask	120	-			0	0	0	0	0	0
23)	Releas	e railcar for shipment	60	-			0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	54.5				69	60	50	0	13	0

O) Plan of the Day and Safety Meeting 30 M R H O S Q M R H O a) Plan of the Day Meeting 15 - I	2B - C	-ST	Db,	Pad Storage Using Standard Storage Overpacks	Dunation	Dana .	Dom		F	-4:		1		Taal	Dana		
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Brance Transport cask on unloading cell transfer cart 15		_		·		-						+			1 -	0	0
30 Remove ralizer from railbay		_		, ,	_	-						+			1 -	0	0
a) Open railbay door	3a)					-						0	U	U	0	U	-
C Rallyard tug removes ralicar from ralibay 10 0 0 0 0 0 0 0 0				•		-						0	0	0	0	0	0
d Rallyard fug connects to next railcar 15 0 0 0 0 0 0 0 0 0		ŀ	b)		10	-						0	0	0	0	0	0
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Monitor and remove transport cask If du sing jib crane					_	-						+				0	0
A) Unboth and remove transport cask lid using jib crane 85		_				-						+		-		0	0
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C Remove and store nuts 30 2A V T 1					5	-						0	0	0	0	0	0
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C Transportation to work site 5		_										+			1 -	0	0
a) Rig lifting lug on storage rack			c)	Transportation to work site		-						0	0	0	0	0	0
b) Use jib crane to lift lifting lug into position c) Bolt lifting lug to canister c) Bolt lifting lug to canister d) QC Hold Point Inspection e) Clear workspace and remove all tools f) Position transport cask transfer cart in unloading cell and close shield doors a) Move transport cask cart into the unloading cell b) Close the shield doors f) Close the shield doors f) Stage empty vertical standardized overpack on receiving cell transfer cart g) Prepare an empty standardized overpack for use a) Prepare an empty standardized overpack on the transfer cart using VCT c) Stage tools on top of the standardized overpack d) Unbolt standardized overpack lid d) Unbolt standardized overpack lid d) Unbolt standardized overpack lid e) Rig the cask lid to the VCT hoist f) Hoist lid and retain on VCT a) Open receiving cell shield doors 8) Position empty standardized overpack in receiving cell using motorized cart f) Hoist lid and retain on VCT d) QC Hold Point Inspection 10 -	5)														<u> </u>		
c) Bolt lifting lug to canister 20 2 V T 0.5 25 0 0 0 d) QC Hold Point Inspection 10 2 V T 0 0.1 0 0 0 0 e) Clear workspace and remove all tools 10 - 0		_	_		_		0.5									0	0
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a) Move transport cask cart into the unloading cell 50		(e)	Clear workspace and remove all tools		-						+				0	0
b) Close the shield doors 10 - 0 0 0 0 0 0 0 0	6)	1															
7) Stage empty vertical standardized overpack on receiving cell transfer cart 90 80 <th< td=""><td></td><td></td><td>_</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td><u> </u></td><td></td><td></td><td>Ŭ</td><td>0</td><td>0</td></th<>			_			-						<u> </u>			Ŭ	0	0
a) Prepare an empty standardized overpack for use 15	71		_			-						U	U	U	U	0	0
b) Place the empty standardized overpack on the transfer cart using VCT c) Stage tools on top of the standardized overpack d) Unbolt standardized overpack lid e) Rig the cask lid to the VCT hoist f) Hoist lid and retain on VCT f) Hoist lid and retain on VCT a) Open receiving cell shield doors b) Transfer empty standardized overpack into receiving cell using motorized cart c) Close the shield doors d) QC Hold Point Inspection b) Move shielded transfer sleeve cart over unloading cell c) QC Hold Point Inspection 15 - 0 0 0 0 0 0 0 0 0 0 0 0	11				_	-						0	0	0	0	0	0
c) Stage tools on top of the standardized overpack 10 - 0			b)	Place the empty standardized overpack on the transfer cart using VCT		-						+		-	-	0	0
e) Rig the cask lid to the VCT hoist 10 - 0 0 0 0 f) Hoist lid and retain on VCT 10 - 0 0 0 0 8) Position empty standardized overpack in receiving cell using motorized cart 45 - 0 0 0 0 0 a) Open receiving cell shield doors 15 - 0		_	c)	Stage tools on top of the standardized overpack		-						-				0	0
f) Hoist lid and retain on VCT 10 - 0 0 0 0 8) Position empty standardized overpack in receiving cell using motorized cart 45 - 0		_				-						+				0	0
8) Position empty standardized overpack in receiving cell using motorized cart 45 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		_		-		-						+		-	-	0	0
a) Open receiving cell shield doors 15 - 0	8)		•			_						J	U		0	J	
b) Transfer empty standardized overpack into receiving cell using motorized cart 15 - 0 0 0 0 c) Close the shield doors 10 - 0	-1					-						0	0	0	0	0	0
d) QC Hold Point Inspection 5 - 0 0 0 0 10) Position shielded transfer sleeve cart over unloading cell 35 - 0		_	b)	Transfer empty standardized overpack into receiving cell using motorized cart		_									1	0	0
10) Position shielded transfer sleeve cart over unloading cell 35 5 5 6 6 7 8 9		-			_	-						+				0	0
a) Inspect transfer sleeve cart 10 - 0 0 0 0 b) Move shielded transfer sleeve cart over unloading cell 15 - 0 0 0 0 c) QC Hold Point Inspection 10 - 0 0 0 0	4.01				_	-						0	0	0	0	0	0
b) Move shielded transfer sleeve cart over unloading cell 15 - 0 0 0 0 c) QC Hold Point Inspection 10 - 0 0 0 0	10)				_	_						0	Λ	Λ	Λ	0	0
c) QC Hold Point Inspection 10 - 0 0 0 0 0				'	_							+		-		0	0
		_	_		-							+		-	-	0	0
	11)	Lov		·	50												

b) Lower	HP survey Lower shield sleeve hoist and grapple DPC lifting lug PC into shield sleeve Raise DPC into shield sleeve HP survey shielded transfer sleeve cart over standardized overpack in receiving cell Position shielded transfer sleeve over standardized overpack in receiving cell HP survey QC Hold Point Inspection	0 50 60 60 0 70	- - -					0	0	0	0	0	0
12) Raise DPC int	PC into shield sleeve Raise DPC into shield sleeve HP survey shielded transfer sleeve cart over standardized overpack in receiving cell Position shielded transfer sleeve over standardized overpack in receiving cell HP survey QC Hold Point Inspection	60 60 0 70	- - -					0	0	0	0	0	
a) Raise b) HP st 13) Position shie a) Position b) HP st c) QC H 14) Lower DPC ir a) Lowe b) HP st b) Stage c) Remove liftin a) HP st b) Stage c) Remove d) Remove d) Remove 16) Open receivi a) HP st b) Open c) Trans 17) Install stands a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans a) Rig V b) Drive c) Posit d) De-ri e) Bolt e) Bolt e) Bolt	Raise DPC into shield sleeve HP survey shielded transfer sleeve cart over standardized overpack in receiving cell Position shielded transfer sleeve over standardized overpack in receiving cell HP survey QC Hold Point Inspection	60 0 70	-										0
b) HP stands	HP survey shielded transfer sleeve cart over standardized overpack in receiving cell Position shielded transfer sleeve over standardized overpack in receiving cell HP survey QC Hold Point Inspection	0 70	-										
13) Position shie	shielded transfer sleeve cart over standardized overpack in receiving cell Position shielded transfer sleeve over standardized overpack in receiving cell HP survey QC Hold Point Inspection	70	-					0	0	0	0	0	0
a) Posit b) HP su c) QC H 14) Lower DPC ir a) Lowe b) HP su b) HP su c) QC H 15) Remove liftin a) HP su b) Stage c) Remove d) Remove d) Remove 16) Open receivi a) HP su b) Oper c) Trans b) Oper c) Trans 17) Install standa a) Posit b) Lowe c) Instal d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Position shielded transfer sleeve over standardized overpack in receiving cell HP survey QC Hold Point Inspection	1						0	0	0	0	0	0
b) HP st	HP survey QC Hold Point Inspection	60											
C) QC H 14) Lower DPC ir a) Lower b) HP st 15) Remove liftin a) HP st b) Stage c) Remove	QC Hold Point Inspection	60	-					0	0	0	0	0	0
14) Lower DPC in		0	-					0	0	0	0	0	0
a) Lowe b) HP st color		10	-					0	0	0	0	0	0
b) HP st a) HP st a) HP st b) Stage c) Remove lifting d) Remove d) Rem	PC into empty standardized overpack, release grapple, and retract hoist	60											
15) Remove lifting a) HP sure states and HP sure states are states as a HP sure states and HP sure states are states as a HP sure states are states as a HP sure states are states as a HP sure states and HP sure states are states are states as a HP sure states are states a	Lower DPC into empty standardized overpack, release grapple, and retract hoist	60	-					0	0	0	0	0	0
a) HP st b) Stage c) Remo d) Remo 16) Open receivi a) HP st b) Open c) Trans 17) Install standa a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt e) Bolt	HP survey	0	-					0	0	0	0	0	0
b) Stage c) Remo d) Remo d) Remo 16) Open receivi a) HP st b) Open c) Trans 17) Install standa a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secut c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	lifting lug from DPC	35											
C) Remoderal Remoderation	HP survey	10	2 V T			0.2		0	0	5	0	0	0
d) Remote 16) Open receivitor a) HP state b) Open c) Transtall standar a) Posititor b) Lower c) Install standar d) QC H e) Clear 17a) Secure seism a) Posititor b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Transtall a) Rig V b) Driver c) Posititor d) De-ritor e) Boltitor 18a) Turnover to the continued	Stage tools on top of the standardized overpack	5	-					0	0	0	0	0	0
16) Open receivi a) HP su b) Open c) Trans 17) Install standa a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Remove bolts and rig lifting lug	10	2 V T	0.3	0.2			7.5	5	0	0	0	0
a) HP st b) Oper c) Trans 17) Install standa a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secu c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Remove the lifting lug from the DPC using the jib crane	10	-					0	0	0	0	0	0
b) Oper c) Trans 17) Install stands a) Posit b) Lowe c) Instal d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stands a) Rig V b) Drive c) Posit d) De-ri e) Bolt e) Bolt control contr	ceiving cell shield doors and transfer standardized overpack out of receiving cell	35											
C) Trans	HP survey	10	-					0	0	0	0	0	0
17) Install standa a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Open receiving cell shield doors	10	-					0	0	0	0	0	0
a) Posit b) Lowe c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secu c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Transfer standardized overpack out of receiving cell using motorized cart	15	-					0	0	0	0	0	0
b) Lower c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans a) Rig V b) Drive c) Posit d) De-ri e) Bolt 1	andardized overpack lid	60											
c) Insta d) QC H e) Clear 17a) Secure seism a) Posit b) Secu c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Position VCT with standardized overpack lid at standardized overpack	15	-					0	0	0	0	0	0
d) QC H e) Clear 17a) Secure seism a) Posit b) Secu c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Lower standardized overpack lid into position	10	-										
e) Clear 17a) Secure seism a) Posit b) Secu c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Install bolts and torque	20	2A V T	1.5				10	0	0	0	0	0
17a) Secure seism a) Posit b) Secure c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt	QC Hold Point Inspection	10	2A V T				0.1	0	0	0	0	0	0.3
a) Posit b) Secu c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Clean out tools and leave the top of the DPC	5	-					0	0	0	0	0	0
b) Security Color of the Description of the Descrip	eismic restraints	40											
c) QC H 17b) Plan of the D a) Plan b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Position seismic restraints	15	-					0	0	0	0	0	0
17b) Plan of the D	Secure seismic restraints	15	-					0	0	0	0	0	0
a) Plan b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt	QC Hold Point Inspection	10	-					0	0	0	0	0	0
b) Safet c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt 18a) Turnover to 0	he Day and Safety Meeting	30											
c) Trans 18) Pick up stanc a) Rig V b) Drive c) Posit d) De-ri e) Bolt 18a) Turnover to 0	Plan of the Day Meeting	15	-					0	0	0	0	0	0
18) Pick up stand a) Rig V b) Drive c) Posit d) De-ri e) Bolt 18a) Turnover to 0	Safety briefing	10	-					0	0	0	0	0	0
a) Rig V b) Drive c) Posit d) De-ri e) Bolt	Transportation to work site	5	-					0	0	0	0	0	0
b) Drive c) Posit d) De-ri e) Bolt	standardized overpack and transfer to pad using VCT	120											
c) Posit d) De-ri e) Bolt	Rig VCT to lift standardized overpack	10	2A V T		2			0	6.7	0	0	0	0
d) De-ri e) Bolt 18a) Turnover to (Drive to storage pad location	60	-					0	0	0	0	0	0
e) Bolt 18a) Turnover to	Position the DPC on the pad	20	-					0	0	0	0	0	0
18a) Turnover to	De-rig standardized overpack from VCT	10	2A V T		2			0	6.7	0	0	0	0
	Bolt DPC to the pad	20	4 V S	1				37	0	0	0	0	0
	Total Hours of Canister Handling Operations	26.1											
	r to Operations	1440											
19) Return VCT t	/CT to CHB	60	-					0	0	0	0	0	0
20) Open unload	loading cell shield doors and position transfer cart under jib crane	120	-					0	0	0	0	0	0
21) Install transp		60	-					0	0	0	0	0	0
22) Lift transport	ransport cask lid	60	-					0	0	0	0	0	0
22a) Reposition th		60	-					0	0	0	0	0	0
	ansport cask lid							0	0	0	0	0	0
	ansport cask lid sport cask and transfer to maintenance	60	-				 -	_	0	0	0	0	0
	ansport cask lid sport cask and transfer to maintenance on the railcar to the railbay	60 60	-					0	U		~		0
	ransport cask lid sport cask and transfer to maintenance on the railcar to the railbay and wipedown transport cask							0	0	0	0	0	U
	ransport cask lid sport cask and transfer to maintenance on the railcar to the railbay and wipedown transport cask sport cask and place on railcar	60	-									0	0

Llo-i-	antal Dr	Co. DDCs in Havisantal Standardized Overseels as and	Duration	Dose	D	ura	tion	Frac	tion				Task	Dose		
HOLIZ	ontai De	Cs - DPCs in Horizontal Standardized Overpacks on pad	(Minutes)		М	R	Н	0	S	Q	М	R	Н	0	S	Q
0)	Plan of	the Day and Safety Meeting	30													
	a)	Plan of the Day Meeting	15	-							0	0	0	0	0	0
	b)	Safety briefing	10	-							0	0	0	0	0	0
	c)	Transportation to work site	5	-							0	0	0	0	0	0
1)	Receive	e transport cask on railcar at Cask Handling Building	145													
	a)	Identify SNF shipment brought from yard	5	-							0	0	0	0	0	0
	b)	Security team sent to railbay door	15	-							0	0	0	0	0	0
	c)	Send operators to railbay door	15	-							0	0	0	0	0	0
	d)	Stage work team to railbay	15	-							0	0	0	0	0	0
	e)	Open railbay door	5	-							0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	-							0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug	15	3 V T				-	0.5		0	0	0	0	3.7	0
	h)	HP survey of SNF shipment	15	3 V T			0.5				0	0	1.8	0	0	0
	i)	Inspection of tamper proof seals	10	3 V T					0.1		0	0	0	0	0.7	0
	j)	Acceptance of SNF shipment	5	-							0	0	0	0	0	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10	-							0	0	0	0	0	0
	I)	Secure the railbay doors	5	-							0	0	0	0	0	0
	m)	Security team leaves	5	-							0	0	0	0	0	0
	n)	Operator leaves	5	-							0	0	0	0	0	0
	0)	Completes paperwork for step #1	5	-							0	0	0	0	0	0
2)	Remov	e impact limiters and place in temporary storage	195													
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-							0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5	-							0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2				0	2.5	2.5	0	0	0
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2					0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2						15	0	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1					0	1.3	0	0	0	0
	h)	Reposition manlift and scaffolding	5	1A V T							0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2						15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2						4.4	0	0	0	0	0
	l)	Rig the personnel barrier	15	3 V T		1	1				0	11	11	0	0	0
	m)	Lift personnel barrier and move to storage location	10	3 V T							0	0	0	0	0	0
	n)	Remove tie-down straps from SNF shipment	10	3A V T	0.4						2.3	0	0	0	0	0
	0)	Rig Tie-Down straps and move to storage location	5	3A V T		1					0	2.8	0	0	0	0
	p)	Inspect transport cask for damage and conduct HP survey	15	3 V T			2				0	0	22	0	0	0
3)	Stage I	Horizontal Cask Transporter (HCT) in truck bay	60													

	a)	Open truck bay door	15	-		LT			0	0	0	0	0	(
		Position HCT in truck bay	30	-			İ		0	0	0	0	0	
	c)	Close truck bay door	15	-					0	0	0	0	0	
4)		and lift transport cask off of railcar and downend on HCT	75									+	+	T
٠,		Select the appropriate lifting block for the transport cask	5	_					0	0	0	0	0	
			5	2A V T	2				0	3.3	0	0	0	
		Secure lifting block to transport cask trunnions		ZAVI	2			+		+	+			+-
	c)	Upend transport cask	30	-					0	0	0	0	0	
	d)	Lift transport cask off railcar	15	-					0	0	0	0	0	
	e)	Move transport cask to HCT	10	-					0	0	0	0	0	
	f)	Downend transport cask on HCT	10	-					0	0	0	0	0	
4a)	Remov	e railcar from railbay	60											
		Open railbay door	5	_					0	0	0	0	0	
	b)	Railyard tug connects to railcar	10	_					0	0	0	0	0	
			10						0	0	0	0	0	
	c)	Railyard tug removes railcar from railbay		-						+ -	+ -		+	+-
	d)	Railyard tug connects to next railcar	15	-					0	0	0	0	0	
	e)	Railyard tug repositions next railcar in railbay	10	-					0	0	0	0	0	
	f)	Railyard tug leaves railbay and railbay door is closed	10	-					0	0	0	0	0	
1b)	Secure	transport cask on HCT	40											
	a)	Position HCT near seismic restraint tie-downs	15	-					0	0	0	0	0	
	b)	Install seismic restraint tie-downs	15	_					0	0	0	0	0	
-			10			+ +			0	0	0	0	0	
4.63		QC Hold Point Inspection		-					1	Ψ.	Ψ-	+-	$+$ $^{\cup}$	+
4c)		the Day and Safety Meeting	30						4	₩	₩	₩	₩	1
		Plan of the Day Meeting	15	-					0	0	0	0	0	
[b)	Safety briefing	10	-	<u> </u>				0	0	0	0	0	
	c)	Transportation to work site	5	-					0	0	0	0	0	
5)	Transfe	er transport cask to HSM on pad via HCT	120							1	1	1	1	T
•		QC Hold Point Inspection	15	-					0	0	0	0	0	
		Open the truck bay door	15			+++			0	0	0	0	0	
		· ·		-		\vdash	_			+ -				_
	c)	Transfer the transport cask to HSM on the pad via HCT	90	-					0	0	0	0	0	
5a)	Prepar	ation of Horizontal Storage Module (HSM)	120									1	\perp	\perp
_ T	a)	Stage equipment near HSM	15			L T	_ [_		0	0	0	0	0	
	b)	Place and align Theodolite heads	30	-					0	0	0	0	0	
	c)	Rig crane to HSM port cover	15	2C H T L	2				0	0.8	0	0	0	
	d)	Use manlift to remove nuts on mounting studs	15	1A HTL	2			+	9.2	0.0	0	0	0	
				IAHIL					_	+	+			-
		Post radiation zone signs and barriers	10	-					0	0	0	0	0	
	f)	Remove HSM port cover and place in storage location	20	1A H T L	1				0	6.1	0	0	0	
	g)	HP survey to verify dose rates	15	1A H T L		1.5			0	0	6.9	0	0	
6)		e transport cask lid	90											
•		Move tools to work platform	15	-					0	0	0	0	0	
		HP survey of lid including gas sampling	10	1A H T L		2	+		0	0	6.1	0	0	
				TUILL						+ -	+		+	-
		Position stick crane	15	44117	-	+			0	0	0	0	0	
	<u>d)</u>	Rig the lid for lifting using the local stick crane	15	1AHTL	2	\vdash			0	9.2	0	0	0	
	e)	Remove and store nuts	20	1A H T L	2				12	0	0	0	0	
[f)	Lift the transport cask lid and move it to the storage stand	10	-					0	0	0	0	0	
	g)	Security inspection of the interior of the transport cask	5	1A H T NL		ΙŢ	0.5	5	0	0	0	0	6.8	
7)	Dock H	CT with HSM and push DPC into module	145											
- 1		Position spotters	10	-					0	0	0	0	0	
	b)	Move HCT into position	15	_		 		+	0	0	0	0	0	
		Check alignment	20	_		+++			0	0	0	0	0	
	c)			-				-		+ -	+ -		+	_
		Dock HCT to HSM	30	-					0	0	0	0	0	
		I Domovo nuching port in baco of transport cack	15	5 H H	2				4.3	0	0	0	0	
	e)	Remove pushing port in base of transport cask					_				Ť		0	
	e) f)	Engage ram and push DPC into module	20						0	0	0	0	L	1
				-					0	+ -	+ -	0	0	4-
	f) g)	Engage ram and push DPC into module Withdraw the ram	20 15	-						0	0		+	
	f) g) h)	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module	20 15 10		2			0.7	0	0 0 0	0 0	0	0	
01	f) g) h)	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection	20 15 10 10	-	2			0.2	0	0	0	0	0	
8)	f) g) h) i) Install	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover	20 15 10 10 90					0.2	0 0 2 0	0 0 0	0 0 0	0 0	0 0	5
8)	f) g) h) i) Install:	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT	20 15 10 10 90 10	- - - 1A H T NL				0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	5
8)	f) g) h) i) Install: a) b)	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints	20 15 10 10 90 10 5	- - 1A H T NL - 1A H T NL	1				0 0 0 2 0 0 14	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	5
8)	f) g) h) i) Install:	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT	20 15 10 10 90 10 5	- - - 1A H T NL				0.2	0 0 0 2 0 0 14	0 0 0 0	0 0 0 0	0 0 0	0 0 0	5
8)	f) g) h) i) Install: a) b)	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints	20 15 10 10 90 10 5	- - 1A H T NL - 1A H T NL					0 0 0 2 0 0 14	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	5
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8)	f) g) h) i) Install: a) b) c) d)	Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module	20 15 10 10 90 10 5 5 15	- - - 1A H T NL - 1A H T NL - 5 H H	1 1				0 0 0 2 0 0 14 2 0 0 0	0 0 0 0 0 0 0 0 0 2.1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	2
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	-STDC, 1	pad Storage using a Horizontal Standard Storage overpack	1	I _	_										
Vertic	al DPCs	- DPCs in horizontal standardized overpacks on pad	Duration (Minutes)	Dose	М			Fractio S		М	R	Task H	Dose O	S	Q
0)	Plan of	the Day and Safety Meeting	30												
		Plan of the Day Meeting	15	-						0	0	0	0	0	0
		Safety briefing	10	-						0	0	0	0	0	0
1)		Transportation to work site e transport cask on railcar at Cask Handling Building	5 145	-						0	0	0	0	0	0
1)		Identify SNF shipment brought from yard	5	-						0	0	0	0	0	0
		Security team sent to railbay door	15	-						0	0	0	0	0	0
		Send operators to railbay door	15	-						0	0	0	0	0	0
	d)	Stage work team to railbay	15	-						0	0	0	0	0	0
		Open railbay door	5	-						0	0	0	0	0	0
		Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
		Security inspection of the SNF shipment and tug	15	3 V T			0.5	0.5		0	0	0	0	5.5	0
		HP survey of SNF shipment Inspection of tamper proof seals	15 10	3 V T			0.5	0.1		0	0	5.5	0	0.7	0
	,	Acceptance of SNF shipment	5	- 3 V I				0.1		0	0	0	0	0.7	0
		Decoupling of railcar and removal of the tug from the railbay	10	-						0	0	0	0	0	0
		Secure the railbay doors	5	-						0	0	0	0	0	0
	m)	Security team leaves	5	-						0	0	0	0	0	0
		Operator leaves	5	-						0	0	0	0	0	0
- 1		Completes paperwork for step #1	5	-						0	0	0	0	0	0
2)		e impact limiters and place in temporary storage Mobilize crew (mechanics, riggers, crane operator, etc.)	195							_	0	0		0	0
	,	Select and inspect rigging for impact limiters on the SNF shipment	5	-						0	0	0	0	0	0
		Rig the lifting devices to the first impact limiter	5	1A V T		2	2			0	2.5	2.5		0	0
		Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2	_			0	2.5	0	0	0	0
		Remove and store bolts holding on the first impact limiter	30	1A V T	2					15	0	0	0	0	0
_	f)	Remove first impact limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
		Remove rigging and reposition on second impact limiter	5	1A V T		1				0	1.3	0	0	0	0
		Reposition manlift and scaffolding	5	1A V T	_					0	0	0	0	0	0
		Remove and store bolts holding on the second impact limiter Remove second impact limiter and place on storage stand	30 10	1A V T	2	1				15 0	0 2.5	0	0	0	0
		Remove second impact limiter and place on storage stand Remove and store bolts for personnel barrier	30	3 V T	0.2	Т				4.4	0	0	0	0	0
		Rig the personnel barrier	15	3 V T	0.2	1	1			0	11	11	0	0	0
		Lift personnel barrier and move to storage location	10	3 V T		-	1			0	0	0	0	0	0
		Remove tie-down straps from SNF shipment	10		0.4					2.3	0	0	0	0	0
		Rig tie-down straps and move to storage location	5	3A V T		1				0	2.8	0	0	0	0
		Inspect transport cask for damage and conduct HP survey	15	3 V T			2			0	0	22	0	0	0
3)		and lift transport cask off of railcar and place on unloading cell transfer cart	120												_
	,	Select the appropriate lifting block for the transport cask Secure lifting block to transport cask trunnions	5 10	- 2A V T		2				0	0 6.7	0	0	0	0
	b) c)	Upend transport cask	30	2A V I						0	0.7	0	0	0	0
	d)	Lift transport cask off railcar	30	-						0	0	0	0	0	0
		Reposition transport cask	30	-						0	0	0	0	0	0
	f)	Place transport cask on unloading cell transfer cart	15	-						0	0	0	0	0	0
4)		e railcar from railbay	60												
		Open railbay door	5	-						0	0	0	0	0	0
		Railyard tug connects to railcar	10	-						0	0	0	0	0	0
		Railyard tug removes railcar from railbay	10	-						0	0	0	0	0	0
		Railyard tug connects to next railcar Railyard tug repositions next railcar in railbay	15 10	_						0	0	0	0	0	0
		Railyard tug leaves railbay and railbay door is closed	10	-						0	0	0	0	0	0
5)		and remove transport cask lid using jib crane	85												
	a)	Move tools to work platform	5	-						0	0	0	0	0	0
		HP survey of lid Including leak detection	15	2A V T			1			0	0	5	0	0	0
	,	Remove and store nuts	30	2A V T	1					10	0	0	0	0	0
		Rig the lid for lifting using the local jib crane	15	2A V T		1.5				0	7.5	0	0	0	0
		Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	10	2 V T				0.2		0	0	0	0	0 5	0
6)		e adaptor frame from overpack fabrication yard	60	2 V I				0.2		0	0	0	U	3	0
-		and inspect adaptor frame	60	-						0	0	0	0	0	0
		nsfer cask from HCT and stage on CHB crane bay floor near upender cell	60	-						0	0	0	0	0	0
9)	Remove	e transfer cask lid with jib crane	60	-						0	0	0	0	0	0
		adaptor frame into transfer cask with cask handling bridge crane	60	-						0	0	0	0	0	0
		ransfer cask with adaptor frame and downend onto horizontal transport cart	30	-						0	0	0	0	0	0
		ocking collar to end of transfer cask	15 40	-						0	0	0	0	0	0
ı∠a)		transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system	15	-						0	0	0	0	0	0
		Secure transport cask and transfer cart	15	-						0	0	0	0	0	0
	~1	'	_	_						0	0	0	0	0	0
	c)	QC Hold Point Inspection	10												
12b)	Plan of	the Day and Safety Meeting	30								_				
12b)	Plan of a)	the Day and Safety Meeting Plan of the Day Meeting	30 15	-						0	0	0	0	0	0
12b)	Plan of a) b)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing	30 15 10	-						0	0	0	0	0	0
	Plan of a) b) c)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site	30 15 10 5							_					_
	Plan of a) b) c) Attach	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC	30 15 10 5 70	-						0	0	0	0	0	0
	Plan of a) b) c) Attach a)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack	30 15 10 5 70 15	-		0.5				0 0	0 0	0 0	0 0	0 0	0 0
	Plan of a) b) c) Attach a) b)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC	30 15 10 5 70	-	0.5	0.5				0	0	0	0	0	0
	Plan of a) b) c) Attach a) b) c)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position	30 15 10 5 70 15 15	- - - 2A V T		0.5			0.1	0 0 0	0 0 0 2.5	0 0 0	0 0 0 0	0 0 0	0 0 0 0
13)	Plan of a) b) c) Attach a) b) c) d)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools	30 15 10 5 70 15 15 20 10	- - 2A V T 2 V T		0.5			0.1	0 0 0 0 0 0 25	0 0 0 2.5 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0
13)	Plan of a) b) c) Attach a) b) c) d) e) Position	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors	30 15 10 5 70 15 15 20 10	- - 2A V T 2 V T		0.5			0.1	0 0 0 0 0 25 0	0 0 0 2.5 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 2.5
13)	Plan of a) b) c) Attach a) b) c) d) e) Position a)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell	30 15 10 5 70 15 15 20 10 10 60	- - 2A V T 2 V T		0.5			0.1	0 0 0 0 25 0 0	0 0 0 2.5 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 2.5 0
13)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors	30 15 10 5 70 15 15 20 10 10 60 50	- - 2A V T 2 V T		0.5			0.1	0 0 0 0 0 25 0	0 0 0 2.5 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 2.5
13)	Plan of a) b) c) Attach a) b) c) d) e) Position b) Position	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors In shielded transfer sleeve cart over unloading cell	30 15 10 5 70 15 15 20 10 10 60 50 10 35	- - 2A V T 2 V T		0.5			0.1	0 0 0 0 25 0 0	0 0 0 2.5 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0
13)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Position a)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors In shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart	30 15 10 5 70 15 15 20 10 10 60 50 10 35	- - 2A V T 2 V T		0.5			0.1	0 0 0 0 25 0 0 0	0 0 0 2.5 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 2.55 0 0
13)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Position b)	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors In shielded transfer sleeve cart over unloading cell	30 15 10 5 70 15 15 20 10 10 60 50 10 35	- - 2AVT 2VT - -		0.5			0.1	0 0 0 0 25 0 0	0 0 0 2.5 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 2.5 0
13)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Column	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors n shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart Move shielded transfer sleeve cart over unloading cell	30 15 10 5 70 15 15 20 10 60 50 10 35 10 15	- - 2AVT 2VT - -		0.5			0.1	0 0 0 0 25 0 0 0	0 0 2.5 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 2.5 0 0
13)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Coulons bo Lower s	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors n shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection shield sleeve hoist and grapple DPC lifting lug HP survey	30 15 10 5 70 15 15 20 10 10 60 50 10 35 10 15 10 60 10	- - 2AVT 2VT - -		0.5			0.1	0 0 0 0 25 0 0 0	0 0 2.5 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 2.5 0 0 0
13) 14) 15)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Position a) b) C) Lower s	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors n shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection shield sleeve hoist and grapple DPC lifting lug HP survey Lower shield sleeve hoist and grapple DPC lifting lug	30 15 10 5 70 15 15 20 10 10 60 50 10 35 10 15 10 10 50	- - 2AVT 2VT - - - -		0.5			0.1	0 0 0 0 25 0 0 0 0	0 0 2.5 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 2.5 0 0 0 0
13) 14) 15)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Position a) b) C) Lower s a) b) Raise D	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors In shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Shield sleeve hoist and grapple DPC lifting lug HP survey Lower shield sleeve Lower shield sleeve	30 15 10 5 70 15 15 20 10 10 60 50 10 15 10 60 50 10 15 10 85	2A V T 2 V T 2 V T		0.5			0.1	0 0 0 0 25 0 0 0 0 0	0 0 2.5 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 2.5 0 0 0 0 0 0
13) 14) 15)	Plan of a) b) c) Attach a) b) c) d) e) Position a) b) Position a) b) C) Lower s a) b) Raise D	the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to DPC QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask transfer cart into the unloading cell Close the shield doors n shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection shield sleeve hoist and grapple DPC lifting lug HP survey Lower shield sleeve hoist and grapple DPC lifting lug	30 15 10 5 70 15 15 20 10 10 60 50 10 35 10 15 10 10 50	2A V T 2 V T 2 V T		0.5			0.1	0 0 0 0 25 0 0 0 0	0 0 2.5 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 2.5 0 0 0 0 0

		,												
	•	QC Hold Point Inspection	10	-					0	0	0	0	0	0
18)	Positio	n shielded transfer sleeve cart over intermediate transfer cask in upender cell	70											
	a)	Position shielded transfer sleeve cart over intermediate transfer cask on upender	60	-					0	0	0	0	0	0
	b)	HP survey	10	-					0	0	0	0	0	0
19)	Lower I	DPC into intermediate transfer cask, release grapple, and retract hoist	70											
		Lower DPC into intermediate transfer cask, release grapple, and retract hoist	60	-					0	0	0	0	0	0
		HP survey	10	_					0	0	0	0	0	0
20)	- /	e lifting lug from DPC and bolt grapple ring to top of DPC	65	-					U	U	0	U	U	U
20)		· · · · · · · · · · · · · · · · · · ·	10	21/1		0.2			0	0	-	0	0	_
		HP survey		2 V T		0.2				_	5			0
		Stage tools on top of the intermediate transfer cask	5	-					0	0	0	0	0	0
		Remove bolts and rig lifting lug for hoisting	10	2 V T	0.3	0.2			7.5	5	0	0	0	0
		Remove the lifting lug from the DPC using the jib crane	10	-					0	0	0	0	0	0
	e)	Hoist grapple ring lug to top of DPC	10	-					0	0	0	0	0	0
	f)	Bolt grapple ring lug to top of DPC	20	2 V T	0.5				25	0	0	0	0	0
21)	Downe	nd intermediate transfer cask	5											
		Downend intermediate transfer cask	5	-					0	0	0	0	0	0
22)	- /	pender to horizontal transfer cart	45						_		_			
		Align and dock horizontal transfer cart with upender	15						0	0	0	0	0	0
		·		24.1/ =		4				_		1	+	_
		Install retaining straps	15	2A V T		1			0	5	0	0	0	0
		Extend ram and engage grapple ring on canister	15	-					0	0	0	0	0	0
22)		er DPC into transfer cask on horizontal transfer cart	55											
	a)	Pull DPC into transfer cask on horizontal cart	30	-					0	0	0	0	0	0
	b)	Disengage ram from grapple ring and fully retract	15	1C V C	0.2				5.9	0	0	0	0	0
	c)	Install port cover in base of transfer cask	10	1B V C	0.2				4.5	0	0	0	0	0
23)	Undock	c upender from horizontal transfer cart	15											
	a)	Unstrap docking collar from transfer cask on horizontal transfer cart	10	4 V X		0.5			0	15	0	0	0	0
		Undock horizontal transfer cart from upender	5	_					0	0	0	0	0	0
24)		transfer cask lid	45							Ť	<u> </u>	 	-	,
,		Hoist and position transfer cask lid using the jib crane	15	_					0	0	0	0	0	0
		Install bolts and torque	20	5 H H	2				5.7	0	0	0	0	0
		·		+				0.5		_		1		
		QC Hold Point Inspection	10	5 H H				0.5	0	0	0	0	0	0.7
24a)		seismic restraints	40							_	1			
		Position seismic restraints	15	-	<u> </u>			<u> </u>	0	0	0	0	0	0
		Secure seismic restraints	15	-					0	0	0	0	0	0
		QC Hold Point Inspection	10	-	$oxedsymbol{oxed}$			$oxedsymbol{oxed}$	0	0	0	0	0	0
24b)	Plan of	the Day and Safety Meeting	30						L	L	L	\Box	7	
L	a)	Plan of the Day Meeting	15	-					0	0	0	0	0	0
	b)	Safety briefing	10	-					0	0	0	0	0	0
		Transportation to work site	5	-					0	0	0	0	0	0
25)		ransfer cask from horizontal transfer cart and place on HCT	70						_			_		
23)		Rig transfer cask for lifting	10	4 H T		2			0	11	0	0	0	0
		Hoist transfer cask with cask handling bridge crane and place on HCT	60	4111		2			0	0	0	0	0	0
36)				-					U	U	U	U	U	U
26)		ransfer cask to the pad using the HCT	70							_	_			_
		Open CHB truck bay doors	10	-					0	0	0	0	0	0
		Move transfer cask to pad using HCT	60	-					0	0	0	0	0	0
27)	Prepara	ation of Horizontal Storage Module (HSM)	135											
	a)	Stage equipment near HSM	15	-					0	0	0	0	0	0
	b)	Place and align Theodolite heads	30	-					0	0	0	0	0	0
	c)	Rig stick crane to HSM port cover	20	2C H T L		2			0	1	0	0	0	0
		Use manlift to remove nuts on mounting studs	20	1A H T L	2				12	0	0	0	0	0
	,	Post radiation zone signs and barriers	15	_					0	0	0	0	0	0
		. 650 . 444.40.01. 2011. 616.15 41.14 541.11.615												·
	f)	Remove HSM nort cover and place in storage location		1A H T I		1				6.1		Λ	Λ	Λ
		Remove HSM port cover and place in storage location	20	1A H T L		1 1 5			0	6.1	0	0	0	0
201	g)	HP survey to verify dose rates	20 15	1AHTL 1AHTL		1 1.5						0	0	0
28)	g) Remov	HP survey to verify dose rates e transfer cask lid	20 15 95						0	6.1	6.9	0	0	0
28)	g) Remove	HP survey to verify dose rates e transfer cask lid Move tools to work platform	20 15 95 15	1A H T L		1.5			0 0	6.1	0 6.9	0	0	0
28)	g) Remove a) b)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid	20 15 95 15 15						0 0 0	6.1 0 0	0 6.9 0 4.6	0 0	0 0 0	0 0
28)	g) Remove a) b) c)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane	20 15 95 15 15 15	1A H T L - 1A H T L -		1.5			0 0 0 0 0	6.1 0 0 0 0	0 6.9 0 4.6 0	0 0 0 0	0 0 0 0	0 0 0
28)	g) Remove a) b) c) d)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane	20 15 95 15 15 15	1A H T L - 1A H T L - 1A H T L		1.5			0 0 0 0 0	6.1 0 0 0 0 0 4.6	0 6.9 0 4.6 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0
28)	g) Remove a) b) c) d) e)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts	20 15 95 15 15 15	1A H T L - 1A H T L -	2	1.5			0 0 0 0 0	6.1 0 0 0 0	0 6.9 0 4.6 0	0 0 0 0	0 0 0 0	0 0 0
28)	g) Remove a) b) c) d) e)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand	20 15 95 15 15 15	1A H T L - 1A H T L - 1A H T L	2	1.5			0 0 0 0 0	6.1 0 0 0 0 0 4.6	0 6.9 0 4.6 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0
28)	g) Remove a) b) c) d) e)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts	20 15 95 15 15 15 15 20	1A H T L - 1A H T L - 1A H T L	2	1.5	0.5		0 0 0 0 0 0	6.1 0 0 0 0 0 4.6	0 6.9 0 4.6 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
	g) Remove a) b) c) d) e) f)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand	20 15 95 15 15 15 15 20	1A HTL - 1A HTL - 1A HTL 1A HTL -	2	1.5	0.5		0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0	0 6.9 0 4.6 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	g) Remove a) b) c) d) e) f) g) Dock H	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask	20 15 95 15 15 15 15 20 10	1A HTL - 1A HTL - 1A HTL 1A HTL -	2	1.5	0.5		0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0	0 6.9 0 4.6 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	g) Remove a) b) c) d) e) f) g) Dock He a)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module	20 15 95 15 15 15 15 20 10 5	1A HTL - 1A HTL - 1A HTL 1A HTL -	2	1.5	0.5		0 0 0 0 0 0 0 12 0	6.1 0 0 0 0 4.6 0 0	0 6.9 0 4.6 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0
	g) Remove a) b) c) d) e) f) g) Dock H a) b)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position	20 15 95 15 15 15 15 20 10 5 145	1A HTL - 1A HTL - 1A HTL 1A HTL 1A HTL - 1A HTL -	2	1.5	0.5		0 0 0 0 0 0 12 0	6.1 0 0 0 0 4.6 0 0	0 6.9 0 4.6 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 6.8	0 0 0 0 0 0 0
	g) Remove a) b) c) d) e) f) g) Dock H a) b) c)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters	20 15 95 15 15 15 15 20 10 5 145 10	1A H T L - 1A H T L - 1A H T L 1A H T L - 1A H T L - 1A H T NL	2	1.5	0.5		0 0 0 0 0 0 12 0 0	6.1 0 0 0 0 4.6 0 0 0	0 6.9 0 4.6 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 6.8	0 0 0 0 0 0 0
	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM	20 15 95 15 15 15 15 20 10 5 145 10 15 20 30	1A H T L - 1A H T L - 1A H T L 1A H T L - 1A H T NL		1.5	0.5		0 0 0 0 0 0 12 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	0 0 0 0 0 0 0 0
	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask	20 15 95 15 15 15 15 20 10 5 145 10 15 20 10 5	1A H T L - 1A H T L - 1A H T L 1A H T L - 1A H T L - 1A H T NL	2	1.5	0.5		0 0 0 0 0 0 0 12 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 6.8	0 0 0 0 0 0 0 0 0
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	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module	20 15 95 15 15 15 15 20 10 5 145 10 15 20 30 15 20 30 15 15 10 15 10 10 10 10 10 10 10 10 10 10	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL - 5 HH		1.5	0.5		0 0 0 0 0 0 0 12 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 6.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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29)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) given i) Install s	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover	20 15 95 15 15 15 15 20 10 5 145 10 15 20 30 15 20 30 15 20 30 15 40 40 40 40 40 40 40 40 40 40	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL - 5 HH		1.5	0.5		0 0 0 0 0 0 12 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 6.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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29)	g) Remove a) b) c) d) e) f) g) Dock He a) b) c) d) e) f) gs h) i) Install s a) b) c) d)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig	20 15 95 15 15 15 15 20 10 5 145 10 15 20 30 15 20 30 15 20 30 15 20 30 15 5 10 5 10 5 10 5 10 10 10 10 10 10 10 10 10 10	1A HTL - 1A HTL - 1A HTL 1A HTL - 1A HTNL	2	1.5	0.5	0.2	0 0 0 0 0 0 0 12 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 6.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
29)	g) Remove a) b) c) d) e) f) g) Dock He a) b) c) d) e) f) gs h) i) Install s a) b) c) d)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection	20 15 95 15 15 15 15 10 10 15 20 30 15 20 15 10 5 15 10 10 5 15 10 10 10 5 115 10 10 10 10 10 10 10 10 10 10 10 10 10	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL 1A HTNL 1A HTNL	2	1.5	0.5	0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 6.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
29)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) for a) b) c) d) e) f) g) h) i) Install s a) b) c) d) ee	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig	20 15 95 15 15 15 15 16 20 10 5 145 10 15 20 15 20 10 5 15 20 15 10 10 5 15 10 10 5 115 10 10 10 10 10 10 10 10 10 10 10 10	1A HTL - 1A HTL - 1A HTL 1A HTL - 1A HTNL	2	1.5	0.5	0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
29)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) h) i) Install s a) b) c) d) e f)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover over the port in the module	20 15 95 15 15 15 15 10 10 15 20 30 15 20 15 10 5 15 10 10 5 15 10 10 10 5 115 10 10 10 10 10 10 10 10 10 10 10 10 10	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL 1A HTNL 1A HTNL	2	1.5		0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
29)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) h) i) Install s a) b) c) d) e) f) gy	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec	20 15 95 15 15 15 15 16 20 10 5 145 10 15 20 15 20 15 10 15 20 15 10 10 5 15 15 15 15 15 15	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL	2	1.5		0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
30)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) h) i) Install s a) b) c) d) e) f)	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials	20 15 95 15 15 15 15 10 10 15 20 30 15 20 15 10 5 15 10 10 5 15 10 10 10 5 15 15 15 15 15 15 15 15 15 15	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL	2	1.5		0.2	0 0 0 0 0 0 12 0 0 0 0 0 4.3 0 0 0 0 0 0 4.3 0 0	6.1 0 0 0 0 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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31a) 31) 31) 31) 32) 33) 34) 35) 36)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) h) i) Install s a) b) c) d) e) f) gy h) ii Install s a) b c d) e f) gy h ti Lift trar Survey	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transfer cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transfer cask to Cask Handling Building via HCT nloading cell shield doors and position transport cask under jib crane transport cask lid sport cask and transfer to maintenance and wipedown transport cask	20 15 95 15 15 15 15 16 20 10 5 145 10 15 20 30 15 20 10 5 15 10 10 90 10 5 15 15 15 15 15 15 15 15 15 15 15 15 1	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL 1A HTNL 1A HTNL 1A HTNL	2	1.5		0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
31a) 31) 31a) 32) 33) 34) 35) 36) 37)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) h) ii) Install s a) b) c) d) e) f) gy h) iii Install s a) b) c) d) e f) gy h iii Install s a) b c) d) e f) gy h iii Install s ai b c) di e fi gy h Install s ai b c di e Install s ai c di	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transfer cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations transfer cask lid sport cask and transfer to maintenance and wipedown transport cask sport cask and place on railcar	20 15 95 15 15 15 15 16 10 10 5 145 20 30 15 20 10 5 15 10 10 90 10 5 5 15 15 15 15 15 15 10 70 10 15 15 20 10 36.5 1440 120 30 60 60 60	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL 1A HTNL 1A HTNL 1A HTNL	2	1.5		0.2	0 0 0 0 0 0 0 12 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
31a) 31) 31a) 32) 33) 34) 35) 36) 37)	g) Remove a) b) c) d) e) f) g) Dock H a) b) c) d) e) f) g) h) ii) Install s a) b) c) d) e) f) gy h) iii Install s a) b) c) d) e f) gy h iii Install s a) b c) d) e f) gy h iii Install s ai b c) di e fi gy h Install s ai b c di e Install s ai c di	HP survey to verify dose rates e transfer cask lid Move tools to work platform HP survey of lid Position stick crane Rig the lid for lifting using the local stick crane Remove and store nuts Lift the transfer cask lid and move it to the storage stand Security inspection of the interior of the transfer cask CT with HSM and push DPC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask Engage ram and push DPC into module Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transfer cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transfer cask to Cask Handling Building via HCT nloading cell shield doors and position transport cask under jib crane transport cask lid sport cask and transfer to maintenance and wipedown transport cask	20 15 95 15 15 15 15 16 20 10 5 145 10 15 20 30 15 20 10 5 15 10 10 90 10 5 15 15 15 15 15 15 15 15 15 15 15 15 1	1A HTL - 1A HTL - 1A HTL - 1A HTL - 1A HTNL 1A HTNL 1A HTNL 1A HTNL	2	1.5		0.2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 6.9 0 4.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

39)	Release	e railcar for shipment	60	-			0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	70.0				167	91	64	0	18	11

Horiz	ont	al D	PC	s - DPCs in Horizontal Standardized Overpacks on pad	Duration (Minutes)	Dose	М	Duration R H		ction S Q	М	R	Task H	Dose O	S	Q
0)	Pla	an c	ıf t	he Day and Safety Meeting	30		IVI	КП	U	3 Q	IVI	K	П	U	3	Q
,		a)		Plan of the Day Meeting	15	-					0	0	0	0	0	0
		b)		Safety briefing	10	-					0	0	0	0	0	0
		c)		Transportation to work site	5	-					0	0	0	0	0	0
1)	Re			transport cask on railcar at Cask Handling Building	145										<u> </u>	<u> </u>
		a)	_	dentify SNF shipment brought from yard	5	-					0	0	0	0	0	0
	-	b)	_	Security team sent to railbay door	15	-					0	0	0	0	0	0
		c) d)	_	Send operators to railbay door Stage work team to railbay	15 15	-					0	0	0	0	0	0
		e)	_	Den railbay door	5	-					0	0	0	0	0	0
		f)	_	Position SNF shipment in the railbay	15	_					0	0	0	0	0	0
		g)	_	Security inspection of the SNF shipment and tug	15	3 V T				0.5	0	0	0	0	3.7	0
		h)	_	HP survey of SNF shipment	15	3 V T		0.5			0	0	1.8	0	0	0
		i)	I	nspection of tamper proof seals	10	3 V T				0.1	0	0	0	0	0.7	0
		j)	ŀ	Acceptance of SNF shipment	5	-					0	0	0	0	0	0
		k)	_	Decoupling of railcar and removal of the tug from the railbay	10	-					0	0	0	0	0	0
	<u> </u>	I)	_	Secure the railbay doors	5	-					0	0	0	0	0	0
	-	m)	_	Security team leaves	5	-					0	0	0	0	0	0
	+	n)	_	Operator leaves	5	-					0	0	0	0	0	0
21	Da	0)	_	Completes paperwork for step #1	5	-					0	0	0	0	0	0
2)	Ke	-	_	impact limiters and place in temporary storage Mobilize crew (mechanics, riggers, crane operator, etc.)	195	-					0	0	0	0	0	0
		a) b)	_	Select and inspect rigging for impact limiters on the SNF shipment	5	_					0	0	0	0	0	0
	1	c)	_	Rig the lifting devices to the first impact limiter	5	1A V T		2 2			0	2.5	2.5	0	0	0
	1	d)	_	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2 2			0	2.5	0	0	0	0
	t	e)	_	Remove and store bolts holding on the first impact limiter	30	1A V T	2	-			15	0	0	0	0	0
	T	f)	_	Remove first impact limiter and place on storage stand	10	1A V T	†	1			0	2.5	0	0	0	0
	T	g)	_	Remove rigging and reposition on second impact limiter	5	1A V T	t	1			0	1.3	0	0	0	0
	T	h)	_	Reposition manlift and scaffolding	5	1A V T					0	0	0	0	0	0
		i)	_	Remove and store bolts holding on the second impact limiter	30	1A V T	2				15	0	0	0	0	0
		j)	F	Remove second impact limiter and place on storage stand	10	1A V T		1			0	2.5	0	0	0	0
		k)	_	Remove and store bolts for personnel barrier	30	3 V T	0.2				4.4	_	0	0	0	0
		I)	_	Rig the personnel barrier	15	3 V T		1 1			0	11	11	0	0	0
	<u> </u>	m)	_	ift personnel barrier and move to storage location	10	3 V T					0	0	0	0	0	0
		n)	-	Remove tie-down straps from SNF shipment	10	3A V T	0.4				2.3		0	0	0	0
	-	0)	_	Rig Tie-Down straps and move to storage location	5	3A V T		1			0	2.8	0	0	0	0
21	C+	p)		nspect transport cask for damage and conduct HP survey	15	3 V T		2			0	0	22	0	0	0
3)	St	age a)		prizontal Cask Transporter (HCT) in truck bay Open truck bay door	60	-					0	0	0	0	0	0
		a) b)	_	Position HCT in truck bay	30	-					0	0	0	0	0	0
		c)	_	Close truck bay door	15	_					0	0	0	0	0	0
4)	Ur			nd lift transport cask off of railcar and downend on HCT	75							†				<u> </u>
	T.	a)		Select the appropriate lifting block for the transport cask	5	-					0	0	0	0	0	0
		b)	_	Secure lifting block to transport cask trunnions	5	2A V T		2			0	3.3	0	0	0	0
		c)	ι	Jpend transport cask	30	-					0	0	0	0	0	0
		d)	L	ift transport cask off railcar	15	-					0	0	0	0	0	0
		e)	_	Move transport cask to HCT	10	-					0	0	0	0	0	0
	<u> </u>	f)	_	Downend transport cask on HCT	10	-					0	0	0	0	0	0
4a)	Re	-	_	railcar from railbay	60										-	<u> </u>
	+	a)	_	Open railbay door	5	-					0	0	0	0	0	0
		b) c)		Railyard tug connects to railcar Railyard tug removes railcar from railbay	10 10	-					0	0	0	0	0	0
		d)	_	Railyard tug connects to next railcar	15	_					0	0	0	0	0	0
		e)		Railyard tug repositions next railcar in railbay	10	_					0	0	0	0	0	0
		f)		Railyard tug leaves railbay and railbay door is closed	10	-					0	0	0	0	0	0
4b)	Se	cur	_	ransport cask on HCT	40											
		a)	F	Position HCT near seismic restraint tie-downs	15	-					0	0	0	0	0	0
		b)	I	nstall seismic restraint tie-downs	15	-					0	0	0	0	0	0
		c)		QC Hold Point Inspection	10	-					0	0	0	0	0	0
4c)	Pla	an c	_	he Day and Safety Meeting	30										<u></u>	└
	-	a)	_	Plan of the Day Meeting	15	-					0	0	0	0	0	0
	-	b)	_	Safety briefing	10	-					0	0	0	0	0	0
5)	T-	c)	_	Transportation to work site transport cask to HSM on pad via HCT	5 120	-					0	0	0	0	0	0
اد	+ır	ansi a)	_	QC Hold Point Inspection	15	_					0	0	0	0	0	0
	1	a) b)	_	Open the truck bay door	15	-					0	0	0	0	0	0
		c)	_	Fransfer the transport cask to HSM on the pad via HCT	90	-					0	0	0	0	0	0
5a)	Pr	-,	_	ion of Horizontal Storage Module (HSM)	120							1		Ť		Ť
	Ť	a)		Stage equipment near HSM	15	-					0	0	0	0	0	0
		b)	_	Place and align Theodolite heads	30	-					0	0	0	0	0	0
		c)	_	Rig crane to HSM port cover	15	2C H T L		2			0	0.8	0	0	0	0
		d)	_	Use manlift to remove nuts on mounting studs	15	1A H T L	2				9.2	0	0	0	0	0
	1	e)		Post radiation zone signs and barriers	10	-	<u> </u>				0	0	0	0	0	0
	-	f)		Remove HSM port cover and place in storage location	20	1AHTL	_	1			0	6.1	0	0	0	0
۲,	-	g)	_	HP survey to verify dose rates	15	1A H T L		1.5			0	0	6.9	0	0	0
6)	KE		_	transport cask lid	90							0	0	0	0	_
	-	a) b)	_	Move tools to work platform HP survey of lid including gas sampling	15 10	1A H T L		2			0	0	6.1	0	0	0
	+	c)	_	Position stick crane	15	- TUILF				\vdash	0	0	0.1	0	0	0
	\vdash	d)	_	Rig the lid for lifting using the local stick crane	15	1A H T L		2			0	9.2	0	0	0	0
	1	e)	_	Remove and store nuts	20	1AHTL	2	-			12	0	0	0	0	0
	t	f)	_	Lift the transport cask lid and move it to the storage stand	10	-	Ē				0	0	0	0	0	0
		g)		Security inspection of the interior of the transport cask	5	1A H T NL				0.5	0	0	0	0	6.8	
7)	Do	<u> </u>		T with HSM and push DPC into module	145							1				Ť
•	T	a)		Position spotters	10	-					0	0	0	0	0	0
		b)	_	Move HCT into position	15	-					0	0	0	0	0	0
		c)	(Check alignment	20	-					0	0	0	0	0	0
			T.	Dock HCT to HSM	30	-					0	0	0	0	0	0
		d) e)	_	Remove pushing port in base of transport cask	15	5 H H	2		-		4.3		0	0	0	0

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	f)	Engage ram and push DPC into module	20	-					() ()	0	0	0	0
	g)	Withdraw the ram	15	-					() ()	0	0	0	0
	h)	Back the HCT away from the module	10	-					() ()	0	0	0	0
	i)	QC Hold Point Inspection	10	1A H T NL				0	.2 () ()	0	0	0	5.4
8)	Install	seismic restraints and HSM port cover	90												
	a)	Retrieve the seismic restraints from HCT	10	-					() ()	0	0	0	0
	b)	Reach into module and install the seismic restraints	5	1A H T NL	1				1	4 ()	0	0	0	0
	c)	QC Hold Point Inspection	5	1A H T NL				0	.2 () ()	0	0	0	2.7
	d)	Pick the HSM port cover still attached to the lifting rig	15	-					() ()	0	0	0	0
	e)	Position the HSM port cover over the port in the module	15	5 H H		1			() 2	.1	0	0	0	0
	f)	Install the nuts on the studs and torque to spec	15	5 H H	2				4	3 ()	0	0	0	0
	g)	HP survey of area	15	5 H H			0.5		() ()	1.1	0	0	0
	h)	Remove radiation zone markers and remove all materials	10	-					() ()	0	0	0	0
9)	Install	transport cask lid	70												
	a)	Security inspection of transport cask to verify lack of contraband	10	-					() ()	0	0	0	0
	b)	Pick the transport cask cover from the still attached to the lifting rig	15	-					() ()	0	0	0	0
	c)	Position the transport cask cover on the transport cask	15	-					() ()	0	0	0	0
	d)	Install the nuts on the studs and torque to spec	20	-					() ()	0	0	0	0
	e)	QC Hold Point Inspection	10	-					() ()	0	0	0	0
		Total Hours of Canister Handling Operations	21.2												
9a)	Turnov	ver to Operations	1440												
		transport cask to Cask Handling Building via HCT	120	-					() ()	0	0	0	0
10a)	Plan of	f the Day and Safety Meeting	30	-					() ()	0	0	0	0
11)	Lift tra	nsport cask and transfer to maintenance	60	-					() ()	0	0	0	0
11a)	survey	and wipedown transport cask	60	-					() ()	0	0	0	0
11b)	Reposi	tion empty railcar	60	-					() ()	0	0	0	0
12)	Lift tra	nsport cask and place on railcar	60	-					() ()	0	0	0	0
13)	Install	impact limiters on transport cask	120	-					() ()	0	0	0	0
14)	Release	e railcar for shipment	60	-					() (כ	0	0	0	0
		Total Hours of All Cask Handling Operations	54.7						8	0 4	7	51	0	11	8.2

		DDCs in underground siles	Duration	Dose	Dur	ation	Fract	ion				Task	Dose		
0)		- DPCs in underground silos	(Min)		M R	Н	0	S (Q	M	R	Н	0	S	Q
-,		the Day and Safety Meeting	30												0
	a) b)	Plan of the Day Meeting Safety briefing	15 10	-					\dashv	0	0	0	0	0	0
	c)	Transportation to work site	5	-					\dashv	0	0	0	0	0	0
1)		e transport cask on railcar at Cask Handling Building	145												
	a)	Identify SNF shipment brought from yard	5	-						0	0	0	0	0	0
	b)	Security team sent to railbay door	15	-					_	0	0	0	0	0	0
	c)	Send operators to railbay door	15	-					_	0	0	0	0	0	0
	d) e)	Stage work team to railbay Open railbay door	15 5	-					\dashv	0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15						\dashv	0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug	15	3 V T			0	.5	\dashv	0	0	0	0	5.5	0
	h)	HP survey of SNF shipment	15	3 V T		0.5				0	0	5.5	0	0	0
	i)	Inspection of tamper proof Seals	10	3 V T			0	.1		0	0	0	0	0.7	0
	j)	Acceptance of SNF shipment	5	-					_	0	0	0	0	0	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10	-					\dashv	0	0	0	0	0	0
	l) m)	Secure the railbay doors Security team leaves	5	-					\dashv	0	0	0	0	0	0
	n)	Operator leaves	5	-					\dashv	0	0	0	0	0	0
	0)	Completes paperwork for step #1	5	-					7	0	0	0	0	0	0
2)	Remov	e impact limiters and place in temporary storage	195												
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the transport cask	5	-					_	0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T	2	2			\dashv	0	2.5	2.5	0	0	0
	d)	Position manlifts and temporary scaffolding near transport cask	5 30	1A V T	2				\dashv	0 15	2.5	0	0	0	0
	e) f)	Remove and store bolts holding on the first impact limiter Remove first impact limiter and place on storage stand	10	1A V T	1				\dashv	0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T	1			+	\dashv	0	1.3	0	0	0	0
	h)	Reposition manlift and scaffolding	5	1A V T					\exists	0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2				力	15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T	1					0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2				\perp	4.4	0	0	0	0	0
	l)	Rig the personnel barrier	15	3 V T	1	1		\perp	\dashv	0	11	11	0	0	0
	m) n)	Lift personnel barrier and move to storage location Remove tie-down straps from transport cask	10 10	3 V T	0.4			+	\dashv	0 2.3	0	0	0	0	0
	0)	Rig tie-down straps and move to storage location	5	3A V T	1				\dashv	0	2.8	0	0	0	0
	p)	Inspect transport cask for damage and conduct HP survey	15	3 V T	 	2			\dashv	0	0	22	0	0	0
3)	Upend	and lift transport cask off of railcar and place on unloading cell transfer cart	120												
	a)	Select the appropriate lifting block for the transport cask	5	-						0	0	0	0	0	0
	b)	Secure lifting block to transport cask Trunnions	10	2A V T	2				_	0	6.7	0	0	0	0
	c)	Upend transport cask	30	-					_	0	0	0	0	0	0
	d)	Lift transport cask off railcar	30	-					\dashv	0	0	0	0	0	0
	e) f)	Reposition transport cask Place transport cask on unloading cell transfer cart	30 15	-					\dashv	0	0	0	0	0	0
3a)		race transport cask on unloading centralister care	60									-	1		-
	a)	Open railbay door	5	-						0	0	0	0	0	0
	b)	Railyard tug connects to railcar	10	-						0	0	0	0	0	0
	c)	Railyard tug removes railcar from railbay	10	-						0	0	0	0	0	0
	d)	Railyard tug connects to next railcar	15	-					_	0	0	0	0	0	0
	e)	Railyard tug repositions next railcar in railbay	10	-					_	0	0	0	0	0	0
4)	f)	Railyard tug leaves railbay and railbay door is closed and remove transport cask lid using jib crane	10 85	-						0	0	0	0	0	0
4)	a)	Move tools to work platform	5	_						0	0	0	0	0	0
	b)	HP survey of lid Including gas sampling	15	2A V T		1			\dashv	0	0	5	0	0	0
	c)	Remove and store nuts	30	2A V T	1					10	0	0	0	0	0
	d)	Rig the lid for lifting using the local jib crane	15	2A V T	1.5	5				0	7.5	0	0	0	0
	e)	Lift the transport cask lid and move it to the storage stand													0
	f)	Security inspection of the interior of the transport cask	10	-						0	0	0	0	0	<u> </u>
4a)			10	2 V T			0	.2			0	0	0	5	0
l	٦١	transport cask and transfer cart seismically	10 40				0	.2		0	0	0	0	5	0
	a) b)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system	10 40 15	- 2 V T			0	.2		0 0	0	0	0	5	0
	b)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart	10 40 15 15				0	.2		0 0 0	0 0	0 0 0	0 0 0	5 0 0	0 0 0
4b)	b) c)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system	10 40 15				0	.2		0 0	0	0	0	5	0
4b)	b) c)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection	10 40 15 15 10				0	.2		0 0 0	0 0	0 0 0	0 0 0	5 0 0	0 0 0
4b)	b) c) Plan of a) b)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing	10 40 15 15 10 30 15				0	.2		0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	5 0 0 0 0	0 0 0 0 0 0
	b) c) Plan of a) b) c)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site	10 40 15 15 10 30 15 10 5				0	.2		0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	5 0 0 0	0 0 0 0
	b) c) Plan of a) b) c) Attach	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC	10 40 15 15 10 30 15 10 5 70	- - - -			0	.2		0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0
	b) c) Plan of a) b) c) Attach a)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack	10 40 15 15 10 30 15 10 5 70	- - - -			0	.2		0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0	0 0 0 0 0 0
	b) c) Plan of a) b) c) Attach a) b)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position	10 40 15 15 10 30 15 10 5 70	- - - - - - 2AVT	0.5			.2		0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
	b) c) Plan of a) b) c) Attach a)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister	10 40 15 15 10 30 15 10 5 70	- - - -	0.5				D.1	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0	0 0 0 0 0 0
	b) c) Plan of a) b) c) Attach a) b) c)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position	10 40 15 15 10 30 15 10 5 70 15 15	- - - - - - 2A V T 2 V T).1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2.5	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0
	b) c) Plan of a) b) c) Attach a) b) c) d) e)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection	10 40 15 15 10 30 15 10 5 70 15 15 10 10 15 10 10 15 10 10 10	- - - - - - 2A V T 2 V T).1	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2.5	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
5)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a)	Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection The Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site Iifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell	10 40 15 15 10 30 15 10 5 70 15 15 10 60 50	- - - - - - 2A V T 2 V T).1	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2.5 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a) b)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors	10 40 15 15 10 30 15 10 5 70 15 15 10 60 50 10	- - - - - - 2A V T 2 V T).1	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 2.5 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0
5)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a) b) Stage 6	Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors empty transfer cask on receiving cell transfer cart	10 40 15 15 10 30 15 10 5 70 15 15 10 60 50 10 90	- - - - - 2AVT 2VT 2VT).1	0 0 0 0 0 0 0 0 0 0 0 0 25 0 0	0 0 0 0 0 0 0 0 2.5 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a) b) Stage 6 a)	Reposition transfer cart near seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors empty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use	10 40 15 15 10 30 15 10 5 70 15 15 10 60 50 10 90	- - - - - 2AVT 2VT 2VT).1	0 0 0 0 0 0 0 0 0 0 0 25 0 0	0 0 0 0 0 0 0 0 2.5 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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5)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a) b) f) Positio a) b) c) d) e) f) Positio a) b) c) e) f) Positio a)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on receiving cell transfer cart Stage tools on top of the transfer cask Unbolt transfer cask lid Rig the cask lid to the VCT hoist Hoist lid and retain on VCT n empty transfer cask in receiving cell using motorized cart Close the shield doors Transfer empty transfer cask into receiving cell using motorized cart Close the shield doors QC Hold Point Inspection n shielded transfer sleeve cart over unloading cell	10 40 15 15 10 30 15 10 5 70 15 15 10 10 60 50 10 90 15 15 10 30 10 10 45 15 15 10 5 40).1 ————————————————————————————————————	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5) 6) 7)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a) b) c) d) e) f) Positio a) b) c) e) e)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on receiving cell transfer cart Stage tools on top of the transfer cask Unbolt transfer cask lid Rig the cask lid to the VCT hoist Hoist lid and retain on VCT n empty transfer cask in receiving cell using motorized cart Close the shield doors Transfer empty transfer cask into receiving cell using motorized cart Close the shield doors QC Hold Point Inspection	10 40 15 15 10 30 15 10 5 70 15 15 10 60 50 10 90 15 15 15 10 30 10 45 15 15 15 15 15 15 10 30 10 10 45 15 15).1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5) 6) 7)	b) c) Plan of a) b) c) Attach a) b) c) d) e) Positio a) b) c) d) e) f) Positio a) b) c) e) f) Positio a) b) c) a)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on receiving cell transfer cart Stage tools on top of the transfer cask Unbolt transfer cask lid Rig the cask lid to the VCT hoist Hoist lid and retain on VCT n empty transfer cask in receiving cell using motorized cart Close the shield doors Transfer empty transfer cask into receiving cell using motorized cart Close the shield doors QC Hold Point Inspection n shielded transfer sleeve cart over unloading cell Inspect transfer sleeve cart	10 40 15 15 15 10 30 15 10 5 70 15 15 10 10 60 50 10 90 15 15 15 10 30 10 10 45 15 15 10 5 40 15).1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

	2)	Lower shield closus heist and grapple DBC Lifting Lug	30	<u> </u>	l l			Τ_0	0	Τ_0	0	0	Τ ο
	a) b)	Lower shield sleeve hoist and grapple DPC Lifting Lug HP survey	15	-				0	_	_	_		0
11)		PC into shield sleeve	75							1			1
	a)	Raise DPC into shield sleeve	60	-				0	0	0	0	0	0
		HP survey	15	-				0	0	0	0	0	0
12)		n shielded transfer sleeve cart over transfer cask in receiving cell	35						4	4	4	<u> </u>	4_
	a)	Position shielded transfer sleeve cart over transfer cask in receiving cell	10	-				0		_			0
		HP survey QC Hold Point Inspection	15 10	-				0		_			0
13)		DPC into empty transfer cask, release grapple, and retract hoist	45	-					+ 0	+ 0	10	+ 0	10
13)	a)	Lower DPC into empty transfer cask, release grapple, and retract hoist	30	-				0	0	0	0	0	0
		HP survey	15	1D V C		0.2		0		_	_		
14)		e lifting lug from DPC	35						+	1		1	1
		HP survey	10	2 V T		0.2		0	0	5	0	0	0
	b)	Stage tools on top of the transfer cask	5	-				0	0	0	0	0	0
		Remove bolts and rig lifting lug	10	2 V T	0.3 0.2			7.5	5 5	0	0	0	0
		Remove the lifting lug from the DPC	10	-				0	0	0	0	0	0
14a)		the DPC and the transfer cask seismically	40						\bot	\bot	\perp		
		Position seismic restraints	15	-				0		_	_		_
		Secure seismic restraints	15	-				0		_			
146\		QC Hold Point Inspection the Day and Safety Meeting	10 30	-				0	0	0	0	0	0
140)		Plan of the Day Meeting	15	-				0	0	0) 0	0	0
		Safety briefing	10	-				0		_	_		0
		Transportation to work site	5					0		_			0
15)		transfer cask and transfer to underground storage cell using VCT	30						+	+	 	+	+
,	a)	HP survey	10	-				0	0	0	0	0	0
	b)	Open receiving cell shield doors	10	-				0		_			_
	c)	Transfer transfer cask out of receiving cell using motorized cart	10	<u> </u>			1	0	0	0	0	0	0
16)	Install	ransfer cask lid	60										
	a)	Position VCT with transfer cask lid at transfer cask	15	-				0	0	0	0	0	0
	b)	Lower transfer cask lid into position	10	-				<u> </u>	Щ	<u> </u>	Щ	<u> </u>	<u> </u>
		Install bolts and torque	20	2A V T	1.5		-	10	_		_	_	0
	-	QC Hold Point Inspection	10	2A V T			0.1	+	_		_		0.3
10)		Clean out tools and leave the top of the DPC	5	-				0	0	0	0	0	0
18)		transfer cask and transfer to pad using VCT Rig VCT to lift transfer cask	80	2437	2			0	6.7	7 0	0	0	0
		Drive to storage pad location	10 70	2A V T	2			0	_		_		-
19)		mating device on Cavity Enclosure Container (CEC)	230	-					+ 0	+ 0	- 0	+ 0	+ 0
13)	a)	Position crane and rig to the underground storage cell cover	30	-				0	0	0	0	0	0
	b)	Move cover to the storage stand	15	-				0	_	_	_		
	c)	Transport the docking collar and mating device to the site.	30	-				0	_				0
	d)	Inspect CEC	15	-				0	0	0	0	0	0
	e)	Rig the docking collar to the crane	10	-				0	0	0	0	0	0
	f)	Position the docking collar on CEC	30	-				0	0	0	0	0	0
	g)	Attach docking collar to the CEC	15	-				0	0	0	0	0	0
	h)	Rig the mating device to the crane	10	-				0	0	_	_		0
	i)	Position the mating device on CEC	30	-				0	_	_	_		0
	j)	Attach mating device to the CEC	15	-				0	_	0			0
	k)	Test mechanism	20	-				0	_	0	_	0	0
20)		QC Hold Point Inspection	10	-				0	0	0	0	0	0
20)		ansfer cask to underground storage cell and remove rigging Position VCT at vault	25 5	-				0	0	0) 0	0	0
		Dock transfer cask with underground storage cell	10	4 V S	2			37	_	_	_		
		Remove rigging	10	-				0	_		_		
21)		to VCT for vertical lift	45							1			
		HP survey	15	-				0	0	0	0	0	0
	b)	Bolt lifting cleats to DPC	15	1B V C	1			34	1 0	0	0	0	0
		Attach rigging to DPC	15	1C V C	0.5			0	15	0	0	0	0
22)		e transfer cask base using docking collar	30						ı				
		Remove transfer cask base	30	4 \ / C					\perp	4			+-
23)		DPC into underground storage cell		4 V S	0.3			17	7 0	0	0	0	0
			70		0.3								
		Lower DPC into empty storage cell	60		0.3			0	0	0	0	0	0
241	b)	Lower DPC into empty storage cell QC Hold Point Inspection	60 10		0.3				0	0	0	0	
24)	b) Access	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging	60 10 60		0.3			0	0 0	0	0 0	0 0	0
24)	b) Access a)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey	60 10	-	0.3			0	0 0	0 0	0 0	0 0	0
24)	b) Access a) b)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging	60 10 60 15	-	0.3			0 0	0 0	0 0	0 0 0	0 0 0 0	0 0
24)	b) Access a) b) c)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask	60 10 60 15 10	-				0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0	0 0 0
24)	b) Access a) b) c) d)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC	60 10 60 15 10	- - - - 1B V C	0.3			0 0 0 0	0 0 0 0 0 10 10	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0
24)	b) Access a) b) c) d) e) Withdr	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base	60 10 60 15 10 15 15 5 30	- - - - 1B V C	0.3			0 0 0 0 0 0 34	0 0 0 0 10 10 10 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0
	b) Access a) b) c) d) e) Withdr a)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging	60 10 60 15 10 15 15 5 30	- - - - 1B V C -	0.3			0 0 0 0 0 0 34 0	0 0 0 0 10 10 4 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base	60 10 60 15 10 15 15 5 30 15	- - - - 1B V C	0.3			0 0 0 0 0 0 34	0 0 0 0 10 10 4 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell	60 10 60 15 10 15 15 5 30 15 15	- - - - 1B V C -	0.3			0 0 0 0 0 34 0	0 0 0 10 10 4 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask	60 10 60 15 10 15 15 5 30 15 15 45		0.3			0 0 0 0 0 0 0 0 344 0	0 0 0 10 10 4 0 0 0 8 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell	60 10 60 15 10 15 15 5 30 15 15 45 15	- - - - 1B V C -	0.3			0 0 0 0 0 0 0 3444 0 0 0 0 0 0	0 0 0 10 10 1 1 0 0 8 0			0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell	60 10 60 15 10 15 15 5 30 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 344 0	0 0 0 10 10 1 1 0 0 8 0			0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15		0.3			0 0 0 0 0 0 0 344 0 0 0.8	0 0 0 1 0 1 0 1 0 0 8 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000		0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell	60 10 60 15 10 15 15 5 30 15 15 15 15 15	- - - 1B V C 1B V C - - 2C H T L	0.3			0 0 0 0 0 0 0 3444 0 0 0 0 0 0	0 0 0 10 10 1 0 8 0 8 0	00 00 00 00 00 00 00 00 00 00 00 00 00		0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install a)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15 15	- - - - 1B V C - - 2C H T L - 2C H T L	0.3			0 0 0 0 0 0 0 344 0 0 0.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 4 0 0 8 0 0 8 0 0 0 0 0 0 0 0 0 0 0 0	00 00 00 00 00 00 00 00 00 00 00 00 00		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install a) b)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 4 0 0 8 0 8 0 0 8 0	00 00 00 00 00 00 00 00 00 00 00 00 00		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install a) b) c)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 10 0 8 0 8 0 8 0 0 0 0 0	00 00 00 00 00 00 00 00 00 00 00 00 00		0 0 0 0 0 0 0 0 0	
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install (a) b) c) d)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 10 10 10 10 10 10 10 10 1	00 00 00 00 00 00 00 00 00 00 00 00 00		0 0 0 0 0 0 0 0 0	
25)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install (a) b) c) d) e) f)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations	60 10 60 15 10 15 15 5 30 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 34446 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 10 10 10 10 10 10 10 10 1	00 00 00 00 00 00 00 00 00 00 00 00 00		0 0 0 0 0 0 0 0 0 0	
25) 26) 27)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install (a) b) c) d) e) f)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations	60 10 60 15 10 15 15 5 30 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 344 0 0 0.8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 1 0 8 0 8 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27a)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install (a) b) c) d) e) f)	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15 15 15 15 15 15 15 1		0.3			0 0 0 0 0 0 0 344 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 4 0 8 0 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27b) 28)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install (a) b) c) d) e) f) Turnov Plan of Return	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting VCT to CHB	60 10 60 15 10 15 15 5 30 15 15 45 15 15 15 15 15 15 15 15 15 1		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27b) 28) 29)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install a) b) c) d) e) f) Turnov Plan of Return Open u	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Rig the storage cell cover Rig the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting VCT to CHB nloading cell shield doors and position transport cask under jib crane	60 10 60 15 10 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27b) 28) 29) 27)	b) Access a) b) c) d) e) Withdr a) b) c) Install a b) c) d) e) f) Turnov Plan of Return Open u Install t	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC awd DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting VCT to CHB Inloading cell shield doors and position transport cask under jib crane	60 10 60 15 10 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27b) 28) 29) 27) 30)	b) Access a) b) c) d) e) Withdr a) b) c) Install (e) f) Turnov Plan of Return Open u Install (Lift trail	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC awd DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting VCT to CHB nloading cell shield doors and position transport cask under jib crane transport cask lid insport cask and transfer to maintenance	60 10 60 15 10 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27b) 28) 29) 27) 30) 30a)	b) Access a) b) c) d) e) Withdr a) b) c) Install (a) b) c) f) Turnov Plan of Return Open u Install (Inst	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC aw DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting VCT to CHB nloading cell shield doors and position transport cask under jib crane transport cask lid isport cask and transfer to maintenance and wipedown transport cask	60 10 60 15 10 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
25) 26) 27) 27a) 27b) 28) 29) 27) 30) 30a)	b) Access a) b) c) d) e) Withdr a) b) Re-Rig a) b) c) Install (e) f) Turnov Plan of Return Open u Install (Lift trai Survey Reposit	Lower DPC into empty storage cell QC Hold Point Inspection top of DPC (by ladder inside transfer cask) and remove rigging HP survey Stage tools on top of the DPC inside of the transfer cask Remove rigging from DPC Remove lifting cleats Clean out tools and leave the top of the DPC awd DPC rigging and replace transfer cask base Withdraw DPC rigging Replace transfer cask base transfer cask to VCT and undock from underground storage cell Re-rig the transfer cask Undock from underground storage cell Back the VCT away from the underground storage cell underground storage cell cover Rig the storage cell cover Pick with crane and place on underground storage cell Bolt the cover down Remove rigging and reposition crane QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations the Day and Safety Meeting VCT to CHB nloading cell shield doors and position transport cask under jib crane transport cask lid insport cask and transfer to maintenance	60 10 60 15 10 15 15 15 15 15 15 15 15 15 15		0.3			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 10 10 10 10 10 10 10 10 10 10 1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

33)	Release	railcar for shipment	60	-		0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	70.6			176	68	54	0	11	2.8

			Duration	Dose	Du						Tas					
Horizo	ontal DP	Cs - DPCs in lifting frames in underground silos	(Min)		М	R	Н	0	S	Q	М	R	Н	0	S	Q
0)		the Day and Safety Meeting	30									-	-			
		Plan of the Day Meeting Safety briefing	15 10	-							0	0	0	0	0	0
	c)	Transportation to work site	5	_							0	0	0	0	0	0
1)		e transport cask on railcar at Cask Handling Building	145													
	a)	Identify SNF shipment brought from yard	5	-							0	0	0	0	0	0
		Security team sent to railbay door	15	-							0	0	0	0	0	0
		Send operators to railbay door Stage work team to railbay	15 15	-							0	0	0	0	0	0
		Open railbay door	5								0	0	0	0	0	0
		Position SNF shipment in the railbay	15	-							0	0	0	0	0	0
		Security inspection of the SNF shipment and tug	15	3 V T					0.5		0	0	0	0	5.5	0
		HP survey of SNF shipment	15	3 V T			0.5		_		0	0	5.5	0	0	0
		Inspection of tamper proof seals	10	3 V T					0.1		0	0	0	0	0.7	0
	j) k)	Acceptance of SNF shipment Decoupling of railcar and removal of the tug from the railbay	5 10	-							0	0	0	0	0	0
	l)	Secure the railbay doors	5	_							0	0	0	0	0	0
	m)	Security team leaves	5	-							0	0	0	0	0	0
		Operator leaves	5	-							0	0	0	0	0	0
		Completes paperwork for step #1	5	-							0	0	0	0	0	0
2)		e impact limiters and place in temporary storage	195 5								0	0	0	0	0	0
		Mobilize crew (mechanics, riggers, crane operator, etc.) Select and inspect rigging for impact limiters on the SNF shipment	5	_							0	0	0	0	0	0
		Rig the lifting devices to the first impact limiter	5	1A V T		2	2				0	2.5	2.5	0	0	0
		Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2	Ė				0	2.5	0	0	0	0
		Remove and store bolts holding on the first impact limiter	30	1A V T	2						15	0	0	0	0	0
		Remove first impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	0
		Remove rigging and reposition on second impact limiter Reposition manlift and scaffolding	5	1A V T		1					0	1.3	0	0	0	0
		Reposition manlift and scaffolding Remove and store bolts holding on the second impact limiter	30	1A V T	2						15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T	† <u> </u>	1					0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2						4.4	0	0	0	0	0
	I)	Rig the personnel barrier	15	3 V T		1	1				0	11	11	0	0	0
	m)	Lift personnel barrier and move to storage location	10	3 V T	0.4						0	0	0	0	0	0
		Remove tie-down straps from SNF shipment Rig tie-down straps and move to storage location	10 5	3A V T	0.4	1					2.3	0 2.8	0	0	0	0
		Inspect transport cask for damage and conduct HP survey	15	3 V T		1	2				0	0	22	0	0	0
3)		and lift transport cask off of railcar and place on transfer fixture	120								_	,				
		Select the appropriate lifting block for the transport cask	5	-							0	0	0	0	0	0
		Secure lifting block to transport cask trunnions	10	2A V T		2					0	6.7	0	0	0	0
		Upend transport cask Lift transport cask off railcar	30	-							0	0	0	0	0	0
	,	Move transport cask of francar Move transport cask to transfer fixture	30 30	-							0	0	0	0	0	0
		Downend transport cask on transfer fixture	15	_							0	0	0	0	0	0
3a)	Remov	e railcar from railbay	60													
		Open railbay door	5	-							0	0	0	0	0	0
		Railyard tug connects to railcar	10	-							0	0	0	0	0	0
	· ·	Railyard tug removes railcar from railbay Railyard tug connects to next railcar	10 15	-							0	0	0	0	0	0
		Railyard tug connects to next railcar Railyard tug repositions next railcar in railbay	10	-							0	0	0	0	0	0
		Railyard tug leaves railbay and railbay door is closed	10	-							0	0	0	0	0	0
4)		ransfer cask on upender using VCT	50													
		Move the VCT into position	5	-							0	0	0	0	0	0
		Grapple the transfer cask	5	-							0	0	0	0	0	0
		Pick the transfer cask Reposition the VCT at the upender in the transfer cell	15 15	-							0	0	0	0	0	0
		Place the transfer cask on the upender	10	-							0	0	0	0	0	0
5)		and hoist transfer cask lid and retain on VCT	70													
		Stage tools on top of the transfer cask	10	-							0	0	0	0	0	0
		Unbolt transfer cask lid	30	-							0	0	0	0	0	0
		Rig lid to the VCT hoist Lift lid to the storage position of the VCT	10 10	-							0	0	0	0	0	0
		Remove grapples and back VCT out of the transfer cell	10	_							0	0	0	0	0	0
5a)		transport cask and transfer cart seismically	40									<u> </u>				
	a)	Reposition transfer cart near seismic restraint system	15	-							0	0	0	0	0	0
_		Secure transport cask and transfer cart	15	-							0	0	0	0	0	0
,		QC Hold Point Inspection	10	-							0	0	0	0	0	0
5b)		the Day and Safety Meeting Plan of the Day Meeting	30 15	_							0	0	0	0	0	0
		Safety briefing	10	-							0	0	0	0	0	0
	b)	, ,		-							0	0	0	0	0	0
	-	Transportation to work site	5										1			
5c)	c) Load lif	ting frame into transfer cask using jib crane	85										ļ			
5c)	c) Load lif a)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart	85 15	-							0	0	0	0	0	0
5c)	c) Load lif a) b)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane	85 15 15	-							0	0	0	0	0	0
5c)	c) Load lif a) b) c)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask	85 15 15 15	- - -							0	0	0	0	0	0
5c)	c) Load life a) b) c) d)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask	85 15 15 15 15 10	- - - -							0	0	0	0	0	0
5c)	c) Load life a) b) c) d) e)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask	85 15 15 15	- - - -							0 0	0 0 0	0 0	0 0 0	0 0 0	0 0 0
	c) Load lif a) b) c) d) e) f)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask	85 15 15 15 10 10	- - - -							0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0
	c) Load lif a) b) c) d) e) f) Downe a)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane nd transfer cask on upender Secure transfer cask to upender	85 15 15 15 10 15 15 30	- - - - -							0 0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0
6)	c) Load lif a) b) c) d) e) f) Downe a) b)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane nd transfer cask on upender Secure transfer cask to upender Downend the transfer cask to the horizontal position	85 15 15 15 10 15 15 30 15	-							0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
6)	c) Load lif a) b) c) d) e) f) Downe a) b) Remove	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane nd transfer cask on upender Secure transfer cask to upender Downend the transfer cask to the horizontal position e transport cask lid	85 15 15 10 15 15 30 15 15 10	-							0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0
6)	c) Load lif a) b) c) d) e) f) Downe a) b) Remove	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane Ind transfer cask on upender Secure transfer cask to upender Downend the transfer cask to the horizontal position e transport cask lid Move tools to work platform	85 15 15 10 15 15 15 15 15 15 15 30 15 15 15 5				2				0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0
6)	c) Load lif a) b) c) d) e) f) Downe a) b) Remove a) b)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane nd transfer cask on upender Secure transfer cask to upender Downend the transfer cask to the horizontal position e transport cask lid Move tools to work platform HP survey of lid including gas sampling	85 15 15 10 15 15 15 15 15 15 15 15 15 15 15 15 15	-			2				0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0
6)	c) Load lif a) b) c) d) e) f) Downe a) b) Remove a) b) c)	ting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane Ind transfer cask on upender Secure transfer cask to upender Downend the transfer cask to the horizontal position e transport cask lid Move tools to work platform	85 15 15 10 15 15 15 15 15 15 15 30 15 15 15 5			2	2				0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0
6)	c) Load lif a) b) c) d) e) f) Downe a) b) Remove a) b) c) d) e)	Move lifting frame into transfer cask using jib crane Move lifting frame into position using a transfer cart Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask Lift docking collar and place on top of transfer cask Strap docking collar to top of transfer cask Remove the rigging and secure the jib crane Ind transfer cask on upender Secure transfer cask to upender Downend the transfer cask to the horizontal position Transport cask lid Move tools to work platform HP survey of lid including gas sampling Position jib crane	85 15 15 10 15 15 15 30 15 15 15 15 15 15 15 15 15 15 15	- - - 1A H T L	2	2	2				0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 9.2	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0

	1 ,		10	T 4 4 11 - 5 11	ı		0.0			Ι	Ι.	I = 4	1 0
7a)		Security inspection of the interior of the transport cask transport cask and Transfer Fixture seismically	10 40	1A H T NL			0.2	0	0	0	0	5.4	0
, .,		Position seismic restraints	15	-				0	0	0	0	0	0
	b)	Secure seismic restraints	15	-				0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
7b)	Plan of	the Day and Safety Meeting	30										
	a)	Plan of the Day Meeting	15	-				0	0	0	0	0	0
		Safety briefing	10	-				0	0	0	0	0	0
	· · ·	Transportation to work site	5	-				0	0	0	0	0	0
8)	Dock tr	ansfer sleeve on horizontal transfer cart with transport cask	75										
	a)	Position spotters	10	-				0	0	0	0	0	0
		Move transfer sleeve into position	10	-				0	0	0	0	0	0
		Align transport cask with transfer sleeve	15	-				0	0	0	0	0	0
		Dock transfer sleeve to transport cask	15	-				0	0	0	0	0	0
		Install retaining straps on transport cask trunnions	15	2A H T		1.5		0	12	0	0	0	0
		QC Hold Point Inspection	10	-				 0	0	0	0	0	0
9)		PC into lift frame inside transfer cask	75	F 11 11				4.2		_			_
		Remove pushing port in base of transport cask	15	5 H H	2			4.3	0	0	0	0	0
		Engage ram and push DPC into transfer sleeve	30	-				0	0	0	0	0	0
	<u> </u>	Withdraw the ram QC Hold Point Inspection	20 10	-				0	0	0	0	0	0
10\			30	-				U	0	U	0	0	U
10)		k horizontal transfer cart from transport cask	10	2A H T		0.2		0	1.1	0	0	0	0
		Remove retaining straps from transfer sleeve Pull horizontal transfer cart back	10	ZATI	-	0.2		0	0	0	0	0	0
				-	-						+		
11)	-,	Close shield door on transfer sleeve rizontal transfer cart onto turntable and rotate 180°	10 30	-				0	0	0	0	0	0
11)		Roll transfer cart onto turntable and rotate 180	10					0	0	0	0	0	0
	a) b)	Rotate turntable 180°	20	 		-		0	0	0	0	0	0
12)	-,	rizontal transfer cart to upending cell and dock with transfer cask on upender	45	-				U	U	U	U	U	U
14)		Unlock wheels and roll transfer cart to upending cell	10	_				0	0	0	0	0	0
		Dock transfer sleeve to transfer cask on upender	20	 				0	0	0	0	0	0
	-	Attach retaining straps to transfer cleeve trunnions	15	2A H T		0.5		0	4	0	0	0	0
13)		PC from transfer sleeve into lift frame in transfer cask	65	<u> </u>		5.5						5	"
/		Plug in hydraulic power pack on transfer cart	15	-				0	0	0	0	0	0
		Engage ram and push DPC into the lift frame in the transfer cask	30	-				0	0	0	0	0	0
		Withdraw the ram	10	-				0	0	0	0	0	0
		QC Hold Point Inspection	10	-				0	0	0	0	0	0
14)		k horizontal transfer cart	50					Ť		<u> </u>	Ť		Ť
,		Remove retaining straps from transfer cask	15	2A H T		0.2		0	1.6	0	0	0	0
	b)	Unplug hydraulic power pack on transfer cart	15	-	1	0		0	0	0	0	0	0
	c)	Undock transfer cart and remove	10	-				0	0	0	0	0	0
		QC Hold Point Inspection	10	-				0	0	0	0	0	0
15)		transfer cask	30										
	a)	Close shield door to upender cell	10	-				0	0	0	0	0	0
	b)	Upend the transfer cask	15	-				0	0	0	0	0	0
	c)	Set locking mechanism on upender	5	-				0	0	0	0	0	0
16)		id on transfer cask	85										
	a)	Open outer shield doors to upender cell	10	-				0	0	0	0	0	0
	b)	Position VCT at transfer cask on upender	15	-				0	0	0	0	0	0
	c)	Lower transfer cask lid into place using the VCT	15	-				0	0	0	0	0	0
	d)	Stage tools on manlift	10	-				0	0	0	0	0	0
	e)	Install bolts and torque	20	2A H T	1.5			16	0	0	0	0	0
	f)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
	g)	Move manlift away	5	-				0	0	0	0	0	0
16a)	Secure	transport cask and Transfer Fixture seismically	40										
	a)	Position seismic restraints	15	-				0	0	0	0	0	0
	b)	Secure seismic restraints	15	-				0	0	0	0	0	0
		QC Hold Point Inspection	10	-				0	0	0	0	0	0
16b)		the Day and Safety Meeting	30										
	 	Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b)	Safety briefing	10	-				0	0	0	0	0	0
	c)	Transportation to work site	5	-				0	0	0	0	0	0
17)		transfer cask and transfer to underground storage cell using VCT	90	24		_		_	<u> </u>	_	_	_	-
		Rig VCT to lift transfer cask	10	2A V T		2		0	6.7	0	0	0	0
		Open CHB doors Back the VCT out of the receiving cell	10			1		0	0	0	0	0	0
	c)	IDACK LIE VOI OULOI LIE IELEIVIIK LEII								0	U		0
	٧١	-	10	-						Λ	0	11	, ,
12)		Drive to storage pad location	10 60	-				0	0	0	0	0	0
18)	Install r	Drive to storage pad location mating device on Cavity Enclosure Container (CEC)	10 60 230	-				0	0		Ť		
18)	Install r	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover	10 60 230 30	-				0	0	0	0	0	0
18)	a) b)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand	10 60 230 30 15	-				0 0 0	0		0 0		
18)	a) b) c)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site.	10 60 230 30 15	- - -				0	0 0 0	0	0	0	0
18)	a) b) c) d)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC	10 60 230 30 15	- - -				0 0 0	0 0 0 0	0 0 0	0 0 0	0 0	0 0
18)	a) b) c) d) e)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane	10 60 230 30 15 30 15	- - - -				0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0 0
18)	a) b) c) d) e)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC	10 60 230 30 15 30 15 10	- - - -				0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0
18)	a) b) c) d) e) f)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC	10 60 230 30 15 30 15 10 30	- - - - -				0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
18)	a) b) c) d) e) f)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC	10 60 230 30 15 30 15 10 30 15	- - - - -				0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0
18)	a) b) c) d) e) f)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane	10 60 230 30 15 30 15 10 30 15	- - - - -				0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
18)	a) b) c) d) e) f)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC	10 60 230 30 15 30 15 10 30 15 10 30	- - - - -				0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
18)	a) b) c) d) e) f) g) h) i)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC	10 60 230 30 15 30 15 10 30 15 10 30 15	- - - - -				0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging	10 60 230 30 15 30 15 10 30 15 10 30 15 20	- - - - -				0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell	10 60 230 30 15 30 15 10 30 15 10 30 15 20	- - - - -				0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging	10 60 230 30 15 30 15 10 30 15 10 30 15 20 10	- - - - -	2			0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging	10 60 230 30 15 30 15 10 30 15 10 30 15 10 20 10 25	- - - - - - - - - -	2			0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c) Rig DPC	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging Cto VCT for vertical lift and hoist	10 60 230 30 15 30 15 10 30 15 10 30 15 10 20 10 25 5	- - - - - - - - - -	2			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c) Rig DPC	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging	10 60 230 30 15 30 15 10 30 15 10 30 15 10 25 5 10 10	- - - - - - - - - -	2			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c) Rig DPC a) b) b)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging C to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 30 15 10 45	- - - - - - - - - -	2			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c) Rig DPC a) b) b)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging to VCT for vertical lift and hoist HP survey	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45	- - - - - - - - - - - - - - - - - - -		0.5		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c) Rig DPC a) b) c)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging C to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45 10 10 45			0.5		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a b c d e f g h i j k l c c c Rig DPC a b c Remove	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC Attach rigging to DPC	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45 15 15 15					0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000
19)	Install r a) b) c) d) e) f) g) h) i) j) k) l) Dock tr a) b) c) Rig DPC a) b) c) Remove a) c) contact contact	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging C to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC Attach rigging to DPC e transfer cask base using docking collar	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45 15 15 15 15 15 15		1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging C to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC Attach rigging to DPC e transfer cask base using docking collar Remove transfer cask base	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45 10 10 45 15 15 30 30		1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging C to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC Attach rigging to DPC e transfer cask base using docking collar Remove transfer cask base DPC into underground storage cell	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45 15 15 15 15 15 17 17 17 18 18 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10		1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19)	Install r a)	Drive to storage pad location mating device on Cavity Enclosure Container (CEC) Position crane and rig to the underground storage cell cover Move cover to the storage stand Transport the docking collar and mating device to the site. Inspect CEC Rig the docking collar to the crane Position the docking collar on CEC Attach docking collar to the CEC Rig the mating device to the crane Position the mating device on CEC Attach mating device to the CEC Test mechanism QC Hold Point Inspection ansfer cask to underground storage cell and remove rigging Position VCT at underground storage cell Dock transfer cask with underground storage cell Remove rigging C to VCT for vertical lift and hoist HP survey Bolt lifting cleats to DPC Attach rigging to DPC e transfer cask base using docking collar Remove transfer cask base DPC into underground storage cell Lower DPC into empty storage cell	10 60 230 30 15 30 15 10 30 15 10 30 15 10 30 15 10 45 15 15 15 15 15 16 30 30 70 60		1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

TO16 Appendix D4 - Study 1 - Rad.xlsx

Stage tools on top of the PPC inside of the transfer cask 10							 	1						
Machine Mach		b)	Stage tools on top of the DPC inside of the transfer cask		-				0		0	0	0	0
Part Clean out tools and leave the top of the DPC S		c)		15	1B V C	0.3			0	10	0	0	0	0
Withdraw DPC rigging and replace transfer cask base 30		d)	-	15	1B V C	1			34	0	0	0	0	0
a) Withdraw DPC rigging 15		- /	'	5	-				0	0	0	0	0	0
b Replace transfer cask base	24)	Withdr	aw DPC rigging and replace transfer cask base	30										
Re-Rig transfer cask to VCT and undock from underground storage cell S		a)	Withdraw DPC rigging	15	-				0	0	0	0	0	0
a Re Righte transfer cask 15 2 1 0 0 0 0 0 0 0 0 0		b)	Replace transfer cask base	15	2CHTL	2			0.8	0	0	0	0	0
b) Undock from underground storage cell 15 2C H T	25)	Re-Rig	transfer cask to VCT and undock from underground storage cell	45										į
C Back the VCT away from the underground storage cell 15 - 0 0 0 0 0 0 0 0		a)	Re Rig the transfer cask	15	-				0	0	0	0	0	0
1 26 Install underground storage cell cover 15 -		b)	Undock from underground storage cell	15	2CHTL	2			0.8	0	0	0	0	0
A Rig the storage cell cover 15		c)	Back the VCT away from the underground storage cell	15	-				0	0	0	0	0	0
b) Pick with crane and place on underground storage cell 15	26)	Install	underground storage cell cover	80										
c) Bolt the cover Down 15 - 0		a)	Rig the storage cell cover	15	-				0	0	0	0	0	0
d Remove rigging and reposition crane 15		b)	Pick with crane and place on underground storage cell	15	-				0	0	0	0	0	0
C Hold Point Inspection 10 -		c)	Bolt the cover Down	15	-				0	0	0	0	0	0
f) HP survey 10 - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		d)	Remove rigging and reposition crane	15	-				0	0	0	0	0	0
Total Hours of Canister Handling Operations 38.1		e)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
27a) Turnover to Operations 1440 8 8 9 9 14 <		f)	HP survey	10	-				0	0	0	0	0	0
27b) Plan of the Day and Safety Meeting 30 - 0			Total Hours of Canister Handling Operations	38.1										1
28) Return VCT to CHB 120 - 0	27a)	Turnov	er to Operations	1440										1
29) Open unloading cell shield doors and position transport cask under jib crane 60 - 0 <	27b)	Plan of	the Day and Safety Meeting	30	-				0	0	0	0	0	0
30) Install transport cask lid 60 - 0	28)	Return	VCT to CHB	120	-				0	0	0	0	0	0
31) Lift transport cask and transfer to maintenance 60 - 0	29)	Open u	inloading cell shield doors and position transport cask under jib crane	60	-				0	0	0	0	0	0
31a) Reposition empty railcar 60 - 0 <	30)	Install t	transport cask lid	60	-				0	0	0	0	0	0
31b) Survey and wipedown transport cask 60 - 0	31)	Lift tra	nsport cask and transfer to maintenance	60	-				0	0	0	0	0	0
32) Lift transport cask and place on railcar 60 - 0 <td< td=""><td>31a)</td><td>Reposi</td><td>tion empty railcar</td><td>60</td><td>-</td><td></td><td></td><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></td<>	31a)	Reposi	tion empty railcar	60	-				0	0	0	0	0	0
33) Install impact limiters on transport cask 120 - 0 0 0 0 0 0 0 34) Release railcar for shipment 60 - 0 0 0 0 0 0 0	31b)	Survey	and wipedown transport cask	60	-				0	0	0	0	0	0
34) Release railcar for shipment 60 - 0 0 0 0 0 0	32)	Lift tra	nsport cask and place on railcar	60	-				0	0	0	0	0	0
	33)	Install i	impact limiters on transport cask	120	-				0	0	0	0	0	0
Total Hours of All Cask Handling Operations 73.6 197 91 50 0 12 0	34)	Release	e railcar for shipment	60	-				0	0	0	0	0	0
			Total Hours of All Cask Handling Operations	73.6			•		197	91	50	0	12	0

		BGVa/AGVa, Below/Above Ground Vault with Integral CHB - Vertical (only) S		r _	т.									
	s stored	l vertically in vault floor	Duration (Minutes)	Dose	М	Duration Fra		n Q	М	R	Task	Dose O	S	Q
0)	Plan of	the Day and Safety Meeting	30		IVI	K H U	3	ζ	IVI	N	П	U	3	Q
<u> </u>	.	Plan of the Day Meeting	15	-					0	0	0	0	0	0
		Safety briefing	10	-					0	0	0	0	0	0
		Transportation to work site	5	-					0	0	0	0	0	0
1)	Receive	e transport cask on railcar at vault	145											
		Identify SNF shipment brought from yard	5	-					0	0	0	0	0	0
		Security team sent to railbay door	15	-					0	0	0	0	0	0
		Send operators to railbay door	15	-					0	0	0	0	0	0
	d)	Stage work team to railbay	15	-					0	0	0	0	0	0
	e)	Open railbay door	5	-					0	0	0	0	0	0
		Position SNF shipment in the railbay Security inspection of the SNF shipment and tug	15 15	3 V T			0.5		0	0	0	0	5.5	0
	g) h)	HP survey of SNF shipment	15	3 V T		0.5	0.5		0	0	5.5	0	0	0
	i)	Inspection of tamper proof Seals	10	3 V T		0.5	0.1		0	0	0	0	0.7	0
	i)	Acceptance of SNF shipment	5	-			0.1		0	0	0	0	0	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10	-					0	0	0	0	0	0
	l)	Secure the railbay doors	5	-					0	0	0	0	0	0
	m)	Security team leaves	5	-					0	0	0	0	0	0
	n)	Operator leaves	5	-					0	0	0	0	0	0
	o)	Completes paperwork for step #1	5	-	*********			*****	0	0	0	0	0	0
2)	.	e impact limiters and place in temporary storage	195						_			_		_
		Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-					0	0	0	0	0	0
	p)	Select and inspect rigging for impact limiters on the transport cask	5	- 4 A V / T		2 2			0	0	0	0	0	0
 	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2 2			0	2.5	2.5	0	0	0
-	d) e)	Position man lifts and temporary scaffolding near transport cask Remove and store bolts holding on the first impact limiter	30	1A V T 1A V T	2	2			0 15	2.5	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T		1			0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1			0	1.3	0	0	0	0
		Reposition manlift and scaffolding	5	1A V T					0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2				15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T		1			0	2.5	0	0	0	0
	- ·	Remove and store bolts for personnel barrier	30	3 V T	0.2				4.4	0	0	0	0	0
		Rig the personnel barrier	15	3 V T		1 1			0	11	11	0	0	0
		Lift personnel barrier and move to storage location	10	3 V T	_				0	0	0	0	0	0
		Remove tie-down straps from transport cask	10		0.4				2.3	0	0	0	0	0
		Rig tie-down straps and move to storage location	5	3A V T		1			0	2.8	0	0	0	0
21		Inspect transport cask for damage and conduct HP survey	15	3 V T		2			0	0	22	0	0	0
3)		and lift transport cask off of railcar and place on unloading cell transfer cart Select the appropriate lifting block for the transport cask	120						0	0	0	0	0	0
	b)	Secure lifting block to transport cask trunnions	10	2A V T		2			0	6.7	0	0	0	0
	c)	Upend transport cask	30	-		2			0	0.7	0	0	0	0
	d)	Lift transport cask off railcar	30	-					0	0	0	0	0	0
		Reposition transport cask	30	-					0	0	0	0	0	0
		Place transport cask on unloading cell transfer cart	15	-					0	0	0	0	0	0
4)	Unbolt	and remove transport cask lid using jib crane	85											
		Move tools to work platform	5	-					0	0	0	0	0	0
	1	HP survey of lid Including gas sampling	15	2A V T		1			0	0	5	0	0	0
	- /	Remove and store nuts	30	2A V T	1				10	0	0	0	0	0
		Rig the lid for lifting using the local jib crane	15	2AVT		1.5			0	7.5	0	0	0	0
		Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	10	2 V T			0.2		0	0	0	0	0 5	0
42)		transport cask and transfer cart seismically	40	2 V I			0.2		U	U	U	U	5	U
74)		Reposition transfer cart near seismic restraint system	15	-					0	0	0	0	0	0
	 	Secure transport cask and transfer cart	15	-					0	0	0	0	0	0
		QC Hold Point Inspection										0	0	_
4b)			10	-					0	0	0	U		0
	-1	the Day and Safety Meeting		-					0	0	0	U		U
	a)	Plan of the Day Meeting	10						0	0	0	0	0	0
<u> </u>	b)	Plan of the Day Meeting Safety briefing	10 30 15 10	-										
	b) c)	Plan of the Day Meeting Safety briefing Transportation to work site	10 30 15 10 5	- - -					0	0	0	0	0	0
5)	b) c) Attach	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC	10 30 15 10 5 70	- - -					0 0	0 0	0 0	0 0	0 0	0 0
5)	b) c) Attach a)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack	10 30 15 10 5 70 15	-					0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
5)	b) c) Attach a) b)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position	10 30 15 10 5 70 15 15	- - - - 2AVT		0.5			0 0 0 0	0 0 0 0 2.5	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
5)	b) c) Attach a) b) c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister	10 30 15 10 5 70 15 15 20	2 V T	0.5			C 1	0 0 0 0 0 25	0 0 0 0 2.5	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0
5)	b) c) Attach a) b) c) d)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection	10 30 15 10 5 70 15 15 20 10		0.5			0.1	0 0 0 0 0 0 25	0 0 0 0 2.5 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 2.5
	b) c) Attach a) b) c) d) e)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools	10 30 15 10 5 70 15 15 20	2 V T	0.5			0.1	0 0 0 0 0 25	0 0 0 0 2.5	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0
	b) c) Attach a) b) c) d) e) Position	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors	10 30 15 10 5 70 15 15 20 10 10	2 V T	0.5			0.1	0 0 0 0 0 0 25	0 0 0 0 2.5 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 2.5
	b) c) Attach a) b) c) d) e) Position a)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools	10 30 15 10 5 70 15 15 20 10 10 60	2 V T	0.5			0.1	0 0 0 0 0 25 0	0 0 0 0 2.5 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 2.5
6)	b) c) Attach a) b) c) d) e) Position a) b)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell	10 30 15 10 5 70 15 15 20 10 10 60	2 V T	0.5			0.1	0 0 0 0 0 25 0 0	0 0 0 0 2.5 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 2.5 0
6)	b) c) Attach a) b) c) d) e) Position b) Position	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors	10 30 15 10 5 70 15 15 20 10 60 50	2 V T	0.5			0.1	0 0 0 0 0 25 0 0	0 0 0 0 2.5 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 2.5 0
6)	b) c) Attach a) b) c) d) e) Position a) b) Position b)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell	10 30 15 10 5 70 15 15 20 10 10 60 50 10 30	2 V T	0.5			0.1	0 0 0 0 0 25 0 0	0 0 0 0 2.5 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 2.5 0
6)	b) c) Attach a) b) c) d) e) Position a) b) Position c) c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 15	2 V T	0.5			0.1	0 0 0 0 0 25 0 0	0 0 0 0 2.5 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0
6)	b) c) Attach a) b) c) d) e) Position a) b) Position c) Lower h	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 10 10 10 10 10 10 10 10 10	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0	0 0 0 2.5 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0
6)	b) c) Attach a) b) c) d) e) Position a) b) Position c) Lower h	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug	10 30 15 10 5 70 15 15 20 10 10 60 50 10 30 5 15 10 10 10 10 10 10 10 10 10 10 10 10 10	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0	0 0 0 0 2.5 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0
6)	b) c) Attach a) b) c) d) e) Position a) b) c) Lower H a) b)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve	10 30 15 10 5 70 15 15 20 10 10 60 50 10 30 5 15 15 10 100 15 60	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0	0 0 0 0 2.5 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0
6)	b) c) Attach a) b) c) d) e) Position a) b) c) Lower h a) b) c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 10 100 15 15 10 100 15 15	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0	0 0 0 0 2.55 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0 0
6)	b) c) Attach a) b) c) d) e) Position a) b) c) Lower h a) b) c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection	10 30 15 10 5 70 15 15 20 10 10 60 50 10 30 5 15 10 100 15 10 100 15 60 15 10	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0	0 0 0 0 2.5 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0
6)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower I a) b) c) d) Transfer	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Inoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection PC TO vault storage location	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 10 10 100 15 10 100 15 60 15 10 100 15 60 15 10	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0 0	0 0 0 2.5 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0 0
6) 7) 8) 9)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower H a) b) Cr d) Transfer a)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Inoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection PT DPC to vault storage location Transfer DPC to vault storage location	10 30 15 10 5 70 15 15 10 10 5 70 15 15 10 10 60 50 10 30 5 15 10 100 15 60 15 10 100 15 60 15 100 120	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0	0 0 0 0 2.55 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0 0
6) 7) 8) 9)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower h a) b) Cransfe a) Remove	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location e shield plug above vault storage location	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 10 10 100 15 10 100 15 60 15 10 100 15 60 15 10	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0 0	0 0 0 2.5 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0 0
6) 7) 8) 9)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower H a) b) c) d) Transfer a) Remove a)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location Position crane over storage location in vault	10 30 15 10 5 70 15 15 10 10 60 10 10 60 50 10 10 10 10 10 10 10 10 10 10 10 10 10	2 V T	0.5			0.1	0 0 0 0 0 25 0 0 0 0 0 0 0	0 0 0 0 2.5 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 2.5 0 0 0 0 0 0
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6) 7) 8) 9)	b) c) Attach a) b) c) d) e) Position a) b) c) Lower H a) b) c) d) Transfe a) Remove a) b) c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location Position crane over storage location in vault Rig the shield plug	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 10 10 10 60 15 10 100 15 60 15 10 100 15 60 15 10 100 15 60 15 10 100 15 60 15 10 120 60 30 15	2 V T	0.5			0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 2.55 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
6) 7) 8) 9)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower I a) b) Transfe a) Remove a) b) c) Lower I c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection Hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location Position crane over storage location in vault Rig the shield plug and place on storage stand	10 30 15 10 5 70 15 15 10 10 60 50 10 30 5 15 10 100 100 15 60 15 10 100 15 60 15 15 10 15 15 10 15 15 15 15 15 15 15 15	2 V T	0.5			0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 2.55 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
6) 7) 8) 9)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower h a) b) Transfe a) Remove a) b) c) Lower I a) b)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location e shield plug above vault storage location Position crane over storage location in vault Rig the shield plug and place on storage stand DPC into storage position on vault floor Align DPC over storage position Lower DPC into vault	10 30 15 10 5 70 15 15 10 10 60 50 10 10 30 5 15 15 10 100 120 120 60 30 15 15 15 15 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	2 V T	0.5			0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 2.5 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
6) 7) 8) 9) 10)	b) c) Attach a) b) c) d) e) Position a) b) C) Lower h a) b) Cr d) Transfe a) Remove a) b) c) Lower I a) b) c)	Plan of the Day Meeting Safety briefing Transportation to work site lifting lug to top of DPC Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection pr DPC to vault storage location Transfer DPC to vault storage location Position crane over storage location in vault Rig the shield plug Lift shield plug and place on storage stand DPC into storage position on vault floor Align DPC over storage position	10 30 15 10 5 70 15 15 10 10 5 70 15 15 10 10 60 50 10 30 5 15 10 100 15 60 15 10 120 60 30 15 15 15 10 15 15 10 110 120 15 15 15 10 110 110 110 110 110 110 11	2 V T	0.5			0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 2.5 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

	a)	Rig the shield plug to the crane	15	-			0	0	0	0	0	0
	b)	Reposition the shield plug	15	-			0	0	0	0	0	0
	c)	Lower the shield plug into the operating floor recess	15	-			0	0	0	0	0	0
	d)	Secure the shield plug and remove rigging	15	-			0	0	0	0	0	0
	e)	QC Hold Point Inspection	10	-			0	0	0	0	0	0
	f)	HP survey	15	-			0	0	0	0	0	0
		Total Hours of Canister Handling Operations	20.7									
12 a)	Turnov	er to Operations	1440									
_		crane to operating floor	60	-			0	0	0	0	0	0
14)	Remov	e transport cask from transfer cell	60	-			0	0	0	0	0	0
15)	Install t	transport cask lid	60									
16)	Lift tran	nsport cask and transfer to maintenance	60	-			0	0	0	0	0	0
16a	Survey	and wipedown transport cask	60	-			0	0	0	0	0	0
17)	Lift tran	nsport cask, place on railcar, and downend	60	-			0	0	0	0	0	0
17a	Plan of	the Day and Safety Meeting	30									
18)	Install i	mpact limiters on transport cask	120	-			0	0	0	0	0	0
19)	Release	e railcar for shipment	60	-			0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	54.2				72	42	46	0	11	2.5

			Duration	Dose	Dura	ation	Fra	ction			Task	Dose		
DPC	s in lift 1	frames stored vertically in vault floor	(Minutes)					S Q	М	R	H	0	S	Q
0)	Plan of	the Day and Safety Meeting	30											
	a)	Plan of the Day Meeting	15	-					0	0	0	0	0	0
	b)	Safety briefing	10	-					0	0	0	0	0	0
	c)	Transportation to work site	5	-					0	0	0	0	0	0
1)		e transport cask on railcar at vault	145						<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>
	a)	Identify SNF shipment brought from yard	5	-					0	0	0	0	0	0
	b)	Security team sent to railbay door	15	-					0	0	0	0	0	0
	c)	Send operators to railbay door	15	-					0	0	0	0	0	0
	d)	Stage work team to railbay	15	-					0	0	0	0	0	0
	e)	Open railbay door	5	-					0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15 15	3 V T				0.5	0	0	0	0	0 5.5	0
	g) h)	Security inspection of the SNF shipment and tug HP survey of SNF shipment	15	3 V T		0.5		0.5	0	0	5.5	0	0	0
	i)	Inspection of tamper proof seals	10	3 V T		0.5		0.1	0	0	0	0	0.7	0
	j)	Acceptance of SNF shipment	5	3 V I				0.1	0	0	0	0	0.7	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10						0	0	0	0	0	0
	l)	Secure the railbay doors	5	_					0	0	0	0	0	0
	m)	Security team leaves	5	_					0	0	0	0	0	0
	n)	Operator leaves	5	_					0	0	0	0	0	0
	0)	Completes paperwork for step #1	5	-					0	0	0	0	0	0
2)		e impact limiters and place in temporary storage	195						ات ا	Ť	Ť	Ť	Ť	Ť
-,	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-					0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5	-					0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T	2	2			0	2.5	2.5	0	0	0
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T	2				0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2				15	0	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T	1				0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T	1				0	1.3	0	0	0	0
	h)	Reposition manlift and scaffolding	5	1A V T					0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2				15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T	1				0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2				4.4	0	0	0	0	0
	l)	Rig the personnel barrier	15	3 V T	1	1			0	11	11	0	0	0
	m)	Lift personnel barrier and move to storage location	10	3 V T					0	0	0	0	0	0
	n)	Remove tie-down straps from SNF shipment	10	3A V T	0.4				2.3	0	0	0	0	0
	o)	Rig tie-down straps and move to storage location	5	3A V T	1				0	2.8	0	0	0	0
	p)	Inspect transport cask for damage and conduct HP survey	15	3 V T		2			0	0	22	0	0	0
3)	Upend	and lift transport cask off of railcar and place on transfer fixture	120						<u> </u>					<u> </u>
	a)	Select the appropriate lifting block for the transport cask	5	-					0	0	0	0	0	0
	b)	Secure lifting block to transport cask trunnions	10	2A V T	2				0	6.7	0	0	0	0
	c)	Upend transport cask	30	-					0	0	0	0	0	0
	d)	Lift transport cask off railcar	30	-					0	0	0	0	0	0
	e)	Move transport cask to transfer fixture	15	-					0	0	0	0	0	0
	 	Downend transport cask on transfer fixture	30	-					0	0	0	0	0	0
4)		e transport cask lid	80						<u> </u>	<u> </u>		<u> </u>		<u> </u>
		Move tools to work platform	15	- 4 4 1 1 7 1		-			0	0	0	0	0	0
	1	HP survey of lid including gas sampling	15	1AHTL	-	2			0	0	9.2	0	0	0
	d)	Rig the lid for lifting using the local jib crane Remove and store nuts	15 20	1A H T L	2				0 12	9.2	0	0	0	0
	e)	Lift the transport cask lid and move it to the storage stand	10	1AHTL					0	0	0	0	0	0
	f)	Security inspection of the interior of the transport cask	5	1A H T NL	\vdash			0.2	0	0	0	0	2.7	0
4a\	g) Secure	transport cask and transfer cart seismically	40	TALLINE				0.2	<u> </u>	U	U	<u> </u>	۷./	┵
+a)		Reposition transfer cart near seismic restraint system	15	-					0	0	0	0	0	0
	b)	Secure transport cask and transfer cart	15	 					0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-	\vdash				0	0	0	0	0	0
4h)	,	the Day and Safety Meeting	30							J	J	Ť	۲	Ť
,,		Plan of the Day Meeting	15	-					0	0	0	0	0	0
	b)	Safety briefing	10	-					0	0	0	0	0	0
	c)	Transportation to work site	5	-					0	0	0	0	0	0
5)		ft frame into upender using jib crane	85						اث	Ť	Ť	Ť	Ť	Ť
-,		Move lifting frame into position using a transfer cart	15	-					0	0	0	0	0	0
	b)	Rig the lifting frame onto the jib crane	15	-					0	0	0	0	0	0
	c)	Hoist the lifting frame and load it into the transfer sleeve on the upender	15	-					0	0	0	0	0	0
	d)	Lift docking collar and place on top of transfer sleeve	10	-					0	0	0	0	0	0
	e)	Strap docking collar to top of transfer sleeve	15	-					0	0	0	0	0	0
	f)	Remove the rigging and secure the jib crane	15	_		1			0	0	0	0	0	0
	1 1)		1 1	_							· ·			
6)	,	and transfer sleeve with lift frame and dock with transport cask	45						ٽ	Ť	<u> </u>	Ť	Ť	

	a)	Secure transfer cask to upender	15	-			0	0	0	0	0	0
	b)	Downend the transfer sleeve to the horizontal position	30	-			0	0	0	0	0	0
7)		ransfer sleeve on horizontal transfer cart with transport cask Position spotters	75 10				0	0	0	0	0	0
	a) b)	Move transfer sleeve into position	10	-			0	0	0	0	0	0
	c)	Align transport cask with transfer sleeve	15	-			0	0	0	0	0	0
	d)	Dock transfer sleeve to transport cask	15	-			0	0	0	0	0	0
	e) f)	Install retaining straps on transport cask trunnions QC Hold Point Inspection	15 10	2A H T	1.5		0	12 0	0	0	0	0
8)		PC into transfer sleeve	75	-			U	U	U	U	U	
	a)	Remove pushing port in base of transport cask	15	5 H H	2		4.3	0	0	0	0	0
	b)	Engage ram and push DPC into transfer sleeve	30	-			0	0	0	0	0	0
	c) d)	Withdraw the ram QC Hold Point Inspection	20 10	-			0	0	0	0	0	0
9)		k horizontal transfer cart from transport cask and close shield door	30	-			U	U	U	U	U	
	a)	Remove retaining straps from transfer sleeve	10	2A H T	0.2		0	1.1	0	0	0	0
	b)	Pull horizontal transfer cart back	10	-			0	0	0	0	0	0
10\	c)	Close shield door on transfer sleeve	10 30	-			0	0	0	0	0	0
10)		Roll transfer cart to turntable Lock wheels	10	-			0	0	0	0	0	0
		Rotate turntable 180°	20	-			0	0	0	0	0	0
11)		rizontal transfer cart to upending cell and dock transfer cart with upender	40									
		Unlock wheels and roll transfer cart to upending cell	10	-			0	0	0	0	0	0
	d) e)	Dock transfer cart with upender Strap docking collar to transfer sleeve on transfer cart	20 10	2A H T	2		0	0 11	0	0	0	0
12)		PC into lift frame inside transfer cask	65	=,	_							Ť
	a)	plug in hydraulic power pack on transfer cart	15	-			0	0	0	0	0	0
	b)	Engage ram and push DPC into the lift frame in the upender transfer sleeve Withdraw the ram	30	-			0	0	0	0	0	0
	c) d)	QC Hold Point Inspection	10 10	-			0	0	0	0	0	0
13)	- /	k transport cask	50				Ě		_			
	a)	Remove retaining straps from transfer sleeve on upender	15	2A H T	0.2		0	1.6	0	0	0	0
	b)	Unplug hydraulic power pack on transfer cart Undock transfer cart and remove	15 10	-			0	0	0	0	0	0
	c) d)	QC Hold Point Inspection	10	-			0	0	0	0	0	0
14)		transfer sleeve with lift frame	30									Ť
	a)	Close shield door to upender cell	10	-			0	0	0	0	0	0
	b)	Upend the transfer sleeve Set locking mechanism on upender	15 5	-			0	0	0	0	0	0
15)	c) Positio	n shielded transfer sleeve above transfer cell	7 0	-			0	0	U	0	0	
	a)	Inspect shielded transfer sleeve	15	-			0	0	0	0	0	0
	b)	Move shielded transfer sleeve cart over unloading cell	30	-			0	0	0	0	0	0
	c)	Secure in position	15	-			0	0	0	0	0	0
15a)	d) Secure	QC Hold Point Inspection shielded transfer sleeve and DPC seismically	10 40	-			0	0	0	0	0	0
	a)	Reposition seismic restraint system	15	-			0	0	0	0	0	0
	b)	Secure shielded transfer sleeve	15	-			0	0	0	0	0	0
1 F h \	c)	QC Hold Point Inspection the Day and Safety Meeting	10 30	-			0	0	0	0	0	0
120)	a)	Plan of the Day Meeting	15	_			0	0	0	0	0	0
	b)	Safety briefing	10	-			0	0	0	0	0	0
	c)	Transportation to work site	5	-			0	0	0	0	0	0
16)	Lower a)	hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple lift frame	90 15	-			0	0	0	0	0	0
	b)	Raise DPC into shield sleeve	45	-			0	0	0	0	0	0
	c)	Close shield sleeve lower doors	15	-			0	0	0	0	0	0
	d)	HP survey	15	-			0	0	0	0	0	0
17)		Transfer DPC to vault storage location	120 120	_			0	0	0	0	0	0
18)		re shield plug above vault storage location	105				U	U	U	U		
	a)	Stage tools in storage vault location	15	-			0	0	0	0	0	0
	b)	Position crane in vault	30	-			0	0	0	0	0	0
<u> </u>	c) d)	Rig the shield plug Lift shield plug and place on storage stand	15 15	-			0	0	0	0	0	0
	e)	Disconnect rigging and return crane to cask handling area	30	-			0	0	0	0	0	0
19)	Lower	DPC and lift frame into storage position on vault floor	85									
	a)	Align DPC over storage position	15	-			0	0	0	0	0	0
	ا _م ا	Lower DPC into vault	45	-	\vdash		0	0	0	0	0	0
1	b) c)		10	-							0	-
	c)	QC Hold Point Inspection HP survey	10 15	-			0	0	0	0		0
20)	c) d) Replac	QC Hold Point Inspection HP survey e shield plug above vault storage location	15 85	-								
20)	c) d) Replac a)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane	15 85 15	- - -			0	0	0	0	0	0
20)	c) d) Replac a) b)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug	15 85 15 15	- - - -			0	0	0	0		
20)	c) d) Replac a)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane	15 85 15	- - - -			0	0	0	0	0	0
20)	c) d) Replace a) b) c) d)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection	15 85 15 15 15 15 10	- - - - -			0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0
20)	c) d) Replac a) b) c) d)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey	15 85 15 15 15 15 10 15	- - -			0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0
	c) d) Replac a) b) c) d) e)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations	15 85 15 15 15 15 10	- - -			0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0
20a) 21)	c) d) Replace a) b) c) d) e) f)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations crane to Operating Floor	15 85 15 15 15 15 10 15 29.8	- - -			0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0
20a) 21) 22)	c) d) Replace a) b) c) d) e) f)	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations rer to Operations crane to Operating Floor transport cask lid	15 85 15 15 15 15 10 15 29.8 1440 60				0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0
20a) 21) 22) 23)	c) d) Replac a) b) c) d) e) f) Turnov Return Install	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations rer to Operations crane to Operating Floor transport cask lid nsport cask and transfer to maintenance	15 85 15 15 15 15 10 15 29.8 1440 60 60				0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0
20a) 21) 22) 23) 23a)	c) d) Replac a) b) c) d) e) f) Turnov Return Install Lift tra Survey	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations er to Operations crane to Operating Floor transport cask lid nsport cask and transfer to maintenance and wipedown transport cask	15 85 15 15 15 15 10 15 29.8 1440 60				0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0
20a) 21) 22) 23) 23a) 24) 25)	c) d) Replac a) b) c) d) e) f) Turnov Return Install Lift tra Survey Lift tra Install	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations or to Operations crane to Operating Floor transport cask lid nsport cask and transfer to maintenance and wipedown transport cask nsport cask and place on railcar impact limiters on transport cask	15 85 15 15 15 15 10 15 29.8 1440 60 60 60	- - - - - - -			0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0
20a) 21) 22) 23) 23a) 24) 25)	c) d) Replac a) b) c) d) e) f) Turnov Return Install Lift tra Survey Lift tra Install	QC Hold Point Inspection HP survey e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging QC Hold Point Inspection HP survey Total Hours of Canister Handling Operations or to Operations crane to Operating Floor transport cask lid nsport cask and transfer to maintenance and wipedown transport cask nsport cask and place on railcar	15 85 15 15 15 10 15 29.8 1440 60 60 60 60	- - - - - - -			0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0

,,, ,	<u> </u>	- С-В	GVb/AGVb, Below/Above Ground Vault with Integral CHB - Vertical and Horizo		T	1					T		_ -			
DPC	s sto	ored	vertically in vault floor	Duration (Minutes)	Dose	М	_		Fraction S	n Q	М	R	Task H	Dose O	S	Q
0)	Plar	n of	the Day and Safety Meeting	30		141	11	11		٧	141	11	- 11	J		
			Plan of the Day Meeting	15	-						0	0	0	0	0	0
	b		Safety briefing	10	-						0	0	0	0	0	0
		_	Transportation to work site	5	-						0	0	0	0	0	0
1)			transport cask on railcar at vault Identify SNF shipment brought from yard	145 5	_						0	0	0	0	0	0
	a b		Security team sent to railbay door	15	-	<u> </u>					0	0	0	0	0	0
	C		Send operators to railbay door	15	-						0	0	0	0	0	0
	d	_	Stage work team to railbay	15	-						0	0	0	0	0	0
	е	e)	Open railbay door	5	-						0	0	0	0	0	0
	f	_	Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
	g		Security inspection of the SNF shipment and tug	15	3 V T				0.5		0	0	0	0	5.5	_
	h	_	HP survey of SNF shipment	15	3 V T			0.5			0	0	5.5	0	0	0
	i	_	Inspection of tamper proof Seals Acceptance of SNF shipment	10 5	3 V T				0.1		0	0	0	0	0.7	0
	j k		Decoupling of railcar and removal of the tug from the railbay	10	-						0	0	0	0	0	0
	I		Secure the railbay doors	5	_						0	0	0	0	0	0
	n	_	Security team leaves	5	-						0	0	0	0	0	0
	n	า)	Operator leaves	5	-						0	0	0	0	0	0
	O		Completes paperwork for step #1	5	-						0	0	0	0	0	0
2)	Ren		e impact limiters and place in temporary storage	195									<u> </u>		<u> </u>	<u> </u>
	a	_	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b		Select and inspect rigging for impact limiters on the transport cask	5	- 1		2	2			0	0	0	0	0	0
	d	_	Rig the lifting devices to the first impact limiter Position manlifts and temporary scaffolding near transport cask	5	1A V T 1A V T	1	2	2			0	2.5	2.5	0	0	0
	e	_	Remove and store bolts holding on the first impact limiter	30	1A V T	2					15	0	0	0	0	0
-	f	_	Remove first impact limiter and place on storage stand	10	1A V T	t	1				0	2.5	0	0	0	0
	Q		Remove rigging and reposition on second impact limiter	5	1A V T	1	1				0	1.3	0	0	0	0
	h		Reposition manlift and scaffolding	5	1A V T						0	0	0	0	0	0
	i	_	Remove and store bolts holding on the second impact limiter	30	1A V T	2					15	0	0	0	0	0
	j	_	Remove second impact limiter and place on storage stand	10	1A V T	<u> </u>	1				0	2.5	0	0	0	0
	k	_	Remove and store bolts for personnel barrier	30	3 V T	0.2	_	_			4.4	0	0	0	0	0
		_	Rig the personnel barrier Lift personnel barrier and move to storage location	15 10	3 V T		1	1			0	11	11	0	0	0
	n		Remove tie-down straps from transport cask	10	3 V T	0.4					2.3	0	0	0	0	0
	O		Rig tie-down straps and move to storage location	5	3A V T	0.4	1				0	2.8	+ -	0	0	0
			Inspect transport cask for damage and conduct HP survey	15	3 V T			2			0	0	22	0	0	0
3)	Upe		and lift transport cask off of railcar and place on unloading cell transfer cart	120												
	а	a)	Select the appropriate lifting block for the transport cask	5	-						0	0	0	0	0	0
	b	_	Secure lifting block to transport cask trunnions	10	2A V T		2				0	6.7	0	0	0	0
	C	- 1	Upend transport cask	30	-						0	0	0	0	0	0
	d	,	Lift transport cask off railcar	30	-	-					0	0	0	0	0	0
_	f	•	Reposition transport cask Place transport cask on unloading cell transfer cart	30 15	-	 					0	0	0	0	0	0
4)		_	Place transport cask on unloading cell transfer cart and remove transport cask lid using jib crane	85	_						U	U	1	U	U	1
-1	a		Move tools to work platform	5	-						0	0	0	0	0	0
	b	_	HP survey of lid Including gas sampling	15	2A V T			1			0	0	5	0	0	0
	C	c)	Remove and store nuts	30	2A V T	1					10	0	0	0	0	0
	d		Rig the lid for lifting using the local jib crane	15	2A V T		1.5				0	7.5	0	0	0	0
	е	_	Lift the transport cask lid and move it to the storage stand	10	-						0	0	0	0	0	0
4-1	f Soci		Security inspection of the interior of the transport cask	10	2 V T				0.2		0	0	0	0	5	0
4a)	Sec		transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system	40 15	_						0	0	0	0	0	0
	b	_	Secure transport cask and transfer cart	15	_						0	0	0	0	0	0
		_	QC Hold Point Inspection	10	-						0	0	0	0	0	0
4b)	Plar		the Day and Safety Meeting	30												
	а	a)	Plan of the Day Meeting	15	-						0	0	0	0	0	0
			Safety briefing	10	-						0	0	0	0	0	0
	C	-,	Transportation to work site	5	-						0	0	0	0	0	0
5)			ifting lug to top of DPC	70							_	_	<u> </u>	_	_	<u> </u>
	a b		Rig lifting lug on storage rack Use jib crane to lift lifting lug into position	15 15	- 2A V T	-	0.5				0	2.5	0	0	0	0
	C		Bolt lifting lug to canister	20	2 V T	0.5					25	0	0	0	0	0
	d	_	QC Hold Point Inspection	10	2 V T	0.3				0.1	0	0	0	0	0	2.5
	е		Clear workspace and remove all tools	10						J. 1	0	0	0	0	0	0
6)			transport cask transfer cart in unloading cell and close shield doors	60												
	а	a)	Move transport cask cart into the unloading cell	50	-						0	0	0	0	0	0
		,	Close the shield doors	10	_						0	0	0	0	0	0
7)			shielded transfer sleeve on bridge crane above transfer cell	30									<u> </u>		<u> </u>	<u> </u>
		•	Inspect shielded transfer sleeve	5	-	<u> </u>					0	0	0	0	0	0
	_	_	Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection	15 10	-	-					0	0	0	0	0	0
8)			OC HOID POINT INSPECTION LOIST, grapple lifting lug, and raise DPC into shield sleeve	10 100	_						0	U		U	U	0
٧,			Lower shield sleeve hoist and grapple DPC lifting lug	15	-						0	0	0	0	0	0
	b	_	Raise DPC into shield sleeve	60	-						0	0	0	0	0	0
	_		HP survey	15							0	0	0	0	0	0
	d	d)	QC Hold Point Inspection	10	-						0	0	0	0	0	0
9)	Trai		r DPC to vault storage location	120												
			Transfer DPC to vault storage location	120	-						0	0	0	0	0	0
10)			shield plug above vault storage location	60							_	_	Ļ	_	Ļ	Ļ
		_	Position crane over storage location in vault	30	-	-					0	0	0	0	0	0
	b		Rig the shield plug Lift shield plug and place on storage stand	15 15	-	-					0	0	0	0	0	0
111		_	Lift shield plug and place on storage stand PPC into storage position on vault floor	15 70	-						0	0	0	0	U	0
1	a		Align DPC over storage position	15	-						0	0	0	0	0	0
	b		Lower DPC into vault	45	-	l					0	0	0	0	0	0
\neg			QC Hold Point Inspection	10	-	t					0	0	0	0	0	0
421	Ren	_	shield plug above vault storage location	85												
12) I	.,,,	_					-	-		-						

	a)	Rig the shield plug to the crane	15	-			0	0	0	0	0	0
	b)	Reposition the shield plug	15	-			0	0	0	0	0	0
	c)	Lower the shield plug into the operating floor recess	15	-			0	0	0	0	0	0
	d)	Secure the shield plug and remove rigging	15	-			0	0	0	0	0	0
	e)	QC Hold Point Inspection	10	-			0	0	0	0	0	0
	f)	HP survey	15	-			0	0	0	0	0	0
		Total Hours of Canister Handling Operations	20.7									
12a)	Turnov	er to Operations	1440									
13)	Return	crane to operating floor	60	-			0	0	0	0	0	0
14)	Remov	e transport cask from transfer cell	60	-			0	0	0	0	0	0
15)	Install t	transport cask lid	60									
16)	Lift trai	nsport cask and transfer to maintenance	60	-			0	0	0	0	0	0
16a)	survey	and wipedown transport cask	60	-			0	0	0	0	0	0
17)	Lift trai	nsport cask, place on railcar, and downend	60	-			0	0	0	0	0	0
17a)	Plan of	the Day and Safety Meeting	30									
18)	Install i	impact limiters on transport cask	120	-			0	0	0	0	0	0
19)	Release	e railcar for shipment	60	-			0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	54.2				72	42	46	0	11	2.5

		rames stored horizontal in concrete pedestals in vault	(Minutes)	1	М	R	Н	O S Q	М	R	Н	0	-	$\overline{}$
0)	Plan of t										•••	0	S	Q
\dashv		the Day and Safety Meeting	30											
		Plan of the Day Meeting	15 10	-					0	0	0	0	0	0
\dashv		Safety briefing Transportation to work site	5	_					0	0	0	0	0	0
1) F		transport cask on railcar at vault	145	-					U	U	U	U		+
-'/ 		Identify SNF shipment brought from yard	5	-					0	0	0	0	0	0
		Security team sent to railbay door	15	-					0	0	0	0	0	0
		Send operators to railbay door	15	-					0	0	0	0	0	0
		Stage work team to railbay	15	-					0	0	0	0	0	0
	e)	Open railbay door	5	-					0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	-					0	0	0	0	0	0
		Security inspection of the SNF shipment and tug	15	3 V T				0.5	0	0	0	0	5.5	
_		HP survey of SNF shipment	15	3 V T			0.5		0	0	5.5	0	0	0
_		Inspection of tamper proof seals	10	3 V T				0.1	0	0	0	0	0.7	-
_		Acceptance of SNF shipment	5	-					0	0	0	0	0	0
\dashv		Decoupling of railcar and removal of the tug from the railbay	10	-					0	0	0	0	0	0
		Secure the railbay doors Security team leaves	5 5	-					0	0	0	0	0	0
\dashv		Operator leaves	5	-					0	0	0	0	0	0
\dashv		Completes paperwork for step #1	5	-					0	0	0	0	0	0
2) F		e impact limiters and place in temporary storage	195						Ť	Ť	Ť		Ť	Ť
~		Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-					0	0	0	0	0	0
\neg		Select and inspect rigging for impact limiters on the SNF shipment	5	-					0	0	0	0	0	0
\neg		Rig the lifting devices to the first impact limiter	5	1A V T		2	2		0	2.5	2.5	0	0	0
		Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2			0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2				15	0	0	0	0	0
		Remove first impact limiter and place on storage stand	10	1A V T		1			0	2.5	0	0	0	0
_		Remove rigging and reposition on second impact limiter	5	1A V T		1			0	1.3	0	0	0	0
_		Reposition manlift and scaffolding	5	1A V T					0	0	0	0	0	0
_		Remove and store bolts holding on the second impact limiter	30	1AVT	2	_			15	0	0	0	0	0
\dashv		Remove second impact limiter and place on storage stand	10	1AVT	0.3	1			0	2.5	0	0	0	0
		Remove and store bolts for personnel barrier Rig the personnel barrier	30 15	3 V T	0.2	1	1		4.4 0	0 11	0 11	0	0	0
\dashv		Lift personnel barrier and move to storage location	10	3 V T		1	1		0	0	0	0	0	0
-+		Remove tie-down straps from SNF shipment	10		0.4				2.3	0	0	0	0	0
-		Rig tie-down straps and move to storage location	5	3A V T	0.1	1			0	2.8	0	0	0	0
		Inspect transport cask for damage and conduct HP survey	15	3 V T			2		0	0	22	0	0	0
3)	Upend a	and lift transport cask off of railcar and place on transfer fixture	120										i	1
	a) :	Select the appropriate lifting block for the transport cask	5	-					0	0	0	0	0	0
		Secure lifting block to transport cask trunnions	10	2A V T		2			0	6.7	0	0	0	0
_		Upend transport cask	30	-					0	0	0	0	0	0
\dashv		Lift transport cask off railcar	30	-					0	0	0	0	0	0
		Move transport cask to transfer fixture	15	-					0	0	0	0	0	0
4) (Downend transport cask on transfer fixture	30	-					0	0	0	0	0	0
4) F		e transport cask lid Move tools to work platform	80 15						0	0	0	0	0	0
-+		HP survey of lid including gas sampling	15	1A H T L			2		0	0	9.2	0	0	0
\dashv		Rig the lid for lifting using the local jib crane	15	1AHTL		2			0	9.2	0	0	0	0
\dashv		Remove and store nuts	20	1AHTL	2	_			12	0	0	0	0	0
\dashv		Lift the transport cask lid and move it to the storage stand	10	-	Ħ				0	0	0	0	0	0
一		Security inspection of the interior of the transport cask	5	1A H T NL				0.2	0	0	0	0	2.7	0
5) [ansport cask with port for transfer cart inside horizontal canister handling area	70											
		Position spotters	10	-					0	0	0	0	0	0
$oldsymbol{\bot}$		Check alignment	20	-					0	0	0	0	0	0
		Dock transport cask with port for transfer cart inside horizontal vault	30	2A H T	0.2				3.2	0	0	0	0	0
\dashv		QC Hold Point Inspection	10	2CHTL				1	0	0	0	0	0	0.3
6) (ort and push DPC through onto vault horizontal transfer cart	80							<u> </u>			-	 _
\dashv		Remove pushing port in base of transport cask	15	5 H H	2				4.3	0	0	0	0	0
\dashv		Open vault port door	10	-					0	0	0	0	0	0
\dashv		Engage ram and push DPC onto vault horizontal transfer cart Withdraw the ram	30 15	-					0	0	0	0	0	0
\dashv		QC Hold Point Inspection	10	2C H T NL				1	0	0	0	0	0	1.2
7) (ault port door	45	ZCIII INL					U	٦	J	J		1.2
'		HP survey	15	-					0	0	0	0	0	0
十		Close vault port door	30	-	T				0	0	0	0	0	0
8) 1		r DPC to horizontal vault storage location	135						Ť	Ť	Ť	_	<u> </u>	Ť
		Open vault inner shield door	15	-					0	0	0	0	0	0
	a)							. t l						+
쿠		Transfer DPC to vault storage location	120	-					0	0	0	0	0	0

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	a)	Check alignment	15	-			0	0	0	0	0	0
	b)	Lower transfer cart carriage	20	-			0	0	0	0	0	0
		Total Hours of Canister Handling Operations	15.6									
9)	Turnov	er to Operations	1440									
10)	Return	transfer cart to Transfer Port and Realign	60	-			0	0	0	0	0	0
11)	Undoc	k transport cask	60	-			0	0	0	0	0	0
12)	Install	transport cask lid	60	-			0	0	0	0	0	0
13)	Lift tra	nsport cask and transfer to maintenance	60	-			0	0	0	0	0	0
13a)	Survey	and wipedown transport cask	60	-			0	0	0	0	0	0
13b)	Reposi	tion empty railcar	60	-			0	0	0	0	0	0
14)	Lift tra	nsport cask and place on railcar	30	-			0	0	0	0	0	0
15)	Install	impact limiters on transport cask	120	-			0	0	0	0	0	0
16)	Release	e railcar for shipment	60	-			0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	49.1				56	38	42	0	2.7	1.4

<u>4C,</u>	<u> 5C - C-B</u>	GVc/AGVc, Below/Above Ground vault with Separate CHB - Vertical (or	1	Ī	_				1					
Ver	tical DPC	s stored vertically in vault floor	Duration (Minutes)	Dose	_		Fractio O S		М	R	Task H	Dose O	S	Q
0)	Plan of	the Day and Safety Meeting	30		141	л П	3	٧	141	11	11	3	,	٧
		Plan of the Day Meeting	15	-					0	0	0	0	0	0
		Safety briefing	10	-					0	0	0	0	0	0
- •		Transportation to work site	5	-					0	0	0	0	0	0
1)		transport cask on railcar at Cask Handling Building Identify SNF shipment brought from yard	145 5						0	0	0	0	0	0
		Security team sent to railbay door	15	-					0	0	0	0	0	0
		Send operators to railbay door	15	-					0	0	0	0	0	0
		Stage work team to railbay	15	-					0	0	0	0	0	0
	e)	Open railbay door	5	-					0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	-					0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug	15	3 V T		0.5	0.5	5	0	0	0	0	5.5	0
	h) i)	HP survey of SNF shipment Inspection of tamper proof Seals	15 10	3 V T		0.5	0.1		0	0	5.5 0	0	0.7	0
		Acceptance of SNF shipment	5	5 V I			0.1	-	0	0	0	0	0.7	0
	,,	Decoupling of railcar and removal of the tug from the railbay	10	-					0	0	0	0	0	0
	l)	Secure the railbay doors	5	-					0	0	0	0	0	0
	m)	Security team leaves	5	-					0	0	0	0	0	0
		Operator leaves	5	-					0	0	0	0	0	0
		Completes paperwork for step #1	5	-					0	0	0	0	0	0
2)		e impact limiters and place in temporary storage	195						<u> </u>		_	_	_	
		Mobilize crew (mechanics, riggers, crane operator, etc.) Select and inspect rigging for impact limiters on the transport cask	5	-					0	0	0	0	0	0
		Rig the lifting devices to the first impact limiter	5	1A V T		2 2			0	2.5	2.5	0	0	0
		Position man lifts and temporary scaffolding near transport cask	5	1A V T		2			0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2				15	0	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T		1			0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1			0	1.3	0	0	0	0
		Reposition manlift and scaffolding	5	1A V T					0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2	1			15	0	0	0	0	0
		Remove second impact limiter and place on storage stand Remove and store bolts for personnel barrier	10 30	1A V T 3 V T	0.2	1			0 4.4	2.5	0	0	0	0
		Rig the personnel barrier	15	3 V T	0.2	1 1			0	11	11	0	0	0
		Lift personnel barrier and move to storage location	10	3 V T		1 1			0	0	0	0	0	0
	n)	Remove tie-down straps from transport cask	10	3A V T	0.4				2.3	0	0	0	0	0
	0)	Rig tie-down straps and move to storage location	5	3A V T		1			0	2.8	0	0	0	0
		Inspect transport cask for damage and conduct HP survey	15	3 V T		2			0	0	22	0	0	0
3)		and lift transport cask off of railcar and place on unloading cell transfer cart	120											
		Select the appropriate lifting block for the transport cask	5			2			0	0	0	0	0	0
	b) c)	Secure lifting block to transport cask Trunnions Upend transport cask	10 30	2A V T		2			0	6.7	0	0	0	0
		Lift transport cask off railcar	30	-					0	0	0	0	0	0
		Reposition transport cask	30	-					0	0	0	0	0	0
		Place transport cask on unloading cell transfer cart	15	-					0	0	0	0	0	0
3a)	Remove	e railcar from railbay	60											
		Open railbay door	5	-					0	0	0	0	0	0
		Railyard tug connects to railcar	10	-					0	0	0	0	0	0
		Railyard tug removes railcar from railbay	10	-					0	0	0	0	0	0
		Railyard tug connects to next railcar Railyard tug repositions next railcar in railbay	15 10	-					0	0	0	0	0	0
		Railyard tug leaves railbay and railbay door is closed	10	_					0	0	0	0	0	0
4)		and remove transport cask lid using jib crane	85							Ŭ				Ť
		Move tools to work platform	5	-					0	0	0	0	0	0
	b)	HP survey of lid Including gas sampling	15	2A V T		1			0	0	5	0	0	0
		Remove and store nuts	30	2A V T	1				10	0	0	0	0	0
		Rig the lid for lifting using the local jib crane	15	2A V T	- 1	1.5			0	7.5	0	0	0	0
	e) f)	Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	10 10	- 2 V T			0.2	,	0	0	0	0	<u> </u>	0
4a\		transport cask and transfer cart seismically	40	4 V I			0.2	-		U	- U			
,		Reposition transfer cart near seismic restraint system	15	-					0	0	0	0	0	0
		Secure transport cask and transfer cart	15						0	0	0	0	0	0
		QC Hold Point Inspection	10	-					0	0	0	0	0	0
4b)		the Day and Safety Meeting	30											
		Plan of the Day Meeting	15	-					0	0	0	0	0	0
		Safety briefing	10	-					0	0	0	0	0	0
E/		Transportation to work site lifting lug to top of DPC	70	-					0	0	0	0	0	0
5)		Rig lifting lug on storage rack	15	_					0	0	0	0	0	0
		Use jib crane to lift lifting lug into position	15	2A V T	(0.5			0	2.5	0	0	0	0
		Bolt lifting lug to canister	20	2 V T	0.5				25	0	0	0	0	0
	ď)	QC Hold Point Inspection	10	2 V T				0.1	_	0	0	0	0	2.5
		Clear workspace and remove all tools	10	-					0	0	0	0	0	0
6)		n transport cask transfer cart in unloading cell and close shield doors	60								_			-
		Move transport cask cart into the unloading cell	50	-					0	0	0	0	0	0
٦١		Close the shield doors	10 90	-					0	0	0	0	0	0
7)		mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use	90 15	_					0	0	0	0	0	0
		Place the empty transfer cask on the transfer cart using VCT	15	_					0	0	0	0	0	0
		Stage tools on top of the transfer cask	10	-					0	0	0	0	0	0
		Unbolt transfer cask lid	30	-					0	0	0	0	0	0
		Rig the cask lid to the VCT hoist	10	-					0	0	0	0	0	0
		Hoist lid and retain on VCT	10	-					0	0	0	0	0	0
8)		n empty transfer cask in receiving cell using motorized cart	45						-		_			<u> </u>
L	a)	Open receiving cell shield doors	15	-					0	0	0	0	0	0

	r		T				1							
		Transfer empty transfer cask into receiving cell using motorized cart Close the shield doors	15	-					0	0	0	0	0	0
	-,	QC Hold Point Inspection	10 5	-					0	0	0	0	0	0
9)	, ,	n shielded transfer sleeve cart over unloading cell	35	-					0	U		-		-
٥,		Inspect transfer sleeve cart	10	_					0	0	0	0	0	0
		Move shielded transfer sleeve cart over unloading cell	15	_					0	0	0	0	0	0
		QC Hold Point Inspection	10	-					0	0	0	0	0	0
10)		shield sleeve hoist and grapple DPC lifting lug	50											
	a)	HP survey	0	-					0	0	0	0	0	0
	b)	Lower shield sleeve hoist and grapple DPC lifting lug	50	-					0	0	0	0	0	0
11)	Raise D	PC into shield sleeve	60											
	,	Raise DPC into shield sleeve	60	-					0	0	0	0	0	0
		HP survey	0	-					0	0	0	0	0	0
12)		n shielded transfer sleeve cart over transfer cask in receiving cell	70								<u> </u>	<u> </u>		<u> </u>
		Position shielded transfer sleeve cart over transfer cask in receiving cell	60	-					0	0	0	0	0	0
	-,	HP survey QC Hold Point Inspection	0 10	-					0	0	0	0	0	0
13)		OPC into empty transfer cask, release grapple, and retract hoist	60	-					U	U		-	-	-
13,		Lower DPC into empty transfer cask, release grapple, and retract hoist	60	-					0	0	0	0	0	0
		HP survey	0	-					0	0	0	0	0	0
14)	Open re	eceiving cell shield doors and transfer transfer cask out of receiving cell	35											
		HP survey	10	-					0	0	0	0	0	0
	b)	Open receiving cell shield doors	10	-					0	0	0	0	0	0
	c)	Transfer transfer cask out of receiving cell using motorized cart	15	-					0	0	0	0	0	0
15)	L	ransfer cask lid	60											
Щ	,	Position VCT with transfer cask lid at transfer cask	15	-					0	0	0	0	0	0
Н		Lower transfer cask lid into position	10	-						_	<u> </u>	<u> </u>	<u> </u>	<u> </u>
		Install bolts and torque	20	2A V T	1.5				10	0	0	0	0	0
\vdash		QC Hold Point Inspection	10 5	-					0	0	0	0	0	0
1521	,	Clean out tools and leave the top of the DPC seismic restraints	4 0	-					U	U	U	1	U	U
13d)	ī	Position seismic restraints	15	-					0	0	0	0	0	0
\vdash	- /	Secure seismic restraints	15	-					0	0	0	0	0	0
	_ ',	QC Hold Point Inspection	10	-					0	0	0	0	0	0
15b)		the Day and Safety Meeting	30											
	a)	Plan of the Day Meeting	15	-					0	0	0	0	0	0
	b)	Safety briefing	10	-					0	0	0	0	0	0
	, ,	Transportation to work site	5	-					0	0	0	0	0	0
16)	· · · · ·	transport cask and transfer to vault using VCT	55								<u> </u>	<u> </u>	ļ	
		Rig VCT to lift transfer cask	10	2A V T		2			0	6.7	0	0	0	0
		Grapple the transport cask	15	-					0	0	0	0	0	0
17\	,	Move the transfer cask to the vault ransfer cask on transfer cart	30 15	-					0	0	0	0	0	0
1/)		Place transfer cask on unloading cell transfer cart in vault	15	_					0	0	0	0	0	0
18)		e transfer cask lid	75	-					0	U		-		-
10,		Move tools to work platform	5	_					0	0	0	0	0	0
		HP survey of lid	15	2A V T		2			0	0	10	0	0	0
	1	Remove and store nuts	30	2A V T	1				10	0	0	0	0	0
	d)	Rig the lid for lifting using the local jib crane	15	2A V T		2			0	10	0	0	0	0
	e)	Lift the transport cask lid and move it to the storage stand	10	-					0	0	0	0	0	0
19)		n transport cask transfer cart in unloading cell and close shield doors	60											
		Move transport cask cart into the unloading cell	50	-					0	0	0	0	0	0
	,	Close the shield doors	10	-					0	0	0	0	0	0
20)		n shielded transfer sleeve on bridge crane above transfer cell	30						_	_	_	_		_
		Inspect shielded transfer sleeve	5 15	-					0	0	0	0	0	0
		Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection	10	_					0	0	0	0	0	0
20a)		transfer sleeve seismically	40								<u> </u>	۳	 	۳
200,		Reposition transfer cart near seismic restraint system	15	-					0	0	0	0	0	0
		Secure transport cask and transfer cart	15	-					0	0	0	0	0	0
		QC Hold Point Inspection	10					Ĺ	0	0	0	0	0	0
20b)	Plan of	the Day and Safety Meeting	30											
		Plan of the Day Meeting	15	-					0	0	0	0	0	0
		Safety briefing	10	-					0	0	0	0	0	0
		Transportation to work site	5	-					0	0	0	0	0	0
21)		noist, grapple lifting lug, and raise DPC into shield sleeve	100						_	_	_	 _	<u> </u>	<u> </u>
\vdash		Lower shield sleeve hoist and grapple DPC lifting lug	15	-	-				0	0	0	0	0	0
	-,	Raise DPC into shield sleeve HP survey	60 15	-					0	0	0	0	0	0
		QC Hold Point Inspection	10	-					0	0	0	0	0	0
221		er DPC to vault storage location	10 120	_					<u> </u>	U				
/		Transfer DPC to vault storage location	120	-					0	0	0	0	0	0
23)		e shield plug above vault storage location	60									Ť		Ť
		Position crane over storage location in vault	30						0	0	0	0	0	0
		Rig the shield plug	15	-					0	0	0	0	0	0
		Lift shield plug and place on storage stand	15	-					0	0	0	0	0	0
24)		OPC into storage position on vault floor	70								<u> </u>	<u> </u>	<u> </u>	ļ
	a)	Align DPC over storage position	15	-					0	0	0	0	0	0
		Lower DPC into vault	45	-					0	0	0	0	0	0
	b)	OC Hald Batet Issue 11	10	-					0	0	0	0	0	0
35,	b) c)	QC Hold Point Inspection	+					Hillian Contraction			ļ			
25)	b) c) Replace	shield plug above vault storage location	85						0	^	0			
25)	b) c) Replace	shield plug above vault storage location Rig the shield plug to the crane	85 15	-					0	0	0	0	0	0
25)	b) c) Replace a) b)	e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug	85 15 15	- - -					0 0	0	0 0	0	0	0
25)	b) c) Replace a) b) c)	Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault	85 15						0		0	+	_	
25)	b) c) Replace a) b) c) d)	e shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug	85 15 15 15						0	0	0	0	0	0
25)	b) c) Replace a) b) c) d)	Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault Secure the shield plug and remove rigging	85 15 15 15 15						0 0	0 0	0 0 0	0 0	0 0	0 0

	Total Hours of Canister Handling Operations	35.8									
25a)	Turnover to Operations	1440									
26)	Return crane to operating floor	120	-			0	0	0	0	0	0
27)	Remove transport cask from transfer cell	60	-			0	0	0	0	0	0
28)	Install transport cask lid	60	-			0	0	0	0	0	0
29)	Lift transport cask and transfer to maintenance	60	-			0	0	0	0	0	0
29a)	Survey and wipedown transport cask	60	-			0	0	0	0	0	0
29b)	Reposition empty railcar to railbay	60	-			0	0	0	0	0	0
30)	Lift transport cask, place on railcar, and downend	60	-			0	0	0	0	0	0
31)	Install impact limiters on transport cask	120	-			0	0	0	0	0	0
32)	Release railcar for shipment	30	-			0	0	0	0	0	0
	Total Hours of All Cask Handling Operations	70.3				92	58	56	0	11	2.5

## A PART OF THE PROPRIES AND THE PROPRESS OF				Duration	Dose	T 1	Dura	tion Fra	ction			Task	Dose		
Ban of the Boy-Medering	DPC	s in lift	frames stored vertically in vault floor		Dose	_	,			М					Q
Display priefling	0)	Plan of	the Day and Safety Meeting	30											
Composition to work size S		- /			-										0
10 Receive transport cask for arillar at Cask Hamiling Bulding 145		- /			-										0
a)	1\		<u>'</u>		-					0	0	0	0	0	0
b) Security Iream sent to railaby door	1)				_					0	0	0	0	0	0
C Send operators to railwy door					_										0
display sport (seem to railbay)			·		-										0
Fig. Resident NSF shapment in the railway 15 3 VT 0.5 0.0 0.0 0.0 0.5		d)		15	-					0	0	0	0	0	0
Part Security inspection of the SNF dishipment 15 34 0.5 0.5 0.0 0.5 0.5 0.0 0.5 0.0 0.5 0.0 0.		e)	Open railbay door	5	-					0	0	0	0	0	0
h HP survey of SNF shipment		f)	·		-							_	_		0
3									0.5						0
December Section Sec			, ·					0.5	0.1						0
Big Decouping of railers and removal of the tug from the railbay 10 . 0 0 0 0 0 0 0 0					3 V I				0.1						0
Discurse the railstay doors		1			_										0
m Security team leaves					_										0
n Operator leaves 5 -		- '.			-										0
2 Remove impact limiters and place in temporary storage 195 0 0 0 0 0 0 0 0 0		n)		5	-					0	0	0	0	0	0
33 Mobilize crew (mechanics, siggers, crane operator, etc.) 5 - 0 0 0 0 0 0 0 0		o)	Completes paperwork for step #1	5	-					0	0	0	0	0	0
b) Select and inspect rigging for impact limiters on the SNI shipment 5	2)	Remov													
C Rig the lifting devices to the first impact limiter 5					-					_	_	_	_		0
d Position manifits and temporary scaffolding near SNF shipment 5					441/-	_	~	3		-					0
e Remove and store bolts holding on the first impact limiter 30 IAVT 2								2							0
1 Remove first impact limiter and place on storage stand		<i>'</i>				2									0
Bemove riging and reposition on second impact limiter						_	1				_		_		0
h Reposition mainlift and scaffolding													_		0
		1		5	1A V T					0	0	0	0	0	0
No. Remove and store bolts for personnel barrier 30 3 V T 0.2		i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2				15	0	0	0	0	0
1) Right the personnel barrier				10						0	2.5	0	0	0	0
m Lift personnel barrier and move to storage location 10 3 VT 0 0 0 0 0 0 0 0		k)		30	3 V T	0.2				4.4	0	0	0	0	0
n Remove title-down straps from SNF shipment 10							1	1				_	_		0
O Rig tie-down straps and move to storage location 5 3AVT 1 0 0 2.8 0 0 0 0					_	0.4					_		_		0
p) Inspect transport cask for damage and conduct HP survey 15 3 V T 2 0 0 0 22 0 0 0 3 Uppend and lift transport cask of of railcar and place on transfer fixture 120						0.4					_		_		0
3			·					2					_		0
a) Select the appropriate lifting block for the transport cask 5	3)									_					
c) Upend transport cask of failcar 30 - 0				5	-					0	0	0	0	0	0
d) Lift transport cask off railcar		b)	Secure lifting block to transport cask trunnions	10	2A V T		2			0	6.7	0	0	0	0
e) Move transport cask to transfer fixture 30 - 0 0 0 0 0 0 0 0		+			-										0
f) Downend transport cask on transfer fixture 15 - 0 0 0 0 0 0 0 3a) Remove railcar from railbay 60		<u> </u>			-										0
Saily Remove railcar from railbay Saily and tug connects to railcar Saily and tug removes railcar from railbay Saily and tug removes railcar from railbay Saily and tug removes railcar Saily and tug removes to next railcar Saily and tug repositions next railcar Saily and tug repositions next railcar Saily and tug repositions next railcar in railbay Saily and trailsay Saily and tug repositions next railcar in railbay Saily and tug repositions next railcar in railbay Saily and tug repositions next railcar Saily and tug repositions Saily and tug repositions next railcar Saily and tug repositions Saily and tug repositions Saily and tug reposition for sailcar Saily and tug repositions Saily and tug reposition for sailcar			·		-					_	_		_		0
a) Open railbay door 5	221				-					U	U	U	U	0	0
b) Railyard tug connects to railcar 10	Saj	t .			_					0	0	0	0	0	0
c) Railyard tug removes railcar from railbay 10 - 0 0					-										0
d) Railyard tug connects to next railcar 15 -		c)			-					0	0	0	0	0	0
f) Railyard tug leaves railbay and railbay door is closed 10 - 0 0 0 0 0 4) Stage transfer cask on upender using VCT 50 0		d)		15	-					0	0	0	0	0	0
4) Stage transfer cask on upender using VCT 50 a) Move the VCT into position 5 - 0 <td></td> <td>1</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0</td>		1			-										0
a) Move the VCT into position 5 - 0 <t< td=""><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></t<>					-					0	0	0	0	0	0
b) Grapple the transfer cask 5	4)									_	_	_	_	_	_
c) Pick the transfer cask 15 - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			·		-	_							_		0
d Reposition the VCT at the upender in the transfer cell 15						\vdash									0
e) Place the transfer cask on the upender 10					<u>-</u> 						_				0
5) Unbolt and hoist transfer cask lid and retain on VCT 70 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 </td <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td>0</td>					-						_				0
a) Stage tools on top of the transfer cask 10 - 0 0<	5)														
b) Unbolt transfer cask lid 30 - 0 0 0 0 0 c) Rig lid to the VCT hoist 10 - 0		a)	Stage tools on top of the transfer cask							0	0	0	0	0	0
d) Lift lid to the storage position of the VCT 10 - 0 <td< td=""><td></td><td>b)</td><td>Unbolt transfer cask lid</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></td<>		b)	Unbolt transfer cask lid		-					0	0	0	0	0	0
e) Remove grapples and back VCT out of the transfer cell 10 - 0 0 0 0 0 5a) Secure transport cask and transfer cart seismically 40 0<					-							_			0
5a) Secure transport cask and transfer cart seismically 40 50 50 60					-	_				_			_		0
a) Reposition transfer cart near seismic restraint system 15 - 0 <td>_ `</td> <td>- /</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>	_ `	- /			-					0	0	0	0	0	0
b) Secure transport cask and transfer cart 15 - 0 0 0 0 0 c) QC Hold Point Inspection 10 - 0 0 0 0 0 5b) Plan of the Day and Safety Meeting 30 0	5a)	1								0	0	^	0	0	0
c) QC Hold Point Inspection 10 - 0 0 0 0 0 5b) Plan of the Day and Safety Meeting 30 0 <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0</td>						-									0
5b) Plan of the Day and Safety Meeting 30 0		<u> </u>	·		<u>-</u> 					-	_			_	0
a) Plan of the Day Meeting 15 - 0 0 0 0 0 0	5b)	,								J		Ť	Ť		Ť
					-					0	0	0	0	0	0
							L								0

'		<u></u>	ī	1				_			1			_
	c)	Transportation to work site	5	-					0	0	0	0	0	0
5c)		iting frame into transfer cask using jib crane	85						_	_			_	_
	•	Move lifting frame into position using a transfer cart	15 15	-					0	0	0	0	0	0
	b)	Rig the lifting frame onto the jib crane Hoist the lifting frame and load it into the transfer cask	15	-					0	0	0	0	0	0
-	c) d)	Lift docking collar and place on top of transfer cask	10	_					0	0	0	0	0	0
	e)	Strap docking collar to top of transfer cask	15	_					0	0	0	0	0	0
	f)	Remove the rigging and secure the jib crane	15	_					0	0	0	0	0	0
6)		nd transfer cask on upender	30							Ŭ	-		0	-
-,	a)	Secure transfer cask to upender	15	-					0	0	0	0	0	0
	- /	Downend the transfer cask to the horizontal position	15	-					0	0	0	0	0	0
7)	•	e transport cask lid	100											
		Move tools to work platform	5	-					0	0	0	0	0	0
	b)	HP survey of lid including gas sampling	15	1A H T L		2			0	0	9.2	0	0	0
	c)	Position jib crane	15	-					0	0	0	0	0	0
	d)	Rig the lid for lifting using the local jib crane	15	1A H T L		2			0	9.2	0	0	0	0
	e)	Remove and store nuts	30	1A H T L	2				18	0	0	0	0	0
	f)	Lift the transport cask lid and move it to the transfer fixture	10	-					0	0	0	0	0	0
	g)	Security inspection of the interior of the transport cask	10	1AHTNL			0.2		0	0	0	0	5.4	0
7a)	Secure	transport cask and transfer fixture seismically	40											
	a)	Position seismic restraints	15	-					0	0	0	0	0	0
	b)	Secure seismic restraints	15	-					0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-					0	0	0	0	0	0
7b)		the Day and Safety Meeting	30											
	a)	Plan of the Day Meeting	15	-					0	0	0	0	0	0
	p)	Safety briefing	10	-					0	0	0	0	0	0
ο,	c)	Transportation to work site	5 75	-					0	0	0	0	0	0
გ)		ransfer sleeve on horizontal transfer cart with transport cask	75						^	^		_		_
\dashv		Position spotters Mayor transfer sleeve into position	10	-	-				0	0	0	0	0	0
	b)	Move transfer sleeve into position	10		-				0	0	0	0	0	0
\dashv	c) d)	Align transport cask with transfer sleeve Dock transfer sleeve to transport cask	15 15	_					0	0	0	0	0	0
\dashv	e)	Install retaining straps on transport cask trunnions	15	2A H T	 	1.5			0	12	0	0	0	0
	f)	QC Hold Point Inspection	10	ZA П I		1.5			0	0	0	0	0	0
9)		PC into lift frame inside transfer cask	75								-		0	0
٥,	a)	Remove pushing port in base of transport cask	15	5 H H	2				4.3	0	0	0	0	0
	b)	Engage ram and push DPC into transfer sleeve	30	-	_				0	0	0	0	0	0
	c)	Withdraw the ram	20	-					0	0	0	0	0	0
	d)	QC Hold Point Inspection	10	-					0	0	0	0	0	0
10)	Undock	k horizontal transfer cart from transport cask	30											Ť
	a)	Remove retaining straps from transfer sleeve	10	2A H T		0.2			0	1.1	0	0	0	0
	b)	Pull horizontal transfer cart back	10	-					0	0	0	0	0	0
	c)	Close shield door on transfer sleeve	10	-					0	0	0	0	0	0
11)	Roll ho	rizontal transfer cart onto turntable and rotate 180°	30											
	a)	Roll transfer cart to turntable lock wheels	10	-					0	0	0	0	0	0
	b)	Rotate turntable 180°	20	-					0	0	0	0	0	0
12)	Roll ho	rizontal transfer cart to upending cell and dock with transfer cask on upender	45											
	a)	Unlock wheels and roll transfer cart to upending cell	10	-					0	0	0	0	0	0
	b)	Dock transfer sleeve to transfer cask on upender	20	-					0	0	0	0	0	0
	c)	Attach retaining straps to transfer sleeve trunnions	15	2A H T		0.5			0	4	0	0	0	0
13)		PC from transfer sleeve into lift frame in transfer cask	65											U
	a)	Plug in hydraulic power pack on transfer cart												
			15	-					0	0	0	0	0	0
		Engage ram and push DPC into the lift frame in the transfer cask	15 30	-					0	0	0	0	0	0 0
	c)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram	15 30 10	- - -					0	0	0	0	0	0 0
14)	c) d)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection	15 30 10 10	- - -					0	0	0	0	0	0 0
14)	c) d) Undock	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection C horizontal transfer cart	15 30 10 10 50	-		0.2			0 0	0 0	0 0 0	0 0 0	0 0	0 0 0 0
14)	c) d) Undock a)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection C horizontal transfer cart Remove retaining straps from transfer cask	15 30 10 10 50 15	- - - - 2A H T		0.2			0 0 0	0 0 0 1.6	0 0 0	0 0 0	0 0 0	0 0 0 0
14)	c) d) Undock a) b)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart	15 30 10 10 50 15	- - - 2A H T		0.2			0 0 0 0	0 0 0 1.6	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0
14)	c) d) Undock a) b)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove	15 30 10 10 50 15 15	-		0.2			0 0 0 0	0 0 0 1.6 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0
	c) d) Undock a) b) c) d)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection C horizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection	15 30 10 10 50 15 15 10	- - - 2A H T		0.2			0 0 0 0	0 0 0 1.6	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0
	c) d) Undock a) b) c) d)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask	15 30 10 10 50 15 15 10 10	- - - 2A H T		0.2			0 0 0 0	0 0 0 1.6 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0
	c) d) Undock a) b) c) d) Upend	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell	15 30 10 10 50 15 15 10 10	- - - 2A H T		0.2			0 0 0 0 0 0	0 0 0 1.6 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	c) d) Undock a) b) c) d) Upend a)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask	15 30 10 10 50 15 15 10 10	- - - 2A H T		0.2			0 0 0 0 0 0 0	0 0 0 1.6 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0
15)	c) d) Undock a) b) c) d) Upend a) b) c)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell	15 30 10 10 50 15 15 10 10 30 10	- - - 2A H T		0.2			0 0 0 0 0 0 0	0 0 0 1.6 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0
15)	c) d) Undock a) b) c) d) Upend a) b) c)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection c horizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender lid on transfer cask	15 30 10 10 50 15 15 10 10 30 10	- - - 2A H T		0.2			0 0 0 0 0 0 0	0 0 0 1.6 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0
15)	c) d) Undock a) b) c) d) Upend a) b) c) Install I	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender	15 30 10 10 50 15 15 10 10 30 10 15 5 85	- - - 2A H T - - - -		0.2			0 0 0 0 0 0 0	0 0 0 1.6 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0
15)	c) d) Undock a) b) c) d) Upend a) b) c) Install I	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell	15 30 10 10 50 15 15 10 10 30 10 15 5 85			0.2			0 0 0 0 0 0 0	0 0 0 1.6 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
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15)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift	15 30 10 10 50 15 15 10 10 30 10 15 5 85 10 15	- - - 2A H T - - - - -	1.5				0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
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15)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection	15 30 10 10 50 15 15 10 10 30 10 15 5 85 10 15 10 10 20 10	- - - 2A H T - - - - -	1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0
15)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender iid on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away	15 30 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 10 10 15 5 85 10 10 15 5 85 10 10 10 10 10 10 10 10 10 10	- - - 2A H T - - - - -	1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0
15)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints	15 30 10 10 10 50 15 15 10 10 30 10 15 5 85 10 15 10 20 10 5 40	- - - 2A H T - - - - -	1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints	15 30 10 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 10 20 10 5 40 15 15 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints	15 30 10 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 40 15 15 15 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b) c) Plan of a)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection c horizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting	15 30 10 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 10 20 10 5 40 15 15 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b) c) Plan of a)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection knorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing	15 30 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 10 20 10 5 40 15 15 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) f) g) Secure a) b) c) Plan of a) b) c)	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site	15 30 10 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 10 20 10 5 40 15 15 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b) c) Plan of a) b) c) Transfer	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection Chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site er transfer cask to vault	15 30 10 10 10 50 15 15 10 10 30 10 15 5 85 10 15 15 10 20 10 5 40 15 15 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
15) 16)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) d) e) f) g) Secure a) b) c) Plan of a) b) c) Transfer	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection chorizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site transfer cask to vault Rig VCT to lift transfer cask	15 30 10 10 10 50 15 15 15 10 10 30 10 15 5 85 10 15 15 10 20 10 5 40 15 15 10 30 15 15 10 5 40 15 15 10 10 15 15 10 10 10 15 15 10 10 10 10 10 10 10 10 10 10 10 10 10		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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15) 16) 16a) 17)	c) d) Undock a) b) c) d) Upend a) b) c) Install I a) b) c) f) g) Secure a) b) c) Plan of a) b) c) Transfe a) b) c) Lift trai	Engage ram and push DPC into the lift frame in the transfer cask Withdraw the ram QC Hold Point Inspection c horizontal transfer cart Remove retaining straps from transfer cask Unplug hydraulic power pack on transfer cart Undock transfer cart and remove QC Hold Point Inspection transfer cask Close shield Door to upender cell Upend the transfer cask Set locking mechanism on upender id on transfer cask Open outer shield doors to upender cell Position VCT at transfer cask on upender Lower transfer cask lid into place using the VCT Stage tools on manlift Install bolts and torque QC Hold Point Inspection Move manlift away transport cask and Transfer Fixture seismically Position seismic restraints Secure seismic restraints Secure seismic restraints QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site transfer cask to vault Rig VCT to lift transfer cask Open transfer cask to vault	15 30 10 10 10 10 50 15 15 10 10 10 30 10 15 5 85 10 10 20 10 5 40 15 15 10 30 15 15 10 30 15 15 10 30 30 30 30 30 30		1.5				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

13)	Remov	ve transfer cask cover using jib crane and set down	85											
13,	a)	Move tools to work platform	5	-					0	0	0	0	0	0
	b)	HP survey of lid	15	1A H T L			2		0	0	9.2	0	0	0
	c)	Remove and store nuts	30	1A H T L	2		_		18	0	0	0	0	0
	d)	Rig the lid for lifting using the local jib crane	15	1AHTL	_	2			0	9.2	0	0	0	0
	e)	Lift the transport cask lid and move it to the storage stand	10	-		_			0	0	0	0	0	0
	f)	Security inspection of the interior of the transport cask	10	1A V C				0.2	0	0	0	0	8.5	0
15)	,	ansfer cart into transfer cell and close shield doors	30	IAVC				0.2	0	-	0	-	0.5	
13)	a)	Move transfer cask cart into the unloading cell	20	_					0	0	0	0	0	0
	b)	Close the shield doors	10	_					0	0	0	0	0	0
16)	٠,	on shielded transfer sleeve above transfer cell	70	-					U	U	U	U	U	
10)		Inspect shielded transfer sleeve	15						0	0	0	0	0	0
	a) b)	·	30	 					0	0	0	0	0	0
	- '	Move shielded transfer sleeve cart over unloading cell		-					0	0	0	0	0	_
	c)	Secure in position	15	-					0			0	_	0
16-1	d)	QC Hold Point Inspection shielded transfer sleeve and DPC seismically	10	-					U	0	0	U	0	U
16a)	i e		40						_	_	_	_	_	_
	a)	Reposition seismic restraint system	15	-					0	0	0	0	0	0
	b)	Secure shielded transfer sleeve	15	-	_				0	0	0	0	0	0
4	c)	QC Hold Point Inspection	10	-					0	0	0	0	0	0
16b)		f the Day and Safety Meeting	30							_		_		_
	a)	Plan of the Day Meeting	15	-					0	0	0	0	0	0
	b)	Safety briefing	10	-					0	0	0	0	0	0
	c)	Transportation to work site	5	-					0	0	0	0	0	0
17)	Lower	hoist, grapple lifting lug, and raise DPC into shield sleeve	90											
	a)	Lower shield sleeve hoist and grapple lift frame	15	-					0	0	0	0	0	0
	b)	Raise DPC into shield sleeve	45	-					0	0	0	0	0	0
	c)	Close shield sleeve lower doors	15	-					0	0	0	0	0	0
	d)	HP survey	15	-					0	0	0	0	0	0
18)	Transf	er DPC to vault storage location	120											
	a)	Transfer DPC to vault storage location	120	-					0	0	0	0	0	0
19)	Remov	e shield plug above vault storage location	105											
	a)	Stage tools in storage vault location	15	-					0	0	0	0	0	0
	b)	Position crane in vault	30	-					0	0	0	0	0	0
	c)	Rig the shield plug	15	-					0	0	0	0	0	0
	d)	Lift shield plug and place on storage stand	15	-					0	0	0	0	0	0
	e)	Disconnect rigging and return crane to cask handling area	30	-					0	0	0	0	0	0
20)	Lower	DPC and lift frame into storage position on vault floor	85											
	a)	Align DPC over storage position	15	-					0	0	0	0	0	0
	b)	Lower DPC into vault	45	-					0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-					0	0	0	0	0	0
	d)	HP survey	15	-					0	0	0	0	0	0
21)	Replac	e shield plug above vault storage location	85											
	a)	Rig the shield plug to the crane	15	-					0	0	0	0	0	0
	b)	Reposition the shield plug	15	-					0	0	0	0	0	0
	c)	Lower the shield plug into the vault	15	-					0	0	0	0	0	0
	d)	Secure the shield plug and remove rigging	15	-					0	0	0	0	0	0
	e)	QC Hold Point Inspection	10	-					0	0	0	0	0	0
	f)	HP survey	15	_					0	0	0	0	0	0
	— <i>''</i>	Total Hours of Canister Handling Operations								Ť	Ť	Ť		
21a\	Turno	ver to Operations	1440											
		o crane to Operating Floor	60	-					0	0	0	0	0	0
_		transport cask lid	60	_					0	0	0	0	0	0
_		Insport cask and transfer to maintenance	60	_					0	0	0	0	0	0
_		and wipedown transport cask	60	_					0	0	0	0	0	0
_		ansport cask and place on railcar	60	_					0	0	0	0	0	0
		· · · · · · · · · · · · · · · · · · ·		-					0	0	0	0		0
		impact limiters on transport cask	120	-	-				0				0	_
2/)	reieas	e railcar for shipment Total Hours of All Cook Handling Operations	60	-	<u> </u>				_	0 75	0	0	0	0
Ī		Total Hours of All Cask Handling Operations	71.1						94	75	59	0	20	0

4D, 5D - C-BGVd/AGVd, Below/Above Ground Vault with Separate CHB - Vertical and Horizontal Storage

Vort	ical D	CCs stored vertically in yoult floor	Duration	Dose	[Dura	tion	Fra	ctio	า			Task	Dose		
		SCs stored vertically in vault floor	(Minutes)		M	R	Н	0	S	Q	М	R	Н	0	S	Q
0)		the Day and Safety Meeting	30 15								0	0	0	0	0	0
	a) b)	Plan of the Day Meeting Safety briefing	10	-							0	0	0	0	0	0
	c)	Transportation to work site	5	-							0	0	0	0	0	0
1)	Receive	e transport cask on railcar at Cask Handling Building	145													
	a)	Identify SNF shipment brought from yard	5	-							0	0	0	0	0	0
	p)	Security team sent to railbay door	15	-	<u> </u>						0	0	0	0	0	0
	c) d)	Send operators to railbay door Stage work team to railbay	15 15	-	-						0	0	0	0	0	0
	e)	Open railbay door	5	-							0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	-							0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug	15	3 V T					0.5		0	0	0	0	5.5	0
	h)	HP survey of SNF shipment	15	3 V T			0.5				0	0	5.5	0	0	0
	i)	Inspection of tamper proof Seals Acceptance of SNF shipment	10 5	3 V T					0.1		0	0	0	0	0.7	0
	j) k)	Decoupling of railcar and removal of the tug from the railbay	10	-							0	0	0	0	0	0
	l)	Secure the railbay doors	5	-							0	0	0	0	0	0
	m)	Security team leaves	5	-							0	0	0	0	0	0
	n)	Operator leaves	5	-							0	0	0	0	0	0
2)	0)	Completes paperwork for step #1	5	-							0	0	0	0	0	0
2)	a)	e impact limiters and place in temporary storage Mobilize crew (mechanics, riggers, crane operator, etc.)	195 5	_							0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the transport cask	5	-							0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2				0	2.5	2.5	0	0	0
	d)	Position man lifts and temporary scaffolding near transport cask	5	1A V T		2					0	2.5	0	0	0	0
<u> </u>	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2	1					15	0	0	0	0	0
	f) g)	Remove first impact limiter and place on storage stand Remove rigging and reposition on second impact limiter	10 5	1A V T 1A V T		1					0	2.5 1.3	0	0	0	0
$\vdash \vdash$	<u>g)</u> h)	Reposition manlift and scaffolding	5	1A V T		1					0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2						15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2		_				4.4	0	0	0	0	0
	l)	Rig the personnel barrier Lift personnel barrier and move to storage location	15 10	3 V T		1	1				0	11	11 0	0	0	0
	m) n)	Remove tie-down straps from transport cask	10	3A V T	0.4						2.3	0	0	0	0	0
	0)	Rig tie-down straps and move to storage location	5	3A V T		1					0	2.8	0	0	0	0
	p)	Inspect transport cask for damage and conduct HP survey	15	3 V T			2				0	0	22	0	0	0
3)	Upend	and lift transport cask off of railcar and place on unloading cell transfer cart	120													
	a)	Select the appropriate lifting block for the transport cask	5	- 24.\/T		2					0	0	0	0	0	0
	b) c)	Secure lifting block to transport cask Trunnions Upend transport cask	10 30	2A V T		2					0	6.7 0	0	0	0	0
	d)	Lift transport cask off railcar	30	-							0	0	0	0	0	0
	e)	Reposition transport cask	30	-							0	0	0	0	0	0
	f)	Place transport cask on unloading cell transfer cart	15	-							0	0	0	0	0	0
3a)		e railcar from railbay	60													
	a) b)	Open railbay door Railyard tug connects to railcar	5 10	-							0	0	0	0	0	0
	c)	Railyard tug removes railcar from railbay	10	-							0	0	0	0	0	0
	d)	Railyard tug connects to next railcar	15	-							0	0	0	0	0	0
	e)	Railyard tug repositions next railcar in railbay	10	-							0	0	0	0	0	0
	f)	Railyard tug leaves railbay and railbay door is closed	10	-							0	0	0	0	0	0
4)		and remove transport cask lid using jib crane Move tools to work platform	85									0	0	0	0	0
	a) b)	HP survey of lid Including gas sampling	5 15	2A V T			1				0	0	<u> </u>	0	0	0
	c)	Remove and store nuts	30	2A V T	1		_				10	0	0	0	0	0
	d)	Rig the lid for lifting using the local jib crane	15	2A V T		1.5					0	7.5	0	0	0	0
	e)	Lift the transport cask lid and move it to the storage stand	10	-							0	0	0	0	0	0
4	f)	Security inspection of the interior of the transport cask	10	2 V T					0.2		0	0	0	0	5	0
4a)	Secure a)	transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system	40 15	_							0	0	0	0	0	0
	а) b)	Secure transport cask and transfer cart	15	-							0	0	0	0	0	0
	c)	QC Hold Point Inspection	10								0	0	0	0	0	0
4b)	Plan of	the Day and Safety Meeting	30													
	a)	Plan of the Day Meeting	15	-							0	0	0	0	0	0
	b) c)	Safety briefing Transportation to work site	10	<u>-</u>							0	0	0	0	0	0
5)		Transportation to work site	70	-							U	U	U	U	U	U
٠,	-,	lifting lug to top of DPC									0	0	0	0	0	0
	Attach	Rig lifting lug on storage rack	15	-			ļ				U		_	_		
	Attach			- 2A V T		0.5					0	2.5	0	0	0	0
	a) b)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister	15 15 20	2 V T	0.5						0 25	2.5	0	0	0	0
	Attach a) b) c) d)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection	15 15 20 10		-					0.1	0 25 0	2.5 0 0	0 0	0 0	0	0 2.5
61	a) b) c) d) e)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools	15 15 20 10 10	2 V T	-					0.1	0 25	2.5	0	0	0	0
6)	Attach a) b) c) d) e) Positio	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors	15 15 20 10 10 60	2 V T	-					0.1	0 25 0 0	2.5 0 0	0 0 0	0 0 0	0 0	0 2.5
6)	Attach a) b) c) d) e) Positio	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools	15 15 20 10 10	2 V T	-					0.1	0 25 0	2.5 0 0	0 0	0 0	0	0 2.5 0
	Attach a) b) c) d) e) Positio a) b)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors Impty transfer cask on receiving cell transfer cart	15 15 20 10 10 60 50 10	2 V T	-					0.1	0 25 0 0	2.5 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 2.5 0
	Attach a) b) c) d) e) Positio a) b) Stage e a)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use	15 15 20 10 10 60 50 10 90	2 V T	-					0.1	0 25 0 0 0 0	2.5 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 2.5 0 0 0
	Attach a) b) c) d) e) Positio a) b) Stage e a) b)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on the transfer cart using VCT	15 15 20 10 10 60 50 10 90 15	2 V T 2 V T - - - -	-					0.1	0 25 0 0 0 0 0	2.5 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 2.5 0 0 0 0
	Attach a) b) c) d) e) Positio a) b) Stage e a) b)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors Impty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on the transfer cart using VCT Stage tools on top of the transfer cask	15 15 20 10 10 60 50 10 90 15 15	2 V T	-					0.1	0 25 0 0 0 0 0 0	2.5 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 2.5 0 0 0 0
	Attach a) b) c) d) e) Positio a) b) Stage e a) b)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on the transfer cart using VCT	15 15 20 10 10 60 50 10 90 15	2 V T 2 V T - - - -	-					0.1	0 25 0 0 0 0 0	2.5 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 2.5 0 0 0 0
	Attach a) b) c) d) e) Position a) b) Stage e a) b) c) d)	Rig lifting lug on storage rack Use jib crane to lift lifting lug into position Bolt lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors Imput transfer cask on receiving cell transfer cart Prepare an empty transfer cask for use Place the empty transfer cask on the transfer cart using VCT Stage tools on top of the transfer cask Unbolt transfer cask lid	15 15 20 10 10 60 50 10 90 15 15 10 30	2 V T 2 V T - - - -	-					0.1	0 25 0 0 0 0 0 0	2.5 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 2.5 0 0 0 0 0

		<u></u>	1	_			_						
		Open receiving cell shield doors	15	-					0	0	0	0	0 0
	b)	Transfer empty transfer cask into receiving cell using motorized cart	15	-					0	0	0	0	0 0
	- /	Close the shield doors	10	-					0	0	0	0	0 0
-		QC Hold Point Inspection	5	-					0	0	0	0	0 0
9)	1	n shielded transfer sleeve cart over unloading cell	35										
		Inspect transfer sleeve cart	10	-					0	0	0	0	0 0
	b)	Move shielded transfer sleeve cart over unloading cell	15	-					0	0	0	0	0 0
	c)	QC Hold Point Inspection	10	-					0	0	0	0	0 0
10)	Lowers	shield sleeve hoist and grapple DPC lifting lug	50										
	a)	HP survey	0	-					0	0	0	0	0 0
	b)	Lower shield sleeve hoist and grapple DPC lifting lug	50	-					0	0	0	0	0 0
11)		PPC into shield sleeve	60										
<u> </u>	_	Raise DPC into shield sleeve	60	-					0	0	0	0	0 0
	- '	HP survey	0	_					0	0	0	0	0 0
12)		n shielded transfer sleeve cart over transfer cask in receiving cell	70						Ť	Ŭ			0 0
,		Position shielded transfer sleeve cart over transfer cask in receiving cell	60	-					0	0	0	0	0 0
	<u> </u>	HP survey	0	_					0	0	0	0	0 0
		QC Hold Point Inspection	10	_					0	0	0	0	0 0
42)		·		-					U	U	U	U	0 0
13)		DPC into empty transfer cask, release grapple, and retract hoist	60						_				
		Lower DPC into empty transfer cask, release grapple, and retract hoist	60	-					0	0	0	0	0 0
		HP survey	0	-					0	0	0	0	0 0
14)		eceiving cell shield doors and transfer transfer cask out of receiving cell	35										
		HP survey	10	-					0	0	0	0	0 0
	b)	Open receiving cell shield doors	10	-					0	0	0	0	0 0
	c)	Transfer transfer cask out of receiving cell using motorized cart	15	-					0	0	0	0	0 0
15)	Install t	transfer cask lid	60									L	
	a)	Position VCT with transfer cask lid at transfer cask	15	-					0	0	0	0	0 0
	b)	Lower transfer cask lid into position	10	-									
		Install bolts and torque	20	2A V T	1.5				10	0	0	0	0 0
		QC Hold Point Inspection	10	-					0	0	0	0	0 0
		Clean out tools and leave the top of the DPC	5	-					0	0	0	0	0 0
15a		seismic restraints	40						Ĺ	Ĺ	Ĺ		
- 	1	Position seismic restraints	15	-					0	0	0	0	0 0
	b)	Secure seismic restraints	15	_					0	0	0	0	0 0
	,	QC Hold Point Inspection	10	<u> </u>					0	0	0	0	0 0
15h		the Day and Safety Meeting	30						0	0	0	0	0 0
130	-	Plan of the Day Meeting	15						0	0	0	0	0 0
		Safety briefing		-					_	0	0		
	+	, .	10	-					0	_	_	0	
46	c)	Transportation to work site	5	-					0	0	0	0	0 0
16)		transport cask and transfer to vault using VCT	55	04.14=					_				
		Rig VCT to lift transfer cask	10	2A V T		2			0	6.7	0	0	0 0
		Grapple the transport cask	15	-					0	0	0	0	0 0
	- /	Move the transfer cask to the vault	30	-					0	0	0	0	0 0
17)		ransfer cask on transfer cart	15										
	-	Place transfer cask on unloading cell transfer cart in vault	15	-					0	0	0	0	0 0
18)		e transfer cask lid	75										
		Move tools to work platform	5	-					0	0	0	0	0 0
		HP survey of lid	15	2A V T		2			0	0	10	0	0 0
					1					_			
		Remove and store nuts	30	2A V T	-		_		10	0	0	0	0 0
<u> </u>	-	Rig the lid for lifting using the local jib crane	15	2A V T		2			0	10	0	0	0 0
	e)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand	15 10			2			_		_	_	
19)	e) Positio	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors	15 10 60			2			0	10	0	0	0 0
19)	e) Position a)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell	15 10 60 50			2			0 0	10 0	0 0	0 0	0 0 0
	e) Position a) b)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors	15 10 60 50 10	2A V T		2			0	10	0	0	0 0
	e) Position a) b)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell	15 10 60 50	2A V T		2			0 0	10 0	0 0	0 0	0 0 0
	e) Position a) b) Position a)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve	15 10 60 50 10 30 5	2A V T		2			0 0	10 0	0 0	0 0	0 0 0
	e) Position a) b) Position a)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell	15 10 60 50 10 30	2A V T		2			0 0 0 0	10 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 0 0
20)	e) Position a) b) Position a) b) c)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection	15 10 60 50 10 30 5	2A V T		2			0 0 0 0	10 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0
20)	e) Position a) b) Position a) b) c)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell	15 10 60 50 10 30 5	2A V T		2			0 0 0 0 0	10 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
20)	e) Position a) b) Position a) b) c) Secure	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection	15 10 60 50 10 30 5 15	2A V T		2			0 0 0 0 0	10 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
20)	e) Position a) b) Position a) b) c) Secure a)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection transfer sleeve seismically	15 10 60 50 10 30 5 15 10 40	2A V T		2			0 0 0 0 0 0	10 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
20)	e) Position a) b) Position a) b) c) Secure a) b)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors n shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection transfer sleeve seismically Reposition transfer cart near seismic restraint system	15 10 60 50 10 30 5 15 10 40	2A V T		2			0 0 0 0 0 0 0	10 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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20) 20a 20b 21) 22) 23)	e) Position a) b) Position a) b) c) Secure a) b) c) Plan of a) b) c) Lower I a) Remove a) b) c) Lower I a) Remove a) b) c) C) Companies and bounder I a) b) c) Companies and bounder I a) b) c) Companies and bounder I a) b) c) Companies and bounder I a) c) Replace	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection transfer sleeve seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Position crane over storage location Position crane over storage location in vault Rig the shield plug Lift shield plug above vault storage position Lower DPC into storage position on vault floor Align DPC over storage position Lower DPC into vault QC Hold Point Inspection e shield plug above vault storage location Lower DPC into vault QC Hold Point Inspection e shield plug above vault storage location	15 10 60 50 10 30 5 15 10 40 15 15 10 5 10 5 10 5 10 15 10 5 10 15 10 5 10 15 10 5 10 15 10 15 10 15 10 15 10 15 10 10 15 10 10 15 10 10 10 10 10 10 10 10 10 10	2A V T		2			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
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20a 20b 21) 22) 23)	e) Position a) b) Position a) b) c) Secure a) b) c) Plan of a) b) c) Lower I a) b) c) C Replace a) b) c)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection transfer sleeve seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location Position crane over storage location Position crane over storage location in vault Rig the shield plug and place on storage stand DPC into storage position on vault floor Align DPC over storage position Lower DPC into vault CC Hold Point Inspection shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug	15 10 60 50 10 30 5 15 10 40 15 15 10 30 15 10 30 15 10 10 5 100 15 60 15 10 120 60 30 15 15 15 10 120 60 30 15 15 15 15 15 15 15 15 15 15 15 15 15	2A V T					0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
20a 20b 21) 22) 23)	e) Position a) b) Position a) b) c) Secure a) b) c) Plan of a) b) c) Lower I a) b) c) C Remove a) b) c) Lower I a) b) c) c) complete and boundary complete	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand In transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors In shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection transfer sleeve seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site Hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Position crane over storage location Position crane over storage location Position crane over storage position Lower DPC into storage position Lower DPC into vault QC Hold Point Inspection e shield plug and place on storage stand DPC into storage position on vault floor Align DPC over storage position Rig the shield plug to the crane Reposition the shield plug Lower the shield plug into the vault	15 10 60 50 10 30 5 15 10 40 15 15 10 30 15 10 30 15 10 10 5 100 15 60 15 10 120 60 30 15 15 15 10 15 15 15 10 15 15 15 10 15 15 10 15 15 15 15 15 15 15 15 15 15 15 15 15	2A V T					0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
20a 20b 21) 22) 23)	e) Position a) b) Position a) b) c) Secure a) b) c) Plan of a) b) c) Lower I a) b) c) to Remove a) b) c) Lower I a) b) c) c) co c) co d)	Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors shielded transfer sleeve on bridge crane above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell QC Hold Point Inspection transfer sleeve seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site hoist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple DPC lifting lug Raise DPC into shield sleeve HP survey QC Hold Point Inspection Transfer DPC to vault storage location Transfer DPC to vault storage location Position crane over storage location Position crane over storage location in vault Rig the shield plug and place on storage stand DPC into storage position on vault floor Align DPC over storage position Lower DPC into vault CC Hold Point Inspection shield plug above vault storage location Rig the shield plug to the crane Reposition the shield plug	15 10 60 50 10 30 5 15 10 40 15 15 10 30 15 10 30 15 10 10 5 100 15 60 15 10 120 60 30 15 15 15 10 120 60 30 15 15 15 15 15 15 15 15 15 15 15 15 15	2A V T					0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		

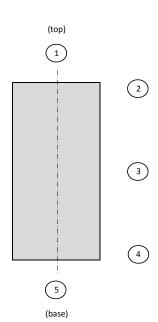
	f)	HP survey	15	-				0	0	0	0	0	0
		Total Hours of Canister Handling Operations	35.8										
25a)	Turnov	ver to Operations	1440										
26)	Return	crane to operating floor	120	-				0	0	0	0	0	0
27)	Remov	re transport cask from transfer cell	60	-				0	0	0	0	0	0
28)	Install	transport cask lid	60	-				0	0	0	0	0	0
29)	Lift tra	nsport cask and transfer to maintenance	60	-				0	0	0	0	0	0
29 a)	Survey	and wipedown transport cask	60	-				0	0	0	0	0	0
29b)	Reposi	tion empty railcar to railbay	60	-				0	0	0	0	0	0
30)	Lift tra	nsport cask, place on railcar, and downend	60	-				0	0	0	0	0	0
31)	Install	impact limiters on transport cask	120	-				0	0	0	0	0	0
32)	Release	e railcar for shipment	30	-				0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	70.3			•	•	92	58	56	0	11	2.5

			Duration	Dose		Dura	tion	Frac	tion	,			Task	Dose		—
Hor	izontal -	-DSCs stored horizontally in racks in vault	(Minutes)	-	м.		Н	0	S	Q	М	R	Н	0	S	Q
0)	Plan of	f the Day and Safety Meeting	30							,						
	a)	Plan of the Day Meeting	15	-							0	0	0	0	0	0
	b)	Safety briefing	10	-							0	0	0	0	0	0
	c)	Transportation to work site	5	-							0	0	0	0	0	0
1)	Receiv	ve transport cask on railcar at Cask Handling Building	145													
	a)	Identify SNF shipment brought from yard	5	-							0	0	0	0	0	0
	b)	Security team sent to railbay door	15	-							0	0	0	0	0	0
	c)	Send operators to railbay door	15	-							0	0	0	0	0	0
	d)	Stage work team to railbay	15	-							0	0	0	0	0	0
	e)	Open railbay door	5	-							0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	- 2.V.T					٥.		0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug HP survey of SNF shipment	15 15	3 V T			0.5		0.5		0	0	0 5.5	0	5.5	0
	h) i)	Inspection of tamper proof seals	10	3 V T			0.5		0.1		0	0	0	0	0.7	0
	j)	Acceptance of SNF shipment	5	3 7 1					0.1		0	0	0	0	0.7	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10	_							0	0	0	0	0	0
	1)	Secure the railbay doors	5	_							0	0	0	0	0	0
	m)	Security team leaves	5	-							0	0	0	0	0	0
	n)	Operator leaves	5	-							0	0	0	0	0	0
	0)	Completes paperwork for step #1	5	-							0	0	0	0	0	0
2)	Remov	ve impact limiters and place in temporary storage	195													
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	<i>7</i> -							0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5								0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2				0	2.5	2.5	0	0	0
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2					0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2						15	0	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1					0	1.3	0	0	0	0
	h)	Reposition manlift and scaffolding	5	1A V T							0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2						15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	0
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2						4.4	0	0	0	0	0
	l)	Rig the personnel barrier	15	3 V T		1	1				0	11	11	0	0	0
	m)	Lift personnel barrier and move to storage location	10	3 V T	0.4						0	0	0	0	0	0
	n)	Remove tie-down straps from SNF shipment	10	3A V T	0.4						2.3	0	0	0	0	0
	0)	Rig tie-down straps and move to storage location	5	3A V T		1	2				0	2.8	0	0	0	0
21	p)	Inspect transport cask for damage and conduct HP survey and lift transport cask off of railcar and place on transfer fixture	15 120	3 V T			2					U	22	0	0	
ارد	a)	Select the appropriate lifting block for the transport cask	5								0	0	0	0	0	0
	b)	Secure lifting block to transport cask trunnions	10	2A V T		2					0	6.7	0	0	0	0
	c)	Upend transport cask	30	2A V I							0	0.7	0	0	0	0
	d)	Lift transport cask off railcar	30	_							0	0	0	0	0	0
	e)	Move transport cask to transfer fixture	30	-							0	0	0	0	0	0
	f)	Downend transport cask on transfer fixture	15	-							0	0	0	0	0	0
4)	Remov	ve railcar from railbay	60													
	a)	Open railbay door	5	-							0	0	0	0	0	0
	b)	Railyard tug connects to railcar	10	-							0	0	0	0	0	0
	c)	Railyard tug removes railcar from railbay	10	-							0	0	0	0	0	0
	d)	Railyard tug connects to next railcar	15	-							0	0	0	0	0	0
	e)	Railyard tug repositions next railcar in railbay	10	-							0	0	0	0	0	0
	f)	Railyard tug leaves railbay and railbay door is closed	10	-							0	0	0	0	0	0
4a)		e transport cask and transfer fixture seismically	40								لــــــا					
	a)	Position seismic restraints	15	-							0	0	0	0	0	0
	p)	Secure seismic restraints	15	-							0	0	0	0	0	0
<u></u>	c)	QC Hold Point Inspection	10	-							0	0	0	0	0	0
4b)	t .	f the Day and Safety Meeting	30										_	_		
	a)	Plan of the Day Meeting	15	-							0	0	0	0	0	0
	b)	Safety briefing Transportation to work site	10 5	 							0	0	0	0	0	0
5)	c)	ve transport cask lid	8 5	-							U	U	U	U	U	U
اد	a)	Move tools to work platform	5	_							0	0	0	0	0	0
	b)	HP survey of lid including gas sampling	15	1A H T L			2			-	0	0	9.2	0	0	0
	c)	Rig the lid for lifting using the local jib crane	15	1A H T L		2				-	0	9.2	9.2	0	0	0
	d)	Remove and store nuts	30	1A H T L	2					-	18	9.2	0	0	0	0
	e)	Lift the transport cask lid and move it to the transfer fixture	10		_						0	0	0	0	0	0
	f)	Security inspection of the interior of the transport cask	10	1A H T NL					0.2		0	0	0	0	5.4	0
			10						J. L			بّ	⊢∸	ب	J	
6)	.,	transfer sleeve on horizontal transfer cart with transport cask	75								1 1				1	
6)	.,	ransfer sleeve on horizontal transfer cart with transport cask Position spotters	75	-							0	0	0	0	0	0
6)	Dock t		-	-							0	0	0	0	0	0

	,	. т				1								Τ_
	c)	_	Align transport cask with transfer sleeve Dock transfer sleeve to transport cask	15 15	-				0	0	0	0	0	0
	e)	_	Install retaining straps on transport cask trunnions	15	2A H T	1.5			0	12	0	0	0	0
	f)	_	QC Hold Point Inspection	10	-	1.5			0	0	0	0	0	0
7)	٠,		PC into transfer cask	75					Ů	Ť			Ť	Ŭ
-,	a)		Remove pushing port in base of transport cask	15	5 H H	2			4.3	0	0	0	0	0
	b)	_	Engage ram and push DPC into transfer sleeve	30	-				0	0	0	0	0	0
	c)	_	Withdraw the ram	20	-				0	0	0	0	0	0
	d)))	QC Hold Point Inspection	10	-				0	0	0	0	0	0
8)	Und	lock	horizontal transfer cart from transport cask	30										
	a)	1)	Remove retaining straps from transport cask	10	2A H T	0.2			0	1.1	0	0	0	0
	b))	Pull horizontal transfer cart back	10	-				0	0	0	0	0	0
	c)	:)	Close shield door on transfer sleeve	10	-				0	0	0	0	0	0
9)	Insta	all t	ransport cask lid	60	-				0	0	0	0	0	0
10)	Lift t	tran	sport cask and transfer to maintenance	60	-				0	0	0	0	0	0
10a)	Secu	ure t	transport cask and transfer fixture seismically	40										
	a))	Position seismic restraints	15	-				0	0	0	0	0	0
	b))	Secure seismic restraints	15	-				0	0	0	0	0	0
	c)	_	QC Hold Point Inspection	10	-				0	0	0	0	0	0
10b)	Plan		the Day and Safety Meeting	30										
	a)	_	Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b)	_	Safety briefing	10	-				0	0	0	0	0	0
	c)		Transportation to work site	5	-				0	0	0	0	0	0
11)			ansfer cask on transfer fixture using HCT	35										
\sqsubseteq	a)	,	Move the HCT with a transfer cask next to the transfer fixture	5	-				0	0	0	0	0	0
Щ	b)		Rig the transfer cask for hoisting	5	-				0	0	0	0	0	0
\vdash	c)	,	Pick the transfer cask	15	-				0	0	0	0	0	0
45	d)	,	Downend the transfer cask on the transfer fixture	10	-				0	0	0	0	0	0
12)			and hoist transfer cask lid using jib crane	50					_	^	^	^	^	_
\vdash	a) b)	_	Rig transfer cask lid to jib crane Unbolt transfer cask lid	10 30	-				0	0	0	0	0	0
	b)	_	Hoist lid and remove	10	-				0	0	0	0	0	0
12\	- /	,	prizontal transfer cart with transfer cask on transfer fixture	45	-				U	U	U	U	U	U
13)	a)		Unlock wheels and position transfer cart at transfer fixture	10	-				0	0	0	0	0	0
H	a) b)	_	Dock transfer sleeve to transfer cask on transfer fixture	20	_				0	0	0	0	0	0
	c)	<u> </u>	Attach retaining straps to transfer cask trunnions	15	2A H T	0.5			0	4	0	0	0	0
14)	- ,		PC from transfer sleeve into transfer cask	65	2/(1111	0.5			Ť			Ť	Ť	Ť
	a)		Plug in hydraulic power pack on transfer cart	15	-				0	0	0	0	0	0
	b)	_	Engage ram and push DPC into the lift frame in the transfer cask	30	-				0	0	0	0	0	0
	c)	_	Withdraw the ram	10	-				0	0	0	0	0	0
	d)))	QC Hold Point Inspection	10	-				0	0	0	0	0	0
15)	Und	lock	horizontal transfer cart	50										
	a))	Remove retaining straps from transfer cask	15	2A H T	0.2			0	1.6	0	0	0	0
	b))	Unplug hydraulic power pack on transfer cart	15	-				0	0	0	0	0	0
	c)	:)	Undock transfer cart and remove	10	-				0	0	0	0	0	0
	d)		QC Hold Point Inspection	10	-				0	0	0	0	0	0
16)	Insta		d on transfer cask	70										
	a)	_	Hoist transfer cask lid into place using jib crane	15	-				0	0	0	0	0	0
	b)	_	Stage tools on manlift	10	-				0	0	0	0	0	0
	c)	_	Install bolts and torque	30	2A H T	2			32	0	0	0	0	0
	d)	_	QC Hold Point Inspection	10	-				0	0	0	0	0	0
47\	e)	, ,	Move manlift away	5	-				0	0	0	0	0	0
17)			r transfer cask to vault	60	241/7	2				6.7	_	_	_	_
	a)	_	Rig VCT to lift transfer cask	10	2A V T	2			0	6.7	0	0	0	0
	b) c)	,	Open transfer cell shield doors and back VCT out of cell Move transfer cask to vault	20 30	-				0	0	0	0	0	0
10\	-,	,	Infove transfer cask to vauit	40	-				0	U	U	U	U	U
10)	a)		Lift Transfer Cask and place on Transfer cell motorized cart	30	-				0	0	0	0	0	0
\vdash	a) b)	_	QC Hold Point Inspection	10	-		 		0	0	0	0	0	0
18a)		_	transport cask and Transfer Fixture seismically	40					Ť	Ť	Ť		Ť	١
	a)		Position seismic restraints	15	-				0	0	0	0	0	0
М	b)	_	Secure seismic restraints	15	-				0	0	0	0	0	0
⊢	c)	,	QC Hold Point Inspection	10	-				0	0	0	0	0	0
	- /		the Day and Safety Meeting	30										
18b)	Plan								0	0	0	0	0	0
18b)	Plan a))	Plan of the Day Meeting	15	-						0	0	0	_
18b)		_	Plan of the Day Meeting Safety briefing	15 10	-				0	0	_			0
	a) b) c)	o) :)	Safety briefing Transportation to work site	10 5	- - -				0	0	0	0	0	0
	a) b) c)) :) nove	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down	10	- - -				₩-			0	0	_
	a) b) c) Rem a)	nove	Safety briefing Transportation to work site transfer cask cover using jib crane and set down Move tools to work platform	10 5 85 5	-				0	0	0	0	0	0
	a) b) c) Rem a) b))) nove	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid	10 5 85 5 15	- - 1A H T L		2		0 0 0	0 0	0 0 9.2	0	0	0 0
	a) b) c) Rem a) b)	nove	Safety briefing Transportation to work site transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts	10 5 85 5 15 30	- - 1A H T L 1A H T L	2	2		0 0 0 0 18	0 0 0 0	0 0 9.2 0	0 0	0 0	0 0 0
	a) b) c) Rem a) b) c)	nove () () () () ()	Safety briefing Transportation to work site transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane	10 5 85 5 15 30	- - 1A H T L	2 2	2		0 0 0 0 18	0 0 0 0 0 9.2	0 0 9.2 0	0 0 0	0 0 0 0	0 0 0 0
	a) b) c) Rem a) b) c) c) d)	nove))))))	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand	10 5 85 5 15 30 15	- 1A H T L 1A H T L 1A H T L		2		0 0 0 0 18 0	0 0 0 0 9.2 0	0 9.2 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0
19)	a) b) c) Rem a) b) c) d) e)	nove	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	10 5 85 5 15 30 15 10	- - 1A H T L 1A H T L		2	0.2	0 0 0 0 18	0 0 0 0 0 9.2	0 0 9.2 0	0 0 0	0 0 0 0	0 0 0 0
19)	a) b) c) Rem a) b) c) d) e) f) Roll	nove	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors	10 5 85 5 15 30 15 10 10	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0	0 0 0 0 9.2 0	0 9.2 0 0 0	0 0 0 0 0	0 0 0 0 0 0 3.9	0 0 0 0 0 0
19)	a) b) c) Rem a) b) c) d) e) f) Roll	nove	Safety briefing Transportation to work site transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell	10 5 85 5 15 30 15 10 10 30 20	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0	0 0 0 0 9.2 0	0 9.2 0 0 0	0 0 0 0 0 0	0 0 0 0 0 3.9	0 0 0 0 0 0
19)	a) b) c) Rem a) b) c) d) e) f) Roll b)	(i) (ii) (iii) (ii	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors	10 5 85 5 15 30 15 10 10 30 20 10	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0	0 0 0 0 9.2 0	0 9.2 0 0 0	0 0 0 0 0	0 0 0 0 0 0 3.9	0 0 0 0 0 0
19)	a) b) c) Rem a) b) c) d) e) f) Roll a) b)	(i) (ii) (iii) (ii	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors In shielded transfer sleeve above transfer cell	10 5 85 5 15 30 15 10 10 30 20 10 70	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0	0 0 0 0 9.2 0 0	0 9.2 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 3.9	0 0 0 0 0 0 0 0
19)	a) b) c) c) c) Remma a) b) b) c) c) c) d) d) e) e) position a)	(i) (ii) (iii) (ii	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors In shielded transfer sleeve above transfer cell Inspect shielded transfer sleeve	10 5 85 5 15 30 15 10 10 30 20 10 70 15	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0	0 0 0 0 9.2 0 0	0 9.2 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 3.9 0	0 0 0 0 0 0 0 0 0 0
19)	a) b) c) Rem a) b) c) d) e) f)) Roll a) b) Posii	(i) (ii) (iii) (ii	Safety briefing Transportation to work site transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors In shielded transfer sleeve above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0	0 0 0 9.2 0 0 0	0 9.2 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0	0 0 0 0 0 0 0 0 0 0 0
19)	a) b) c) c) Remma) b) c) d)	(i) (ii) (iii) (ii	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors In shielded transfer sleeve above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell Secure in position	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30 15	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0	0 0 0 9.2 0 0 0	0 9.2 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0	0 0 0 0 0 0 0 0
20)	a) b) c) c) Remma a) b) c) c) d)	(i) (ii) (iii) (ii	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell Secure in position QC Hold Point Inspection	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30 15	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0	0 0 0 9.2 0 0 0	0 9.2 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0	0 0 0 0 0 0 0 0
20)	a) b) c) c) Remma a) b) b) c) c) d) d) e) e) e) e) c) c) d) d) d) d) d) d) d) Lowweigh a) b) b) c) d)	n)	Safety briefing Transportation to work site transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors Inspect shielded transfer sleeve above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell Secure in position QC Hold Point Inspection Inspect shield sleeve	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30 15 10 90	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0 0	0 0 0 0 9.2 0 0 0 0	0 9.2 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
20)	a) b) c) c) Remma a) b) b) c) d) f) b) position a) b) c) d) d) b) b) c) d) Low a)	(i) (ii) (iii) (ii	Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell Secure in position QC Hold Point Inspection Insight grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple lift frame	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30 15 10 90 15	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0 0 0	0 0 0 9.2 0 0 0 0	0 9.2 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0 0	0 0 0 0 0 0 0 0 0
20)	a) b) c) Rem a) b) c) d) e) f) Roll a) b) c) c) d) Low b)		Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors in shielded transfer sleeve above transfer cell Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell Secure in position QC Hold Point Inspection ioist, grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple lift frame Raise DPC into shield sleeve	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30 15 45	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0 0 0 0	0 0 0 9.2 0 0 0 0 0	0 9.2 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
20)	a) b) c) c) Remma a) b) b) c) d) f) b) position a) b) c) d) d) b) b) c) d) Low a)		Safety briefing Transportation to work site e transfer cask cover using jib crane and set down Move tools to work platform HP survey of lid Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask Insfer cart into transfer cell and close shield doors Move transfer cask cart into the unloading cell Close the shield doors Inspect shielded transfer sleeve Move shielded transfer sleeve cart over unloading cell Secure in position QC Hold Point Inspection Insight grapple lifting lug, and raise DPC into shield sleeve Lower shield sleeve hoist and grapple lift frame	10 5 85 5 15 30 15 10 10 30 20 10 70 15 30 15 10 90 15	- 1A H T L 1A H T L 1A H T L		2	0.2	0 0 0 18 0 0 0 0 0 0	0 0 0 9.2 0 0 0 0	0 9.2 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 3.9 0 0 0	000000000000000000000000000000000000000

	I					1			1	1			
23)		er DPC to vault storage location	120						_	_	_		
22-1	a)	Transfer DPC to vault storage location	120	-				0	0	0	0	0	0
23a)		shielded transfer sleeve and DPC seismically	40						_	_	_		
	a)	Reposition seismic restraint system	15	-	ļ			0	0	0	0	0	0
	b)	Secure shielded transfer sleeve	15	-	ļ			0	0	0	0	0	0
221)	c)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
23b)		the Day and Safety Meeting	30								_		
		Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b)	Safety briefing	10	-				0	0	0	0	0	0
	c)	Transportation to work site	5	-				0	0	0	0	0	0
24)		e shield plug above vault storage location	105					L_					<u> </u>
	a)	Stage tools in storage vault location	15	-				0	0	0	0	0	0
	b)	Position crane in vault	30	-				0	0	0	0	0	0
	c)	Rig the shield plug	15	-				0	0	0	0	0	0
	d)	Lift shield plug and place on storage stand	15	-				0	0	0	0	0	0
	e)	Disconnect rigging and return crane to cask handling area	30	-				0	0	0	0	0	0
25)	Lower	DPC and lift frame into storage position on vault floor	85										
	a)	Align DPC over storage position	15	-				0	0	0	0	0	0
	b)	Lower DPC into vault	45	-				0	0	0	0	0	0
	c)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
	d)	HP survey	15	-				0	0	0	0	0	0
26)	Replac	e shield plug above vault storage location	85										
	a)	Rig the shield plug to the crane	15	-				0	0	0	0	0	0
	b)	Reposition the shield plug	15	-				0	0	0	0	0	0
	c)	Lower the shield plug into the vault	15	-				0	0	0	0	0	0
	d)	Secure the shield plug and remove rigging	15	-				0	0	0	0	0	0
	e)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
	f)	HP survey	15	-				0	0	0	0	0	0
		Total Hours of Canister Handling Operations	36.3										
		er to Operations	1440										
27)	Return	crane to Operating Floor	60	-				0	0	0	0	0	0
		transport cask lid	60	-				0	0	0	0	0	0
29)	Lift tra	nsport cask and transfer to maintenance	60	-				0	0	0	0	0	0
29a)	Survey	and wipedown transport cask	60	-				0	0	0	0	0	0
30)	Lift tra	nsport cask and place on railcar	60	-				0	0	0	0	0	0
31)	Install	impact limiters on transport cask	120	-				0	0	0	0	0	0
32)	Release	e railcar for shipment	60	-				0	0	0	0	0	0
		Total Hours of All Cask Handling Operations	68.3					110	75	59	0	16	0

Container Doses



					rectes.
1 V C	1	٧	С	512	transport cask lid removed
1AHTL	1A	Н	Т	18.4	transport cask lid installed
1A H T NL	1A	Н	Т	163.2	transport cask lid removed
1A V C	1A	V	С	254	no transfer cask lid
1A V T	1A	V	Т	15	impact limiters installed
1B V C	1B	V	С	134	no transfer cask lid
1C V C	1C	V	С	117	no transfer cask lid
1D V C	1D	V	С	62	no transfer cask lid
2 V T	2	V	Т	150	transport cask lid removed
2A H T	2A	Н	Т	31.8	transport cask lid installed
2A V T	2A	V	Т	20	transport cask lid installed
2B V X	2B	V	Χ	125	
2CHTL	2C	Н	Т	1.5	transport cask lid installed
2C H T NL	2C	Н	Т	7.1	transport cask lid removed
3 V T	3	V	Т	44	
3A V T	3A	V	Т	34	
3B V C	3B	V	С	146	
4 H T	4	Н	Т	31.8	
4 V S	4	V	S	111	
4 V X	4	V	X	177	
4A H H	4A	Н	Н	2.5	port cover installed
5 H H	5	Н	Н	8.5	port cover installed
5A H H	5A	Н	Н	3.2	port cover installed

Notes:

TO16 Appendix D4 - Study 1 - Rad.xlsx

		[Dose pe			ker by C m/DPC)	•	у*	An	nual Do		nit Wo (rem/y	rker by r)	Catego	ry**					s by Cat worker			_	Hours
Study #1 Storage Alternative	Worker Category: No. of Workers:	v Mechanics	5 Riggers	∾ Health Physics	1 Operators	1 Security	1 Quality	Total	T Mechanics	T Riggers	т Health Physics	1 Operators	1 Security	1 Quality	Total	1 Mechanics	T Riggers	U Health Physics	1 Operators	1 Security	1 Quality	Total	Canister Transfe	Cask Handling
App A1 - C-PAD	Vertical	126	60	51	0	11	3	251	15.8	7.5	6.4	0.0	2.8	0.7	33.2	32	16	13	0	6	2	69	26	61
	Horizontal	80	47	51	0	11	8	198	10.0	5.8	6.4	0.0	2.8	2.0	27.1	21	12	13	0	6	5	57	21	55
App A2 - C-STDa	Vertical	126	60	51	0	11	3	251	15.8	7.5	6.4	0.0	2.8	0.7	33.2	32	16	13	0	6	2	69	26	61
	Horizontal	69	60	50	0	13	0	192	8.6	7.4	6.3	0.0	3.3	0.0	25.6	18	15	13	0	7	0	53	31	55
App A2 - C-STDb	Vertical	126	60	51	0	11	3	251	15.8	7.5	6.4	0.0	2.8	0.7	33.2	32	16	13	0	6	2	69	26	61
	Horizontal	80	47	51	0	11	8	198	10.0	5.8	6.4	0.0	2.8	2.0	27.1	21	12	13	0	6	5	57	21	55
App A2 - C-STDc	Vertical	167	91	64	0	18	11	351	20.8	11.4	7.9	0.0	4.5	2.8	47.5	42	23	16	0	10	6	97	37	70
	Horizontal	80	47	51	0	11	8	198	10.0	5.8	6.4	0.0	2.8	2.0	27.1	21	12	13	0	6	5	57	21	55
App A3 - C-UGS	Vertical	176	68	54	0	11	3	313	22.0	8.5	6.8	0.0	2.8	0.7	40.8	45	18	14	0	6	2	85	35	71
	Horizontal	197	91	50	0	12	0	350	24.7	11.4	6.3	0.0	2.9	0.0	45.2	50	23	13	0	6	0	92	38	74
App A4 - C-BGVa, App	Vertical	72	42	46	0	11	3	173	9.0	5.2	5.8	0.0	2.8	0.6	23.4	18	11	12	0	6	2	49	21	54
A5 - C-AGVa,	Horizontal	53	66	50	0	9	0	178	6.6	8.3	6.3	0.0	2.2	0.0	23.4	14	17	13	0	5	0	49	30	62
App A4 - C-BGVb, App	Vertical	72	42	46	0	11	3	173	9.0	5.2	5.8	0.0	2.8	0.6	23.4	18	11	12	0	6	2	49	21	54
A5 - C-AGVb,	Horizontal	56	38	42	0	3	1	141	7.0	4.8	5.3	0.0	0.7	0.4	18.2	15	10	11	0	2	1	39	16	49
App A4 - C-BGVc, App	Vertical	92	58	56	0	11	3	220	11.5	7.3	7.0	0.0	2.8	0.6	29.2	23	15	14	0	6	2	60	36	70
A5 - C-AGVc,	Horizontal	94	75	59	0	20	0	249	11.7	9.4	7.4	0.0	5.0	0.0	33.6	24	19	15	0	11	0	69	39	71
App A4 - C-BGVd, App	Vertical	92	58	56	0	11	3	220	11.5	7.3	7.0	0.0	2.8	0.6	29.2	23	15	14	0	6	2	60	36	70
A5 - C-AGVd,	Horizontal	110	75	59	0	16	0	260	13.7	9.4	7.4	0.0	3.9	0.0	34.4	28	19	15	0	8	0	70	36	68

DPC/Year

Vertical: 250 Horizontal: 250 ** Annual Dose = (Total dose to worker by category) * (# DPC's per year) / (# workers in rad zone)

^{*} Dose/DPC = (time in rad zone) * (# workers in rad zone) * (dose in rad zone)

NOTES AND ASSUMPTIONS:

- The data in these spreadsheets are approximate intended to support occupational exposure estimates only. They are neither definitive nor precise enough to support detailed operational decision.
- 2. The occupational exposure calculations only consider the scope of activities required to place SNF shipments into storage. Ongoing site monitoring activities are not included.
- 3. These crew sizes and durations are based on commercial nuclear plant ISFSI operations. Durations are based on real world experience, thus include real world worker efficiencies. Work scope is consistent with C-OPS and has been extrapolated to address the other alternates.
- 4. Duration fractions incorporate both the number of workers of each category performing the activity and the percentage of time that each worker is occupying the radiation zone.
- 5. Mechanics are responsible for bolting and unbolting connections to the various SNF containers, other than rigging.
- 6. Riggers are responsible for attaching and removing rigging to and from the various SNF containers. They are also responsible for observing and guiding heavy lift operations.
- 7. Health physicists are responsible for measuring the radiation fields and contamination associated with the SNF containers. They are also responsible for decontamination activities and for certifying equipment that enters the radiation zone for release.
- 8. Operators have overall responsibility for the entire facility. Their activities with respect to SNF processing include opening and closing facility doors, operating the machinery used in SNF container processing, and overseeing the acceptance of the SNF container into the facility.
- 9. Security personnel are responsible for keeping the facility secure while the CHB railbay doors are open and for verifying that no contraband is introduced to the facility inside of SNF containers.
- 10. Quality Assurance/Control personnel are responsible to assure that the chain of custody paperwork is properly filled out and for observing hold points in the process to assure proper fitment and placement of SNF containers.
- 11. Mechanics, riggers, and health physicists (i.e. radiation protection technicians, or radiation control technicians) are assumed to work in pairs. They typically are only near the waste package when needed. If remote monitoring is utilized, the number of health physicists can be reduced in the work area.
- 12. Duration fractions are only assigned to workers who are in the radiation zone adjacent to the SNF container. Other people may be in the vicinity, but they will remain outside of the radiation zone in accordance with ALARA principles.
- 13. Although all personnel in the vicinity are accumulating dose, the dose rate for the general area is low and accumulated doses to personnel in the vicinity are insignificant when determined on an individual DPC basis.

	C-OP:	3, C	Current Canister Transfer Operations Using Cask Handling Building (Base						_		r			_		
Ver	tical E	OPC	s - DPCs in storage casks on pad	Duration (Minutes)	Dose	М		tion H		s Q	М	R	Task H	Dose O	S	Q
0)	Plan	of	the Day and Safety Meeting	30		IVI	N.	П	U	3 Q	IVI	N	П	U	3	Q
~/	a)		Plan of the Day Meeting	15	-						0	0	0	0	0	0
	b)		Safety briefing	10	-						0	0	0	0	0	0
	c)	_	Transportation to work site	5	-						0	0	0	0	0	0
1)		_	transport cask on railcar at Cask Handling Building	125												
	a)		Identify transport cask brought from yard	5	-						0	0	0	0	0	0
	b)		Operators and Security team sent to railbay door Stage work team to railbay	15 15	-						0	0	0	0	0	0
	c) d)	_	Open railbay door	5	_						0	0	0	0	0	0
	e)		Position transport cask in the railbay	15	_						0	0	0	0	0	0
	f)	_	Security inspection of the transport cask and tug	15	3 V T					0.5	0	0	0	0	5.5	0
	g)		HP survey of transport cask	15	3 V T			0.5			0	0	5.5	0	0	0
	h))	Inspection of tamper proof Seals	10	3 V T					0.1	0	0	0	0	0.7	0
	i)		Acceptance of transport cask	5	-						0	0	0	0	0	0
	j)		Decoupling of railcar and removal of the tug from the railbay	10	-						0	0	0	0	0	0
	k)		Secure the railbay doors	5	-						0	0	0	0	0	0
	l) m	_	Operators and Security team leaves	5	-						0	0	0	0	0	0
21	_		Completes paperwork for step #1 e impact limiters and place in temporary storage	195	-						U	U	U	U	U	U
	a)	_	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b)		Select and inspect rigging for impact limiters on the transport cask	5	-						0	0	0	0	0	0
	c)		Rig the lifting devices to the first impact limiter	5	1A V T		2	2			0	2.5	2.5	0	0	0
	d)	_	Position man lifts and temporary scaffolding near transport cask	5	1A V T		2				0	2.5	0	0	0	0
	e))	Remove and store bolts holding on the first impact limiter	30	1A V T	2					15	0	0	0	0	0
	f)		Remove first impact limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
	g)	_	Remove rigging and reposition on second impact limiter	5	1A V T		1				0	1.3	0	0	0	0
	h)		Reposition manlift and scaffolding	5	1A V T	~					0	0	0	0	0	0
	i)	_	Remove and store bolts holding on the second impact limiter	30	1A V T	2	1				15	0	0	0	0	0
	j) k)	_	Remove second impact limiter and place on storage stand Remove and store bolts for personnel barrier	10 30	1A V T 3 V T	0.2	1				0 4.4	2.5	0	0	0	0
	(K)		Rig the personnel barrier	15	3 V T	0.2	1	1			0	11	11	0	0	0
	m)	_	Lift personnel barrier and move to storage location	10	3 V T		_	-			0	0	0	0	0	0
	n)	_	Remove tie-down straps from transport cask	10		0.4					2.27	0	0	0	0	0
	0))	Rig tie-down straps and move to storage location	5	3A V T		1				0	2.8	0	0	0	0
	p))	Inspect transport cask for damage and conduct HP survey	15	3 V T			2			0	0	22	0	0	0
3)	Upe		and lift transport cask off of railcar and place on unloading cell transfer cart	120												
	a)		Select the appropriate lifting block for the transport cask	5	-						0	0	0	0	0	0
	b)	_	Secure lifting block to transport cask trunnions	10	2A V T		2				0	6.7	0	0	0	0
	c)		Upend transport cask	30	-						0	0	0	0	0	0
	d)		Lift transport cask off railcar	30 30	-						0	0	0	0	0	0
	e) f)	_	Reposition transport cask Place transport cask in canister transfer cell	15	_						0	0	0	0	0	0
4)	- '		seismic restraints to Transport Cask	95	_						U	0	U	0	0	U
	a)		Move tools to work platform	5	-		******				0	0	0	0	0	0
	b)	_	Attach Struts to CHB	10	-						0	0	0	0	0	0
	c)		Rig and Lift Seismic Struts 1&2 into position	30	3 V T		0.2				0	4.4	0	0	0	0
	d)		Rig and lift Struts 3&4 into position	30	3 V T		0.2				0	4.4	0	0	0	0
	e)		Bolt Seismic collar together around Transport Cask.	10	3 V T	2					14.7	0	0	0	0	0
-\	f)		QC Hold Point Inspection	10	-						0	0	0	0	0	0
5)	_	_	mpty Storage Cask into Transfer Cell using VCT Transporter places storage overpack in canister transfer cell	75							0	0	0	0	0	0
	a) b)		Crews mobilize to top of storage overpack	10	_						0	0	0	0	0	0
	c)		Unbolt storage overpack lid	30	_						0	0	0	0	0	0
	d)	_	Rig storage overpack lid and lift	15	-						0	0	0	0	0	0
	e)		QC Hold Point Inspection	10	-						0	0	0	0	0	0
6)	Retr	act	VCT from transfer cell and close shield doors	30												
	a)	_	Back the VCT out of the Receiving Cell	20	-						0	0	0	0	0	0
	b)		Close the canister transfer cell shield doors	10	-						0	0	0	0	0	0
7)			seismic restraints to storage overpack	95										_		
	a) b)	_	Move tools to work platform Attach Struts to CHB	5	-						0	0	0	0	0	0
	c)	_	Rig and Lift Seismic Struts 1&2 into position	10 30	-						0	0	0	0	0	0
	d)	_	Rig and lift Struts 3&4 into position	30	_						0	0	0	0	0	0
	e)		Bolt Seismic collar together around storage overpack	10	-						0	0	0	0	0	0
	f)	_	QC Hold Point Inspection	10	_						0	0	0	0	0	0
8)	Mou		adaptor plates to storage overpack	75												
	a)		Move tools to work platform	5	-						0	0	0	0	0	0
	b)	_	Rig and lift adapter plate 1 to top of Storage Cask	5	-						0	0	0	0	0	0
	c)		Bolt Adapter plate 1 to top of cask	30	-						0	0	0	0	0	0
	d)		Rig and lift adapter plate 2 into position	15	-						0	0	0	0	0	0
	e)		Bolt Adapter plate 2 to top of cask	10	-							^	^	^		^
9)	f) Plan		QC Hold Point Inspection the Day and Safety Meeting	10 30	-						0	0	0	0	0	0
ارد	Pian a)	_	Plan of the Day Meeting	15	_						0	0	0	0	0	0
	b)		Safety Briefing	10	_						0	0	0	0	0	0
	c)		Transportation to work site	5	-						0	0	0	0	0	0
10)			and remove transport cask lid using jib crane	60										L		
	a))	Stage tools on top of the transfer cask	10	-						0	0	0	0	0	0
	b)	_	Unbolt transport cask lid	30	-						0	0	0	0	0	0
	c)		Rig the cask lid to the stick crane	10	-						0	0	0	0	0	0
	d)		Lift lid and place it on the storage stand	10	-						0	0	0	0	0	0
		_	lifting lug to top of DPC	70							_	_	_	^		
11)		٠.	Rig lifting lug on storage rack	15	-						0	0	0	0	0	0
11)	a)			_	241/7		0 -				^	ე г	^	^	^	^
11)	a) b))	Use Jib crane to lift lifting lug into position	15	2A V T		0.5				0 25	2.5 0	0	0	0	0
11)	a) b) c))	Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister	_	2 V T	0.5	0.5			0 1	0 25 0	2.5 0 0	0 0	0 0	0	0
11)	a) b)))	Use Jib crane to lift lifting lug into position	15 20			0.5			0.1	25	0	0	0		

12)	Mou	ınt a	adapter plates to top of Transport Cask using jib crane	85											
	a)	_	Move tools to work platform	5	-						0	0	0	0	0 0
	b))	Rig and lift adapter plate 1 to top of Transport Cask	15	-						0	0	0	0	0 0
	c))	Bolt Adapter plate 1 to top of cask	20	2A V T	1.5					10	0	0	0	0 0
	d))	Rig and lift adapter plate 2 into position	15	-						0	0	0	0	0 0
	e))	Bolt Adapter plate 2 to top of cask	20	2A V T	1.5					10	0	0	0	0 0
	f))	QC Hold Point Inspection	10	-						0	0	0	0	0 0
13)	Insta	all t	he Transfer Cask on Transport Cask using the OTB crane	70											
	a)		Rig Transfer Cask using the OTB Crane	15	-						0	0	0	0	0 0
	b)		Lift Transfer Cask to upper position	15	-						0	0	0	0	0 0
	c)		Reposition the OTB crane	15	-						0	0	0	0	0 0
	d)	_	Lower Transfer cask onto alignment lugs	15	2A V T		1				0	5	0	0	0 0
	e)		QC Hold Point Inspection	10	_						0	0	0	0	0 0
14)			nsfer Cask to Transport Cask adapter plate	70											
	a)		Position Man Lifts with bolts and tools	15	_						0	0	0	0	0 0
	b)	_	Bolt Transfer cask to adapter plate	15	2A V T	2					10	0	0	0	0 0
	c)	_	Torque bolts	20	2A V T	2					13.3	0	0	0	0 0
	d)	_	QC Hold Point Inspection	10							0	0	0	0	0 0
	e)	_	Clear workspace and remove all tools	10	 -						0	0	0	0	0 0
15)		_	inister from transport cask up into transfer cask	70							Ť			Ť	0 0
-5,	a)		Release Lifting block and reposition 200T hoist	5	2 V T	0.3	0.2				3.75	2.5	0	0	0 0
	b)	_	Position auxiliary hoist over Transfer Cask	5	Z V 1	0.5	0.2				0	0	0	0	0 0
	c)	_	Lower grapple and grapple DPC	15	+ -						0	0	0	0	0 0
	d)		Lift DPC into transfer cask	20	+ -						0	0	0	0	
	+	_		5	+ -				+	\dashv	0	0	0	0	0 0
	e)	_	Engage locking mechanism OC Hold Point Inspection		 				+	\dashv		_	_	_	
	f)		QC Hold Point Inspection	10	 -			\vdash	+		0	0	0	0	0 0
45 .	g)		Release grapple and withdraw hoist	10	-						0	0	0	0	0 0
15a)	1 .		the Day and Safety Meeting	30									_	 _	
	a)	_	Plan of the Day Meeting	15	-				+ +		0	0	0	0	0 0
	b)	_	Safety Briefing	10	 -			\vdash	+		0	0	0	0	0 0
	c)		Transportation to work site	5	-						0	0	0	0	0 0
16)			Transfer Cask from adapter plate	70									_	1	
	a)	_	Position Man Lifts with tools	10	-				1		0	0	0	0	0 0
	b)	_	Position OTB crane over transfer cask	15	-				+	ļ	0	0	0	0	0 0
	c)	_	Secure lifting block to Transfer Cask Trunnions	15	-						0	0	0	0	0 0
	d)	_	Unbolt Transfer Cask bolts and remove	20	2A V T	2					13.3	0	0	0	0 0
	e)	_	Clear workspace and remove all tools	10	-				xxx xxxxxxxxxxx xx		0	0	0	0	0 0
17)	Mov	_	ransfer Cask from Transport Cask to Storage Overpack	65											
	a))	Lift the Transfer Cask off the Transport Cask	20	-						0	0	0	0	0 0
	b)	_	Reposition OTB Crane	15	-						0	0	0	0	0 0
	c))	Lower Transfer Cask onto Storage overpack alignment blocks	20	-						0	0	0	0	0 0
	d))	QC Hold Point Inspection	10	-						0	0	0	0	0 0
18)	Bolt	Tra	nsfer Cask to Storage overpack adapter plate	65											
	a))	Position Man Lifts with bolts and tools	10	-						0	0	0	0	0 0
	b))	Bolt Transfer cask to adapter plate	15	2A V T	2					10	0	0	0	0 0
	c))	Torque bolts	20	2A V T	2					13.3	0	0	0	0 0
	d))	QC Hold Point Inspection	10	-						0	0	0	0	0 0
	e)		Clear workspace and remove all tools	10	-						0	0	0	0	0 0
19)	Lowe	er c	anister from Transfer Cask into Storage Cask	70											
	a))	Release Lifting block and reposition 200T hoist	5	-						0	0	0	0	0 0
	b))	Position auxiliary hoist over Transfer Cask	10	-						0	0	0	0	0 0
	c))	Lower grapple and grapple DPC	10	-						0	0	0	0	0 0
	d))	Lift DPC to clear locking mechanism	5	-						0	0	0	0	0 0
	e))	Lower Canister into Storage overpack	20	-						0	0	0	0	0 0
	f))	Release grapple and withdraw hoist	10	-						0	0	0	0	0 0
	g))	HP Survey	10	-						0	0	0	0	0 0
20)	Unbo	olt	Transfer Cask from adapter plate	75											
	a))	Position Man Lifts with tools	10	-						0	0	0	0	0 0
	b))	Reposition 200T hoist over Transfer Cask	15	-						0	0	0	0	0 0
	c)		Grapple the Transfer cask	10	_				IT		0	0	0	0	0 0
	d))	Unbolt Transfer cask from adapter plate	30	2A V T			_						1	
	e)				ZA V I	1					10	0	0	0	0 0
21)	Pom)	Clear workspace and remove all tools	10		1					10 0	0	0	0	0 0
	Keiii	_	Clear workspace and remove all tools Transfer Cask and place into storage			1							_		
	a)	iove	·	10	- -	1							_		
	1 .	nove)	Transfer Cask and place into storage	10 60		1					0	0	0	0	0 0
	a))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location	10 60 15		1					0	0	0	0	0 0
	a) b))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane	10 60 15 15	- - -	1					0 0 0	0 0	0 0 0	0 0 0	0 0 0 0 0 0
22)	a) b) c) d)))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location	10 60 15 15 20	- - -	1					0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0 0 0 0 0
22)	a) b) c) d)))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist	10 60 15 15 20 10	- - -	1					0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem))))) nove	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack	10 60 15 15 20 10 95	- - -		1				0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem a)))))) nove	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift	10 60 15 15 20 10 95		1.0					0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem a) b))))) nove	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2	10 60 15 15 20 10 95 5 10	- - - - - 2A V T						0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem a) b)))))) nove))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2	10 60 15 15 20 10 95 5 10 20	- - - - - 2A V T						0 0 0 0 0 0	0 0 0 0 0 0 3.3	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem a) b) c) d)))))) nove	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane	10 60 15 15 20 10 95 5 10 20 10	2A V T		1				0 0 0 0 0 0 0 6.67	0 0 0 0 0 0 3.3 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem a) b) c) c) d) f))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1	10 60 15 15 20 10 95 5 10 20 10		1.0	1				0 0 0 0 0 0 0 6.67 0	0 0 0 0 0 3.3 0 0 3.3	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22)	a) b) c) d) Rem a) b) c) d)))))))))))))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist e adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1	10 60 15 15 20 10 95 5 10 20 10 10 20		1.0	1				0 0 0 0 0 0 6.67 0	0 0 0 0 0 3.3 0 0 3.3 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	a) b) c) d) Rem a) b) c) c) d) f) g) h))))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane	10 60 15 15 20 10 95 5 10 20 10 10 20 10		1.0	1				0 0 0 0 0 0 0 6.67 0 0 6.67	0 0 0 0 0 3.3 0 0 3.3 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	a) b) c) d) Rem a) b) c) c) d) f) g) h))))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting	10 60 15 15 20 10 95 5 10 20 10 10 20 10		1.0	1				0 0 0 0 0 0 0 6.67 0 0 6.67	0 0 0 0 0 3.3 0 0 3.3 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	a) b) c) d) Rem a) b) c) d) e) f) g) h)	nove)))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools	10 60 15 15 20 10 95 5 10 20 10 10 20 10 30		1.0	1				0 0 0 0 0 0 6.67 0 0 6.67	0 0 0 0 0 3.3 0 0 3.3 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	a) b) c) d) Rem a) b) c) d) e) f) plan a)	nove)))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist e adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing	10 60 15 15 20 10 95 5 10 20 10 20 10 10 30 15		1.0	1				0 0 0 0 0 0 6.67 0 6.67 0	0 0 0 0 0 3.3 0 0 3.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) plan a) b) c)	nove)))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 30 15		1.0	1				0 0 0 0 0 0 6.67 0 0 6.67 0	0 0 0 0 0 3.3 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) pi d) f) g) h) Plan a) b) c) Rem Rem	nove)))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Elifting lug from DPC	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 30 15 10 5 40		1.0	1	0.2			0 0 0 0 0 0 6.67 0 0 0 0	0 0 0 0 3.3 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) pi g) h) Plan b) c) Rem a) b) c)	nove)))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Elifting lug from DPC HP Survey	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 5 40 10		1.0	1	0.2			0 0 0 0 0 0 6.67 0 0 6.67 0	0 0 0 0 0 3.3 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) g) h) Plan b) c) Rem a) b)	nove)))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Lifting lug from DPC HP Survey Stage tools on top of the storage overpack	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 5 40 10 5		1.0	1	0.2			0 0 0 0 0 0 6.67 0 0 0 0	0 0 0 0 0 3.3 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) plan a) b) c) Rem a) b) c)	nove)))))))))))))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Plifting lug from DPC HP Survey Stage tools on top of the storage overpack Rig the lifting lug assembly to the jib crane and remove the bolts	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 5 40 10 5		1.0	1				0 0 0 0 0 0 6.67 0 0 0 0 0	0 0 0 0 0 3.3 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) g) h) Plan a) b) c) Rem a) b) c)	nove)))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist E adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Ilifting lug from DPC HP Survey Stage tools on top of the storage overpack Rig the lifting lug assembly to the jib crane and remove the bolts Remove the lifting lug from the DPC	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 5 10 5 40 10 5 10 10		1.0	1				0 0 0 0 0 0 6.67 0 0 0 0 0	0 0 0 0 0 3.3 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) g) h) Plan a) b) c) Rem a) b) c) d e) e)	nove)))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Plifting lug from DPC HP Survey Stage tools on top of the storage overpack Rig the lifting lug assembly to the jib crane and remove the bolts Remove the lifting lug from the DPC Clean out tools and leave the top of the DPC	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 30 15 10 5 40 10 5 10 5		1.0	1				0 0 0 0 0 0 6.67 0 0 0 0 0	0 0 0 0 0 3.3 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) g) h) Plan a) b) c) Rem a) b) c) Rem a) b) c)	nove nove nove nove nove nove nove nove	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Lifting lug from DPC HP Survey Stage tools on top of the storage overpack Rig the lifting lug assembly to the jib crane and remove the bolts Remove the lifting lug from the DPC Clean out tools and leave the top of the DPC E seismic/stack-up struts on Storage overpack	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 30 15 10 5 40 10 5 10 10 5 70		1.0	1				0 0 0 0 0 0 6.67 0 0 0 0 0	0 0 0 0 3.3 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) g) h) Plan b) c) Rem a) b) c) Rem a) b) c) Rem a)	nove nove nove nove nove nove nove nove	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Lifting lug from DPC HP Survey Stage tools on top of the storage overpack Rig the lifting lug assembly to the jib crane and remove the bolts Remove the lifting lug from the DPC Clean out tools and leave the top of the DPC seismic/stack-up struts on Storage overpack Position Tools	10 60 15 15 15 20 10 95 5 10 20 10 10 20 10 10 30 15 10 5 40 10 5 70 5		1.0	1 1 1				0 0 0 0 0 0 6.67 0 0 0 0 0 0	0 0 0 0 3.3 0 0 0 0 0 0 0 0 0 0 13 7.3 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
22a)	a) b) c) d) Rem a) b) c) d) e) f) g) h) Plan a) b) c) Rem a) b) c) Rem a) b) c)	nove))))))))))))))))))))))))))	E Transfer Cask and place into storage Lift Transfer Cask off of Storage overpack adaptor plates Reposition overhead Crane Lower Transfer Cask onto location Release Lifting block and raise 200T hoist adapter plates from Storage overpack Move tools to Man Lift Attach rigging to Adapter Plate 2 Unbolt Adaptor plate 2 Lift Adaptor Plate 2 and place in storage location using stick crane Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Clear workspace and remove all tools the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site Lifting lug from DPC HP Survey Stage tools on top of the storage overpack Rig the lifting lug assembly to the jib crane and remove the bolts Remove the lifting lug from the DPC Clean out tools and leave the top of the DPC E seismic/stack-up struts on Storage overpack	10 60 15 15 20 10 95 5 10 20 10 10 20 10 10 30 15 10 5 40 10 5 10 10 5 70		1.0	1				0 0 0 0 0 0 6.67 0 0 0 0 0	0 0 0 0 3.3 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

	c)	Unbolt Seismic collar around Storage overpack	15	3 V T	1		11	0	0	0	0	0
	d)	Lift the Seismic struts	10	-			0	0	0	0	0	0
	e)	Remove pins from CBH support stantions	10	-			0	0	0	0	0	0
	f)	Move Strut assemblies to storage location	10	-			0	0	0	0	0	0
	g)	Place Strut assemblies into storage	5	-			0	0	0	0	0	0
25)	Dock V	CT with Storage overpack and bolt on lid	65									
	a)	Position VCT	15	-			0	0	0	0	0	0
	b)	Move forward and grapple Storage overpack	15	-			0	0	0	0	0	0
	c)	Move Storage overpack lid into position	15	-			0	0	0	0	0	0
	d)	Bolt Lid onto Storage overpack	15	2A V T	2		10	0	0	0	0	0
	e)	QC Hold Point Inspection	5	-			0	0	0	0	0	0
26)	Transp	ort Storage overpack to Pad using VCT	120									
	a)	Lift the Storage overpack	10	-			0	0	0	0	0	0
	b)	Drive to storage pad location	70	-			0	0	0	0	0	0
	c)	Position the storage overpack on the Pad	20	-			0	0	0	0	0	0
	d)	Bolt storage overpack to the Pad	20	4 V S	1		37	0	0	0	0	0
		Total Hours of Canister Handling Operations	35.8									
		er to Operations	1440									
27)	Return	VCT to CHB	120									
28)	Remov	e adapter plates from Transport Cask	60									
		transport cask lid	60									
30)	Lift tra	nsport cask and transfer to maintenance	60									
30a)	Survey	and wipedown Transport Cask	60									
		nsport cask and place on railcar	60									
		mpact limiters on transport cask	120									
33)	Release	e railcar for shipment	60									
		Total Hours of Cask Handling Operations	69.8				241	87	53	0	6.2	2.5

ori	izontal I	DPCs - DPCs in Horizontal Storage Modules on pad		Dose		Dura	atior	า Fra	ctio	n			Task	Dose		
OII	izontan	DPCS - DPCS III HOIIZOIItai Storage Modules oli pad			М	R	Н	0	S	Q	М	R	Н	0	S	I
0)	Plan of	f the Day and Safety Meeting	30													
	a)	Plan of the Day Meeting	15	-							0	0	0	0	0	┵
	b)	Safety briefing	10	-							0	0	0	0	0	_
	c)	Transportation to work site	5	-							0	0	0	0	0	_
)	Receiv	e transport cask on railcar at Cask Handling Building	125										<u> </u>	Ь		
	a)	Identify SNF shipment brought from yard	5	-							0	0	0	0	0	
	b)	Security and operator teams sent to railbay door	15	-							0	0	0	0	0	
	c)	Stage work team to railbay	15	-							0	0	0	0	0	
	d)	Open railbay door	5	-							0	0	0	0	0	
	e)	Position SNF shipment in the railbay	15	-							0	0	0	0	0	
	f)	Security inspection of the SNF shipment and tug	15	3 V T					0.5		0	0	0	0	5.5	
	g)	HP survey of SNF shipment	15	3 V T			0.5				0	0	5.5	0	0	
	h)	Inspection of tamper proof seals	10	3 V T					0.1		0	0	0	0	0.7	
	i)	Acceptance of SNF shipment	5	-							0	0	0	0	0	
	j)	Decoupling of railcar and removal of the tug from the railbay	10	-							0	0	0	0	0	
	k)	Secure the railbay doors	5	-							0	0	0	0	0	
	I)	Operator and Security teams leave	5	-							0	0	0	0	0	_
	m)	Completes paperwork for step #1	5	-							0	0	0	0	0	_
2)	Remov	re impact limiters and place in temporary storage	195													-
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-							0	0	0	0	0	-
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5	_							0	0	0	0	0	
	c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2				0	2.5	2.5	0	0	-
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T		2					0	2.5	0	0	0	-
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2						15	0	0	0	0	1
	f)	Remove first impact limiter and place on storage stand	10	1A V T	<u> </u>	1					0	2.5	0	0	0	-
	g)	Remove rigging and reposition on second impact limiter	5	1A V T		1					0	1.3	0	0	0	-
	ь) h)	Reposition manlift and scaffolding	5	1A V T		-					0	0	0	0	0	-
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2						15	0	0	0	0	-
	j)	Remove and store bots holding on the second impact limiter Remove second impact limiter and place on storage stand	10	1A V T		1					0	2.5	0	0	0	-
	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2	_					4.4	0	0	0	0	-
	I)	Rig the personnel barrier	15	3 V T	0.2	1	1				0	11	11	0	0	-
	– ′.	Lift personnel barrier and move to storage location	10	3 V T		1	1				0	0	0	0	0	-
	m) n)	Remove tie-down straps from SNF shipment	10	3A V T	0.4						2.27	0	0	0	0	-
		Rig Tie-Down straps and move to storage location	5	3A V T	0.4	1					0	2.8	0	0	0	-
	0)	Inspect transport cask for damage and conduct HP survey	15	3 V T		1	2				0	0	22	0		_
• •	p)	,	60	3 V I			2					U		Η-	0	-
<u>)</u>		Horizontal Cask Transporter (HCT) in truck bay										_		<u> </u>	_	-
	a)	Open truck bay door Position HCT in truck bay	15	-							0	0	0	0	0	_
	b)	·	30	-							0	0	0	0	0	-
	c)	Close truck bay door	15	-							0	0	0	0	0	_
+)		and lift transport cask off of railcar and downend on HCT	75								_			 _		_
	a)	Select the appropriate lifting block for the transport cask	5	- 24) (T		_					0	0	0	0	0	_
	b)	Secure lifting block to transport cask trunnions	5	2A V T		2					0	3.3	0	0	0	_
	c)	Upend transport cask	30	-	-						0	0	0	0	0	_
	d)	Lift transport cask off railcar	15	-							0	0	0	0	0	_
	e)	Move transport cask to HCT	10	-							0	0	0	0	0	_
	f)	Downend transport cask on HCT	10	-							0	0	0	0	0	_
a)		re railcar from railbay	60								L		<u> </u>	<u> </u>		_
	a)	Open railbay door	5	-							0	0	0	0	0	_
	b)	Railyard tug connects to railcar	10	-							0	0	0	0	0	_
	c)	Railyard tug removes railcar from railbay	10	-							0	0	0	0	0	_
	d)	Railyard tug connects to next railcar	15	-	<u> </u>						0	0	0	0	0	_
	e)	Railyard tug repositions next railcar in railbay	10	-	<u> </u>						0	0	0	0	0	_
	f)	Railyard tug leaves railbay and railbay door is closed	10	-							0	0	0	0	0	_
b)	Secure	transport cask on HCT	40													_
	a)	Position HCT near seismic restraint tie-downs	15	-							0	0	0	0	0	_
	b)	Install seismic restraint tie-downs	15	-							0	0	0	0	0	
	c)	QC Hold Point Inspection	10	-							0	0	0	0	0	
c)	Plan of	f the Day and Safety Meeting	30								L	L	L			
_		Plan of the Day Meeting	15				-	_		-	0		-		0	-

		To a superior of the superior								T _				_	
	b)	Safety briefing	10	-						0	0	0	0	0	0
	c)	Transportation to work site	5	-						0	0	0	0	0	0
5)		fer transport cask to HSM on pad via HCT	120								<u> </u>				<u> </u>
	a)	QC Hold Point Inspection	15	-						0	0	0	0	0	0
	b)	Open the truck bay door	15	-						0	0	0	0	0	0
	c)	Transfer the transport cask to HSM on the pad via HCT	90	-						0	0	0	0	0	0
5a)	Prepa	ration of Horizontal Storage Module (HSM)	120								Ь				Ь
	a)	Stage equipment near HSM	15	-						0	0	0	0	0	0
	b)	Place and align Theodolite heads	30	-						0	0	0	0	0	0
	c)	Rig crane to HSM port cover	15	2CHTL		2				0	0.8	0	0	0	0
	d)	Use manlift to remove nuts on mounting studs	15	1A HTL	2					9.2	0	0	0	0	0
	e)	Post radiation zone signs and barriers	10	-						0	0	0	0	0	0
	f)	Remove HSM port cover and place in storage location	20	1A H T L		1				0	6.1	0	0	0	0
	g)	HP survey to verify dose rates	15	1AHTL		1.	5			0	0	6.9	0	0	0
6)	Remo	ve transport cask lid	90												
	a)	Move tools to work platform	15	-						0	0	0	0	0	0
	b)	HP survey of lid including gas sampling	10	1A H T L		2				0	0	6.1	0	0	0
	c)	Position stick crane	15	-						0	0	0	0	0	0
	d)	Rig the lid for lifting using the local stick crane	15	1AHTL		2				0	9.2	0	0	0	0
	e)	Remove and store nuts	20	1AHTL	2					12.3	0	0	0	0	0
	f)	Lift the transport cask lid and move it to the storage stand	10	-						0	0	0	0	0	0
	g)	Security inspection of the interior of the transport cask	5	1A H T NL				0.5		0	0	0	0	6.8	0
7)	Dock I	HCT with HSM and push DPC into module	145												
	a)	Position spotters	10	-						0	0	0	0	0	0
	b)	Move HCT into position	15	-						0	0	0	0	0	0
	c)	Check alignment	20	-						0	0	0	0	0	0
	d)	Dock HCT to HSM	30	-						0	0	0	0	0	0
	e)	Remove pushing port in base of transport cask	15	5 H H	2					4.25	0	0	0	0	0
	f)	Engage ram and push DPC into module	20	_						0	0	0	0	0	0
	g)	Withdraw the ram	15	_						0	0	0	0	0	0
	h)	Back the HCT away from the module	10	-						0	0	0	0	0	0
	i)	QC Hold Point Inspection	10	1A H T NL					0.2	0	0	0	0	0	5.4
8)		seismic restraints and HSM port cover	90						0.2	Ť	Ť	Ť	Ť		J
٠,	a)	Retrieve the seismic restraints from HCT	10	-						0	0	0	0	0	0
	b)	Reach into module and install the seismic restraints	5	1A H T NL	1					13.6		0	0	0	0
	c)	QC Hold Point Inspection	5	1A H T NL	_				0.2		0	0	0	0	2.7
	d)	Pick the HSM port cover still attached to the lifting rig	15	-					0.2	0	0	0	0	0	0
	e)	Position the HSM port cover over the port in the module	15	5 H H		1				0	2.1	0	0	0	0
	f)	Install the nuts on the studs and torque to spec	15	5 H H	2	_				4.25	0	0	0	0	0
	g)	HP survey of area	15	5 H H	_	0.5	5			0	0	1.1	0	0	0
	<u>g)</u> h)	Remove radiation zone markers and remove all materials	10	31111		0	,			0	0	0	0	0	0
9)		transport cask lid	60							Ů		0			Ü
٦,	a)	Pick the transport cask cover from the still attached to the lifting rig	15							0	0	0	0	0	0
	a) b)	Position the transport cask cover norm the still attached to the inting rig	15							0	0	0	0	0	0
	c)	Install the nuts on the studs and torque to spec	20	-	\vdash					0	0	0	0	0	0
	d)	QC Hold Point Inspection	10	-	\vdash					0	0	0	0	0	0
	u)	•		-						U	-	U	U	U	-
0~1	Tuess	Total Hours of Canister Handling Operations	20.7								 	-			
		ver to Operations	1440							 	 		 		-
		n transport cask to Cask Handling Building via HCT	120							 	 		 		-
		f the Day and Safety Meeting	30							\vdash	₩	1	-		
		ansport cask and transfer to maintenance	60							 	₩	-	<u> </u>		—
_		y and wipedown transport cask	60							<u> </u>	<u> </u>				
	_	ition empty railcar	60							<u> </u>	 				
_		ansport cask and place on railcar	60							<u> </u>	 	<u> </u>	<u> </u>		—
_		impact limiters on transport cask	120							_	₩				↓
14)	Releas	se railcar for shipment	60								<u> </u>				
		Total Hours of Cask Handling Operations	54.2							80	47	55	0	13	8.2

			Automated Canister Transfer Operations Using Cask Handling Building	1		_										
Vert	tical I	DPC	s - DPCs in storage casks on pad	Duration (Minutes)	Dose	М	ura R		Fraction S	า Q	М	R	Task H	Dose O	S	Q
0)	Plan	n of	the Day and Safety Meeting	(iviinutes)		141	n	11	J 3	7	IVI	K	П	J	3	Ų
-1	a		Plan of the Day Meeting	15	-						0	0	0	0	0	0
	b)	Safety briefing	10	-						0	0	0	0	0	0
	C)	,	Transportation to work site	5	-						0	0	0	0	0	0
1)	1		transport cask on railcar at Cask Handling Building	145									_			
	a	_	Identify SNF shipment brought from yard	5	-						0	0	0	0	0	0
	b c	_	Security team sent to railbay door Send operators to railbay door	15 15	-						0	0	0	0	0	0
	d d	_	Stage work team to railbay	15	_						0	0	0	0	0	0
	e	_	Open railbay door	5	_						0	0	0	0	0	0
	f)	_	Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
	g		Security inspection of the SNF shipment and tug	15	3 V T				0.5		0	0	0	0	5.5	0
	h	_	HP survey of SNF shipment	15	3 V T			0.5			0	0	5.5	0	0	0
	i)	_	Inspection of tamper proof Seals	10	3 V T				0.1		0	0	0	0	0.7	0
	j)	_	Acceptance of SNF shipment	5	-						0	0	0	0	0	0
	k)	_	Decoupling of railcar and removal of the tug from the railbay Secure the railbay doors	10 5	-						0	0	0	0	0	0
	m		Security team leaves	5	_						0	0	0	0	0	0
	n		Operator leaves	5	_						0	0	0	0	0	0
	О	_	Completes paperwork for step #1	5	-						0	0	0	0	0	0
2)	Rem		e impact limiters and place in temporary storage	195												
	a	1)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b		Select and inspect rigging for impact limiters on the transport cask	5	-						0	0	0	0	0	0
	c)	_	Rig the lifting devices to the first impact limiter	5	1A V T		2	2			0	2.5	2.5	0	0	0
	d	_	Position man lifts and temporary scaffolding near transport cask	5	1A V T	_	2			_	0	2.5	0	0	0	0
	e f)	_	Remove and store bolts holding on the first impact limiter Remove first impact limiter and place on storage stand	30 10	1A V T 1A V T	2	1				15 0	0 2.5	0	0	0	0
	g		Remove rigging and reposition on second impact limiter	5	1A V T		1				0	1.3	0	0	0	0
	h	_	Reposition manlift and scaffolding	5	1A V T		_				0	0	0	0	0	0
	i)	_	Remove and store bolts holding on the second impact limiter	30	1A V T	2					15	0	0	0	0	0
	j))	Remove second impact limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
	k)	_	Remove and store bolts for personnel barrier	30	3 V T	0.2					4.4	0	0	0	0	0
	I)	•	Rig the personnel barrier	15	3 V T		1	1			0	11	11	0	0	0
	m	_	Lift personnel barrier and move to storage location	10 10	3 V T 3A V T	0.4					0 2.3	0	0	0	0	0
	n o	_	Remove tie-down straps from transport cask Rig tie-down straps and move to storage location	5	3A V T	0.4	1				0	2.8	0	0	0	0
	g		Inspect transport cask for damage and conduct HP survey	15	3 V T			2			0	0	22	0	0	0
3)			and lift transport cask off of railcar and place on unloading cell transfer cart	120	'			_			,	Ť		j		<u> </u>
	a		Select the appropriate lifting block for the transport cask	5							0	0	0	0	0	0
	b		Secure lifting block to transport cask Trunnions	10	2A V T		2				0	6.7	0	0	0	0
	C)	,	Upend transport cask	30	-						0	0	0	0	0	0
	d		Lift transport cask off railcar	30	-						0	0	0	0	0	0
	e e	_	Reposition transport cask	30	-					_	0	0	0	0	0	0
3-1	f) Rem		Place transport cask on unloading cell transfer cart	15 60	-						0	0	0	0	0	0
Jdj	Kem		Open railbay door	5	-						0	0	0	0	0	0
	b	_	Railyard tug connects to railcar	10	-						0	0	0	0	0	0
	c)	_	Railyard tug removes railcar from railbay	10	-						0	0	0	0	0	0
	d	l)	Railyard tug connects to next railcar	15	-						0	0	0	0	0	0
	e	_	Railyard tug repositions next railcar in railbay	10	-						0	0	0	0	0	0
	f)	•)	Railyard tug leaves railbay and railbay door is closed	10	-						0	0	0	0	0	0
4)	iUnh		1												i	1
	t .	oolt	and remove transport cask lid using jib crane	85							0	0	0	^	^	^
	a	oolt 1)	Move tools to work platform	85 5	- ЭД V/ Т			1			0	0	0	0	0	0
	t .	oolt (85	- 2A V T 2A V T	1		1			0 0 10	0 0	0 5 0	0 0	0 0	0 0
	a b	oolt (Move tools to work platform HP survey of lid Including gas sampling	85 5 15		1	1.5	1			0	0	5	0	0	0
	a) b c)	oolt (1) (1) (2) (3) (4)	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts	85 5 15 30	2A V T	1	1.5	1			0 10	0	5	0	0 0 0	0
	a b c c d d e f)	boolt (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	85 5 15 30 15 10	2A V T	1	1.5	1	0.2		0 10 0	0 0 7.5	5 0 0	0 0	0 0	0 0
4a)	a) b) c) d e) f)	oolt (a) (b) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically	85 5 15 30 15 10 10 40	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0	0 0 7.5 0	5 0 0 0 0	0 0 0 0 0	0 0 0 0 5	0 0 0 0
4a)	a) b) c) d e) f) Secu	oolt (a) (b) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system	85 5 15 30 15 10 10 40	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0 0	0 0 7.5 0 0	5 0 0 0 0	0 0 0 0 0	0 0 0 0 5	0 0 0 0 0
4a)	a) b) c) d e) f) Secu	boolt (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart	85 5 15 30 15 10 10 40 15 15	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0 0	0 0 7.5 0 0	5 0 0 0 0	0 0 0 0 0	0 0 0 0 5	0 0 0 0 0
	a) b) c) d e) f) Secu	boolt (a) (b) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection	85 5 15 30 15 10 10 40 15 15 10	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0 0	0 0 7.5 0 0	5 0 0 0 0	0 0 0 0 0	0 0 0 0 5	0 0 0 0 0
	a) b) c) d e) f) Secu	a) b) c) d) c) d) f) ure f b) c) c) c) n of	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart	85 5 15 30 15 10 10 40 15 15	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0 0	0 0 7.5 0 0	5 0 0 0 0	0 0 0 0 0	0 0 0 0 5	0 0 0 0 0
	b c',d e f) Secu b c',	a) (b) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting	85 5 15 30 15 10 10 40 15 15 10 30	2A V T 2A V T - 2 V T	1	1.5	1	0.2		0 10 0 0 0 0	0 0 7.5 0 0 0 0	5 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 5 0 0	0 0 0 0 0 0
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4b) 5)	a b b c c c Plan a b b c c c c c c c c c c c c c c c c c	oolt (a) (b) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site iffting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack for use Place the empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 30 15 10 5 70 15 15 15 20 10 10 60 50 10 195 15 15 15 10 30	2A V T 2A V T - 2 V T 2A V T 2 V T			1		0.1	0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5)	a b b c c c Plan a b b c c c plan a b b c c c c b b c c c c c c c c c c c	oolt (a) (b) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site ifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid Rig the overpack lid to the VCT hoist	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 30 15 10 10 5 70 15 15 10 10 60 50 10 195 15 15 10 30 10	2A V T 2A V T - 2 V T 2A V T 2 V T			1		0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5) 6)	a b b c c c Plan a b c c c Plan a b c c c c c c c c c c c c c c c c c c	book (a) (b) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site iffting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack for use Place the empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 30 15 10 5 70 15 15 15 20 10 10 60 50 10 195 15 15 15 10 30	2A V T 2A V T - 2 V T 2A V T 2 V T			1		0.1	0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5) 6)	a b b c c c Plan a b c c c Plan a b c c c c c c c c c c c c c c c c c c	oolt (a) (b) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site ifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools n transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid Rig the overpack lid to the VCT hoist Hoist lid and retain on VCT	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 30 15 10 5 70 15 15 10 60 50 10 195 15 15 10 30 10 10 10 10 10 10 10 10 10 10 10 10 10	2A V T 2A V T - 2 V T 2A V T 2 V T			1		0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5) 7)	a a b b c c c c c c c c c c c c c c c c	book (a) (b) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site ifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack for use Place the empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid Rig the overpack lid to the VCT hoist Hoist lid and retain on VCT The empty storage overpack in receiving cell using motorized cart Open receiving cell shield doors Transfer empty storage overpack into receiving cell using motorized cart	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 5 70 15 15 10 60 50 10 195 15 10 30 10 10 60 60	2A V T 2A V T - 2 V T 2A V T 2 V T			1		0.1	0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5) 7)	a b c c c c c c c c c c c c c c c c c c	oolt (a) (b) (c) (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site ifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools 1 transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid Rig the overpack lid to the VCT hoist Hoist lid and retain on VCT n empty storage overpack in receiving cell using motorized cart Close the shield doors Transfer empty storage overpack into receiving cell using motorized cart Close the shield doors	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 5 70 15 15 10 60 10 10 30 10 10 60 15 15 15 10 30 10 10 10 60 15 15	2A V T 2A V T - 2 V T					0.1	0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5) 6) 7)	a b c c c c c c c c c c c c c c c c c c	oolt i) i) ii) iii) iii) iii) iii) iiiior iii) iiiiior iiiiior iiiiior iiiiior iiiiiior iiiiiior iiiiiiior	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site ifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools 1 transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack for use Place the empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid Rig the overpack lid to the VCT hoist Hoist lid and retain on VCT 1 empty storage overpack in receiving cell using motorized cart Close the shield doors QC Hold Point Inspection	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 5 70 15 15 10 60 10 10 30 10 10 60 15 15 15 15 10 30 10 10 50 50 10 50 50 50 50 50 50 50 50 50 50 50 50 50	2A V T 2A V T					0.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4b) 5) 6) 7)	a b c c c c c c c c c c c c c c c c c c	oolt i) i) ii) iii) iii) iii) iii) iiiior iii) iiiiior iiiiior iiiiior iiiiior iiiiiior iiiiiior iiiiiiior	Move tools to work platform HP survey of lid Including gas sampling Remove and store nuts Rig the lid for lifting using the local jib crane Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask transport cask and transfer cart seismically Reposition transfer cart near seismic restraint system Secure transport cask and transfer cart QC Hold Point Inspection the Day and Safety Meeting Plan of the Day Meeting Safety briefing Transportation to work site ifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools 1 transport cask transfer cart in unloading cell and close shield doors Move transport cask cart into the unloading cell Close the shield doors mpty storage overpack on receiving cell transfer cart Prepare an empty storage overpack on the transfer cart using VCT Stage tools on top of the storage overpack Unbolt storage overpack lid Rig the overpack lid to the VCT hoist Hoist lid and retain on VCT n empty storage overpack in receiving cell using motorized cart Close the shield doors Transfer empty storage overpack into receiving cell using motorized cart Close the shield doors	85 5 15 30 15 10 10 40 15 15 10 30 15 10 30 15 10 5 70 15 15 10 60 10 10 30 10 10 60 15 15 15 10 30 10 10 10 60 15 15	2A V T 2A V T					0.1	0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 7.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

	-1	Inchest transfer cleave cort	10	I						0	0	0	0	0	
		Inspect transfer sleeve cart	10	-						0	0	0	0	0	0
-		Move shielded transfer sleeve cart over unloading cell	15	-						0	0	0	0	0	0
441		QC Hold Point Inspection	10	-						0	0	0	0	0	0
11)		shield sleeve hoist and grapple DPC lifting lug	50							_					_
-		HP survey	0	-					-	0	0	0	0	0	0
42)		Lower shield sleeve hoist and grapple DPC lifting lug	50	-						0	0	0	0	0	0
12)		PPC into shield sleeve	190							_					_
-		Raise DPC into shield sleeve	60	-					-	0	0	0	0	0	0
42)		HP survey	0	-						0	0	0	0	0	0
13)		n shielded transfer sleeve cart over storage overpack in receiving cell	60							0	_	_	_	_	
		Position shielded transfer sleeve cart over storage overpack in receiving cell	60	-						0	0	0	0	0	0
		HP survey	0	-						0	0	0	0	0	0
44		QC Hold Point Inspection	10	-						0	0	0	0	0	0
14)		DPC into empty storage overpack, release grapple, and retract hoist	60							0	_				
-		Lower DPC into empty storage overpack, release grapple, and retract hoist	60	-					-	0	0	0	0	0	0
45\	•	HP survey	0	-						0	0	0	0	0	0
15)		e lifting lug from DPC	35	21/7			0.3			0	_				
-		HP survey	10	2 V T			0.2		-	0	0	5	0	0	0
\vdash		Stage tools on top of the storage overpack	5	- 2.4.T	0.3	0.3				0	0	0	0	0	0
		Remove bolts and rig lifting lug	10	2 V T	0.3	0.2				7.5	5	0	0	0	0
1.51		Remove the lifting lug from the DPC using the jib crane	10	-						0	0	0	0	0	0
16)	_	eceiving cell shield doors and transfer storage overpack out of receiving cell	35							0	_	_	_	_	
-		HP survey	10	-					-	0	0	0	0	0	0
-		Open receiving cell shield doors	10	-					-	0	0	0	0	0	0
47\		Transfer storage overpack out of receiving cell using motorized cart	15	-						0	0	0	0	0	0
1/)		storage overpack lid	60							0	_				\Box
-		Position VCT with storage cask lid at storage overpack	15	-					-	0	0	0	0	0	0
		Lower storage overpack lid into position	10	- 241/7	1 -					10	_	_	_		\vdash
-		Install bolts and torque	20	2A V T	1.5				0.4	10	0	0	0	0	0
-		QC Hold Point Inspection	10	2A V T					0.1	0	0	0	0	0	0.3
47-1	•	Clean out tools and leave the top of the DPC seismic restraints	5	-						0	0	0	0	0	0
1/a)			40							0	_	_	_	_	
		Position seismic restraints	15	-						0	0	0	0	0	0
Н		Secure seismic restraints	15	-						0	0	0	0	0	0
471-1	•	QC Hold Point Inspection the Day and Safety Meeting	10	-						0	0	0	0	0	U
1/0)			30							0	0	_	_	0	
		Plan of the Day Meeting	15	-						0	0	0	0	0	0
		Safety briefing	10 5	-								_	_	0	0
10\		Transportation to work site storage overpack and transfer to pad using VCT		-						0	0	0	0	0	U
18)			120 10	2A V T		2				0	6.7	0	0	0	
		Rig VCT to lift storage overpack		ZAVI		2				0		0	_		0
\vdash		Drive to storage pad location	60	-				-		0	0		0	0	0
\vdash		Position the storage overpack on the pad	20	24 \/ T		2	+	+		0	6.7	0	0	_	0
$\vdash\vdash\vdash$		De-rig storage cask from VCT	10	2AVT	1	2				0	6.7	0	0	0	0
\vdash	e)	Bolt storage overpack to the pad Total Hours of Capitar Handling Operations	20	4 V S	1			+		37	0	0	0	0	U
10-1	T.,,,,,,	Total Hours of Canister Handling Operations	30.1												
		er to Operations VCT to CHB	1440 60												
															
		Inloading cell shield doors and position transfer cart under jib crane transport cask lid	120 60												}
		rransport cask lid nsport cask and transfer to maintenance	60												-
-															
_	_	tion the railcar to the railbay	60												
		and wipedown transport cask	60												-
-		nsport cask and place on railcar	60												\vdash
-		impact limiters on transport cask	120												-
25)	kelease	e railcar for shipment	60							120	CO	Г4	_	11	2.0
Ш		Total Hours of Cask Handling Operations	65.1	L	<u> </u>					126	60	51	0	11	2.8

			Duration	Dose	Dur	ation	Fra	ction				Task	Dose		
Hor	rizontal	DPCs - DPCs in Horizontal Storage Modules (HSMs) on pad	(Minutes)		M R	Н	0	S	Q	М	R	Н	0	S	Q
0)	Plan of	f the Day and Safety Meeting	30												
	a)	Plan of the Day Meeting	15	-						0	0	0	0	0	0
	b)	Safety briefing	10	-						0	0	0	0	0	0
	c)	Transportation to work site	5	-						0	0	0	0	0	0
1)	Receiv	e transport cask on railcar at Cask Handling Building	145												L
	a)	Identify SNF shipment brought from yard	5	-						0	0	0	0	0	0
	b)	Security team sent to railbay door	15	-						0	0	0	0	0	0
	c)	Send operators to railbay door	15	-						0	0	0	0	0	0
	d)	Stage work team to railbay	15	-						0	0	0	0	0	0
	e)	Open railbay door	5	-						0	0	0	0	0	0
	f)	Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
	g)	Security inspection of the SNF shipment and tug	15	3 V T				0.5		0	0	0	0	3.7	0
	h)	HP survey of SNF shipment	15	3 V T		0.5				0	0	1.8	0	0	0
	i)	Inspection of tamper proof seals	10	3 V T				0.1		0	0	0	0	0.7	0
	j)	Acceptance of SNF shipment	5	-						0	0	0	0	0	0
	k)	Decoupling of railcar and removal of the tug from the railbay	10	-						0	0	0	0	0	0
	l)	Secure the railbay doors	5	-						0	0	0	0	0	0
	m)	Security team leaves	5	-						0	0	0	0	0	0
	n)	Operator leaves	5	-						0	0	0	0	0	0
	o)	Completes paperwork for step #1	5	-						0	0	0	0	0	0
2)	Remov	ve impact limiters and place in temporary storage	195												
	a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
	b)	Select and inspect rigging for impact limiters on the SNF shipment	5	-						0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T	2	2				0	2.5	2.5	0	0	0
	d)	Position manlifts and temporary scaffolding near SNF shipment	5	1A V T	2					0	2.5	0	0	0	0
	e)	Remove and store bolts holding on the first impact limiter	30	1A V T	2					15	0	0	0	0	0
	f)	Remove first impact limiter and place on storage stand	10	1A V T	1					0	2.5	0	0	0	0
	g)	Remove rigging and reposition on second impact limiter	5	1A V T	1					0	1.3	0	0	0	0
	h)	Reposition manlift and scaffolding	5	1A V T						0	0	0	0	0	0
	i)	Remove and store bolts holding on the second impact limiter	30	1A V T	2					15	0	0	0	0	0
	j)	Remove second impact limiter and place on storage stand	10	1A V T	1					0	2.5	0	0	0	0

· .	k)	Remove and store bolts for personnel barrier	30	3 V T	0.2			4.4	0	0	0	0	0
	I)	Rig the personnel barrier	15	3 V T	1	1		0	11	11	0	0	0
	m)	Lift personnel barrier and move to storage location	10	3 V T				0	0	0	0	0	0
	n)	Remove tie-down straps from SNF shipment	10	3A V T	0.4			2.3	0	0	0	0	0
	o)	Rig Tie-Down straps and move to storage location	5	3A V T	1			0	2.8	0	0	0	0
2)	p)	Inspect transport cask for damage and conduct HP survey	15	3 V T		2		0	0	22	0	0	0
3)	a)	Open truck bay door	60 15	_				0	0	0	0	0	0
		Position HCT in truck bay	30	-				0	0	0	0	0	0
	c)	Close truck bay door	15	-				0	0	0	0	0	0
4)	Upend	and lift transport cask off of railcar and downend on HCT	75										
	a)	Select the appropriate lifting block for the transport cask	5	-				0	0	0	0	0	0
	b)	Secure lifting block to transport cask trunnions	5	2A V T	2			0	3.3	0	0	0	0
	c)	Upend transport cask	30	-				0	0	0	0	0	0
	d)	Lift transport cask off railcar Move transport cask to HCT	15 10	-				0	0	0	0	0	0
		Downend transport cask to HCT	10	-				0	0	0	0	0	0
4a)		e railcar from railbay	60						_		_	ٽ	_
	-	Open railbay door	5	-				0	0	0	0	0	0
	b)	Railyard tug connects to railcar	10	-				0	0	0	0	0	0
	c)	Railyard tug removes railcar from railbay	10	-				0	0	0	0	0	0
	d)	Railyard tug connects to next railcar	15	-				0	0	0	0	0	0
		Railyard tug repositions next railcar in railbay	10	-				0	0	0	0	0	0
۱۲ ۱		Railyard tug leaves railbay and railbay door is closed transport cask on HCT	10 40	-				0	0	0	0	0	0
4u)		Position HCT near seismic restraint tie-downs	40 15	-				0	0	0	0	0	0
	a) b)	Install seismic restraint tie-downs	15	-				0	0	0	0	0	0
		QC Hold Point Inspection	10	-				0	0	0	0	0	0
4c)		the Day and Safety Meeting	30										
	a)	Plan of the Day Meeting	15	-				0	0	0	0	0	0
	b)	Safety briefing	10	-				0	0	0	0	0	0
	c)	Transportation to work site	5	-				0	0	0	0	0	0
5)		er transport cask to HSM on pad via HCT	120					_	_	<u> </u>	_	_	-
	a) b)	QC Hold Point Inspection Open the truck bay door	15 15	-	\vdash			0	0	0	0	0	0
	c)	Transfer the transport cask to HSM on the pad via HCT	90					0	0	0	0	0	0
5a)		ation of Horizontal Storage Module (HSM)	120					Ť	Ů	<u> </u>	Ť	Ť	Ť
		Stage equipment near HSM	15	-				0	0	0	0	0	0
	b)	Place and align Theodolite heads	30	=				0	0	0	0	0	0
	c)	Rig crane to HSM port cover	15	2C H T L	2			0	0.8	0	0	0	0
	d)	Use manlift to remove nuts on mounting studs	15	1AHTL	2			9.2	0	0	0	0	0
	e)	Post radiation zone signs and barriers	10	-				0	0	0	0	0	0
	f) g)	Remove HSM port cover and place in storage location HP survey to verify dose rates	20 15	1A H T L 1A H T L	1	1.5		0	6.1	0 6.9	0	0	0
6)		e transport cask lid	90	IAIIIL		1.5		U	0	0.9	0		-
٠,		Move tools to work platform	15	-				0	0	0	0	0	0
	b)	HP survey of lid including gas sampling	10	1A H T L		2		0	0	6.1	0	0	0
	c)	Position stick crane	15	=				0	0	0	0	0	0
	d)	Rig the lid for lifting using the local stick crane	15	1A H T L	2			0	9.2	0	0	0	0
	e)	Remove and store nuts	20	1AHTL	2			12	0	0	0	0	0
	f)	Lift the transport cask lid and move it to the storage stand Security inspection of the interior of the transport cask	10 5	1A H T NL			0.5	0	0	0	0	0 6.8	0
7)	g) Dock H	CT with HSM and push DPC into module	145	TATINE			0.5	U	U	0	0	0.8	0
,,		Position spotters	10	-				0	0	0	0	0	0
	b)	Move HCT into position	15	-				0	0	0	0	0	0
	c)	Check alignment	20	-				0			$\overline{}$	-	_
	d)	Dock HCT to HSM	30	-				•	0	0	0	0	0
	e)	Remove pushing port in base of transport cask	4.5					0	0	0	0	0	0
	f)		15	5 H H	2			0 4.3	0	0	0	0	0
	۸-۱	Engage ram and push DPC into module Withdraw the ram	20	5 H H -	2			0 4.3 0	0 0	0 0	0 0	0 0	0 0
	g) h)	Withdraw the ram	20 15	5 H H - -	2			0 4.3 0 0	0 0 0	0 0 0	0 0 0	0	0 0 0
			20	5 H H - - - 1A H T NL	2		0.2	0 4.3 0	0 0	0 0	0 0	0 0 0 0	0 0
8)	h) g)	Withdraw the ram Back the HCT away from the module	20 15 10	- - -	2		0.2	0 4.3 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
8)	h) g) Install s	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT	20 15 10 10 90 10	- - - 1A H T NL	2		0.2	0 4.3 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0
8)	h) g) Install s a) b)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints	20 15 10 10 90 10	- - 1A H T NL - 1A H T NL	1			0 4.3 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 5.4
8)	h) g) Install s a) b) c)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection ceismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection	20 15 10 10 90 10 5	- - - 1A H T NL			0.2	0 4.3 0 0 0 0 0 0 14	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 5.4 0
8)	h) g) Install s a) b) c) d)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig	20 15 10 10 90 10 5 5	- - 1A H T NL - 1A H T NL 1A H T NL	1			0 4.3 0 0 0 0 0 0 14 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 5.4 0 0 0
8)	h) g) Install s a) b) c) d)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module	20 15 10 10 90 10 5 5 15	- - 1A H T NL - 1A H T NL 1A H T NL - 5 H H				0 4.3 0 0 0 0 0 14 0 0	0 0 0 0 0 0 0 0 0 0 2.1	0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 5.4 0
8)	h) g) Install s a) b) c) d) e)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig	20 15 10 10 90 10 5 5	- - 1A H T NL - 1A H T NL 1A H T NL	1 1	0.5		0 4.3 0 0 0 0 0 0 14 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.4 0 0 0 2.7 0
8)	h) g) Install s a) b) c) d) e) f)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec	20 15 10 10 90 10 5 5 15 15	- - 1A H T NL - 1A H T NL 1A H T NL - 5 H H 5 H H	1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3	0 0 0 0 0 0 0 0 0 2.1	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 5.4 0 0 0 0 0
	h) g) Install s a) b) c) d) e) f) g) h) Install t	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid	20 15 10 10 90 10 5 5 15 15 15 15 10 70	- - 1A H T NL - 1A H T NL 1A H T NL - 5 H H 5 H H	1 1	0.5		0 4.3 0 0 0 0 0 0 14 0 0 0 0 4.3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	h) g) Install s a) b) c) d) e) f) g) h) Install t a)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband	20 15 10 10 90 10 5 5 15 15 15 10 70		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 4.3 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig	20 15 10 10 90 10 5 5 15 15 15 10 70 10	- - 1A H T NL - 1A H T NL 1A H T NL - 5 H H 5 H H	1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials Cransport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15 20		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d)	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15 15		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 9a) 10)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) Turnov Return	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15 20 10 21.2		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 9a) 10)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) e Turnov Return Plan of	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection Seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT the Day and Safety Meeting	20 15 10 90 10 5 5 15 15 15 10 70 10 15 15 20 10 21.2 1440 30		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 9a) 10) 110)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) ev Turnov Return Plan of Lift tran	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT the Day and Safety Meeting Insport cask and transfer to maintenance	20 15 10 90 10 5 5 15 15 15 16 70 10 15 15 20 10 21.2 1440 120 30 60		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 9a) 10) 110a) 111a)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) e Turnov Return Plan of Lift trar survey	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection seismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials transport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT the Day and Safety Meeting insport cask and transfer to maintenance and wipedown transport cask	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15 20 10 21.2 1440 120 30 60 60		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 10) 110a) 111a) 111b)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) ev Turnov Return Plan of Lift transurvey Reposit	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection reismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials ransport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT the Day and Safety Meeting resport cask and transfer to maintenance and wipedown transport cask tion empty railcar	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15 15 20 10 21,2 1440 120 30 60 60 60		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 9a) 10) 10a) 11a) 11b) 12)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) e Turnov Return Plan of Lift tran survey Reposit Lift tran	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection ceismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials cransport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT the Day and Safety Meeting resport cask and transfer to maintenance and wipedown transport cask tion empty railcar resport cask and place on railcar	20 15 10 10 90 10 5 5 15 15 15 15 10 70 10 15 15 20 10 21.2 1440 120 30 60 60 60		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9) 9a) 10) 10a) 11a) 11b) 12) 13)	h) g) Install s a) b) c) d) e) f) g) h) Install t a) b) c) d) e Turnov Return Plan of Lift trar survey Reposit Lift trar	Withdraw the ram Back the HCT away from the module QC Hold Point Inspection reismic restraints and HSM port cover Retrieve the seismic restraints from HCT Reach into module and install the seismic restraints QC Hold Point Inspection Pick the HSM port cover still attached to the lifting rig Position the HSM port cover over the port in the module Install the nuts on the studs and torque to spec HP survey of area Remove radiation zone markers and remove all materials ransport cask lid Security inspection of transport cask to verify lack of contraband Pick the transport cask cover from the still attached to the lifting rig Position the transport cask cover on the transport cask Install the nuts on the studs and torque to spec QC Hold Point Inspection Total Hours of Canister Handling Operations er to Operations transport cask to Cask Handling Building via HCT the Day and Safety Meeting resport cask and transfer to maintenance and wipedown transport cask tion empty railcar	20 15 10 10 90 10 5 5 15 15 15 10 70 10 15 15 20 10 21,2 1440 120 30 60 60 60		1 1	0.5		0 4.3 0 0 0 0 0 14 0 0 0 4.3 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

	DPC	S - DPCs in storage casks on pad	Duration	Dose	_			Fraction	_		_	Task	1		
			(Minutes)		М	R	Н	O S	Q	M	R	Н	0	S	Q
aj		the Day and Safety Meeting Plan of the Day Meeting	30							0	0	0	0	0	0
b)	_	Safety briefing	10	_						0	0	0	0	0	0
c)		Transportation to work site	5	_						0	0	0	0	0	0
		transportation to work site	145							Ť	Ŭ	Ť	Ť	Ŭ	Ť
a)		Identify SNF shipment from yard	5	-						0	0	0	0	0	0
b)	_	Security team sent to railbay door	15	-						0	0	0	0	0	0
c)		Send operators to railbay door	15	-						0	0	0	0	0	0
d))	Stage work team to railbay	15	-						0	0	0	0	0	0
e)	_	Open railbay door	5	-						0	0	0	0	0	0
f))	Position SNF shipment in the railbay	15	-						0	0	0	0	0	0
g))	Security inspection of the SNF shipment and tug	15	3 V T				0.5		0	0	0	0	5.5	0
h))	HP survey of SNF shipment	15	3 V T			0.5			0	0	5.5	0	0	0
i)	1	Inspection of tamper proof Seals	10	3 V T				0.1		0	0	0	0	0.7	0
j))	Acceptance of SNF shipment	5	-						0	0	0	0	0	0
k))	Decoupling of railcar and removal of the tug from the railbay	10	-						0	0	0	0	0	0
I))	Secure the railbay doors	5	-						0	0	0	0	0	0
m))	Security team leaves	5	-						0	0	0	0	0	0
n)	_	Operator leaves	5	-						0	0	0	0	0	0
o)		Completes paperwork for step #1	5	-						0	0	0	0	0	0
2) Rem		e impact limiters and place in temporary storage	195									<u> </u>			
a))	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
b)	_	Select and inspect rigging for impact limiters on the SNF shipment	5	-						0	0	0	0	0	0
c)		Rig the lifting devices to the first impact limiter	5	1A V T		2	2			0	2.5	2.5	0	0	0
d)		Position man lifts and temporary scaffolding near SNF shipment	5	1A V T		2				0	2.5	0	0	0	0
e)	_	Remove and store bolts holding on the first Impact Limiter	30	1A V T	2					15	0	0	0	0	0
f)	_	Remove first Impact limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
g)	_	Remove rigging and reposition on Impact Limiter #2	5	1A V T		1				0	1.3	0	0	0	0
h)		Reposition Manlift and Scaffolding	5	1A V T						0	0	0	0	0	0
i)		Remove and store bolts holding on the Second Impact Limiter	30	1A V T	2					15	0	0	0	0	0
j)		Remove second Impact Limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
k))	Remove and store bolts for SNF shipment cover	30	3 V T	0.2					4.4	0	0	0	0	0
l)		Rig the personnel barrier	15	3 V T		1	1			0	11	11	0	0	0
m))	Lift personnel barrier and move to storage location	10	3 V T						0	0	0	0	0	0
n))	Remove Tie-Down Straps from transport cask	10	3A V T	0.4					2.3	0	0	0	0	0
0))	Rig Tie-Down straps and move to storage location	5	3A V T		1				0	2.8	0	0	0	0
p))	Inspect Transport Cask for damage and conduct HP survey	15	3 V T			2			0	0	22	0	0	0
) Uper	nd a	and lift transport cask off of railcar and place on remote cell transfer carl	120												
a))	Select the appropriate lifting block for the Transport Cask	5	-						0	0	0	0	0	0
b))	Secure lifting block to Transportation Cask Trunnions	10	2A V T		2				0	6.7	0	0	0	0
c))	Upend Transportation Cask	30	-						0	0	0	0	0	0
d)	_	Lift Transportation Cask off railcar	30	-						0	0	0	0	0	0
e))	Reposition Transportation Cask	30	-						0	0	0	0	0	0
f))	Place Transportation Cask on remote cell Transfer Cart	15	-						0	0	0	0	0	0
a) Rem	_	e railcar from railbay	120												
a))	Open railbay door	5							0	0	0	0	0	0
b))	Railyard tug connects to railcar	10	-						0	0	0	0	0	0
c))	Railyard tug removes railcar from railbay	10	-						0	0	0	0	0	0
d))	Railyard tug connects to next railcar	15	-						0	0	0	0	0	0
e))	Railyard tug repositions next railcar in railbay	10	-						0	0	0	0	0	0
f))	Railyard tug leaves railbay and railbay door is closed	10	-						0	^	0	0	0	0
	، خارم	manyara tab reaves rambay and rambay assisting a	10								0				
) Unbo	OIL	and remove transport cask lid using jib crane	75								U				
) Unbo				-						0	0	0	0	0	0
)	and remove transport cask lid using jib crane	75	- 2A V T			1			0		0 1.7	0	0	+
a)))	and remove transport cask lid using jib crane Move tools to work platform	75 5	- 2A V T 2A V T	1		1				0	_	-	_	0 0
a) b))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts	75 5 5		1	1.5	1			0	0	1.7	0	0	0
a) b) c))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid	75 5 5 30	2A V T	1	1.5	1			0 10	0 0	1.7	0	0	0
a) b) c) d)))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane	75 5 5 30 15	2A V T	1	1.5	1	0.2		0 10 0	0 0 0 0 7.5	1.7 0 0	0 0	0 0	0 0 0
a) b) c) d) e)))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand	75 5 5 30 15	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0	0 0 0 7.5	1.7 0 0	0 0 0	0 0 0	0 0 0
a) b) c) d) e)))))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask	75 5 5 30 15 10	2A V T 2A V T -	1	1.5	1	0.2		0 10 0 0	0 0 0 7.5	1.7 0 0	0 0 0	0 0 0	0 0 0 0
a) b) c) d) e) f) Attace)))))) och l	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask lifting lug to top of DPC	75 5 5 30 15 10 10	2A V T 2A V T - 2 V T		1.5	1	0.2		0 10 0 0 0	0 0 0 7.5 0	1.7 0 0 0 0	0 0 0 0	0 0 0 0 0 5	0 0 0 0
a) b) c) d) e) f) Attac))))) (ch I	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask lifting lug to top of DPC Rig lifting lug on storage rack	75 5 5 30 15 10 10 70	2A V T 2A V T - 2 V T - 2A V T			1	0.2		0 10 0 0 0	0 0 0 7.5 0 0	1.7 0 0 0 0	0 0 0 0 0	0 0 0 0 5	0 0 0 0 0
a) b) c) d) e) f) Attac a) b))))))) och I)	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask lifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position	75 5 5 30 15 10 10 70 15 15	2A V T 2A V T - 2 V T - 2A V T			1		0.1	0 10 0 0 0	0 0 0 7.5 0 0 0	1.7 0 0 0 0 0	0 0 0 0 0	0 0 0 0 5 0	0 0 0 0 0
a) b) c) d) e) f) Attac a) b)))))))))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask lifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister	75 5 30 15 10 10 70 15 15 20	2A V T 2A V T - 2 V T - 2A V T 2 V T			1		0.1	0 10 0 0 0 0 0 0 25	0 0 0 7.5 0 0 0 2.5	1.7 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 5 0 0	0 0 0 0 0 0 0 0 2.5
a) b) c) d) e) f) Attac a) b) c) d))))))))))))))))))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask lifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection	75 5 30 15 10 10 70 15 15 20 10	2A V T 2A V T - 2 V T - 2A V T 2 V T			1		0.1	0 10 0 0 0 0 0 25	0 0 0 7.5 0 0 2.5 0	1.7 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 5 0 0 0	0 0 0 0 0 0 0 0 2.5
a) b) c) d) e) f) Attac a) b) c) d e) e f f e f f f f f f f f f f f f f f)))))))))))))))))))))	and remove transport cask lid using jib crane Move tools to work platform HP survey of lid Remove and store Nuts Rig the Lid for lifting using the local jib crane Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask lifting lug to top of DPC Rig lifting lug on storage rack Use Jib crane to lift lifting lug into position Bolt Lifting lug to canister QC Hold Point Inspection Clear workspace and remove all tools	75 5 30 15 10 10 70 15 15 20 10	2A V T 2A V T - 2 V T - 2A V T 2 V T			1		0.1	0 10 0 0 0 0 0 25	0 0 0 7.5 0 0 2.5 0	1.7 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 5 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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	b)	Lower remote cell hoist and place DPC in storage overpack	60					0	0	0	0	0	0
13)	- /	e grapple, and retract hoist	15					Ů	Ů	-		Ť	Ŭ
13,		Release grapple, and retract hoist	15	-				0	0	0	0	0	0
14)		remote cell shield doors and position VCT at storage overpack	70					Ť	Ť				Ť
	a)	HP survey	10	-				0	0	0	0	0	0
	b)	Open remote cell shield doors	10	-				0	0	0	0	0	0
	c)	Position the VCT at the Storage overpack	50	-				0	0	0	0	0	0
15)	Remov	re lifting lug from DPC	40										
	a)	HP survey	10	2 V T		0.2		0	0	5	0	0	0
	b)	Stage tools on top of the storage overpack	5	-				0	0	0	0	0	0
	c)	Remove bolts and rig lifting lug	10	2 V T	0.3 0.2			7.5	5	0	0	0	0
	d)	Remove the lifting lug from the DPC using the jib crane	10	-				0	0	0	0	0	0
	e)	Clean out tools and leave the top of the DPC	5	-				0	0	0	0	0	0
16)	Install	storage cask lid	60										
	a)	Position VCT with storage overpack lid at storage cask	15	-				0	0	0	0	0	0
	b)	Lower storage overpack lid into position	10	-				0	0	0	0	0	0
	c)	Install bolts and torque	20	2A V T	1.5			10	0	0	0	0	0
	d)	QC Hold Point Inspection	10	2A V T			0.1	0	0	0	0	0	0.3
	e)	Clean out tools and leave the top of the DPC	5	-				0	0	0	0	0	0
17)	Pick up	storage overpack and transfer to pad using VCT	120										
	a)	Rig VCT to lift storage overpack	10	2A V T	2			0	6.7	0	0	0	0
	b)	Drive to storage pad location	60	-				0	0	0	0	0	0
	c)	Position the storage overpack on the pad	20	-				0	0	0	0	0	0
	d)	De-rig storage overpack from VCT	10	2A V T	2			0	6.7	0	0	0	0
	e)	Bolt storage overpack to the pad	20	4 V S	1			37	0	0	0	0	0
		Total Hours of Canister Handling Operations	23.5										
_		ver to Operations	1440										
		VCT to CHB	60										
		emote cell shield doors and position transfer cart under jib crane	120										
		transport cask lid	60										
_		nsport cask and transfer to maintenance	60										
		and wipedown Transport Cask	60										
	_	tion empty railcar	60										
		nsport cask and place on railcar	60										
_		impact limiters on transport cask	120										
24)	Releas	e railcar for shipment	60										
		Total Hours of Cask Handling Operations	58.5					126	60	48	0	11	2.8

Vertical DS	SCs - DSCs in storage casks on pad	Duration (Minutes)	Dose	М		tion I		ion S Q	М	R	Task H	Dose O	S	Q
0) Plan o	of the Day and Safety Meeting	30		141	IX.	11		, Q	IVI	K			3	Q
a)	Plan of the Day Meeting	15	-						0	0	0	0	0	0
b)	Safety Briefing	10	-						0	0	0	0	0	0
c)	Transportation to work site	5	-						0	0	0	0	0	0
1) Receiv	ve transport cask on railcar at the siding	100									<u> </u>	<u> </u>		
a)	Identify Transport Cask in yard	5	-						0	0	0	0	0	0
b)	Stage work team at siding	15	-						0	0	0	0	0	0
c)	Position Waste Package under gantry crane	15					_	-	0	0	0	0	0	0
d)	Security inspection of the Transport Cask	15 15	3 V T			0.5	U	.5	0	0	0	0	5.5	0
e) f)	HP Survey of Transport Cask Inspection of Tamper proof Seals	10	3 V T	-		0.5	0	0.1	0	0	5.5	0	0.7	0
g)	Acceptance of Package	5	3 V I				U	'. 1	0	0	0	0	0.7	0
h)	Decoupling of railcar and removal of the tug from the siding	10	_						0	0	0	0	0	0
i)	Security team leaves	5	_						0	0	0	0	0	0
i)	Completes paperwork for step #1	5	-						0	0	0	0	0	0
,,,	ve impact limiters and place in temporary storage using the gantry crane	195												<u> </u>
a)	Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
b)	Select and inspect rigging for impact limiters on the Transport Cask	5	-						0	0	0	0	0	0
c)	Rig the lifting devices to the first impact limiter	5	1A V T		2	2			0	2.5	2.5	0	0	0
d)	Position man lifts and temporary scaffolding near Transport Cask	5	1A V T		2				0	2.5	0	0	0	0
e)	Remove and store bolts holding on the first Impact Limiter	30	1A V T	2					15	0	0	0	0	0
f)	Remove first Impact limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
g)	Remove rigging and reposition on Impact Limiter #2	5	1A V T		1				0	1.3	0	0	0	0
h)	Reposition Manlift and Scaffolding	5	1A V T						0	0	0	0	0	0
i)	Remove and store bolts holding on the Second Impact Limiter	30	1A V T	2					15	0	0	0	0	0
j)	Remove second Impact Limiter and place on storage stand	10	1A V T		1				0	2.5	0	0	0	0
k)	Remove and store bolts for package cover	30	3 V T	0.2			\perp		4.4	0	0	0	0	0
l)	Rig the package cover	15	3 V T	-	1	1	\perp		0	11	11	0	0	0
m)	Lift package cover and move to storage location	10	3 V T	_			\perp		0	0	0	0	0	0
n)	Remove Tie-Down Straps from Transport Cask	10	3A V T	0.4	-				2.3	0	0	0	0	0
o)	Rig Tie-Down straps and move to storage location	5 15	3A V T		1	3	+	-	0	2.8	0	0	0	0
p)	Inspect Transport Cask for damage and conduct HP Survey	15	3 V T			2			0	0	22	0	0	0
	d and lift transport cask off of railcar and place on the pad Select the appropriate lifting block for the Transport Cask	120							0	0	0	0	0	0
a) b)	Secure lifting block to Transportation Cask Trunnions	5 10	2A V T		2				0	6.7	0	0	0	0
			ZAVI						<u> </u>	 	0	0	0	-
c) d)	Upend Transportation Cask Lift Transportation Cask off railcar	30							0	0	0	0	0	0
e)	Reposition Transportation Cask	30							0	0	0	0	0	0
f)	Place Transportation Cask on the "spot"	15	_						0	0	0	0	0	0
	I seismic/stack-up struts on Transport Cask using stick crane	95							Ť		<u> </u>	-		Ť
a)	Move tools to work platform	5	-						0	0	0	0	0	0
b)	Attach Struts to Stantions on pad	10	_						0	0	0	0	0	0
c)	Rig and Lift Seismic Struts 1&2 into position	30	3 V T		0.2				0	4.4	0	0	0	0
d)	Rig and lift Struts 3&4 into position	30	3 V T		0.2				0	4.4	0	0	0	0
e)	Bolt Seismic collar together around Transport Cask.	10	3 V T	2	0				15	0	0	0	0	0
f)	QC Hold Point Inspection	10	-						0	0	0	0	0	0
,	porter moves storage overpack into position and removes lid	75												Ť
a)	Transporter places Storage overpack on "spot"	10	-						0	0	0	0	0	0
b)	Crews mobilize to top of Storage overpack	10	-						0	0	0	0	0	0
c)	Unbolt storage overpack lid	30	-						0	0	0	0	0	0
d)	Rig Storage overpack Lid and lift	15	-						0	0	0	0	0	0
e)	QC Hold Point Inspection	10	-						0	0	0	0	0	0
6) Moun	at adapter plates to top of storage overpack using stick crane	75												
a)	Move tools to work platform	5	-						0	0	0	0	0	0
b)	Rig and lift adapter plate 1 to top of Storage Cask	5	-						0	0	0	0	0	0
c)	Bolt Adapter plate 1 to top of cask	30	-						0	0	0	0	0	0
d)	Rig and lift adapter plate 2 into position	15	-						0	0	0	0	0	0
e)	Bolt Adapter plate 2 to top of cask	10	-						0	0	0	0	0	0
f)	QC Hold Point Inspection	10	-						0	0	0	0	0	0
	l seismic stack-up struts on storage overpack and weather cover using stick crane	85												<u> </u>
a)	Move tools to work platform	5	-						0	0	0	0	0	0
b)	Attach Struts to Stantions on pad	5	-						0	0	0	0	0	0
c)	Rig and Lift Seismic Struts 1&2 into position	30	-				_		0	0	0	0	0	0
d)	Rig and lift Struts 3&4 into position	15	2A V T	0 -	0.5		+		12	2.5	0	0	0	0
e)	Bolt Seismic collar together around Transport Cask.	10	2 V T	0.5			+	0.4	13	0	0	0	0	0
f)	QC Hold Point Inspection Install Weather cover	10	2 V T	1			+	0.1	0	0	0	0	0	2.5
g) 7a) Plan o	Install Weather cover If the Day and Safety Meeting	30	-						U	U	U	U	U	U
		15	-						0	0	0	0	0	0
a)	Plan of the Day Meeting	15	-	-			+		0	0	0	0	0	0
b)	Safety Briefing Transportation to work site		-	1			+			<u> </u>	<u> </u>			<u> </u>
c)	Transportation to work site It and remove transport cask lid	5 60	-						0	0	0	0	0	0
		10	-						0	_	_	_	0	0
a) b)	Stage tools on top of the transport cask Unbolt transport cask lid	30	 				+		0	0	0	0	0	0
- '	Rig the cask lid to the stick crane		 				+		0			0	0	
c) d)	Lift lid and place it on the storage stand	10 10	-				+		0	0	0	0	0	0
	Lift lid and place it on the storage stand h lifting lug to top of DSC	70	-							U	U	U	U	U
	Rig lifting lug on storage rack	15	-						0	0	0	0	0	0
a) b)	Use stick crane to lift lifting lug into position	15	2A V T	1	0.5		+		0	2.5	0	0	0	0
c)	Bolt Lifting lug to canister	20	2 V T	0.5			+		25	0	0	0	0	0
(c)	QC Hold Point Inspection	10	2 V T	0.5			+	0.1	0	0	0	0	0	2.5
	Clear workspace and remove all tools		∠ V I				+	0.1	0	0	0	0	0	0
e)	•	10	-						U	U	U	U	U	U
เบาเทเกแท	at adapter plates to top of Transport Cask using stick crane	85								_	_	_		_
	Move tools to work platform	5	-	-			+		0	0	0	0	0	0
a)	Rig and lift adapter plate 1 to top of Transport Cask Bolt Adapter plate 1 to top of cask	15	- 24.\/T	4 -			+		10	0	0	0	0	0
a) b)	LBOIT AGAITER DIATE 1 TO TOP OF CASK	20	2A V T	1.5			+		10	0	0	0	0	0
a) b) c)	, ,		1 -	1	1	1			0	0	0	0	0	0
a) b) c) d)	Rig and lift adapter plate 2 into position	15		1.		-				 -		 		-
a) b) c) d)	Rig and lift adapter plate 2 into position Bolt Adapter plate 2 to top of cask	20	2A V T	1.5					10	0	0	0	0	0
a) b) c) d) e)	Rig and lift adapter plate 2 into position Bolt Adapter plate 2 to top of cask QC Hold Point Inspection	20 10	2A V T	1.5					10 0	0		0	0	0
a) b) c) d) e) f) unstall	Rig and lift adapter plate 2 into position Bolt Adapter plate 2 to top of cask QC Hold Point Inspection I the Transfer Cask on Transport Cask using the gantry crane	20 10 75	-	1.5					0	0	0	0	0	0
a) b) c) d) e)	Rig and lift adapter plate 2 into position Bolt Adapter plate 2 to top of cask QC Hold Point Inspection	20 10	2A V T - -	1.5							0	_		1

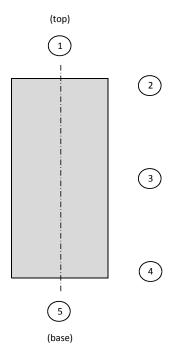
c) d)			1									
a)	Reposition the Gantry crane	20	- 24.)/T		1			0	0	0	0	0
۱۵	Lower Transport cask onto alignment lugs QC Hold Point Inspection	15 10	2A V T		1			0	5	0	0	0
e)	Transfer Cask to adapter plate	70	-					U	- 0	U	U	-
a)	Position Man Lifts with bolts and tools	15	-					0	0	0	0	0
b)	Bolt Transfer cask to adapter plate	15	2A V T	2				10		0	0	0
c)	Torque bolts	20	2A V T	2				13		0	0	0
d)	QC Hold Point Inspection	10	-	_				0	_	0	0	0
e)	Clear workspace and remove all tools	10	-					0	0	0	0	0
	canister from transport cask up into transfer cask	105										
a)	Release Lifting block and reposition gantry crane hoist	10	2 V T	0.3	0.2			7.5	5 5	0	0	0
b)	Position auxiliary hoist over Transfer Cask	15	-					0	0	0	0	0
c)	Lower grapple and grapple DSC	20	-					0	0	0	0	0
d)	Lift DSC into transfer cask	15	-					0	0	0	0	0
e)	Engage locking mechanism	15	-					0	0	0	0	0
f)	QC Hold Point Inspection	10	-					0	0	0	0	0
g)	Release grapple and withdraw hoist	20	-					0	0	0	0	0
3a) Plan	of the Day and Safety Meeting	30										
a)	Plan of the Day Meeting	15	-					0	0	0	0	0
b)	Safety Briefing	10	2A V T	1.5				5	0	0	0	0
c)	Transportation to work site	5	2A V T				0.	1 0	0	0	0	0 0
14) Unbo	It Transfer Cask from adapter plate	80										
a)	Position Man Lifts with tools	15	-					0	0	0	0	0
b)	Position Gantry crane over transfer cask	15	-					0	0	0	0	0
c)	Engage Lifting Block onto Transfer Cask Trunnions	20	-					0	0	0	0	0
d)	Unbolt Transfer Cask bolts and remove	20	2A V T	2				13	0	0	0	0
e)	Clear workspace and remove all tools	10	-					0	0	0	0	0
15) Move	Transfer Cask from Transport Cask to Storage Cask	60										
a)	Lift the Transfer Cask off the Transport Cask	15	-					0	0	0	0	0
b)	Reposition Gantry Crane	15	-					0	0	0	0	0
c)	Lower Transfer Cask onto Storage cask alignment blocks	20	-					0	0	0	0	0
d)	QC Hold Point Inspection	10	-					0	0	0	0	0
16) Instal	Il weather cover to Transport Cask	105										
a)	Retrieve Weather Cover from Storage box	60	-					0	0	0	0	0
b)	Position Man Lifts on either side of Transport Cask	15	-					0	0	0	0	0
c)	Install Weather cover	20	4 V S	1				37	0	0	0	0
d)	QC Hold Point Inspection	10	-					0	0	0	0	0
17) Bolt 1	Fransfer Cask to adapter plate	70										
a)	Position Man Lifts with bolts and tools	15	-					0	0	0	0	0
b)	Bolt Transfer cask to adapter plate	15	2A V T	2				10	0	0	0	0
c)	Torque bolts	20	2A V T	2				13	0	0	0	0
d)	QC Hold Point Inspection	10	-					0	0	0	0	0
e)	Clear workspace and remove all tools	10	-					0	0	0	0	0
18) Lowe	r canister from Transfer Cask into Storage overpack	10										
a)	Release Lifting block and reposition gantry crane hoist	60	-					0	0	0	0	0
b)	Position auxiliary hoist over Transfer Cask	15	-					0	0	0	0	0
c)	Lower grapple and grapple DSC	20	-					0	0	0	0	0
d)	Lift DSC to clear locking mechanism	15	-					0	0	0	0	0
e)	Lower Canister into Storage overpack	10	-					0	0	0	0	0
f)	Release grapple and withdraw hoist	20	-					0	0	0	0	0
g)	HP Survey	10	-					0	0	0	0	0
19) Unbo	lt Transfer Cask from adapter plate	70										
a)	Reposition gantry crane hoist over Transfer Cask	15	-					0	0	0	0	0
b)	Grapple the Transfer cask	15	-					0	0	0	0	0
a)	Position Man Lifts with tools	15	-					0	0	0	0	0
b)	Unbolt Transfer cask from adapter plate	15	-					0	0	0	0	0
e)	Clear workspace and remove all tools	10	-					0	0	0	0	0
20) Remo	ove Transfer Cask and place into storage	60										<u> </u>
a)	Lift Transfer Cask off of Storage overpack adaptor plates	15	-					0	0	0	0	0
b)	Reposition Gantry Crane	15	-					0	0	0	0	0
c)	Lower Transfer Cask onto location	20	-					0	0	0	0	0
d)	Release Lifting block and raise gantry crane hoist	10	3 V T				0.5	0	0	0	0	3.7
	ove adapter plates	115							1			
a)	Move tools to Man Lift	5	-	<u> </u>			1	0		0	0	0
b)	Attach rigging to Adapter Plate 2	5	-	<u> </u>			1	0	0	0	0	0
- \	Unbolt Adaptor plate 2	30	-	<u> </u>			++-	0	0	0	0	0
c)	liste Adame - Diaca 2							0			0	0
d)	Lift Adaptor Plate 2 and place in storage location using stick crane	15	-					-	0	0	-	
d) e)	Attach rigging to Adapter Plate 1	15 10	-					0	0	0	0	0
d) e) f)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1	15 10 10						0	0	0	0	0
d) e) f)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane	15 10 10 10	-					0	0 0	0 0 0	0	0 0
d) e) f) g) h)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover	15 10 10 10 15 15						0 0	0 0 0	0 0 0	0 0 0	0 0 0 0
d) e) f) g) h)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools	15 10 10 15 15 15						0	0 0 0	0 0 0	0	0 0
d) e) f) g) h) i)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting	15 10 10 15 15 10 30						0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting	15 10 10 15 15 10 30						0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing	15 10 10 15 15 10 30 15						0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site	15 10 10 15 15 10 30 15 10 5						0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC	15 10 10 15 15 10 30 15 10 5 5	- - - - -			0.2		0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c) 22) Remo	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey	15 10 10 15 15 10 30 15 10 5 5 55	- - - - - - - 2 V T	1		0.2		0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover	15 10 10 15 15 15 10 30 15 10 5 55 10 10	- - - - -			0.2		0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask	15 10 10 15 15 15 10 30 15 10 5 55 10 15 5		1		0.2		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts	15 10 10 15 15 15 10 30 15 10 5 55 10 15 10		1	1			0 0 0 0 0 0 0 0 3.8	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug from the DSC	15 10 10 15 15 15 10 30 15 10 5 55 10 15 10 15 10 15 10 15 10 15 10 10 10		1				0 0 0 0 0 0 0 0 3.8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d) e) f)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC	15 10 10 15 15 15 10 30 15 10 5 55 10 10 10 5 5 55 10 10 5 5 55 5 5 5		1	1			0 0 0 0 0 0 0 0 3.8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask	15 10 10 15 15 10 30 15 10 5 55 10 10 15 5 75		1	1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Reposition Man Lifts	15 10 10 15 15 10 30 15 10 5 55 10 10 15 5 75 5 5 5 5 5 75 5		1	1 1			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2	15 10 10 15 15 10 30 15 10 5 55 10 10 5 75 5 5 5 5 5		1	1 1 1			00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4	15 10 10 15 15 15 10 30 15 10 5 55 10 10 5 75 5 10 10		1	1 1	1		00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 0 25 7.3 0 0 2.8 7.3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b) c) d)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4 Unbolt Seismic collar around Transport Cask	15 10 10 15 15 15 10 30 15 10 5 55 10 10 5 75 5 10 10 10 5 15 10 10 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 10 15 15 10 15 15 15 15 15 15 15 16 17 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18		1	1 1 1			00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 25 7.3 0 2.8 7.3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo b) c) d) e) f)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4 Unbolt Seismic collar around Transport Cask Lift the Seismic struts	15 10 10 10 15 15 15 10 30 15 10 5 55 10 10 5 75 5 10 10 5 10 10 5 10 10 5 10 10 10 5 10 10 10 10 10 10 10 10 10 10 10 10 10		1	1 1 1	1		00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 0 25 7.3 0 0 2.8 7.3 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan (a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b) c) d) e) f)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4 Unbolt Seismic collar around Transport Cask Lift the Seismic struts Remove pins from support stantions on the pad	15 10 10 10 15 15 15 10 30 15 10 5 55 10 10 5 75 5 10 10 10 5 75 10 10 10 10 10 10 10 10 10 10 10 10 10		1	1 1 1	1		00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 0 25 7.3 0 0 2.8 7.3 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b) c) d) e) f) g)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4 Unbolt Seismic collar around Transport Cask Lift the Seismic struts Remove pins from support stantions on the pad Move Strut assemblies to storage location	15 10 10 15 15 15 10 30 15 10 5 55 10 10 10 5 75 5 10 10 10 10 10 10 10		1	1 1 1	1		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b) c) d) e) f) g) h)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4 Unbolt Seismic collar around Transport Cask Lift the Seismic struts Remove pins from support stantions on the pad Move Strut assemblies to storage location Place Strut assemblies into storage	15 10 10 10 15 15 10 30 15 10 5 55 10 10 15 5 10 10 15 5 10 10 5 75 5 10 10 10 5 5 5 10 10 5 5 5 5 10 10 5 5 5 5		1	1 1 1	1		00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 3 0 25 7.3 0 0 2.8 7.3 0 0 0	0 0 0 0 0 0 0 0 0 0 0 7.3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
d) e) f) g) h) i) 1a) Plan a) b) c) 22) Remo a) b) c) d) e) f) 23) Remo a) b) c) d) e) f) g) h) i) i)	Attach rigging to Adapter Plate 1 Unbolt Adaptor Plate 1 Lift Adaptor Plate 1 and place in storage location using stick crane Install Weather cover Clear workspace and remove all tools of the Day and Safety Meeting Plan of the Day Meeting Safety Briefing Transportation to work site ove lifting lug from DSC HP Survey Remove the Weather Cover Stage tools on top of the storage cask Rig the lifting lug assembly to the stick crane and remove the bolts Remove the lifting lug from the DSC Clean out tools and leave the top of the DSC ove seismic/stack-up struts on Storage Cask Rig Seismic Struts 1&2 Rig seismic struts 3&4 Unbolt Seismic collar around Transport Cask Lift the Seismic struts Remove pins from support stantions on the pad Move Strut assemblies to storage location	15 10 10 15 15 15 10 30 15 10 5 55 10 10 10 5 75 5 10 10 10 10 10 10 10		1	1 1 1	1		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 3 0 25 7.3 0 0 2.8 7.3 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

	b)	Move forward and grapple Storage Overpack	15	-			0	0	0	0	0	0
	c)	Move Storage Cask lid into position	15	-			0	0	0	0	0	0
	d)	Bolt Lid onto Storage Overpack	15	2A V T	2		10	0	0	0	0	0
	e)	QC Hold Point Inspection	5	-			0	0	0	0	0	0
25)	Pick up	storage overpack and transfer to pad using VCT	110									
	a)	Lift the Storage overpack	10	-			0	0	0	0	0	0
	b)	Drive to storage pad location	60	-			0	0	0	0	0	0
	c)	Position the storage overpack on the Pad	20	-			0	0	0	0	0	0
	d)	Bolt storage overpack to the Pad	20	4 V S	1		37	0	0	0	0	0
		Total Hours of Canister Handling Operations	36.8									
26)	Turnov	ver to Operations	1440									
27)	Return	VCT to siding	120									
28)	Install	transport cask lid	60									
29)	Remov	e seismic/stack-up struts from Transport Cask	60									
30)	Lift Tra	insport Cask and Transfer to Maintenance	60									
30a)	Survey	and wipedown Transport Cask	60									
31)	Lift tra	nsport cask and place on railcar	60									i
32)	Install	impact limiters on transport cask	120									
33)	Release	e railcar for shipment	60									
		Total Hours of Cask Handling Operations	70.8				269	98	75	0	9.9	5.2

lori	zontal D	DSCs - DSCs in Horizontal Storage Modules on pad	Duration		Dura	_							Dose		
			(Min)	Top of DSC	M R	Н	0	S	Q	M	R	Н	0	S	Q
		the Day and Safety Meeting	30												
\dashv		Plan of the Day Meeting Safety Briefing	15 10	-						0	0	0	0	0	0
\dashv	,	Transportation to work site	5							0	0	0	0	0	0
1)		e transport cask on railcar at site	100										Ť	Ŭ	
		Identify Transport Cask to bring in from yard	5	-						0	0	0	0	0	0
		Stage work team to siding	15	-						0	0	0	0	0	0
	c)	Position Transport Cask under the gantry crane	15	-						0	0	0	0	0	0
		Security inspection of the Transport Cask and tug	15	3 V T				0.5		0	0	0	0	5.5	0
		HP Survey of Transport Cask	15	3 V T		0.5				0	0	5.5	0	0	0
	-	Inspection of Tamper proof Seals	10	3 V T				0.1		0	0	0	0	0.7	0
\dashv		Acceptance of Package Paperwork	5	-						0	0	0	0	0	0
\dashv		Decoupling of railcar and removal of the tug from the siding Security team leaves	10 5	-						0	0	0	0	0	0
\dashv		Completes paperwork for step #1	5							0	0	0	0	0	0
2)		e impact limiters and place in temporary storage	195							_			Ü	0	
		Mobilize crew (mechanics, riggers, crane operator, etc.)	5	-						0	0	0	0	0	0
\neg		Select and inspect rigging for impact limiters on the Transport Cask	5							0	0	0	0	0	0
	c)	Rig the lifting devices to the first impact limiter	5	1A V T	2	2				0	2.5	2.5	0	0	0
		Position man lifts and temporary scaffolding near Transport Cask	5	1A V T	2					0	2.5	0	0	0	0
		Remove and store bolts holding on the first Impact Limiter	30	1A V T	2					15	0	0	0	0	0
		Remove first Impact limiter and place on storage stand	10	1A V T	1					0	2.5	0	0	0	0
		Remove rigging and reposition on Impact Limiter #2	5 5	1A V T	1					0	1.3	0	0	0	0
	•	Reposition Manlift and Scaffolding Remove and store bolts holding on the Second Impact Limiter	30	1A V T	2					0 15	0	0	0	0	0
\dashv		Remove second Impact Limiter and place on storage stand	10	1A V T	1					0	2.5	0	0	0	0
\dashv		Remove and store bolts for package cover	30	3 V T	0.2					4.4	0	0	0	0	0
\dashv		Rig the package cover	15	3 V T	1	1				0	11	11	0	0	0
\neg		Lift package cover and move to storage location	10	3 V T						0	0	0	0	0	0
	n)	Remove Tie-Down Straps from Transport Cask	10	3A V T	0.4					2.3	0	0	0	0	0
		Rig Tie-Down straps and move to storage location	5	3A V T	1					0	2.8	0	0	0	0
		Inspect Transport Cask for damage and conduct HP Survey	15	3 V T		2				0	0	22	0	0	0
3)		and lift transport cask off of railcar and downend on HCT	75												
		Select the appropriate lifting block for the Transport Cask	5							0	0	0	0	0	0
\dashv	•	Secure lifting block to Transport Cask Trunnions	5	2A V T	2					0	3.3	0	0	0	0
\dashv		Upend Transport Cask Lift Transport Cask off railcar	30 15	-						0	0	0	0	0	0
\dashv		Reposition Transport Cask	10	_						0	0	0	0	0	0
\neg		Place Transport Cask on HCT	10	-						0	0	0	0	0	0
4)	Plan of	the Day and Safety Meeting	30												
	a)	Plan of the Day Meeting	15	-						0	0	0	0	0	0
		Safety Briefing	10	-						0	0	0	0	0	0
	•	Transportation to work site	5	-						0	0	0	0	0	0
5)		r transport cask to Horizontal Storage Module on pad via HCT	105								•	_			
\dashv		QC Hold Point Inspection	15	-						0	0	0	0	0	0
Ea)		Transfer the transport cask to Horizontal Storage Module on the pad via HCT	90 120	-						0	0	0	0	0	0
Jaj		Stage equipment near Horizontal Storage Module	15	-						0	0	0	0	0	0
\dashv		Place and align Theodolite heads	30	_						0	0	0	0	0	0
\dashv		Rig crane to Horizontal Storage Module (HSM) port cover	15	2C H T L	2					0	0.8	0	0	0	0
		Use man lift to remove nuts on mounting studs	15	1A H T L	2					9.2	0	0	0	0	0
		Post Radiation Zone signs and barriers	10	-						0	0	0	0	0	0
\Box		Remove HSM Port cover and place in storage location	20	1A H T L	1					0	6.1	0	0	0	0
		HP Survey to verify Dose Rates	15	1AHTL		1.5				0	0	6.9	0	0	0
6)		e transport cask lid	90							_	_	_	_		
_		Move tools to work platform	15	- 441171		2				0	0	0	0	0	0
		HP Survey of lid	10	1AHTL		2				0	0	6.1	0	0	0
		Position Stick Crane Rig the Lid for lifting using the local stick crane	15 15	1A H T L	2					0	9.2	0	0	0	0
ì	u,	Remove and store Nuts	20	1AHTL	2					12	0	0	0	0	0
			10		_					0	0	0	0	0	0
	e)		10	+				0.5		0			-	6.8	0
	e) f)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask	5	1A H T NL				0.5		U	0	0	0		
7)	e) f) g)	Lift the Transport Cask Lid and move it to the storage stand		1A H T NL				0.5			0	0	0		
7)	e) f) g) Dock Ho a)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask CT with HSM and push DSC into module Position spotters	5	1A H T NL -				0.3		0	0	0	0	0	0
7)	e) f) g) Dock Ho a) b)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask CT with HSM and push DSC into module Position spotters Move HCT into position	5 145					0.5							
7)	e) f) g) Dock Ho a) b) c)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask CT with HSM and push DSC into module Position spotters Move HCT into position Check alignment	5 145 10 15 20	-				0.5		0	0	0	0	0	0
7)	e) f) g) Dock Ho a) b) c) d)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask CT with HSM and push DSC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM	5 145 10 15 20 30					0.3		0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
7)	e) f) g) Dock H(a) b) c) d) e)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask CT with HSM and push DSC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM Remove pushing port in base of transport cask	5 145 10 15 20 30 15		2			0.3		0 0 0 0 0 4.3	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 0 0
7)	e) f) g) Dock He a) b) c) d) e)	Lift the Transport Cask Lid and move it to the storage stand Security inspection of the interior of the Transport Cask CT with HSM and push DSC into module Position spotters Move HCT into position Check alignment Dock HCT to HSM	5 145 10 15 20 30		2			0.3		0 0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0

	i)	QC Hold Point Inspection	10	1A H T NL			0.2	0	0	0	0	0	5.4
8)	Install	seismic restraints and HSM port cover	90										1
	a)	Retrieve the seismic restraints from HCT	10	-				0	0	0	0	0	0
	b)	Reach into module and install the seismic restraints	5	1A H T NL	1			14	0	0	0	0	0
	c)	QC Hold Point Inspection	5	1A H T NL			0.2	0	0	0	0	0	2.7
	d)	Pick the HSM port cover still attached to the lifting rig	15	-				0	0	0	0	0	0
	e)	Position the HSM port cover over the port in the module	15	5 H H	1			0	2.1	0	0	0	0
	f)	Install the nuts on the studs and torque to spec	15	5 H H	2			4.3	0	0	0	0	0
	g)	HP survey of area	15	5 H H		0.5		0	0	1.1	0	0	0
	h)			-				0	0	0	0	0	0
9)	Install t	transport cask lid	60										i
	a)	Pick the Transport Cask Cover from the still attached to the Lifting Rig	15	-				0	0	0	0	0	0
	b)	Position the Transport Cask Cover on the Transport Cask	15	-				0	0	0	0	0	0
	c)	Install the nuts on the studs and torque to spec	20	-				0	0	0	0	0	0
	d)	QC Hold Point Inspection	10	-				0	0	0	0	0	0
		Total Hours of Canister Handling Operations	17.3										
9a)	Turnov	er to Operations	1440										
10)	Return	transport cask to rail siding	120										
10a)	Plan of	the Day and Safety Meeting	30										
11)	Lift trai	nsport cask and transfer to maintenance	60										
11a)	Survey	and wipedown Transport Cask	60										
11b)	Reposit	tion empty railcar	60										
12)	Lift trai	nsport cask and place on railcar	60										
13)	Install i	impact limiters on transport cask	120										
14)	Release	e railcar for shipment	60										
		Total Hours of Cask Handling Operations	50.8					80	47	55	0	13	8.2

Container Doses



-					
1 V C	1	V	С	512	transport cask lid removed
1AHTL	1A	Н	Т	18.4	transport cask lid installed
1A H T NL	1A	Н	Т	163.2	transport cask lid removed
1A V C	1A	V	С	254	no transfer cask lid
1A V T	1A	V	Т	15	impact limiters installed
1B V C	1B	V	С	134	no transfer cask lid
1C V C	1C	V	С	117	no transfer cask lid
1D V C	1D	V	С	62	no transfer cask lid
2 V T	2	V	T	150	transport cask lid removed
2A H T	2A	Н	Т	31.8	transport cask lid installed
2AVT	2A	V	T	20	transport cask lid installed
2B V X	2B	V	Χ	125	
2CHTL	2C	Н	T	1.5	transport cask lid installed
2C H T NL	2C	Н	T	7.1	transport cask lid removed
3 V T	3	V	Т	44	
3A V T	3A	V	T	34	
3B V C	3B	V	С	146	
4 H T	4	Н	Т	31.8	
4 V S	4	V	S	111	
4 V X	4	V	Χ	177	
4A H H	4A	Н	Н	2.5	port cover installed
5 H H	5	Н	Н	8.5	port cover installed
5A H H	5A	Н	Н	3.2	port cover installed

TO16 Appendix D4 - Study 2 - Rad.xlsx

			Total I	Dose to	Worke	r by Ca	tegory*	k	An	nual Do	se to U	nit Wo	rker by	Catego	ry**		Num	ber of \	Worker	s by Ca	tegory	
Storage Alternative	Worker Category: # of Workers:	v Mechanics	5 Riggers	v Health Physics	1 Operators	1 Security	т Quality	Total	1 Mechanics	T Riggers	ь Health Physics	ר Operators	1 Security	т Quality	Total	1 Mechanics	1 Riggers	ь Health Physics	ר Operators	1 Security	1 Quality	Total
App B1 - C-OPS	Vertical	241	87	53	0	6	3	391	30.2	10.9	6.7	0.0	1.6	0.6	49.9	61	22	14	0	4	2	103
	Horizontal	80	47	55	0	13	8	203	10.0	5.8	6.9	0.0	3.3	2.0	28.0	21	12	14	0	7	5	59
App B2 - A-OPS	Vertical	126	60	51	0	11	3	251	15.8	7.5	6.4	0.0	2.8	0.7	33.2	32	16	13	0	6	2	69
	Horizontal	80	47	51	0	11	8	198	10.0	5.8	6.4	0.0	2.8	2.0	27.1	21	12	13	0	6	5	57
App B3 - R-OPS	Vertical	126	60	48	0	11	3	248	15.8	7.5	6.0	0.0	2.8	0.7	32.8	32	16	12	0	6	2	68
	Horizontal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
App B4 - S-OPS	Vertical	269	98	75	0	10	5	458	33.6	12.3	9.4	0.0	2.5	1.3	59.1	68	25	19	0	5	3	120
	Horizontal	80	47	55	0	13	8	203	10.0	5.8	6.9	0.0	3.3	2.0	28.0	21	12	14	0	7	5	59

DPC/Year

* Dose/DPC = (time in rad zone) * (# workers in rad zone) * (dose in rad zone)

Vertical: 250 Horizontal: 250 ** Annual Dose = (Total dose to worker by category) * (# DPC's per year) / (# workers in rad zone)