

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES 1 OF 23
2. AMENDMENT/MODIFICATION NO. 451	3. EFFECTIVE DATE (M/D/Y) See Block 16C	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY U.S. Department of Energy Office of River Protection P. O. Box 450, MS H6-60 Richland, WA 99352	CODE	7. ADMINISTERED BY (If other than Item 6)	CODE
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP code) Bechtel National, Inc. 2435 Stevens Center Place Richland, WA 99354		9A. AMENDMENT OF SOLICITATION NO.	<input type="checkbox"/>
		9B. DATED (SEE ITEM 11)	
		10A. MODIFICATION OF CONTRACT/ ORDER NO. DE-AC27-01RV14136	<input checked="" type="checkbox"/>
		10B. DATED (SEE ITEM 13) December 11, 2000	
CODE 396A5	FACILITY CODE 153392068		

11. THIS ITEM APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE DATE AND HOUR SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and amendment and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

See Schedule Net Increase

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS SET FORTH IN ITEM 14.

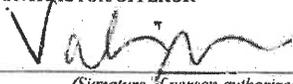
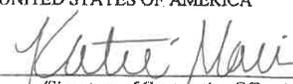
CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/>	
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO THE AUTHORITY OF:
<input checked="" type="checkbox"/>	D. OTHER (Specify type of modification and authority) FAR 43.103 Types of Contract Modifications (a) Bilateral - Mutual Agreement of the Parties

E. IMPORTANT: Contractor is not, is required to sign this document and return **1** copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

See Continuation Page(s)
Period of Performance: 12/11/2000 to 12/31/2022

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) Valerie McCain Project Director		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Robert Burrier. Katie Mair Contracting Officer	
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	15C. DATE SIGNED 10 Apr 19	16B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16C. DATE SIGNED 4/11/19

Purpose of Modification:

The purpose of this modification is to make the following changes at no cost or schedule impacts:

1. Revise Contract Section C, *Statement of Work*, to add the U.S. Department of Energy (DOE) as a voting member on the Commissioning Joint Test Group (JTG) as follows:
 - a) Revise Table C.5-1.1 Deliverables
 - b) Revise C.6 Standards, Standard 5 Commissioning

Description of Modification:

1. Revise Contract Section C, *Statement of Work*, as follows:
 - a) Revise Table C.5-1.1 Deliverables as follows:

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
C5.1	Select a Commissioning Contractor	Section C.5 (a)(4)	A	D	COR(131)	4/15/2001
1.1	Plan for Transition	Section C.5 (a)(1)	A	D	COR(131)	2/15/2001
1.2	Project Execution Plan	Standard 1 (b)(2)	A	D	COR(131)	12/15/2006 with updates as required
1.3	Earned Value Management System Description	Standard 1 (a) & (b)(3)	A	D	COR(131)	4/15/2001 with updates as required
1.4	Interface Management Plan	Standard 1 (b)(1) and C.9(b)	A	D	COR(131)	6/29/2001 with updates as required
1.5	WTP Project Baseline	Standard 1 (d)(3)	A	D	COR(131)	4/15/2001 with updates as required
1.6	Baseline Risk Plan	Standard 1 (c)(1)	A	D	COR(131)	7/1/2001 with annual updates as required
1.7	Monthly Status Report	Standard 1 (c)(4), (a)(2)(i)(d) & (d)(1), Standard 3 (g)(3), and Standard 4 (f)(2)]	I	D	COR(131)	First Wednesday of the second month

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
1.8	Occurrence Reporting	Standard 1 (d)(5) (147)	A	D	COR(131)	as required
1.9	ES&H Reporting	Standard 1 (d)(6)(147)	A	D	COR(131)	as required
1.10	Contract Performance Report	Standard 1 (d)(2)	I	D	COR(131)	Last Wednesday of each month(147)
1.11	Change Control Program Procedure	Standard 1 (a) & (a)(4)	A	D	COR(131)	05/15/03 with updates as required Delivery 30 days after contract modification – implementation 60 days after Approval
1.12	Electronic Data	Standard 1 (d)(3) & (4)	I	D	COR(131)	Last Wednesday of each month(147)
1.13	LAW Physical Plant Complete Inclusion/Exclusion List of Activities for Determination of Milestone	Standard 1(a)(2) (iii)	A	D, E	CO, COR(384)	Submit quarterly and final list 90 days prior to completion date of milestone LAW Physical Plant Complete in Section J of contract
2.1	Updated Research and Technology Program Plan	Standard 2 (a)(1)(ii) & C.7 Table C.7-1.1 Note 1	A	D	COR(131)	4/15/2001 with annual updates through 2004 and with updates as needed from 6/30/2008 through the initiation of cold commissioning
2.2	R&T Test Plans	Standard 2 (a)(2)(i) & (a)(3)(ix)	I	D	COR(131)	as required
2.3	R&T Test Reports	Standard 2 (a)(2)(ii) & (a)(3)(ix)	C	D	COR(131)	as required
2.4	Regulatory Data Quality Objective	Standard 2 (a)(3)(i)(D)	A	D	COR(131)	as negotiated (384)
2.5	Operations Research Assessment	Standard 2 (b)(1) & Standard 3 (c)(6)(ii)(A) (c.7(b))	C	D	COR(131)	12/19/2008, 6/19/2010, FEBRUARY 2012 and MAY of (310) 2014

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
2.6	WTP Tank Utilization Assessment	Standard 2 (b)(2) [C.7(b)]	C	D	COR(131)	12/19/2008, 6/19/2010, FEBRUARY 2012 and AUGUST 2014 (310)
2.7	DELETED					
2.8	Technical Report on Oxidative Leaching	Standard 2 (a)(3)(ix)	C	D	COR(131)	(384)
2.9	Test Report on Oxidative Leaching	Standard 2 (a)(3)(ix); Standard 5 (e)(3)(ii)	C	D	COR(131)	(384)
2.10	Proposed Process Steps for Sludge Treatment	Standard 2 (a)(3)(iii) & C.7(d)(1)(vii)	A	D	COR(131)	one year before the start of cold commissioning for the PT Facility(255)
2.11	Proposed Deminimus Organic Concentration in Received Tank Waste	Standard 2 (a)(3)(viii)	A	D	COR(131)	12/31/2012(255)
3.1	Design Process	Standard 3 (a)(2)	I	D	COR(131)	2/15/2001 1/15/2004
3.2	Functional Specification	Standard 3 (b)(1)	I	D	COR(131)	8/20/2001 with updates as required
3.3 (a)	Basis of Design	Standard 3 (b)(2) & C.7(b)(1)	C(171)	D	COR(131)	8/20/2001 with updates as required
3.3 (b)	Design Criteria Database	Standard 3 (b)(3)	M	D	COR(131)	30 days after issue of Basis of Design, with updates as required
3.3 (c)	Engineering, Procurement, and Construction Code of Record	Standard 3 (b)(6)	A for initial Deliverable, Revisions, Change Notices. C for Case-by-Case Exceptions	D	COR(363)	9/18/2015 with updates as required
3.4	Operations Requirements Document	Standard 3 (b)(4)	A for bolded document text and M for non-bolded document text	D	COR(131)	8/20/2001
3.5	Master Equipment List	Standard 3 (c)(6)(i)	C	D	COR(131)	Prior to ORR completion

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
3.6	Analytical Laboratory Design Requirements	Standard 3 (c)(18) & C.7(a)(9)(350)	A	D	COR(131)	10/1/2001 and as required thereafter
3.7	Site Layout Drawings	Standard 3 (c)(19)	A	D	COR(131)	4/15/2001 and as required thereafter
3.8	Optimization Studies	Standard 3 (d)	A	D	COR(131)	3/15/2001
3.9	Spare Parts List	Standard 3 (c)(6)(ii, iii, & iv)	C	D	COR(131)	12 months prior to the start of cold commissioning
3.10	Deleted					
3.11	Code of Record Case by Case Exception Report	Standard 3 (b)(6)	C	D	COR	As needed
4.1	Construction, Procurement, and Acceptance Testing Plan	Standard 4 (a), (f)(3) & (i)	A on initial Deliverable and I for any subsequent updates	D	COR(131)	As required
4.2	Purchasing System	Standard 4 (b)(2)	A	D	COR(131)	As required
4.3	Construction Bid and Work Packages	Standard 4 (c)	I	D	COR(131)	As required
4.4	Construction and Acceptance Testing Program	Standard 4 (f)(1)	A	D	COR(131)	Prior to start of construction
4.5	Construction Overview Meetings	Standard 4 (h)	M	D	COR(131)	Ongoing
4.6	Construction Emergency Response Plan	Standard 4 (j)	I	D	COR(131)	Prior to Start of Limited Construction
4.7	As-built Program Description	Standard 4 (f)(5)	C	D	COR(131)	June 2009 with updates as required (369)
5.1	Commissioning Plan	Standard 5 (c)	A	D	COR(131)	36 months prior to start of cold commissioning and as required thereafter. A preliminary version delivered to DOE for comment in calendar year 2016.
5.2	DELETED					
5.3	Waste Form Qualification Tests	Standard 5 (e)(3)(i)	P	D	COR(131)	during cold commissioning
5.4	Cold Commissioning Capacity Tests	Standard 5 (e)(3)(ii)	A I (451)	D	COR(131)	during cold commissioning

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
5.5	DELETED (029)					
5.6	Resultant Products from Cold Commissioning	Standard 5 (e)(1)	P	D	COR(131)	during cold commissioning
5.7	Environmental Performance Test	Standard 5 (e)(3)(v)	A	D	COR(131)	during cold commissioning
5.8	Cold Commissioning Results	Standard 5 (e)(5)	A I (451)	D	COR(131)	prior to hot commissioning
5.9	Certification of Completion of Cold Commissioning	Standard 5 (e)(6)	A I (451)	D	COR(131)	when complete
5.10	Certification of Readiness for Hot Commissioning Start	Standard 5 (g)(1)	A	D	COR (131)	prior to hot commissioning
5.11	Certification Notification of Hot Commissioning Start (451)	Standard 5 (g)(3)	A I (451)	D	COR (131)	Upon receipt of Tank Farm waste feed
5.12	Hot Commissioning Capacity Tests	Standard 5 (g)(5)	A	D	COR (131)	during hot commissioning
5.13	Resultant Products from Hot Commissioning	Standard 5 (g)(iii & iv)	P	D	COR (131)	during hot commissioning
5.14	Hot Commissioning Results and Documentation	Standard 5 (g)(6)	A I (451)	D	COR (131)	upon completion of hot commissioning
5.15	Certification of Completion of Hot Commissioning	Standard 5 (g)(7) & 5(m)(1, 3 & 4)(350)	A	D	COR (131)	when complete
5.16	Facility Turnover	Standard 5 (m)(7)	A	D	COR (131)	after successful commissioning
5.17	DELETED					
5.18	Cold Commissioning Simulant Definition	Standard 5 (b) & Table C.6-5.1 Note 1	A	D	COR(131)	24 months prior to the initiation of cold commissioning
5.19	WTP Facility Transition Plan	Standard 5 (i); (j); & (m)(7)	A	D	COR (131)	12 months prior to the initiation of hot commissioning
5.20	Cold Commissioning Capacity Test Criteria	Standard 5 (e)(3)(ii) & Table C.6-5.1 Note 2	A	D	COR(131)	Prior to completion of Deliverable 5.8
5.21	Hot Commissioning Capacity Test Criteria	Standard 5 (g)(4) & Table C.6-5.2 Note 1	A	D	COR (131)	Prior to completion of Deliverable 5.14

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
5.22	WTP Operational Readiness Support Plan (Jointly submitted with Tank Farms Operating Contractor (TOC) as TOC deliverable C.2.3.2-1)	Standard 5 (f) (i)	A	D	COR	9/30/2013 with annual updates as needed thereafter (285) (451)
5.23	Commissioning Joint Test Group Charter (451)	Standard 5 (d)	A	D	COR	Prior to the next Commissioning JTG decisions
6.1	Secondary Wastes Compliance Plan	Standard 6 [Std. 5 (e)(1)(i) & (e)(3)(i & ii), Std. 6(b), (c)(3 & 4), C.8 Spec. 9.2.2.5]	A	D	COR(131)	2004, 2006, 2008, and as required thereafter
6.2	IHLW Waste Form Compliance Plan	Standard 6 [Standard 2 (a) (3)(vii)(B); Standard 5 (e)(1)(i) & (e)(3)(i & ii); Standard 6 (b), (c)(2 & 4), C.7(d)(2)(i), C.8 (Spec. 1 (1.4) & Spec. 13 (13.3.2))]	A	D	COR (131)	2004, 2005, 2007, 2009, and as required thereafter
6.3	ILAW Product Compliance Plan	Standard 6 [Std. 2 (a)(3)(v)(B), Std. 5 (e)(1)(i) & (e)(3)(i & ii); Std. 6(b) & (c)(1 & 4), C.7(d)(3)(i); C.8 Spec. 2, 2.2.2.11, & 2.4]	A	D	COR(131)	2004, 2006, 2008, and as required thereafter
6.4	IHLW Product Qualification Report	Standard 6 (c) (5) & (6)	C/A	D	COR(131)	Plan in 2004, report in 2008 and as required thereafter
6.5	Production Documentation for IHLW Product	Standard 6 (c)(9)	A	D	COR(131)	at time of production
6.6	ILAW Product Qualification Report	Standard 6 (c)(5) Spec. 2 (2.2.7.1)	C/A	D	COR(131)	Plan in 2004, report in 2007 and as required thereafter
6.7	Production Documentation for ILAW Product	Standard 6 (c)(9); C.8 Spec. 2, 2.2.2.6.2 & 2.2.2.7.2	C/A	D	COR (131)	at time of production
6.8	DELETED					

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
6.9	RESERVED					
6.10	Secondary Wastes Production Documentation	Standard 6 (c)(9)	C/A	D	COR(131)	at time of production
6.11	Deleted					
7.0	Non-radiological Worker Safety and Health	Standard 7 (e)(1)	R	D	COR (131)	per Standard 7.a(1)
7.1	DELETED (166)					
7.2	Quality Assurance	Standard 7 (e)(3); C.8 Spec 2, 2.3 and Spec 12, 12.3	A/R	D	COR(131)	4/15/2001
7.3	Environmental Plan	Standard 7 (e)(4) & (e)(4)(vi)(A)	A	D	COR(131)	3/15/2001 and as required thereafter
7.4	DELETED					
7.5	Dangerous Waste Permit Application	Standard 7 (e)(4)(vi)(B)	A	D	COR(131)	as required
7.6	Risk Assessment Work Plan	Standard 7 (e)(4)(vi)(C) & Std 5 (e)(3)(v)	A	D	COR(131)	as required
7.7	Notice(s) of Construction	Standard 7 (e)(4)(vi)(D)	A	D	COR(131)	150 days prior to submission to the regulators
7.8	Prevention of Significant Deterioration Permit Application	Standard 7 (e)(4)(vi)(E)	A	D	COR(131)	150 days prior to submission to the regulators
7.9	Petition for Exemption or Exclusion for IHLW	Standard 7 [Std 6(c)(7), Standard 7 (e)(4)(vi)(F)]	A	D	COR (131)	06/2005
7.10	Petition for a New Treatment Standard	Standard 6 (c)(8), Standard 7 (e)(4)(vi)(G)	A	D	COR(131)	08/2003
7.11 (397)	Extent of Condition review of LBL & DFLAW Per 24590-WTP-PL-ENG-16-0003, Rev 0, "Extent of Condition Plan for Review of CGD Documentation for RCA-MGT-00338 CA, Section 7"	Standard 7(e) (3)(v)	C for interim/ A for final	D/E	COR/CO	Annually starting 12/31/2017 and ending 12/31/2021, as required
8.0	Safeguards and Security	Standard 8 [Table S8-1]	A	D	COR(131)	see Table S8-1
9.1	Radiological, Nuclear and Process Safety(M166)	Standard 9	R	D	COR (131)	Various (303)

Table C.5-1.1. Deliverables.

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
C.7-1	Procedure to Determine the Waste Feed Treatment Approach	C.7(d) (1)(vii) Spec. 12	A	D	COR(131)	one year before the start of cold commissioning for the Pretreatment Facility (255)
C.8-1	Deleted (384)					
C.8-2 (384)	DFLAW Commissioning Waste Loading	C.8 Spec 2 (2.2.2.2)	A	D	COR	Two years before the start of hot commissioning
C.9.1	Interface Control Documents	Section C.9	A/J	D	COR(131)	7/15/2001, 3/15/2002, and as required
H.1	Environmental Permits	Clause H.26 (d) (152)	A	D	COR(131)	ongoing
H.2	Litigation Management Plan	Clause H.33	A	D	COR(131)	4/15/2001
H.3	Deleted					
H.4	Property Management System (120)	Clause H.51	A	D	COR(131)	10/1/2008, with annual updates thereafter

Legend Definitions:

- A Approval — The deliverable shall be provided to DOE for review and approval. DOE will review the deliverable and provide comments in writing. Comments will be discussed through the partnering process and the Contractor is required to provide written responses using Review Comment Records. Documents shall be re-written to incorporate all DOE mandatory comments. Once a deliverable or document has been approved by DOE, it shall be placed under change control and no changes to that document shall be made without DOE approval. All documents and deliverables that previously had a “K” designation and that were concurred upon by DOE shall be deemed “approved” by DOE.
- C Review and Comment — The deliverable shall be provided to DOE for review and comment. DOE will have the option for reviewing the information and providing comment. The Contractor shall respond to all written comments in Review Comment Record forms. DOE comments that cannot be resolved in the appropriate partnering team shall be elevated to the Project Management Team for resolution.
- D DOE Office of River Protection, Contracting Officer’s Representative (COR).
- E DOE Office of River Protection, Contracting Officer (CO).
- I Information — The deliverable shall be provided for information purposes only. DOE will have the option of reviewing the information and providing comments through the partnering process. Such comments do not require resolution under the Contract.
- J Jointly Developed, Review and Comment — The ICDs shall be jointly developed with DOE, the Tank Farm Contractor, and Hanford Site contractors. The deliverable shall be provided to DOE for review and comment. DOE will have the option for reviewing the information and providing comment. The Contractor shall respond to all written comments. DOE comments that cannot be resolved in the appropriate partnering team shall be elevated to the senior management for resolution.
- M Monitor — The deliverable shall be developed with input from DOE. DOE will be highly involved as the deliverable is developed, and will monitor the progress of the deliverable. DOE comments shall be discussed in the partnering teams as the deliverable develops. If DOE direction is determined to be appropriate, DOE shall provide such direction in writing.
- P Product Acceptance — As defined in Specification 13, “Waste Product Inspection and Acceptance.”
- R Regulatory Deliverable Approval — Will be performed in accordance with Standard 7, “Environment, Safety, Quality, and Health” or Standard 9, “Nuclear Safety” as appropriate.

b) Revise C.6 Standards, Standard 5 Commissioning as follows:

Standard 5: Commissioning

The purpose of this standard is to describe the requirements and deliverables for the startup testing and commissioning of the WTP.

Startup testing begins following turnover of systems from construction, including component and system level tests that will be performed in a planned sequence at each facility, and precedes cold commissioning of the facility.

The Startup and Commissioning process begins with Startup testing followed by Commissioning testing, which includes testing during Cold Commissioning making production runs using agreed upon simulant waste, then Hot Commissioning using actual tank waste, and continues through to turnover to the future Operations Contractor. Commissioning is supported by testing, operations, maintenance, procedure development, and training required to support the scope contained in this standard. The Contractor may choose to commission the facilities in a sequential order or a parallel order.

Many of the Contract deliverables in this standard require information from commissioning activities in multiple facilities. Consistent with the Consent Decree, commissioning of the LBL facilities will be completed ahead of the PT and HLW facilities. Contract deliverables specified in this standard shall be completed in parts consistent with the facility commissioning sequence in the approved commissioning plan.

- (a) Objectives: The Contractor shall:
- (1) Demonstrate that the waste treatment capacity performance of the WTP facilities meets the facility minimum capacity criteria as specified in Tables C.6-5.1 and C.6-5.2;
 - (2) Provide a Commissioning Plan that documents how objectives of Commissioning will be met;
 - (3) Demonstrate that the waste form products and secondary wastes produced in commissioning testing comply with DOE-approved compliance plans;
 - (4) Demonstrate facility remotability in areas designed for remote maintenance;
 - (5) Ensure WTP facilities, programs, and personnel are prepared for, and successfully complete an ORR (**196**) in accordance with DOE O 425.1D, CRD, *Verification of Readiness to Start Up or Restart Nuclear Facilities (190)*, prior to start of Hot Commissioning; for facilities that will be commissioned as Hazard Category 3 or higher as defined in DOE-STD-1027, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*;
 - (6) Complete CD-4 in accordance with DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, CRD. Prerequisites for CD-4 will be completed prior to Hot Commissioning. Post CD-4 activities shall be completed prior to completion of Project Closeout (**271**); and
 - (7) Transition WTP facilities, programs, and operations personnel to the Operations Contractor.

- (b) Simulant Testing: Simulant shall be used to demonstrate the normal flow of WTP feed material, individual facility production capability, and the ability to predict product quality, and produce acceptable ILAW and IHLW products.

Simulant(s) shall be defined to support cold commissioning performance testing. The waste feed simulant(s) shall be mutually agreed to by both DOE and the Contractor to represent typical feeds to the WTP. For PT, this **(350)** simulant may be comprised of a baseline composition that, with spiking, will demonstrate water washing, caustic, and oxidative leaching to solubilize aluminum (Al) and Cr. For DFLAW, the simulant should represent, to the extent practical, the average of the 10-year feed vector as defined in RPP-40149, *Integrated Waste Feed Delivery Plan*, Volume 2, Revision 3. The simulant compositions will be specified in a Cold Commissioning Simulant Definition deliverable (Table C.5-1.1, Deliverable 5.18) due to DOE, 24 months prior to the start of Cold Commissioning.

The PT Facility simulant properties for demonstrating capacity shall:

- (1) Support caustic and oxidative leaching;
- (2) Be based on the average chemical composition, solids loading, operating conditions, and leaching performance based on the design basis G2 Model Run (24590-WTP- MRR-PET-08-002, *WTP Contract Run – (G2) Dynamic Model Run Results Report*, Revision 2, August 25, 2008);
- (3) Have average physical properties including particle size, particle density, and rheological properties;
- (4) Contain the major chemical constituents required to cost effectively demonstrate treatment; and
- (5) Support LAW and HLW vitrification facility melter operations.

- (c) Commissioning Plan: The Contractor shall prepare a Commissioning Plan for DOE review and approval (Table C.5-1.1, Deliverable 5.1), a minimum of twelve (12) months prior to the start of Cold Commissioning. For DFLAW a preliminary version of the Commissioning Plan will be delivered to DOE for comment in calendar year 2016. For DFLAW, the Table C.5-1.1, Deliverable 5.1 shall be submitted to DOE for approval a minimum of 36 months before the start of Cold Commissioning. Updates shall be completed on a periodic basis providing increasing detail with full content required a minimum of 12 months before the start of LAW Cold Commissioning. Table C.5-1.1, Deliverable 5.1 shall:

- (1) Meet the Commissioning objectives stated in this standard (a);
- (2) Define the sequence for commissioning of the WTP facilities;
- (3) Describe the process for ensuring readiness to start cold commissioning;
- (4) Define the WTP test control programs;
- (5) Define the Startup, Cold Commissioning, and Hot Commissioning phase organizations; and
- (6) Identify planned actions to ensure readiness, prior to Hot Commissioning of the associated facility, for ORRs **(196)** per DOE O 425.1D, CRD, *Verification of Readiness to Start Up or Restart Nuclear Facilities (190)* (e.g., facility testing, programmatic controls, qualification of personnel, and regulatory permits).

Planning should be based on multiple ORRs for the WTP Project, with a single ORR for each applicable facility (LAW, PT, and HLW). For DFLAW, the LAB will complete "Start Up" as a less than Hazard Category 3 facility. **(196) (257)**

- (7) The Commissioning Plan shall be updated as required and provided to DOE for approval.
- (d) Joint Test Groups (JTG): The ~~Contractor's~~ JTGs will be responsible for **(451)**:
- (1) Verifying the correct functioning of applicable systems to engineering approved test acceptance criteria;
 - (2) Testing process and facility systems to test and evaluate the design basis operating envelope;
 - (3) Demonstrating emergency procedures for recovery from simulated off-normal events using drills, tabletop exercises, or the simulator;
 - (4) Validating operating procedures and instructions during the commissioning test program;
 - (5) Completing corrective actions derived from the commissioning test programs; and
 - (6) Confirming successful conduct and performance of Technical Safety Requirements (TSR) surveillance.

~~The DOE will participate in the Commissioning JTG as a voting member. DOE participation in all Commissioning JTG decisions is required unless DOE chooses to not participate in specific decisions. Protocols shall be defined in the Commissioning JTG Charter. The Commissioning JTG Charter shall be delivered to DOE for approval (Table C.5-1.1, Deliverable 5.23) (451).~~

~~The DOE, DOE's Owner's Agent, and Operations Contractor will participate in the JTG as observers (451).~~

The JTG will approve the test procedures and results for Safety Class (SC), SS, environmental performance, and QARD (DOE/RW-0333P) system acceptance testing during Commissioning, as well as Contract technical performance test results as defined in this standard, (e) for "Cold Commissioning" and (g) for "Hot Commissioning."

- (e) Cold Commissioning: The Contractor will initiate non-radioactive "cold" commissioning using nonhazardous simulants to begin testing individual facility functionality. Cold Commissioning described below follows this initial period and requires DOE approval prior to introduction of simulants that introduce significant hazards including nitrogen oxide (NO_x) and ammonia.

During the Cold Commissioning test period, the Contractor shall conduct testing operations to verify that the WTP will perform in accordance with design specifications using DOE-approved nonradioactive simulated waste feeds that demonstrate the ability of the facility to treat tank waste. Prior to Cold Commissioning, the Contractor shall have in-place required permits, licenses, necessary safety programs (including initial authorization basis), and interfaces per Section C.9, "Interface Control Documents," to support Cold Commissioning.

- (1) The Contractor shall carry out the Cold Commissioning performance tests of the PT, LAW, and HLW facilities to:

- (i) Verify through the Waste Form Qualification Tests (e)(3)(i) that the WTP can produce qualified waste products (Specification 1, “Immobilized High-Level Waste Product” and Specification 2, “Immobilized Low-Activity Waste Product”) and secondary wastes based upon DOE-approved waste compliance plans (Table C.5-1.1, Deliverable 6.1, 6.2, and 6.3).
- (ii) Demonstrate through the Cold Commissioning capacity tests (e)(3)(ii) the WTP capacity for process systems as defined in Table C.6-5.1.
- (iii) Demonstrate through the remotability test (e)(3)(iv) the remotability of components installed in areas designed for remote maintenance.
- (iv) Demonstrate through the Environmental Performance test (e)(3)(v) that the WTP is operating in accordance with applicable permit requirements.

The testing, combined with other operational readiness activities, shall be planned and conceived to provide the basis necessary to support the Certification for Readiness for Hot Commissioning Start (Table C.5-1.1, Deliverable 5.10).

The Contractor shall provide a strategy to achieve the Cold Commissioning performance test objectives specified in the WTP Commissioning Plan. Representative temporary analytical facilities may be used to perform elements of these demonstrations. Resultant products from Cold Commissioning (Table C.5-1.1, Deliverable 5.6) shall be transferred to DOE in accordance with the ICDs. During the tests, the Contractor shall provide documentation of the waste form products for DOE acceptance in accordance with Specification 13, “Waste Product Inspection and Acceptance.”

- (2) Request for Approval to Initiate Cold Commissioning: Cold Commissioning begins with introduction of simulants that introduce significant hazards including NO_x and ammonia into the process facilities. The Contractor shall request approval from DOE to initiate Cold Commissioning following:

- The Contractor’s completion of a management assessment to evaluate the readiness of facilities and personnel to initiate cold commissioning based upon the Minimum Core Requirements identified in DOE O 425.1D, CRD, *Verification of Readiness to Start Up or Restart Nuclear Facilities (190)*. The results of the management assessment shall be provided to DOE.
- Identification of the status of the authorization basis implementation, permits and safety program implementation, and any remaining construction scope that requires completion before simulant introduction.

The Contractor shall not proceed with introduction of simulants that introduce significant hazards including NO_x and ammonia without DOE approval. The Contractor shall notify DOE that Cold Commissioning has commenced.

- (3) Testing:

- (i) Waste Form Qualification Tests (Table C.5-1.1; Deliverable 5.3): The Contractor shall complete WTP waste form qualification testing during cold commissioning to demonstrate the production of acceptable nonradioactive products (ILAW and IHLW) and secondary wastes in accordance with the Secondary Wastes Compliance Plan (Table C.5-1.1,

Deliverable 6.1), ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3), and IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2). Applicable process unit operations, sampling and analysis, process control systems, and operating procedures shall be utilized in these qualification tests in a manner that represents planned operations with actual wastes. Test results will be evaluated and documented as part of the waste form qualification reports identified in Standard 6, "Product Qualification, Characterization, and Certification."

- (ii) Cold Commissioning Capacity Tests: Cold Commissioning testing shall be conducted to demonstrate the capacity of the WTP as noted in Table C.6-5.1. Waste form products and secondary wastes will be produced in accordance with the qualification strategies and requirements identified in the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1), ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3), and IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2), and meet the relevant specification and interface requirements. The results shall be provided to DOE for ~~review and approval information~~ (Table C.5-1.1, Deliverable 5.4) (451).

The Cold Commissioning capacity tests shall test the individual facility operations in terms of function and capacity. Applicable facility system components, both process and mechanical, shall be tested.

The water washing, caustic, and oxidative leaching process steps shall be performed consistent with the process model used to develop Table C.6-5.1 and the process steps as defined in Standard 2, "Research, Technology, and Modeling," Deliverable 2.10. Leaching effectiveness is not a criterion for acceptability of Cold Commissioning capacity test results.

The minimum testing duration for the Cold Commissioning capacity testing is defined below:

- The HLW Facility shall be operated for 20 days.
- The LAW Facility shall be operated continuously for two 5-day tests.
 - Unit operations such as melter feeding and offgas ventilation shall be operated with the exception of required interruption for planned maintenance or repair.
 - Demonstrated capacity (Table C.6-5.1) shall be the average achieved production rate of nonradioactive ILAW product glass over two 5-day tests.
 - The Contractor may choose to run additional 5-day tests if necessary to achieve capacity requirements (Table C.6-5.1).
 - Credit in achieved capacity will be granted for in-process products as approved by DOE and as defined or referenced in Table C.5-1.1, Deliverable 5.1.
- The pretreatment testing duration is based on four (4) ultrafiltration cycles (two in each ultrafiltration train).

- An ultrafiltration cycle is a series of process steps including receipt, treatment, and transfer.
- The Cold Commissioning capacity test is based on the measurement of waste treated between the following points:
 - For high-level waste pretreatment (i.e., solids) between UFP-VSL-00001A/B and HLP-VSL-00027A/B or HLP-VSL-00028.
 - For low-activity waste pretreatment (i.e., sodium [Na]) between UFP-VSL-00001A/B and TCP-VSL-00001.

The measure of HLW Facility pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and product vessels (HLP-VSL-00027A/B or HLP-VSL-00028) and adjusted for any changes to vessel heels. An insoluble component may be used to determine the quantity of treated solids.

The measure of LAW Facility pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and the product vessel (TCP-VSL-00001) and adjusted for any changes to vessel heels. This determination shall be based on waste Na as defined in Table C.7-1.1. The Contractor shall have the right to extend the testing period for any facility beyond the testing duration indicated above, and in such an event the Contractor may choose any consecutive window within that period to report against.

Table C.6-5.1. Cold Commissioning Capacity Testing Criteria

Facility	Minimum Capacity	Treatment Capacity	Design Capacity
LAW PT	2,244 MT Na per year	2,620 MT Na per year	3,740 MT Na per year
HLW PT	735 MT as-delivered solids per year	860 MT as-delivered solids per year	1,225 MT as-delivered solids per year
LAW	18 MT glass per day	21 (350) MT glass per day	30 MT glass per day
HLW	3.6 MT glass per day	4.2 MT glass per day	6.0 MT glass per day

Notes:

1. PT and HLW facilities production rates in are based on the facility specification treatment capacity for treating all waste feed batches from the HNF-SD-WM-SP-012, *Tank Farm Contractor Operation and Utilization Plan* (TFCOUP; Revision 6, feed vector). Characterization of the as-delivered DOE approved simulant (Table C.5-1.1, Deliverable 5.18) and an updated model reflecting changes to design, assumptions, and administrative controls affecting throughput shall be used to re-establish performance criteria in Table C.6-5.1. For example, model assumptions may change following completion of Phase I PT Engineering Platform testing. Changes to the model reflecting design, assumptions, and administrative controls shall be approved by DOE.
2. For the PT and HLW facilities revised values for Table C.6-5.1 will be documented in cold commissioning capacity test criteria (Table C.5-1.1, Deliverable 5.20) due prior to completion of Deliverable 5.8.
3. Interface service delays in excess of that assumed in the process models used to create Table C.6-5.1 shall not be counted in the duration of the performance runs.
4. The contractor shall manage the excess treated LAW simulant from the cold commissioning tests.

- (iii) Integrated Operations Demonstration: Deleted.
- (iv) Remotability Test: The Contractor shall demonstrate by prototypic remotability testing, and the use of the planned operating and maintenance procedures, all normally required remote maintenance activities to support operation of the WTP during hot operations. This testing shall include verification of remote access and viewing to remotely maintain equipment including the ability to install, connect, disconnect, remove and reconnect remote replaceable components, calibration and replacement of instruments located in areas serviced by remote cranes and manipulators, and the use of remote and direct viewing technologies.

This testing may be demonstrated and documented prior to commencing Cold Commissioning and shall be completed before the end of Cold Commissioning. Any design changes required, based upon these test results, shall be corrected and the specific systems retested to verify acceptability prior to the completion of Cold Commissioning.

- (v) Environmental Performance Test: The Contractor shall complete environmental testing as required under the Dangerous Waste Permit Application, Air Permitting Requirements; and applicable Federal, state, and local laws, regulations, and permits to demonstrate the operation of the WTP in accordance with applicable legal and permit requirements. The testing requirements shall be based upon the Environmental Performance Test Plan described in the WTP conceptual design and supporting information and as modified by the Dangerous Waste Permit Application permitting process.

The Contractor shall produce an environmental performance test report(s) after the completion of each environmental performance test trial (Table C.5-1.1, Deliverable 5.7). The report shall, at a minimum, provide the required information identified in Risk Assessment Work Plan (Table C.5-1.1, Deliverable 7.6), including a description of the sampling and analysis activities conducted during the testing, definition of the simulants, and assess the performance of the LAW and HLW Melter Treatment Units. The report shall also provide recommended operating conditions for the WTP to assure compliance with required permits and statutes.

- (4) Deleted
- (5) Cold Commissioning Results and Documentation: The Contractor shall provide results from Cold Commissioning testing to DOE for ~~review and approval~~ **information** (Table C.5-1.1, Deliverable 5.8) (451). The information shall be in the form of controlled documents (hardcopy or electronic) maintained and updated by the Contractor. Information shall include, but not be limited to:
 - (i) System startup plans and system verification reports;
 - (ii) Test Plans and Summary Test Reports for demonstrating and/or establishing permitting conditions; and
 - (iii) Test Plans and Summary Test Reports for process verification and product qualification.

(6) Certification of Completion of Cold Commissioning: The Contractor shall certify to DOE that Cold Commissioning is complete and that the Contractor met the requirements contained in Standard 5(e), "Cold Commissioning" (Table C.5-1.1, Deliverable 5.9) or as outlined in Standard 5(h), "Cold and Hot Commissioning Capacity Testing Deficiency Remedial Actions."

(f) Readiness:

Operational Readiness Support Plan (257): Prior to ORRs, the Contractor, jointly with the TOC, shall submit an Operational Readiness Support Plan (Joint WTP/TOC Contract Deliverable [Table C.5-1.1, Deliverable 5.22]). **After initial approval the plan shall be updated as needed (451)**. The plan will address facility operational readiness requirements for the tank farms and each of the five (5) WTP facilities (PT, HLW, LAW, LAB, and BOF). Topical areas for review may include (but are not limited to):

- Management self-assessment process;
- Startup notification report;
- Procedures;
- Training and testing activities; and
- Cold and hot commissioning

Operational Readiness Review(s)(196): The WTP ORR process shall be conducted in accordance with DOE O 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*, CRD (190), prior to the start of Hot Commissioning. (257)

(g) Hot Commissioning:

The objective of the Hot Commissioning phase is to:

- Demonstrate the operability of the WTP during radioactive operations;
- Achieve the capacity criteria specified in Table C.6-5.2.

The Hot Commissioning period begins upon receipt of permission to commence Hot Commissioning from the DOE Authorization Authority in accordance with DOE O 425.1D, CRD, *Verification of Readiness to Start Up or Restart Nuclear Facilities (190)*. DOE/ORP approval is required for the introduction of radioactive waste into the WTP. The approval for Hot Commissioning will be granted by DOE/ORP following DOE Authorization Authority approval for Hot Commissioning startup.

Hot commissioning includes testing the facility using radioactive materials transferred from the tank farms. The PT Facility shall be tested to demonstrate the flow of radioactive feed material through the facility to produce LAW and HLW feed, which may be placed into lag storage or fed forward to support coincident LAW and/or HLW hot commissioning. Each WTP processing facility may be tested individually to demonstrate that the facility performs in accordance with operational, safety, and Contract performance requirements.

(1) Certification of Readiness for Hot Commissioning Start: The Contractor shall certify to DOE that the facility is ready to receive waste feed (Table C.5-1.1, Deliverable 5.10) and all Contractor requirements in the Section C.9, "Interface Control Documents," are complete.

(2) Waste Transfer Notification: For Hot Commissioning, the Contractor shall provide a written notice to the DOE Contracting Officer, specifying the date the Contractor requests the start of a transfer of a batch of feed, herein referred to as the waste transfer date. The written notice shall be provided to the DOE

Contracting Officer at least two (2) months prior to the requested waste transfer date.

- (3) Certification of Notification of Hot Commissioning Start (451): The Contractor shall ~~certify~~ notify to DOE that the facility Hot Commissioning has started (Table C.5-1.1, Deliverable 5.11). Start of Hot Commissioning is defined as receiving actual tank farm waste feed into one of the WTP processing facilities.
- (4) Hot Commissioning Tests (Table C.5-1.1, Deliverable 5.21): Hot Commissioning testing shall be conducted to demonstrate **(350)** capacity of the WTP as identified in Table C.6-5.2. Hot Commissioning capacity tests do not apply to the LAW Facility.

LAW Facility Hot Commissioning shall include operations with radioactive tank waste per Specification 7, "Low-Activity Waste Envelopes Definitions," Envelope E producing a minimum quantity of 10 ILAW glass containers from each melter. The final container shall meet waste loading criteria of Specification 2, "Immobilized Low-Activity Waste Product," Section 2.2.2.2, "Waste Loading."

- (5) The plant capacity test results shall be demonstrated using the plant instrumentation, and sampling, analyses, and product control systems. The JTG approved results of the Hot Commissioning capacity tests shall be provided to DOE for review and approval (Table C.5-1.1, Deliverable 5.12).

The Hot Commissioning **(350)** tests shall test the individual facility operations in terms of function and capacity. Applicable facility system components, both process and mechanical, shall be tested. Hot Commissioning capacity tests do not apply to the LAW Facility.

The leaching process shall be performed as required per Specification 12, "Procedure to Determine the Waste Feed Treatment Approach," and consistent with the process model used to develop Table C.6-5.2. Leaching effectiveness is not a criterion for acceptability of Hot Commissioning capacity test results. The minimum testing duration for the Hot Commissioning capacity testing is defined below:

- The HLW Facility shall be operated for 20 days.
- The PT Facility testing duration is based on four (4) ultrafiltration cycles (two [2] in each ultrafiltration train). An ultrafiltration cycle is a series of process steps including receipt, treatment, and transfer.
- The Hot Commissioning capacity testing **(350)** is based on the measurement of waste treated between the following points:
 - For HLW pretreatment (i.e., solids) between UFP-VSL-00001A/B and HLP-VSL-00027A/B or HLP-VSL-00028;
 - For LAW pretreatment (i.e., Na) between UFP-VSL-00001A/B and TCP-VSL-00001.
 - The measure of HLW pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and product vessels (HLP-VSL-00027A/B or HLP-VSL-00028) and adjusted for any changes

to vessel heels. An insoluble component may be used to determine the quantity of treated solids.

- The measure of LAW pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and the product vessel (TCP-VSL-00001) and adjusted for any changes to vessel heels. This determination shall be based on waste Na as defined in Table C.7-1.1.

The Contractor shall have the right to extend the testing period for any facility beyond the testing duration indicated above, and in such event the Contractor may choose any consecutive window within that period to report against.

Processing of vitrification facility recycles will be done in parallel with continued PT Facility feed preparation during vitrification facility performance runs for at least 10 days or until pretreatment feed is no longer available, whichever is sooner.

Table C.6-5.2. Hot Commissioning Capacity Testing Criteria.

Facility	Minimum Capacity	Treatment Capacity	Design Capacity
LAW Pretreatment	2,244 MT Na per year	2,620 MT Na per year	3,740 MT Na per year
HLW Pretreatment	735 MT as-delivered solids per year	860 MT as-delivered solids per year	1,225 MT as-delivered solids per year
HLW Vitrification	3.6 MT Glass per day	4.2 MT Glass per day	6.0 MT Glass per day

Notes:

1. PT and HLW facilities production rates are based on the facility specification (Table C.7-1.1) capacity for treating all waste feed batches from the HNF-SD-WM-SP-012, *Tank Farm Contractor Operation and Utilization Plan* (TFCOUP; Revision 6, feed vector.) Characterization of the actual delivery feed to WTP and an updated model reflecting changes to design, assumptions, and administrative controls affecting throughput will be used to re-establish performance criteria in Table C.6-5.2. For example, model assumptions may change following completion of Phase I Pretreatment Engineering Platform Testing. Changes to the model reflecting design, assumptions, and administrative controls shall be approved by DOE. The revised values for Table C.6-5.2 will be documented in Hot Commissioning capacity test criteria (Table C.5-1.1, Deliverable 5.21) due prior to completion of Deliverable 5.14.
2. Waste feed delivery delays, and other interface service delays in excess of that assumed in the process models used to create this table shall not be counted in the duration of the capacity runs.
3. If supplemental low-activity waste treatment lag storage facilities are not available to receive the excess treated low-activity waste, the low-activity waste pretreatment rates will be adjusted to align with LAW Facility performance.
 - (i) HLW Pretreatment: The HLW pretreatment line shall be operated in order to produce feed to the HLW Facility that results in IHLW in compliance with Specification 1, "Immobilized High-Level Waste Product."

- (ii) LAW Pretreatment: The LAW pretreatment line shall be operated to produce feed to the LAW Facility that results in ILAW in compliance with Specification 2, "Immobilized Low-Activity Waste Product."
 - (iii) LAW Facility: The LAW Facility shall produce containers of ILAW. Each container shall be routed through the complete process and equipment system, including level measurement, sampling as required, inert fill as required, lid closure, decontamination, and placement in position for shipment. In accordance with ICD 15, "Immobilized Low-Activity Waste" documentation requirements for the production of the ILAW containers are described in Specification 13, "Waste Product Inspection and Acceptance," and shall be transmitted to DOE per deliverable, *Resultant Products from Hot Commissioning* (Table C.5-1.1, Deliverable 5.13).
 - (iv) HLW Facility: The HLW Facility shall produce canisters of IHLW. Each canister shall be routed through the complete process and equipment system, including level measurement, sampling, lid closure, decontamination, and placement of the canister in HLW storage in accordance with ICD 14, "Immobilized High-Level Waste." Documentation requirements for the production of the IHLW canisters are described in Specification 13, "Waste Product Inspection and Acceptance," and shall be transmitted to DOE per deliverable, *Resultant Products from Hot Commissioning* (Table C.5-1.1, Deliverable 5.13).
- (6) Hot Commissioning Results and Documentation: The Contractor shall provide Hot Commissioning test results to DOE for ~~review and approval information~~ (Table C.5-1.1, Deliverable 5.14) (451). The information shall be in the form of controlled copies or electronic media as requested by DOE. The information shall include, but not be limited to:
- (i) Test plans and test reports for demonstrating and establishing permitting conditions (e.g., RCRA, authorization basis, air, performance test plan, etc.).
 - (ii) Test plans and test reports for process verification and product qualification, including documentation and certification, that the IHLW and ILAW products meet requirements per Specification 1, "Immobilized High-Level Waste Product" and Specification 2, "Immobilized Low-Activity Waste Product," respectively.
 - (iii) DELETED (409)
 - (iv) Certify waste product (ILAW and IHLW) and secondary waste acceptability per Standard 6, "Product Qualification, Characterization, and Certification" through implementation of the waste compliance plans.
 - (v) Copies of required information sent to regulators (e.g., RCRA, air, authorization basis, etc.) and as required elsewhere in the Contract.

- (7) Certification of Completion of Hot Commissioning: **(350)** The Contractor shall provide Certification of Completion of Hot Commissioning. For LAW Facility the certification shall be based on completing the initial production quantity as described in Standard 5(g)(4), "Hot Commissioning Tests (Table C.5-1.1, Deliverable 5.21)." The Contractor shall certify to DOE that the Hot Commissioning is complete and that the Contractor met the requirements contained in Standard 5(g), "Hot Commissioning" (Table C.5-1.1, Deliverable 5.15 or as outlined in Standard 5(h), "Cold and Hot Commissioning Capacity Testing Deficiency Remedial Actions").
- (h) Cold and Hot Commissioning Capacity Testing Deficiency Remedial Actions: The Contractor and DOE agree that the Contractor shall be allowed to exercise best efforts to achieve the waste treatment capacity testing levels prescribed in Tables C.6.5-1 and C.6.5-2 for each WTP facility. However, in the event that a significant deficiency is encountered during Commissioning that degrades the performance of any facility so significantly that the minimum capacity levels for cold or hot commissioning of that facility cannot be achieved, the Contractor shall notify DOE of the need to expend additional time and funds to correct the deficiency.

It is the Contractor's responsibility within the scope of Commissioning to provide a realistic estimate of the cost and schedule for any such requisite remedial response. If both parties agree that a deficiency exists and that remedial measures are necessary then:

- (1) If the deficiency results from an inadequate and/or incomplete test procedure, the Contractor shall correct the test procedure and re-test within its scope of Commissioning;
- (2) If the deficiency results from a design or construction nonconformance, the Contractor shall correct the nonconformity and re-test within its scope of Commissioning;
- (3) If the cause of a deficiency cannot be determined, the Contractor shall propose a reasonable investigation program to determine the cause and following ORP approval of the investigation cost and schedule, shall implement the investigation program.
- (4) If DOE does not wish to fund additional remedial expenses, the related testing is consequently accepted as completed at the minimum level defined in Section B.12, "Attachments," Attachment B-2-F, "Incentive Fee F – Commission LBL in the DFLAW Configuration Performance Based Incentive."

- (i) Facility Transition Plan: The Contractor shall prepare, for DOE review and approval, a WTP Facility Transition Plan (Table C.5-1.1, Deliverable 5.19) that describes the strategy, schedule, and requirements for safe and efficient transition of the WTP facilities to the Operations Contractor. The Plan shall identify, at a minimum for each facility, the proposed schedule for facility turnover and provide a checklist of requirements to be completed to ensure that the facilities can be safely transitioned and operated by the Operations Contractor. The Transition Plan shall also identify provisions to retain appropriate qualified engineering, operations, and maintenance staff to support continued safe operations of the WTP facilities at designed treatment rates of the facilities. Migration for electronic documents, records, data, and DOE-owned software will be included. The Contractor shall obtain input and concurrence on the Facility Transition Plan from the Operations Contractor, if available, before transmittal to DOE. The Facility Transition Plan is due to the DOE 12 months prior to the start of Hot Commissioning.
- (j) Transition: The following items shall be provided to the Operations Contractor at facility transition. In addition, systems and other items necessary to facilitate safe and efficient operation of the WTP shall be provided during the transition period in accordance with the WTP Facility Transition Plan (Table C.5-1.1, Deliverable 5.19).
- (i) Safety Management Programs to ensure safe accomplishment of work **(190)**.
 - (ii) Facility safety documentation (normally DSAs and TSRs) that describes the safety envelope of the facility **(190)**.
 - (iii) Program to confirm and periodically reconfirm the condition and operability of Vital Safety Systems. This includes examinations of records of tests and calibration of these systems **(190)**.
 - (iv) The facility systems and procedures, as affected by facility modifications, that are consistent with the description of the facility, procedures, and accident analysis, and assumptions included in the safety basis **(190)**.
 - (v) Adequate and accurate procedures and safety limits are in place for operating the process systems and utility systems. The procedures include necessary revisions for all modifications that have been made to the facility. Facility processes ensure that only the most current revision to each procedure is in use **(190)**.
 - (vi) A routine operations drill program and an emergency management drill and exercise program. Records for each program are adequate to demonstrate the effectiveness of completed drills and exercises as well as planning for future drills and exercises **(190)**.
 - (vii) The formality and discipline of operations is adequate to conduct work safely and programs are in place to maintain this formality and discipline. This item is satisfied by transition of a Conduct of Operations program.
 - (viii) The selection, training, and qualification programs for operations and operations support personnel **(152) (190)**.

Transition of LBL in the DFLAW configuration is currently excluded from the cost and schedule of the contract. The facility transition period shall be planned to complete transition of all facilities within ninety (90) days following DOE's acceptance of the Contractor's Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).

- (k) Completion of Contract Workscope Requirements: The Contractor shall complete post-CD-4 activities, "Approve Start of Operations or Project Closeout," in accordance with DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, CRD (271).
- (l) Post-Commissioning Services: Following hot commissioning, the Contractor shall conduct necessary activities to ensure that the facility is safe and ready for hot operations and facility turnover. This period ends upon DOE approval of Table C.5-1.1, Deliverable 5.15.

DOE may request the Contractor to provide additional waste treatment from the successfully commissioned facility or to maintain standby status for a period of time.

If standby status is requested, the Contractor shall maintain the necessary staff for full facility operations as determined by the Contractor.

If DOE requests standby status, or additional waste treatment, beyond that required for hot commissioning, such requests will be pursuant to the Section I, "Contract Clauses," Clause I.82, "FAR 52.243-2 Changes -- Cost-Reimbursement (Aug 1987) -- Alternate III (Apr 1984)."

- (m) Project Closeout: Project closeout is complete when:
- (1) DOE approves the Contractors Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).
 - (2) DOE accepts all ILAW and IHLW products produced during Hot Commissioning in accordance with Specification 13, "Waste Product Inspection and Acceptance."
 - (3) The Contractor responds to technical questions from the DOE or Operations Contractor, as instructed by DOE for a period not to exceed six (6) months following DOE's approval of the Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).
 - (4) The Contractor provides support to DOE in the conduct of internal and external technical reviews and presentations for a period not to exceed six (6) months following DOE's approval of the Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).
 - (5) The Contractor assures operations, maintenance, engineering, licensing, and purchasing activities developed under this Contract are transitioned to the Operating Contractor as instructed by DOE.
 - (6) The Contractor transitions spare parts to the Operating Contractor, as instructed by DOE.
 - (7) The Contractor completes transition of the WTP facilities to the Operating Contractor (Table C.5-1.1, Deliverable 5.16) (152) in accordance with the approved WTP Facility Transition Plan (Table C.5-1.1, Deliverable 5.19).
 - (8) The Contractor assures completion of as-builts in accordance with the approved as-built program description (Table C.5-1.1, Deliverable 4.7).

2. All other terms and conditions remain unchanged.

(End of Modification)