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**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**JAN 31 2017**

17-ECD-0001

Ms. Alexandra K. Smith, Program Manager  
Nuclear Waste Program  
Washington State  
Department of Ecology  
3100 Port of Benton Blvd.  
Richland, Washington 99354

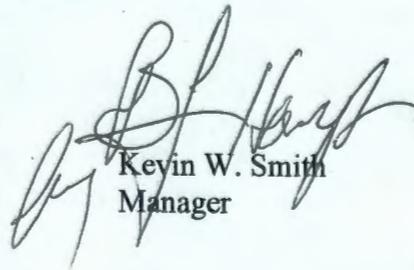
Ms. Smith:

**JANUARY 2017 QUARTERLY REPORT FOR THE STATE OF WASHINGTON VS. U.S. DEPARTMENT OF ENERGY, CASE NO. 08-5085-RMP, FOR WASTE TREATMENT AND IMMOBILIZATION PLANT CONSTRUCTION AND STARTUP ACTIVITIES AND TANK RETRIEVAL ACTIVITIES – OCTOBER 1, 2016, THROUGH DECEMBER 31, 2016**

This letter transmits the U.S. Department of Energy January 2017 Quarterly Report (Attachment) under Section IV-C-1 of the subject referenced Amended Consent Decree, for the period of October 1, 2016, through December 31, 2016. Pursuant to the Amended Consent Decree, this report provides the status and progress made during the reporting period.

As requested by Washington State Department of Ecology, copies of the directives given to contractors for work required by the Amended Consent Decree are also attached.

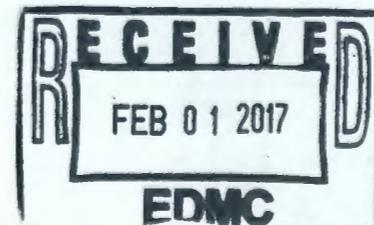
If you have any questions, please contact William F. Hamel, Assistant Manager, Waste Treatment and Immobilization Plant Project, (509) 376-6727, or Glyn D. Trenchard, Acting Assistant Manager, Tank Farms Project, (509) 373-4016.

  
Kevin W. Smith  
Manager

ECD:RLE

Attachment

cc: See page 2



JAN 3 1 2017

Ms. Alexandra K. Smith  
17-ECD-0001

-2-

cc w/attach:

K. Niles, Oregon Energy  
BNI Correspondence  
Environmental Portal, LMSI  
TPA Administrative Record  
WRPS Correspondence

cc w/o attach:

R.S. Skeen, CTUIR  
S.L. Dahl, Ecology  
J.J. Lyon, Ecology  
J.D. McDonald, Ecology  
J.B. Price, Ecology  
C.L. Whalen, Ecology  
D.A. Faulk, EPA  
S.E. Hudson, HAB  
R.A. Kaldor, MSA  
R.E. Piippo, MSA  
G. Bohnee, NPT  
R. Buck, Wanapum  
R. Jim, YN  
D. Rowland, YN

**Attachment  
17-ECD-0001  
(183 Pages Excluding Cover Sheet)**

**U.S. Department of Energy, Office of River Protection  
Quarterly Report, October 1, 2016, through December 31, 2016,  
and Waste Treatment and Immobilization Plant Direction Letters**

# Office of River Protection Quarterly Report

**October 1, 2016, through December 31, 2016**

Consent Decree, *State of Washington v. Dept. of Energy*, Case No. 2:08-cv-05085-FVS (October 25, 2010)

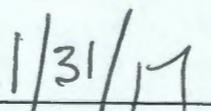
Amended Consent Decree, *State of Washington v. Dept. of Energy*, Case No. 2:08-CV-5085-RMP (March 11, 2016)

Second Amended Consent Decree, *State of Washington v. Dept. of Energy*, Case No. 2:08-5085-RMP (April 12, 2016)<sup>1</sup>



**2440 Stevens Center Place  
Richland, Washington 99352  
Office of River Protection**

  
\_\_\_\_\_  
B.J. Harp, Deputy Manager  
Office of River Protection

  
\_\_\_\_\_  
Date

<sup>1</sup> The cited consent decrees are between the State of Washington and U.S. Department of Energy. For each of these decrees, there are companion, separate consent decrees with the State of Oregon, as Intervener, under the same case numbers.

**Project Earned Value Management System Reflects up to November 2016 Information**

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## Acronyms and Abbreviations

BNI	Bechtel National, Inc.
BOF	Balance of Facilities
C5V	C5 ventilation system
CGD	commercial grade dedication
CO2e	carbon dioxide equivalent
CSER	Criticality Safety Evaluation Report
CV	cost variance
DFLAW	direct-feed low-activity waste
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EM-1	Office of Environmental Management
EM	Environmental Management
EMF	effluent management facility
ERSS	extended reach sluicer system
FY	fiscal year
HAMTC	Hanford Atomic Metal Trades Council
HEPA	high-efficiency particulate air
HLW	High-Level Waste (Facility)
HPAV	hydrogen in piping and ancillary vessels
HVAC	heating, ventilation, and air-conditioning
LAB	Analytical Laboratory
LAW	Low-Activity Waste (Facility)
LBL	Low-Activity Waste Facility, Balance of Facilities, and Analytical Laboratory
MARS-V	Mobile Arm Retrieval System-Vacuum
ORP	Office of River Protection
PDSA	preliminary documented safety analysis
PJM	pulse-jet mixer
PT	Pretreatment (Facility)
SCBA	self-contained breathing apparatus
SHSV	standard high solids vessel
SST	single-shell tank
SV	schedule variance
WRPS	Washington River Protection Solutions LLC
WTP	Waste Treatment and Immobilization Plant

## **Introduction**

The U.S. Department of Energy is submitting the following information to satisfy its obligation to provide “a written report documenting WTP construction and startup activities and tank retrieval activities” as required by Section IV-C-1 of the Amended Consent Decree in *State of Washington vs. United States Department of Energy*, Case No. 2:08-CV-5085-RMP (March 11, 2016) and Second Amended Consent Decree, same case (April 12, 2016).

The narrative descriptions of progress in this report cover the period from October 1, 2016, to December 31, 2016. Earned Value Management System data and descriptions cover the quarterly period ending November 30, 2016; this includes the facility completion percentage estimates included at various locations in the Waste Treatment and Immobilization Plant section.

As the Washington State Department of Ecology has requested, written directives from October 1, 2016, through December 31, 2016, for work required by the Consent Decree have been included with this report.

**Tank Farm Actions and Milestones**

<b>Number</b>	<b>Title</b>	<b>Due Date</b>	<b>Status</b>
<i>Actions</i>			
D-16E-01	U.S. Department of Energy must purchase by December 31, 2016, a spare A-E-1 <sup>1</sup> reboiler for the 242-A Evaporator.	12/31/2016	Complete
D-16E-02	Have a spare A-E-1 <sup>1</sup> reboiler available by December 31, 2018.	12/31/2018	On Schedule
<i>Milestones</i>			
D-16B-03	Of the 12 Single-Shell Tanks (SST) referred to in B-1 and B-2, complete retrieval of tank waste in at least five.	12/31/2020	Notice given that a serious risk has arisen. See letter 16-ORP-0097.
D-16B-01	Complete retrieval of tank waste from the following remaining SSTs in WMA-C: C-102, C-105, and C-111.	03/31/2024	On Schedule
D-16B-02	Complete retrieval of tank wastes from the following SSTs in Tank Farms A and AX: A-101, A-102, A-104, A-105, A-106, AX-101, AX-102, AX-103, and AX-104. Subject to the requirements of Section IV-B-3, the U.S. Department of Energy may substitute any of the identified nine SSTs and advise the Washington State Department of Ecology accordingly.	03/31/2024	Notice given that a serious risk has arisen. See letter 16-ORP-0097.

<sup>1</sup> The Consent Decrees referred to the 242-A reboiler as “A-E-1”; the correct designation is “E-A-1.”

DOE = U.S. Department of Energy.

SST = single-shell tank.

Ecology = Washington State Department of Ecology.

WMA-C = C Farm waste management area.

## **Single-Shell Tank Retrieval Program**

**Quarterly Statement:** Tank retrieval activities have complied with milestones already come due as of the date of this report. There are no missed milestones that may affect compliance with other milestones.

**Facility Project Director:** Ben Harp

**Facility Operations Activity Manager:** Chris Kemp

### **Accomplishments during the Reporting Period**

- Completed removal and disposal of 801A building legacy material and equipment
- Completed AX 801-B/C building demolition
- Completed AX Farm air and water service building major utilities installation
- Received slurry pump hose support assemblies for AX-102/104
- Completed an additional AX Farm pit clean out (AX-04D); six of eight pit clean outs completed
- Completed AX POR-126 exhauster and POR-127 exhauster cold operational acceptance tests and hot tie-ins
- Completed electrical service installation for A/AX change trailer
- Submitted C-102 Retrieval Data Report to the Washington State Department of Ecology (Ecology)
- Components from the removed C-105 Mobile Arm Retrieval System – Vacuum (MARS-V) were shipped to the Environmental Restoration Disposal Facility for disposal
- Removed C-105 A and C pit cover blocks and completed pit/riser inspections
- Received three extended reach sluicer systems (ERSS) for installation in Tank C-105.

### **Accomplishments Expected in the Next Three Months**

- Initiate C Farm hose-in-hose transfer line removals that have been planned for fiscal year (FY) 2017
- Negotiate contract proposal for installing and performing the third retrieval technology at Tank C-105
- Complete Tank C-105 third retrieval technology design
- Initiate C-105 ERSS installation
- Complete AX ventilation readiness/turnover at portable exhauster POR126 and POR127
- Initiate AX-102 and AX-104 in-tank equipment removal

- Complete the two remaining AX-104 pit clean outs
- Initiate AX-101 and AX-103 pit clean out activities.

### **Issues Encountered during the Reporting Period**

The U.S. Department of Energy (DOE) has provided notification to Ecology that a serious risk has arisen where DOE may be unable to meet Consent Decree milestones B-2 and B-3 via letter 16-ORP-0097 dated December 6, 2016 (see page 2 of this report).

DOE has already retrieved two of the five single-shell tanks (SST) required by Milestone B-3 to be retrieved by December 31, 2020 (C-102 and C-111). DOE expects that Tank C-105 will be field complete by December 2017, which is three months later than the date reported in the October 2016 Consent Decree quarterly report (16-ECD-0054, "October 2016 Quarterly Report for the State of Washington vs. U.S. Department of Energy, Case No. 08-5085-RMP, for Waste Treatment and Immobilization Plant Construction and Startup Activities and Tank Retrieval Activities – July 1, 2016, through September 30, 2016"). The construction and placement of retrieval equipment at AX-102 and AX-104 has been negatively impacted by the need to deploy a third retrieval technology at C-105, the only remaining C Farm tank still to be retrieved.

A planning assumption to be able to complete some tank retrieval construction field work to install tank retrieval equipment within the AX Tank Farm without self-contained breathing apparatus (SCBA) in 2016, was not realized, and ongoing vapor concerns continue to impact workers both inside and outside of the tank farm boundary. Retrieval of AX-102 and AX-104 is now expected to start in January 2019 and installation of retrieval equipment in AX-101 and AX-103 will be delayed into 2018 and 2019. These factors are causing a slip to internal AX-102 and AX-104 tank retrieval start dates by at least six months to January 2019, which affects DOE's ability to complete Consent Decree milestones B-2 and B-3. There has been a delay in starting the ventilation system at AX-102 and AX-104, which is necessary for removal of legacy in-tank equipment (16 pieces of long length equipment) required as a predecessor activity prior to installation of new tank retrieval systems. Separately, during soil excavation activities, higher than expected radiological contamination levels have been encountered requiring additional protective measures for the work force and additional disposal requirements.

The MARS-V retrieval system for Tank 241-C-105 failed in September 2015 and required the retrieval team to complete a system engineering evaluation to assist with developing alternatives and determining a path forward. The system engineering evaluation determined the best alternative to retrieving the remaining waste in the tank was to proceed with implementing a sluicing as the third technology for the Consent Decree. Implementing a third technology requires partial disassembly of the MARS-V retrieval system and installation of two ERSS retrieval systems currently being prepared for installation in May 2017.

### **Issues Expected in the Next Three Months**

On July 11, 2016, the Hanford Atomic Metal Trades Council (HAMTC), a labor organization composed of various unions working at Hanford, issued a "stop work" requiring mandatory use of supplied air within the perimeter fence lines of both single- and double-shell tank farms. This letter also included six other demands HAMTC expected Washington River Protection Solutions

LLC (WRPS) to implement immediately. On July 21, 2016, the Washington State Attorney General and citizens (Local Union 598 and Hanford Challenge) filed motions for preliminary injunction in federal court (Case 4:15-cv-05086-TOR) seeking, among other things, all work inside the perimeter fences of any tank farm be performed while wearing *mandatory* supplied air. This stop work and the interim measures associated with the motions for preliminary injunction has slowed and/or delayed field work at the AX and C farms. For example the AX-102 and AX-104 retrieval construction (removal of legacy/long length equipment) is affected by not being able to operate the tank-specific ventilation system. DOE and WRPS continue to evaluate near-term and long-term impacts of these actions though at this time we have not determined the effect, if any, on Consent Decree milestones. Due to the prior technical challenges related to completing retrievals at Tank 241-C-102 and Tank 241-C-111, and the current modifications to Tank 241-C-105, funding will be needed to complete Tank 241-AX-102 and Tank 241-AX-104 tank retrieval system(s) installation through FY 2018 with retrieval operations starting in FY 2019 to meet Milestone D-16B-03 by December 31, 2020.

The DOE Office of River Protection (ORP) submitted letter 16-TF-0102, "Status Update Related to Tank Farm Vapors," on September 15, 2016, to make certain Ecology is aware of several recent events regarding the Hanford tank farms retrieval activities, to pass along relevant information, and provide updates on the status of ongoing processes related to those vapor events and their mitigation. Ecology acknowledged receipt of the letter on October 17, 2016, and requested a copy of the WRPS response to ORP's September 8, 2016, request for additional information. WRPS responded to ORP's September 8, 2016, request by letter dated November 22, 2016. ORP discussed the WRPS November 22, 2016, letter informally with Ecology on November 25, 2016; ORP formally provided this on December 2, 2016, via 16-TF-0132, "Clarification of the Impact Analysis Related to Stop Work Order Issued on July 11, 2016." ORP submitted letter 16-ORP-0097 on December 6, 2017, which formally notified Ecology that serious risk has arisen that DOE may be unable to meet milestones B-2 and B-3.

In ORP letter 16-ORP-0097, ORP also noted that although the November 22, 2016, WRPS letter indicated the expanded and extended usage of SCBA within all tank farms has potential impacts on DOE's ability to meet Milestone A-9. DOE has determined there are a number of options available to modify operational and programmatic priorities so as to meet Milestone A-9. As a result, DOE has not made a determination at this time that a serious risk has arisen that DOE may be unable to meet Milestone A-9 and, therefore, is not providing notification regarding Milestone A-9.

### **Actions Initiated or Taken to Address Potential Schedule Slippage**

There are a limited number of critical personnel resources (trained and available construction craft and support personnel) available to continue ORP high priority field activities related to completion of retrieval at 241-AY-102 and its follow-on investigation of a leak cause, 241-C-105 ERSS installation, preparations for retrieval equipment installation at the 241-AX-102 and 241-AX-104 tanks. WRPS has initiated a training series for health physics technicians and industrial hygiene technicians, and is working within the local area to have skilled construction forces available to achieve work execution in the field.

The AX Farm exhauster POR126 and POR127 (redundant exhauster) ventilation installation activities were completed, however, system testing and startup was not completed as a result of a stop work action taken on July 11, 2016, by HAMTC and due to voluntary restraints associated with the motions for preliminary injunction filed by plaintiffs in the ongoing vapors litigation which prohibited “waste disturbing activities” until November 24, 2016, or until the Court ruled on the plaintiffs motions for preliminary injunction, whichever was earlier (The Court provided its ruling on November 15, 2016). Operation of portable AX Farm exhausters provide active ventilation to AX Farm, which is needed to remove in-tank equipment including legacy pumps and long length probes.

**Tank Waste Retrieval Work Plan Status**

Tank	TWRWP	Expected Revisions	Retrieval Technology		
			First	Second	Third
AX-101	RPP-RPT-58932, Rev. 0	In Progress	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
AX-102	RPP-RPT-58933, Rev. 0	In Progress	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
AX-103	RPP-RPT-58934, Rev. 0	In Progress	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
AX-104	RPP-RPT-58935, Rev. 0	In Progress	Sluicing with ERSS	High-Pressure Water deployed with ERSS	-
C-101	RPP-22520, Rev. 8	Complete	Modified Sluicing with ERSS	High-Pressure Water deployed with the ERSS	-
C-102	RPP-22393, Rev. 7	Complete	Modified Sluicing with ERSS	High-Pressure Water deployed with the ERSS	-
C-104	RPP-22393, Rev. 7	Complete	Modified Sluicing	Chemical Retrieval Process complete per 13-TF-0018	-
C-105	RPP-22520, Rev. 8	Complete	MARS-V	MARS-V-High Pressure Water Spray	Chemical Dissolution Process with ERSS
C-107	RPP-22393, Rev. 7	Complete	MARS-S	MARS-S -High Pressure Water Spray	Water Dissolution
C-108	RPP-22393, Rev. 7	Complete	Modified Sluicing	Chemical Retrieval Process complete per 13-TF-0025	-
C-109	RPP-21895, Rev. 5	Complete	Modified Sluicing	Chemical Retrieval Process complete per 13-TF-0037	-
C-110	RPP-33116, Rev. 3	Complete	Modified Sluicing	Mechanical Waste Conditioning with an In-Tank Vehicle	High Pressure Water

Tank	TWRWP	Expected Revisions	Retrieval Technology		
			First	Second	Third
C-111	RPP-37739, Rev. 2	Complete	Modified Sluicing	High pressure water using the ERSS	Chemical Dissolution Process with ERSS
C-112	RPP-22393, Rev. 7	Complete	Modified Sluicing	Chemical Retrieval Process	-

ERSS = extended reach sluicer system.  
 MARS-V = Mobile Arm Retrieval System-Vacuum.  
 TWRWP = Tank Waste Retrieval Work Plan

**Tank Waste Retrieval Work Plan Accomplishments during the Reporting Period**

- None.

**Tank Waste Retrieval Work Plan Accomplishments Expected in the Next Three Months**

- None.

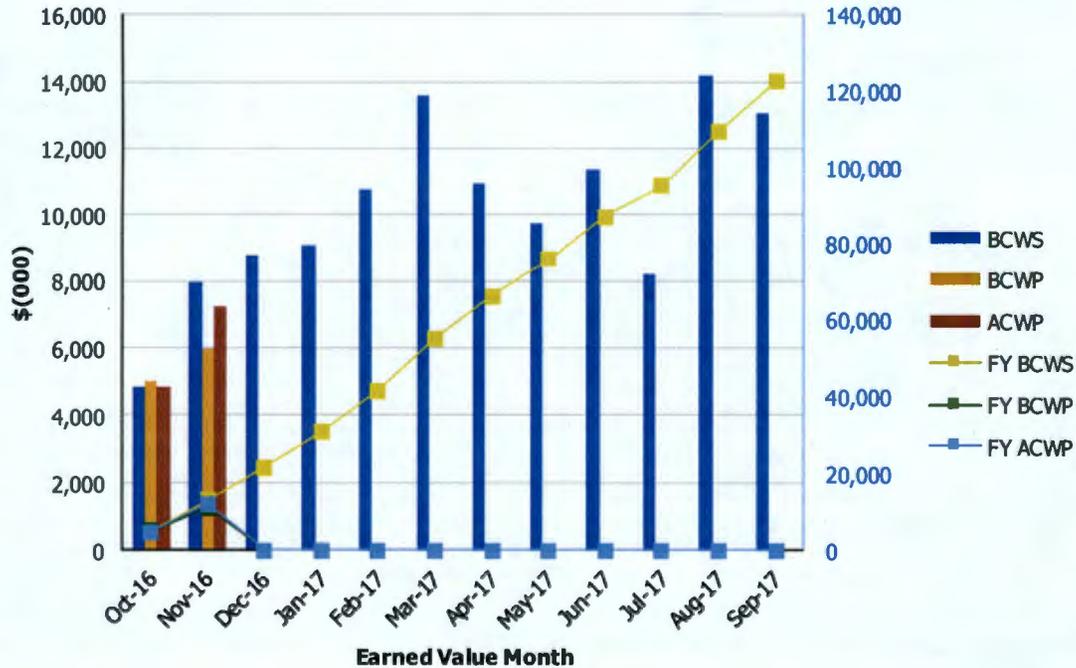
**EXC-01a: Fiscal Year Cost and Schedule Report**

Earned Value Data: Fiscal Year 2017

November-16

**Tank Farms ORP-0014  
Retrieve and Close SST's 5.02**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2016	\$4,816	\$4,996	\$4,822	1.04	1.04	\$4,816	\$4,996	\$4,822	1.04	1.04
Nov 2016	\$7,924	\$5,969	\$7,241	0.75	0.82	\$12,740	\$10,965	\$12,063	0.86	0.91
Dec 2016	\$8,772	\$0	\$0	0.00	0.00	\$21,512	\$0	\$0	0.00	0.00
Jan 2017	\$9,093	\$0	\$0	0.00	0.00	\$30,605	\$0	\$0	0.00	0.00
Feb 2017	\$10,763	\$0	\$0	0.00	0.00	\$41,369	\$0	\$0	0.00	0.00
Mar 2017	\$13,612	\$0	\$0	0.00	0.00	\$54,981	\$0	\$0	0.00	0.00
Apr 2017	\$10,950	\$0	\$0	0.00	0.00	\$65,931	\$0	\$0	0.00	0.00
May 2017	\$9,771	\$0	\$0	0.00	0.00	\$75,702	\$0	\$0	0.00	0.00
Jun 2017	\$11,344	\$0	\$0	0.00	0.00	\$87,046	\$0	\$0	0.00	0.00
Jul 2017	\$8,180	\$0	\$0	0.00	0.00	\$95,226	\$0	\$0	0.00	0.00
Aug 2017	\$14,158	\$0	\$0	0.00	0.00	\$109,385	\$0	\$0	0.00	0.00
Sep 2017	\$13,021	\$0	\$0	0.00	0.00	\$122,406	\$0	\$0	0.00	0.00

CTD	\$721,907	\$709,014	\$732,737	0.98	0.97
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- |      |   |                                  |      |   |                                 |
|------|---|----------------------------------|------|---|---------------------------------|
| ACWP | = | actual cost of work performed.   | CTD  | = | contract to date.               |
| BCWP | = | budgeted cost of work performed. | EVMS | = | earned value management system. |
| BCWS | = | budgeted cost of work scheduled. | FY   | = | fiscal year.                    |
| CPI  | = | cost performance index.          | SPI  | = | schedule performance index.     |

**Earned Value Management System Quarterly Analysis**

The fourth quarter **unfavorable** schedule variance (SV) of (\$2,929K) is due to:

- Critical field activities such as in-tank equipment removal within AX Farm have been impacted due to delays in awaiting the Court's ruling on the Plaintiffs motions for preliminary injunction, which restrained certain activities, which are "waste disturbing." Ventilation of tanks AX-102 and AX-104 was considered a waste distributing activity. Active ventilation of AX-102 and AX-104 is required to remove in tank legacy tank equipment such as pumps and thermocouples in preparation of installing new tank retrieval enhanced reach sluicers and slurry pumps. Non-tank intrusive work has been impacted due to SCBA usage and resulting inefficiencies. These factors have contributed to this negative variance and to DOE's notification to Ecology that a serious risk has arisen that DOE may be unable to meet Consent Decree milestones B-2 and B-3 as noted in 16-TF-0097.
- Installation of the third retrieval technology (slurry pump and enhanced reach sluicers) at 241-C-105 has been impacted due to the A and C pit risers failing the go/no go gauge test.

The fourth quarter **unfavorable** cost variance (CV) of (\$742K) is due to:

- Increased costs are associated with the continued inefficiencies associated with SCBA usage. Unanticipated additional costs were incurred as a result of possible beryllium contamination, and sampling required in A/AX Farm and C Farm for personnel protection.

## **Waste Treatment and Immobilization Plant Project**

***Federal Project Director:*** Bill Hamel

***Deputy Federal Project Director:*** Joni Grindstaff

**Quarterly Statement:** The Waste Treatment and Immobilization Plant (WTP) Project has complied with applicable milestones already come due as of the date of this report. There are no missed milestones that may affect compliance with other milestones.

The WTP Project currently employs approximately 3,052 full-time equivalent contractor, (Bechtel National, Inc. [BNI]) and subcontractor personnel. This includes 592 craft, 538 non-manual, and 166 subcontractor full-time equivalent personnel working at the WTP construction site (all facilities).

The WTP Project continues to focus on completion of the Low-Activity Waste (LAW) Facility, Balance of Facilities (BOF), and the Analytical Laboratory (LAB) (collectively referred to as LBL, including direct-feed low-activity waste (DFLAW) and LBL facility services). As of November 2016, LBL facilities were 52 percent complete, design and engineering was 77 percent complete, procurement was 66 percent complete, construction was 68 percent complete, and startup and commissioning was 14 percent complete.

### **Accomplishments during the Reporting Period**

- DOE ORP and BNI contract modification and Baseline Change Proposal to support the new LBL/DFLAW work scope was approved by the Deputy Energy Secretary, in her role as the Chief Executive for Project Management, and the Energy System Acquisition Advisory Board.

### **Accomplishments Expected Next Reporting Period**

- Significant accomplishments expected in the next reporting period are noted in project reports for the Pretreatment (PT) Facility, High-Level Waste (HLW) Facility, LAW, BOF and LAB.

### **Issues Encountered during the Reporting Period**

- Ecology's greenhouse gas emissions rule (WAC 173-442, "Clean Air Rule") went into effect in mid-October.
  - *Impact:* Implementation of DFLAW is estimated to produce approximately 75,000 metric tons of CO<sub>2</sub>e per year. Other Hanford Site greenhouse gas emissions are approximately 15,000 MT CO<sub>2</sub>e for 2015. At full operations, it is estimated the WTP will burn approximately 13.4 million gallons of diesel fuel per year with an estimated 136,000 metric tons of CO<sub>2</sub>e emissions per year.
  - *Actions initiated or taken to address potential project schedule slippage:* DOE is continuing to evaluate the impacts of this rule on the WTP Project.

**Issues Expected in the Next Three Months**

- Issues expected in the next three months are noted in project reports for PT, HLW, LAW, BOF, and LAB.

**Waste Treatment and Immobilization Plant Milestones**

<b>Milestone</b>	<b>Title</b>	<b>Due Date</b>	<b>Status</b>
<b>Waste Treatment and Immobilization Plant Project</b>			
D-00A-06	Complete Methods Validations	06/30/2032	On Schedule
D-00A-17	Hot Start of WTP	12/31/2033	On Schedule
D-00A-01	Achieve Initial Plant Operations for WTP	12/31/2036	On Schedule
<b>Pretreatment Facility</b>			
D-00A-18	Complete Structural Steel Erections Below Elevation 56' in PT Facility	12/31/2009	Complete
D-00A-19	Complete Elevation 98' Concrete Floor Slab in PT Facility	12/31/2031	On Schedule
D-00A-13	Complete Installation of PT Feed Separation Vessels	12/31/2031	On Schedule
D-00A-14	PT Facility Construction Substantially Complete	12/31/2031	On Schedule
D-00A-15	Start PT Facility Cold Commissioning	12/31/2032	On Schedule
D-00A-16	PT Facility Hot Commissioning Complete	12/31/2033	On Schedule
<b>High-Level Waste Facility</b>			
D-00A-20	Complete Construction of Structural Steel to 14' in HLW Facility	12/31/2010	Complete
D-00A-21	Complete Construction of Structural Steel to 37' in HLW Facility	12/31/2012	Complete
D-00A-02	HLW Facility Construction Substantially Complete	12/31/2030	On Schedule
D-00A-03	Start HLW Facility Cold Commissioning	06/30/2032	On Schedule
D-00A-04	HLW Facility Hot Commissioning Complete	12/31/2033	On Schedule
<b>Low-Activity Waste Facility</b>			
D-00A-07	LAW Facility Construction Substantially Complete	12/31/2020	On Schedule
D-00A-08	Start LAW Facility Cold Commissioning	12/31/2022	On Schedule
D-00A-09	LAW Facility Hot Commissioning Complete	12/31/2023	On Schedule
<b>Balance of Facilities</b>			
D-00A-12	Steam Plant Construction Complete	12/31/2012	Complete
<b>Analytical Laboratory</b>			
D-00A-05	LAB Construction Substantially Complete	12/31/2012	Complete

BOF = balance of facilities.

LAW = low-activity waste.

HLW = high-level waste.

PT = pretreatment.

LAB = analytical laboratory.

WTP = Waste Treatment and Immobilization Plant.

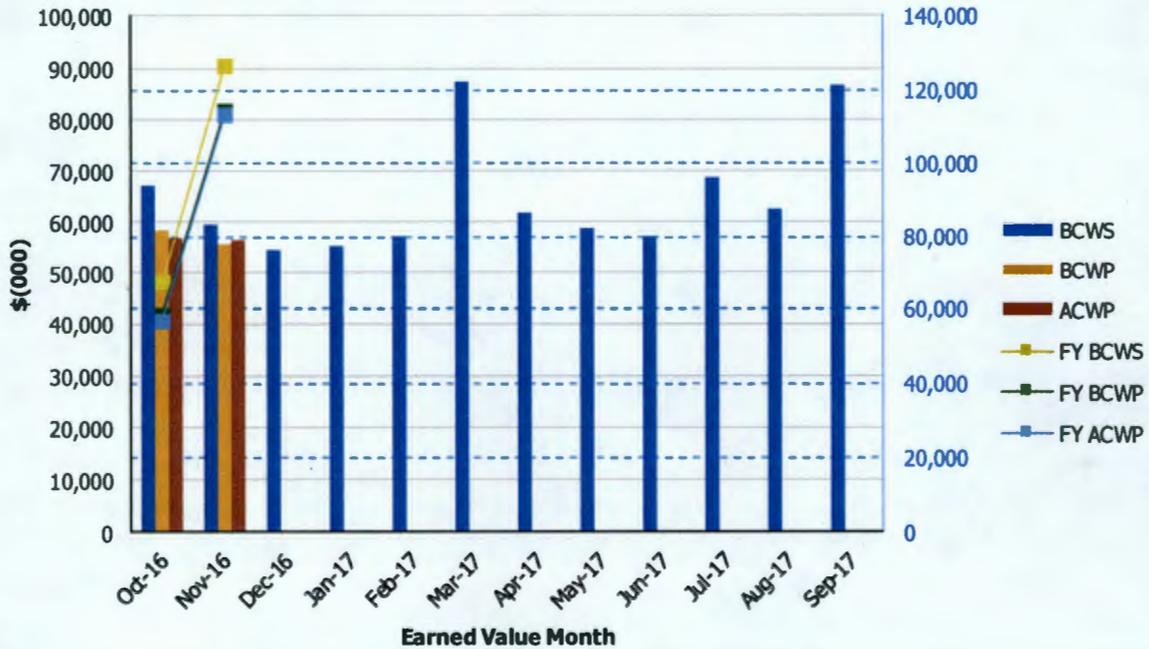
**EXC-01a: Fiscal Year Cost and Schedule Report**

Data Set: FY 2017 Earned Value Data

Data as of: November 2016

**River Protection Project  
Waste Treatment Plant (WTP) Project**

EVMS Monthly and Fiscal Year Values



Earned Value Month	BCWS	BCWP	ACWP	SPI	CPI	FY BCWS	FY BCWP	FY ACWP	FY SPI	FY CPI
Oct 2016	\$67,019	\$58,321	\$56,633	0.87	1.03	\$67,019	\$58,321	\$56,633	0.87	1.03
Nov 2016	\$59,361	\$55,681	\$56,299	0.94	0.99	\$126,379	\$114,002	\$112,932	0.90	1.01
Dec 2016	\$54,672									
Jan 2017	\$55,245									
Feb 2017	\$57,092									
Mar 2017	\$87,425									
Apr 2017	\$61,907									
May 2017	\$58,572									
Jun 2017	\$57,328									
Jul 2017	\$68,817									
Aug 2017	\$62,680									
Sep 2017	\$86,488									

PTD	\$9,954,495	\$9,915,012	\$9,843,021	1.00	1.01
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- ACWP = actual cost of work performed.
- BCWP = budgeted cost of work performed.
- BCWS = budgeted cost of work scheduled.
- CPI = cost performance index.
- CTD = contract to date.
- EVMS = earned value management system.
- FY = fiscal year.
- SPI = schedule performance index.

<b>Performance Tracking</b>	<b>SV (\$x1,000)</b>	<b>CV (\$x1,000)</b>
Cumulative (through Nov. 2016)	(\$39,483)	\$71,990
FY 2017 to-date	(\$12,377)	\$1,070
November 2016	(\$3,679)	(\$618)
October 2016	(\$8,698)	\$1,688
September 2016	(\$2,934)	(\$261)

SV = schedule variance.

CV = cost variance.

### **Earned Value Management System Analysis**

The earned value management system is intended to provide a status of how the contractor is progressing against its planned work (i.e., schedule), and whether it is costing more or less to complete the work than planned. The project plan is measured by expressing the schedule in terms of dollars spread over the anticipated project duration, and then for each month, determining how much of the planned work was accomplished or “earned,” as measured in equivalent dollars. If more work is accomplished than planned, then the project is ahead of schedule and has a favorable SV. Similarly, if less work is accomplished, the project is behind schedule and has an unfavorable SV. Accomplished work is reported in the month it was completed, which may not be when it was planned. For example, work completed in a month earlier than planned would be reported as a favorable SV for the month in which it was completed, but would be reported as an unfavorable SV in the month it was planned. The end result would be the overall cumulative SV netting out to zero over these months. Likewise, work completed late will recover an earlier reported unfavorable SV.

The CV measures the actual cost of work performed against the earned dollar value of that performed work. As an example, assume \$10,000 of work was planned to-date, \$8,000 was reported as being performed (earned), at an actual cost of \$9,000. This work would be reported as being \$2,000 behind schedule [a negative or unfavorable SV:  $\$8,000 - \$10,000 = (\$2,000)$ ], and has cost \$1,000 more [a negative or unfavorable CV:  $\$8,000 - \$9,000 = (\$1,000)$ ] than was planned for completing that work scope. Likewise, a favorable or positive CV would be reported if it cost less to complete the work than the performed dollar value of the work.

The SV and CV are reported for each monthly period, fiscal year-to-date, as well as for the project-to-date value. The monthly variances can fluctuate significantly (for reasons noted earlier), so the fiscal year or cumulative-to-date report provides a better indicator of the overall project completion status, and can give a reasonable projection of how the project will finish, based on the progress-to-date.

**Schedule Variance Summary:**

For the November reporting period, a net **unfavorable SV** of approximately **(\$3.7 million)** was reported, primarily due to the following:

- Scheduled work for LBL/DFLAW, at a net unfavorable SV of (\$2.6 million), was not completed due to construction delays in receipt of temporary authorization permitting and challenges with on-time pipe procurement deliveries (accordingly, construction is deferring site and concrete work); the engineering review of the draft LAW Preliminary Documented Safety Analysis (PDSA) was delayed due to late submittal of the PDSA; there was a delay in negotiations for the carbon media shakedown testing technical subcontract; the BOF commissioning delay was related to the management suspension of work, which froze maintenance and lockout/tagout work; BOF experienced startup delays in nonradioactive liquid disposal system testing and not receiving turnover of systems in the cooling tower and water treatment facilities.
- The PT Facility reported a net unfavorable SV of (\$1.6 million), mostly related to delays in the technical team's vessel testing at the National Energy Technology Laboratory, delay of simulant procurement for erosion/corrosion testing, and test completion team delays of simulant procurement and analysis. This was offset by testing equipment modifications being ahead of schedule, and a favorable plant equipment completion of final payments for two purchase orders.
- The HLW Facility reported a net favorable SV of \$0.5 million, mostly related to a reporting adjustment associated with cold weather construction shutdown and work priority replanning, and plant equipment early completion of a shield door recovery plug test frame assembly.

For the October reporting period, a net **unfavorable SV** of approximately **(\$8.7 million)** was reported, primarily due to the following:

- Scheduled work for LBL/DFLAW, at a net unfavorable SV of (\$4.7 million), was not completed due to equipment not being delivered as planned because of failed acceptance tests; delays in installation of DFLAW excavation shoring due to differing site conditions; a replanning delay of special coatings work to next summer; and delays in LAW engineering completions related to procurement support, the 90 percent design review for mechanical systems, and PDSA support. This was offset by early completion of planned construction activities and LAB maintenance activities being completed earlier than planned.
- The PT Facility reported a net unfavorable SV of (\$4.3 million) during the reporting period, mostly resulting from earlier purchases of pipe materials (\$2.9 million), and a Test Completion Team unfavorable SV of (\$1.1 million) resulting from delays in simulant procurement and analysis, vessel testing, and earlier completion of work scope.

For the September reporting period, a net **unfavorable SV** of approximately **(\$2.9 million)** was reported, primarily due to the following:

- LBL/DFLAW reported a net unfavorable SV of (\$4.6 million) due to unresolved issues with the carbon media shakedown testing and vendor delays for commercial grade dedication (CGD) procurements, delays in receipt of the LAW programmable protection system and DFLAW rotary screw compressor equipment deliverables, along with installation of electrical fixtures due to delays in receipt of the fixtures.
- HLW Facility engineering reported a delay in design calculations as resources were supporting design and operability reviews. Construction reported delays in civil work as a result of doing high-level work scope and the liner plate subcontractor taking longer to demobilize than planned. These delays were almost equally offset by early delivery of blocks or slabs used at the base of a column (e.g., plinths) and brackets, and approval of cable reel drawings submittals.
- PT Facility reported a net favorable SV of \$1.7 million, resulting from early purchase of pipe materials and replanning and removal of work scope, which was offset by work having been completed in earlier reporting periods.

#### **Cost Variance Summary:**

For the November reporting period, a net **favorable CV** of approximately **\$0.6 million** was reported, primarily due to the following:

- LBL reported a net unfavorable CV of (\$1.7 million), mostly related to significantly more engineering hours than planned in support of the draft PDSA development (which included multiple review teams, comment resolution/incorporation, and compiling of the draft PDSA); additional resources to close out actions related to the lockout/tagout management suspension of work; additional construction scaffold efforts to support electrical, architectural, pipe, and melter direct scope; and recovery of a delayed construction trailer setup.
- Project Services reported a net favorable CV of \$0.5 million, primarily due to Information Systems and Technology equipment and software, and furniture procurement costs being deferred to later months, and a reduction in administrative services labor hours.
- HLW Facility reported a net favorable CV of \$0.4 million, mostly from expedient civil craft installation performance, staffing underruns in non-manual field support, and less support needed than planned in the distributable support account; an engineering underrun in the remote change high-efficiency particulate air (HEPA) filter qualification fabrication and testing effort; and procurement needing less direct labor and supplier quality (subcontract) resources than planned.
- PT Facility reported a net favorable CV of \$0.2 million, mostly related to technical teams staff efficiencies for deliverables related to pulse jet mixer (PJM) vessel mixing and control and reduced support from the national laboratories.

For the October reporting period, a net **favorable CV** of approximately **\$1.7 million** was reported, primarily due to the following:

- LBL/DFLAW reported a net unfavorable CV of (\$0.2 million), resulting from a significant amount of engineering overtime hours worked during the period to support the LAW PDSA and multiple other reviews, along with higher freight and construction scaffolding costs. This was offset by DFLAW rotary screw compressor procurements coming in under budget, and lower labor costs in startup and commissioning activities due to lower staffing needs than planned.
- HLW Facility reported a net unfavorable CV of (\$0.5 million), resulting from unplanned gravel and permanent power installation at the Material Handling Facility, receipt of temporary construction cranes, and other minor adjustments.
- PT Facility reported a net unfavorable CV of (\$0.4 million), associated with improvements at the Material Handling Facility, and increased cost in support of completing Test Completion Team vessel testing and simulant development deliverables.
- Project Services reported a net favorable CV of \$2.8 million, primarily related to being understaffed compared to budgeted staffing levels, deferrals of equipment and software purchase, and a favorable adjustment related to a re-evaluation of actual construction subcontracts cost-to-date.

For the September reporting period, a net **unfavorable CV** of approximately **(\$0.3 million)** was reported, primarily due to the following:

- LBL/DFLAW reported a net unfavorable CV of (\$0.95 million), resulting from the early purchase of software used for Startup, more engineering hours spent on resolving CGD procurements than planned, delays in the carbon media shakedown testing, and more procurement support hours being needed than planned. This was offset by construction craft taking less time than planned for site work and pipe rack piping installation.
- HLW Facility reported a net unfavorable CV of (\$0.2 million), resulting from early work associated with procurement of the autosampling system (tied to CGD), and higher Project Services support cost than planned. This was offset by lower cost in engineering support scope, construction support staff less than planned, and civil work scope completion taking less time than planned.
- PT Facility reported a net unfavorable CV of (\$0.3 million), resulting from additional technical team hours expended to support completion of deliverables related to the technical issues (T4, T5-T7), and additional Nuclear Safety Division hours supporting key deliverables for T1 through T3. This was offset by less cost for gravel installation and Facility Services support staffing.
- Project Services reported a net unfavorable CV of (\$1.2 million), primarily related to not being staffed to budgeted staffing levels. This was offset by higher labor rates charges and more subcontractor work being performed than planned.

**WTP Project Cumulative through November 2016**

Through November 2016, the WTP Project is behind the planned work scheduled by (\$39.5 million), but it has cost about \$72.0 million less to perform the work than originally estimated. The cumulative to-date schedule and cost variances are reported against the LBL/DFLAW Performance Measurement Baseline, while the HLW Facility, PT Facility, and Project Services variances are still being reported against an Internal Forecast, pending rebaseline Baseline Change Proposals for those areas.

## **Pretreatment Facility**

***Federal Project Director:*** Bill Hamel

***Facility Federal Project Director:*** Wahed Abdul

As of September 2012, the PT Facility was 56 percent complete overall, with engineering design 85 percent complete, procurement 56 percent complete, construction 43 percent complete, and startup and commissioning 3 percent complete.

ORP continues to focus on resolving five outstanding WTP technical issues as described in the Amended Consent Decree (i.e., preventing potential hydrogen buildup, preventing criticality, ensuring control of the PJMs, protecting against possible erosion and corrosion, and ensuring an adequate ventilation system), while performing hazards analyses, and completing safety evaluations for process systems in accordance with the revised PT Facility Three-Year Interim Work Plan.

The WTP Project has made sustained progress on resolution of the five outstanding technical issues. ORP attained resolution and closure of the nuclear safety technical issues, “Preventing Potential Hydrogen Build-Up” and “Preventing Criticality” during December 2016 (specifically, T1 in relation to hydrogen gas events in vessels, T2 in relation to criticality in PJM vessels, and T3 in relation to hydrogen in piping and ancillary vessels). Work will continue in 2017 on resolving the remaining technical issues. ORP has worked with BNI to develop closure packages for each remaining technical issue, defining work scope, required deliverables, and technical issue closure criteria.

**Quarterly Statement:** There are no missed milestones that may affect compliance with other milestones.

### **Accomplishments during the Reporting Period**

- ORP, in coordination with BNI and DOE Office of Environmental Management (EM) staff, provided the technical basis for resolution of the Defense Nuclear Facilities Safety Board (DNFSB) identified safety issue associated with hydrogen generation and control in PT Facility process vessels mixed with PJM (also referred to as ORP technical issue T1). The documents were provided to the DOE Assistant Secretary for Environmental Management (EM-1). Based on the extensive analyses completed, ORP considers the DNFSB safety issue regarding hydrogen retention and control and heat transfer in PJM vessels resolved.
- ORP, in coordination with BNI and EM staff, provided the technical basis to EM-1 for resolution of the DNFSB identified safety issue associated with criticality in PJM vessels (also referred to as ORP technical issue T2). The criticality issue was extensively investigated and does not represent a credible hazard based on the proposed controls in the WTP Preliminary Criticality Safety Evaluation Report, and a proposed strategy in an engineering study used to evaluate potential treatment of Hanford tank waste containing plutonium particulates and oxide. Based on the resolution of the DNFSB safety issue on criticality, ORP considers the criticality issue resolved and has determined WTP is ready

to resume PT Facility and HLW Facility design completion in areas related to criticality design.

- ORP, in coordination with BNI and EM staff, provided the technical basis to EM-1 for resolution of the DNFSB identified safety issue associated with hydrogen in piping and ancillary vessels (HPAV) (also referred to as ORP technical issue T3). ORP has determined WTP is ready to resume PT Facility design completion in areas related to HPAV process piping.
- ORP and BNI initiated testing of a proposed PJM standard high-solids vessel (SHSV) design to replace a number of vessel designs in the PT Facility (this is in relation to resolving concerns over PJM vessel mixing and control, also referred to as ORP technical issue T4). A prototype of the 16-foot-diameter SHSV was commissioned on December 22, 2016. The scheduled testing will complete the final stage of PJM control system testing to support resolution of control issues applicable to PT Facility vessels with high solids concentrations and non-Newtonian slurries. This testing will demonstrate the required PJM control parameters and control approach to be used during the qualification of the design for the SHSV design. Testing is expected to be completed by December 2017 and will provide the required design and operations information to support completion of the PT Facility design.
- BNI issued a Basis of Design Change Notice establishing the erosion/corrosion basis of design parameters (this is in relation to resolving concerns over erosion/corrosion in piping and vessels, also referred to as ORP technical issue T5).
- BNI issued the SHSV Conceptual Design Plan to ORP for concurrence.

#### **Accomplishments Expected in the Next Three Months**

- BNI to complete the erosion/corrosion synergistic test simulant qualification and final recipe.
- BNI will continue testing the SHSV design prototype, focusing on the PJM control system testing.
- ORP and BNI will continue efforts to resolve the spray leak methodology and sliding bed wear issues identified by the DNFSB in its *26<sup>th</sup> Annual Report to Congress*, dated March 2016. Resolution of these issues is significant in supporting ORP's decision to resume production engineering at the PT Facility.
- BNI to start the full-scale vessel operational set point test.
- BNI to complete non-Newtonian blend testing at the National Engineering Technology Laboratory.
- BNI to update the localized corrosion test basis document update.
- ORP to review the SHSV Conceptual Design Plan.

### Issues Encountered during the Reporting Period

- PT Facility budgets are challenged because of the need for additional funding to support the DFLAW.
  - *Impact:* It is not anticipated at this time that a potential budget reduction would affect DOE's ability to achieve Consent Decree milestones; however, it would delay completing PT Facility redesign activities.
  - *Actions initiated or taken to address potential project schedule slippage:* Continue to discuss the funding needs for the WTP Project with DOE Headquarters, including the remaining technical issue resolution, and engineering, procurement, and construction work at the PT Facility.

### Issues Expected in the Next Three Months

- Funding for the PT Facility has been constrained due to higher priority LBL work within WTP, which has resulted in limited work on technical issue resolution.
  - *Impact:* The project schedule for completing the PT Facility redesign could be at risk.
  - *Actions initiated or taken to address potential project schedule slippage:* Continue to discuss the funding needs for the WTP Project with DOE Headquarters, including the remaining technical issue resolution, and engineering, procurement, and construction work at the PT Facility to ensure funds are made available.

### Status of Outstanding WTP Technical Issues

ORP attained resolution and closure of the nuclear safety technical issues, "Preventing Potential Hydrogen Build-Up" and "Preventing Criticality" during December 2016 (specifically, T1 in relation to hydrogen gas events in vessels, T2 in relation to criticality in PJM vessels, and T3 in relation to hydrogen in piping and ancillary vessels). Work will continue in 2017 on resolving the remaining technical issues. ORP has worked with BNI to develop closure packages for each technical issue, defining work scope, required deliverables, and technical issue closure criteria. The status for each of the five technical issues is provided below:

- ***Preventing Potential Hydrogen Build-Up:***
  - *Issue:* This issue encompasses two separate but related hydrogen risks:
    - Risk of combustion in vessel headspace due to hydrogen accumulation (T1)
    - Risk of HPAV that could lead to a hydrogen deflagration or detonation in a piping system (T3).
  - *Progress:*
    - Hydrogen in Vessels – ***Resolved:***  
BNI provided an engineering study with supporting calculations in August 2016 to document the proposed hydrogen control strategy for vessels consisting of both

preventive and mitigation controls. The analysis and calculations included the impact of decay heat, process changes, and assumptions on hydrogen generation rate and consequences. ORP completed a formal review of BNI's study, calculations, and proposed hydrogen controls; and solicited comments from DOE Headquarters and DNFSB staff. As a result of these reviews, additional calculations and analyses were added to the engineering study.

Based on the extensive analyses completed and documented in the engineering study, ORP considers the DNFSB identified issue associated with hydrogen retention and control, and heat transfer in PJM vessels resolved. ORP has determined WTP is ready to resume PT Facility design completion in areas related to hydrogen retention and control. ORP will proceed with final design and safety basis development of the PT Facility using the hydrogen control strategies presented in the engineering study.

- **HPAV – Resolved:**

BNI submitted the HPAV PDSA Change Package and supporting calculations to ORP for formal review and approval in July 2016. ORP conducted its formal review of the HPAV PDSA Change Package and supporting documents; and solicited comments from DOE Headquarters and DNFSB staff on those documents. BNI developed a Basis of Design Change Notice and Safety Requirements Document Change Notice to confirm HPAV considerations are consistent with the PDSA Change Package. The combination of the HPAV PDSA, Basis of Design Change Notice, and Safety Requirements Document changes were approved in December 2016. These documents provide the basis to approve the path forward for HPAV design and nuclear safety basis development, resolving this technical issue.

- **Preventing Criticality:**

- *Issue:* A total of 16 Hanford waste tanks may contain plutonium particles of the size and density that makes them prone to settling in a WTP process vessel in a configuration that could result in an inadvertent criticality event (T2).

- *Progress – Resolved:*

- BNI submitted a revision to the WTP Criticality Safety Evaluation Report (CSER) in March 2016. ORP reviewed and approved the CSER revision with four conditions of approval in June 2016. ORP also reviewed and accepted an engineering study evaluating the potential heavy plutonium particulates in the PT Facility design basis. DOE's Criticality Safety Support Group performed an independent review of the WTP criticality documentation and issued a report from its review in the fourth quarter of calendar year 2016. The criticality issue, as described in the Statement of Issue, has been extensively investigated and does not represent a credible hazard based on the proposed controls in the WTP CSER and proposed strategy in the Criticality Safety Evaluation Engineering Study. Based on resolution of the DNFSB identified issue on criticality, ORP considers the criticality issue resolved and has determined WTP is ready to resume PT and HLW Facility design completion in areas related to criticality design.

- ***Ensuring Control of the PJMs:***

- *Issue:* Concern with adequacy of PJMs and PJM controls to adequately mix high-solids slurries in PT Facility process vessels (also referred to as ORP technical issue T4 [PJM vessel mixing and control]).
- *Progress:*
  - As ORP has previously reported, BNI is conducting a three-phased test program to demonstrate the ability of PJM vessels to adequately mix high-solids slurries in the PT Facility. Results from the first and second phase of PJM control system testing were previously provided.
  - The third phase of PJM control system testing has been initiated. ORP and BNI have identified a new proposed PJM mixed SHSV design to replace a number of vessel designs in the PT Facility. A prototype of the 16-foot-diameter SHSV was commissioned on December 22, 2016. This testing will complete the final stage of PJM control system testing to support resolution of control issues applicable to PT Facility vessels with high-solids concentrations and non-Newtonian slurries. This testing will demonstrate the required PJM control parameters and control approach to be used during the qualification of the design for the SHSV design. Testing is expected to be completed by December 2017 and will provide the required design and operations information to support completion of the PT Facility design.

- ***Protecting against Possible Erosion and Corrosion:***

- *Issue:* Uncertainties exist in waste feed characteristics and the ability to meet a 40-year service life; requiring confirmation erosion/corrosion design basis, including margin, through testing and analysis (also referred to as ORP technical issue T5 [erosion/corrosion in piping and vessels]).
- *Progress:*
  - A testing program to provide the technical information to underpin the design basis for erosion and corrosion is being implemented.
  - A WTP Basis of Design Change Notice establishing the erosion/corrosion basis of design parameters was issued in November 2016.
  - A pipe loop test platform to evaluate wear in piping is complete and the test plan is in final development. This testing is focused on confirming the design basis for wear in piping systems caused by transfer of slurries and is expected to start in February 2017.
  - Laboratory scale corrosion testing to assess localized corrosion material degradation mechanisms started in August 2016 and approximately 35 percent of the test runs have been completed. This testing involves immersion of small metal samples in fluids representing anticipated WTP chemistries. Material degradation mechanisms being evaluated include pitting, crevice cracking, and stress cracking.

- Test platform shakedown of bench scale jet impingement test equipment apparatus continues. This test platform will be used to evaluate erosion wear from the impinging PJM jets in process vessels.
- A multi-mineral synergistic test simulant is being developed for the erosion testing. Selection and qualification of the simulant minerals is in progress.
- ***Ventilation System:***
  - *Issue:* There are multiple technical challenges associated with the PT Facility ventilation system, including cascading airflows from lower to higher contaminated areas and performance of HEPA filters (also referred to as ORP technical issue T8 [facility ventilation/process offgas treatment]).
  - *Progress:*
    - Resolution of this technical issue requires completing engineering/nuclear safety assessments to ensure the PT Facility ventilation system meets performance requirements, which would be initiated once the PJM testing and its ventilation demands are finalized.
    - Testing of HEPA filters to ensure filters can withstand environmental conditions and loading during normal and off normal operating conditions continues. HEPA filter design and qualification testing have been performed and reported under the HLW Facility project. Several filter designs were under consideration and are on parallel tracks for testing and qualification. One of the filter designs has successfully completed NQA-1 qualification testing at Mississippi State University for all WTP normal and abnormal conditions. The final test report is expected to be issued in early 2017.

## High-Level Waste Facility

**Federal Project Director:** Bill Hamel

**Facility Federal Project Director:** Wahed Abdul

Work on the HLW Facility is now being performed in accordance with the FY 2017 – FY 2021 Interim Work Plan, although BNI is still working under a limited construction and procurement authorization. The WTP contractor is currently focusing its efforts on completing activities required to obtain full-production authorization from ORP. In addition, BNI has submitted a Facility Completion Plan for ORP review and approval identifying the strategy for completing engineering, procurement, and construction of the HLW Facility.

**Quarterly Statement:** There are no missed milestones that may affect compliance with other milestones.

### Accomplishments during the Reporting Period

- ORP provided comments to BNI on the submitted HLW Facility Completion Plan for resolution. The document provides the strategy, approach, and key deliverables required for ORP to authorize full release of procurement and construction of the HLW Facility. In addition, the plan provides the strategy for development of the revised performance baseline.
- BNI completed NQA-1 full-scale HEPA filter testing of the safe-change and remote-change filters to support the WTP ventilation and offgas needs.
- ORP received the draft HLW Facility PDSA update aligning the facility design and the safety basis for review and approval.
- BNI submitted the HLW Facility canister receipt handling system engineering study for review.
- BNI issued the melter cave support handling engineering study.
- BNI provided the draft HLW Facility offgas process system Phase II engineering study for ORP review.
- BNI issued the radioactive solid waste handling system operability engineering study.
- ORP is in the process of reviewing the draft HLW PDSA update submitted by BNI.
- BNI released material procurement and fabrication of RLD-8. RLD-8 is located in the wet process cell and must be installed prior to concrete slab placement to support roof installation.

### Accomplishments Expected in the Next Three Months

- Phase II melter offgas processing system engineering study is expected to be completed by BNI in early 2017. Over the past several months, BNI developed several key engineering studies, which have been effective in the disposition of HLW Facility design and operability vulnerabilities by establishing the pathway to resolve HLW Facility

design and operational issues. The disposition of all HLW design and operability issues will be completed in early 2017.

- BNI design of the remaining portions of the radioactive liquid disposal system (Phase II) will continue following incorporation of the recently approved radioactive liquid disposal PDSA Change Package. Material procurement and fabrication has been authorized for vessel RLD-8, with vessel RLD-7 authorization to proceed with fabrication expected in early 2017. BNI and ORP developed a risk mitigation strategy to allow vessel fabrication to continue, but not be completed, during completion of the additional analysis being performed. Installation of these two vessels allows the concrete slab to be placed over the wet process cell in support of installation of the facility roof and weathering-in of the facility.
- ORP to receive the formal HLW Facility PDSA update for approval.
- ORP approval of the HLW Facility Completion Plan is expected in early calendar year 2017.
- BNI to issue the reports associated with the full-scale testing and final selection of HEPA filters supporting the ventilation and offgas systems of HLW and LBL Facilities.
- BNI to continue limited civil build-out of the HLW Facility focusing on weathering-in the building.

#### **Issues Encountered during the Reporting Period**

- Funding for the HLW Facility continues to be constrained due to higher priority LBL work within the WTP. This has resulted in limited engineering resources to perform production work. Limited construction is continuing and an important project objective is to weather-in the HLW Facility. Due to funding limitations, design and construction is limited such that installing a roof and siding on the facility is not expected in the near term.
  - *Impact:* Delay in completing HLW Facility redesign activities.
  - *Actions initiated or taken to address potential project schedule slippage:*
    - Continue to discuss the funding needs for the WTP Project with DOE Headquarters, including the remaining engineering, procurement, and construction work at the HLW Facility.
    - Evaluating funding alternatives and planning scenarios to define additional scope that could be performed if increased funding becomes available.

#### **Issues Expected in the Next Three Months**

- Funding for the HLW Facility has been constrained due to higher priority LBL work within WTP. This has resulted in limited engineering and construction resources to perform production work.
  - *Impact:* The project schedule for completing the HLW Facility could be impacted.

- *Actions initiated or taken to address potential project schedule slippage:* Continue to discuss the funding needs for the WTP Project with DOE Headquarters, including the remaining engineering, procurement, and construction work at the HLW Facility to ensure funds are made available.

## **Low-Activity Waste Facility**

**Federal Project Director:** Bill Hamel

**Facility Federal Project Director:** Jeff Bruggeman

As of November 2016, the LAW Facility was 58 percent complete overall, with engineering design 79 percent complete, procurement 74 percent complete, construction 82 percent complete, and startup and commissioning 8 percent complete.

Milestones associated with the commissioning of LAW are on schedule.

**Quarterly Statement:** There are no missed milestones that may affect compliance with other milestones.

### **Accomplishments during the Reporting Period**

- BNI set the caustic scrubber vessel in its final position in mid-November, and the caustic scrubber internals arrived onsite in late December.
- BNI completed radiographic testing of nine wet electrostatic precipitator nozzles to verify adequacy of welds.
- BNI completed base frame modifications on both melters.
- ORP and BNI received approval of melter dangerous waste permit from Ecology.
- BNI completed redesign of the melter jack-bolts as progress continues on completing the melters.
- BNI temporarily installed bubblers for both melters to verify proper fit-up of melter shield lid.
- BNI welded shield lids onto melter 1.

### **Accomplishments Expected in the Next Three Months**

- BNI to weld shield lid onto melter 2.
- BNI to deliver and install melter offgas caustic scrubber internals.
- ORP to evaluate preliminary hazard category calculation for LAW.
- BNI to develop hazard identification checklist, what-if tables, and process hazard analysis events for accident scenarios to support PDSA update development.
- BNI to continue installation of LAW Facility secondary offgas/vessel vent process system pipe tie-ins between thermal catalytic oxidizer and ammonia skid.
- BNI to receive grapples, thermocouple, and thermowells from vendors.

### **Issues Encountered during the Reporting Period**

- No new issues were encountered during the reporting period.

**Issues Expected in the Next Three Months**

- An ongoing issue for the project has been the concern about how BNI has managed its CGD program.
  - *Impact:* This puts at risk some of the equipment purchased that performs a specific safety function in the LAW Facility. The consequence of identified CGD deficiencies are:
    - Material requisitions with vendors will need to be revised or re-established to incorporate the new CGD documentation and test requirements.
    - CGD plans produced by both vendors and WTP will be required to be updated; additional documentation and testing will be required to meet the updated CGD plans; where test results or documentation cannot demonstrate items meet the required critical characteristics, items will need to be repurchased to replace existing equipment.
  - *Actions initiated or taken to address potential project schedule slippage:*
    - Additional personnel have been added to the CGD group to work on both WTP-generated and vendor-generated CGD packages to update the CGD plans and documentation to meet current customer expectations.
    - New staff and/or subcontractors have been added to provide subject matter expertise and oversight to enhance the CGD program.
    - Every effort will be made to qualify existing items to the new CGD plans. This may involve modifying existing requisitions or reopening closed material requisitions to upgrade the CGD plans and provide additional documentation and testing of items, or generating new material requisitions to purchase replacement equipment that cannot be qualified.
- Nuclear safety documents being developed by BNI during the design phase PDSA and the scheduled activities for the final documented safety analysis have been taking longer than planned.
  - *Impact:* Delay in DOE approval of the documented safety analysis could impact some early LAW Facility commissioning activities.
  - *Actions initiated or taken to address potential project schedule slippage:* The project team has been hosting workshops with the nuclear safety teams from BNI and ORP to outline expectations and come to a common understanding of document development deliverables. A draft PDSA was submitted by BNI in early December 2016 for ORP initial review.
- Project team has been evaluating concerns about the controls associated with the LAW Facility C5 ventilation system (C5V) as it provides a safety function for the offgas system that prevents noxious gas from the melters from harming the facility workers.
  - *Impact:* The LAW C5V may require redesign for purposes of safety classification.

- *Action initiated or taken to address potential project schedule slippage:* BNI developed a safety control strategy for loss of LAW Facility melter plenum vacuum due to offgas system failure that will not require significant modifications to C5V systems. ORP concurred with the safety control strategy and this issue is considered closed.

## **Balance of Facilities**

***Federal Project Director:*** Bill Hamel

***Facility Federal Project Director:*** Jason Young

As of November 2016, BOF was 62 percent complete overall, with engineering design 81 percent complete, procurement 78 percent complete, construction 88 percent complete, and startup and commissioning 22 percent complete. Design of the Effluent Management Facility (EMF) was 66 percent complete.

**Quarterly Statement:** There are no missed milestones that may affect compliance with other milestones.

BOF will provide services and utilities to support operation of the main production facilities: PT, HLW, LAW, and LAB. The BOF are designed to support operation of the entire WTP and construction is complete for the majority of BOF systems. To improve operational flexibility and support WTP operations in a DFLAW configuration, additional construction and facility modifications are required. Operational flexibility improvements to the BOF include:

- Design and construction of an EMF to concentrate effluents from the LAW Facility, allow transfer of secondary effluent stream to the Liquid Effluent Retention Facility/Effluent Treatment Facility, and provide a low point drain for potential contaminated systems during DFLAW operations.
- Addition of a fourth rotary screw air compressor to the chiller compressor plant and piping reconfigurations to optimize operations at a reduced facility output level.
- Modifications to steam plant piping and equipment to optimize operations at a reduced facility output level.
- Construction of a fenced area to separate the portion of WTP actively operating in a DFLAW configuration from the ongoing construction activities for the HLW and PT facilities.
- Improved isolation capabilities for BOF systems to maintain safe control and isolation within the DFLAW operations area.

## **Accomplishments during the Reporting Period**

- BNI submitted the EMF Secondary Containment Permit to Ecology on November 22, 2016.
- EMF Secondary Containment Permit 60-day public comment period began on November 28, 2016. As part of the public comment process a public meeting was scheduled for December 14, 2016, but was rescheduled due to unsafe travel conditions caused by weather.
- To accelerate the EMF design BNI has decided to self-perform the design of the EMF evaporator and provide the required design information to the selected fabrication facility.

- BNI has completed the rebar and formwork placement required to support placement of the EMF basemat and stem walls.
- Subcontractor for soldier pile placement completed drilling and began excavation of the low-point drain section of the EMF.
- BNI initiated component testing for the newly installed portions of the cathodic protection system rectifiers.
- BNI completed the functional review of installation of the fire detection and alarm system fire detection equipment in the Water Treatment Facility (Building 86) and Cooling Tower Facility (Building 83).
- BNI completed the acceptance test report for switchgear Building 87 and switchgear Building 91.

#### **Accomplishments Expected in the Next Three Months**

- As part of the EMF Secondary Containment Permit public comment process, a public meeting was held on January 9, 2017.
- BNI will submit a request to Ecology requesting authorization to place the basemat and stem walls for the EMF in parallel with continued permit review activities.
- Required repairs for the BOF Switchgear transformers will be completed by a subcontractor.
- BOF switchgear (Building 91) will complete testing required for energization from the WTP switchgear (Building 87).
- Initial startup testing activities will begin in the Water Treatment Facility.

#### **Issues Encountered during the Reporting Period**

- An extended review of the Draft EMF Secondary Containment Permit delayed formal submittal of the permit from the scheduled date of September 22, 2016, to November 22, 2016, and resulted in further delays to the DFLAW critical path.
  - *Impact:* Delays in approval of the EMF Secondary Containment Permit delayed placement of the EMF basemat and stem walls. BNI completed placement of the rebar and formwork required for the basemat and will be suspending work activities until temporary authorization is received from Ecology. This delays the DFLAW critical path, but is not anticipated at this time to affect DOE's ability to achieve Consent Decree milestones.
  - *Actions initiated or taken to address potential WTP project schedule slippage:*
    - Discussions with Ecology continued on comments to the Draft Secondary Containment Permit.
    - Strategic discussions were held with Ecology to evaluate options for the permitting process at EMF that will help recover schedule.

**Issues Expected in the Next Three Months**

- If similar conditions in Building 87 occur for Building 91, such as deficient material conditions and incomplete test procedures, distribution of power to the rest of the BOF will be delayed.
  - *Impact:* Delayed testing of BOF switchgear systems delayed power distribution to the Cooling Tower Facility as well as its availability to support component testing in other BOF.
  - *Actions initiated or taken to address potential project schedule slippage:*
    - Delays to the energized testing of the nonradioactive liquid waste disposal system and Water Treatment Facility can be mitigated via a temporary power supply. However, the large electrical load of the cooling tower pumps requires energization from the permanent power supply via Building 91.
    - Breakers refurbishment for the 4160V and 480V distribution systems continue.
    - Test procedure preparation is being prioritized.

## **Analytical Laboratory**

***Federal Project Director:*** Bill Hamel

***Facility Federal Project Director:*** Jason Young

The LAB will support WTP operations by analyzing samples of waste feed, vitrified waste, and effluent streams from the WTP processing facilities. As of November 2016, the LAB was 62 percent complete overall, with engineering design 81 percent complete, procurement 88 percent complete, construction 95 percent complete, and startup and commissioning 15 percent complete.

**Quarterly Statement:** There are no missed milestones that may affect compliance with other milestones.

### **Accomplishments during the Reporting Period**

- BNI loaded software and began testing control and monitoring systems in the test engineers' workstation to support the nonradioactive liquid waste disposal system functional tests.
- BNI received replacement heating, ventilation, air-conditioning [HVAC] condenser.

### **Accomplishments Expected in the Next Three Months**

- BNI to issue the temporary laboratory space request for proposal, which allows for earlier laboratory methods development and training to ensure laboratory staff are ready at the start of commissioning.
- BNI to perform final functional tests of test engineers' workstation with approved software.
- BNI to install replacement HVAC condenser.

### **Issues Encountered during the Reporting Period**

- There is a potential the radioactive material handling hoods in the LAB, which are currently ventilated by the C3V system, may have C5V airborne contamination levels.
  - *Impact:* Modifications to the LAB hood ventilation may be required
  - *Action initiated or taken to address potential project schedule slippage:* BNI is in the process of completing an engineering evaluation, which will close the condition report and associated risk to the baseline.

### **Issues Expected in the Next Three Months**

None expected.

## Written Directives

Written directives from October 1, 2016, through December 31, 2016, have been included with this report.

No written letters of direction were issued to WRPS during the reporting period.

Eighteen letters of direction were issued to BNI during the reporting period. The letters are listed below and copies are attached:

- 16-CPM-0150, “Transmittal of Contract Modification No. 379,” – dated October 21, 2016
- 16-CPM-0154, “Transmittal of Contract Modification No. 380 – Revision to the Not-To-Exceed Value for the Funding Limitation Established in the Change Order for the Procurement of the Effluent Management Facility (EMF) Equipment and Effluent Transfer Lines and Limited EMF Construction Previously Incorporated in Modification 354,” dated October 27, 2016
- 16-CPM-0155, “Transmittal of Contract Modification No. 381 – Change Order to Upgrade Portions of the Low Activity Waste Carbon Dioxide System to Safety Significant,” dated November 7, 2016
- 16-CPM-0158, “Transmittal of Contract Modification No. 382 – Revision to the Not-To-Exceed Value Established in the Change Order for Full-Scale Vessel and Proof-of-Concept Testing Beyond RLD-8 Previously Incorporated in Modification 372,” dated November 9, 2016
- 16-CPM-0160, “Request for Signature - Contract Modification No. 383,” dated November 18, 2016
- 16-CPM-0173, “Transmittal of 2017 Performance Evaluation and Measurement Plan,” dated December 30, 2016
- 16-CPM-0174, “Transmittal of Contract Modification No. 385 – Change Order for Partial Reclassification of the Low-Activity Waste Facility C5 Ventilation System to Safety Significant,” dated December 22, 2016
- 16-CPM-0176, “Transmittal of Contract Modification No. 386,” dated December 29, 2016
- 16-NSD-0044, “Agreement With Implementation Plan Revision for Waste Treatment and Immobilization Plant Contract, Section C, Standard 9, Nuclear Safety,” dated November 9, 2016
- 16-NSD-0058, “Approval of Preliminary Documented Safety Analysis Change Package to Reflect Updated Unmitigated Consequence Calculations and Associated Functional Classification for Structures, Systems, and Components Associated With Hydrogen in Piping and Ancillary Vessel,” dated December 17, 2016

- 16-SHD-0073, “Approval of Fiscal Year 2017 Performance Objectives, Measures, and Commitments and Revised Integrated Safety Management System Description,” dated December 12, 2016
- 16-WSC-0064, “Contract Deliverable 1.4 – Interface Management Plan, Rev. 9,” dated December 6, 2016
- 16-WTP-0190, “Direction to Cancel DOE Risk ID: 619 (Legacy Risk Numbers: DOE-049 and CON-052) – ‘Recovery of Equipment Salvage Value,’” dated October 26, 2016
- 16-WTP-0202, “New Direction Related to Use of Authorized Unpriced Work,” dated November 1, 2016
- 16-WTP-0218, “Potential Direct Feed Low-Activity Waste Project Impacts Due to Effluent Management Facility Permitting Delays,” dated November 18, 2016
- 16-WTP-0238, “Acceptance of Completion of Activity Milestone BOF-05, Complete Electrical Distribution System Testing MVE (Site Energization),” dated December 12, 2016
- 16-WTP-0250, “Concurrence With Safety Strategy Summary Document for Low-Activity Waste Facility Melter Offgas/Oxides of Nitrogen Releases,” dated December 22, 2016.

**Retrieval Labor Hours****Federal Project Director:** Ben Harp**Facility Operations Activity Manager:** Chris Kemp

**Labor Hours Expended on Self Contained Breathing Apparatus  
(October – December 2016)**

	<b>SCBA Direct Labor Hours</b>	<b>SCBA Subcontractor Hours<sup>1</sup></b>	<b>Total SST Operation Hours</b>	<b>Total Hours<sup>2</sup></b>	<b>Total Percent on SCBA</b>	<b>Detrimental Impacts<sup>3</sup></b>
C Farm	11,312	3,659	14,971	52,669	28%	92
A/AX Farm	4,447	6,010	10,457	50,496	21%	92
<b>Total</b>	<b>15,759</b>	<b>9,669</b>	<b>25,428</b>	<b>103,165</b>	<b>25%</b>	<b>92</b>

<sup>1</sup> Subcontractor hours include labor hours from subcontractors including; North Point Electrical Contracting Inc., Geophysical Survey Inc., Fowler General Construction, American Electric, BNL Technical Services, and Intermech Inc.

<sup>2</sup> Includes all labor hours that supported SST farms in retrieval including support outside farm fence (Engineering, Project Management and other support accounts)

<sup>3</sup> Detrimental impacts are presented as the number of days in which a stop work related to SCBA use prevented field operations from continuing. It is limited to SCBA stop works only and excludes vapor impacts (i.e., AOP-15 events).

SCBA = self-contained breathing apparatus.

SST = single-shell tank.

## **Spare Reboiler Requirement Status**

***Facility Project Director:*** Ben Harp

***Facility Operations Activity Manager:*** Paul Hernandez

Description of activity and progress made for the spare E-A-1 re-boiler for the 242-A Evaporator, including a description of cost and schedule performance:

- Since issuance of the March 11, 2016, Amended Consent Decree, DOE has provided WRPS with funding to accelerate the planned FY 2017 work to design and procure the spare E-A-1 re-boiler. DOE ORP authorized WRPS to proceed by awarding a not-to-exceed contract action.
- Proposals for the design/build of the new spare 242-A Evaporator reboiler were received by procurement.
- WRPS awarded a design/fabrication contract (P.O. 00061664) for the 242-A spare reboiler to ABW Technologies Inc., on November 15, 2016.
- WRPS and ABW Technologies Inc., are in the process of finalizing the design/fabrication schedule with associated with the new spare 242-A Evaporator reboiler.

Enclosure

(140 Pages Excluding Cover Sheet)

Written Directives from October 1, 2016, through December 31, 2016



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**OCT 21 2016**

16-CPM-0150

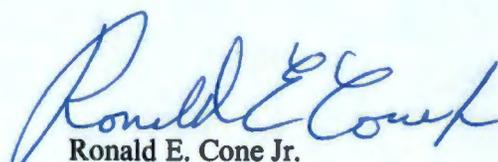
Ms. L. W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT  
MODIFICATION NO. 379**

The purpose of this letter is to transmit an executed original of the subject modification. This modification revises Contract Section B, Supplies or Services and Prices/Costs, to obligate incremental funding and update Inter-Entity Work Order funding. The updated conformed contract section can be accessed from the U.S. Department of Energy, Office of River Protection website.

If you have any questions regarding this contract action, please contact Katie Mair at (509) 376-4427.



Ronald E. Cone Jr.  
Contracting Officer

CPM:KAM

Attachment

cc w/attach:  
BNI Correspondence

Attachment  
to  
16-CPM-0150

Contract Modification 379

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE: **17EM000055**      PAGE **1** OF **4** PAGES

2. AMENDMENT/MODIFICATION NO. **379**      3. EFFECTIVE DATE (M/D/Y) **See Block 16C**      4. REQUISITION/PURCHASE REQ. NO. **17EM000055**      5. PROJECT NO. (If applicable)

6. ISSUED BY CODE      7. ADMINISTERED BY (If other than Item 6) CODE

**U.S. Department of Energy  
Office of River Protection  
P. O. Box 450, MS H6-60  
Richland, WA 99352**

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.     

9B. DATED (SEE ITEM 11)     

10A. MODIFICATION OF CONTRACT/ ORDER NO.       **DE-AC27-01RV14136**

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)

**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) Clause B.3, "Obligation and Availability of Funds," Clause I.66 "Limitation of Funds"

E. IMPORTANT: Contractor  is not,  is required to sign this document and return 2 copies to the issuing office.

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

See following page(s)  
Period of Performance: 12/11/2000 to 8/15/2019

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)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
	<b>Ronald E. Cone Jr. Contracting Officer</b>
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED
(Signature of person authorized to sign)	
16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
BY <i>Ronald E. Cone Jr.</i> (Signature of Contracting Officer)	<b>10-21-2016</b>

**Purpose of Modification:**

The purpose of this modification is to make the following changes:

1. The purpose of this modification is to update Contract Section B, *Supplies or Services and Prices/Costs*, to obligate incremental funding provided under Purchase Requisition Number 17EM000055. Incremental funding provided herein is as follows:

Description	Control Point	Appropriation Year	Funded Amount
BOF	1111243	2017	\$20,000,000.00
DFLAW	1111243	2017	\$20,000,000.00
HLW	1111244	2017	\$10,000,000.00
PT	1111245	2017	\$16,500,000.00
LAB	1111242	2017	\$4,000,000.00
LAW	1111241	2017	\$54,000,000.00
		<b>Total</b>	<b>\$124,500,000.00</b>

2. Update Inter-Entity Work Order Funding as follows:

IEWO ID Number	IEWO Amendment No.	Funding
MOFTV00117 Funding (NETL)	4	\$100,000.00
	<b>TOTAL</b>	<b>\$100,000.00</b>

**Description of Modification:**

1. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a) is revised as follows:

- The total amount of funds obligated to Balance of Facilities 1111243 is increased by \$20,000,000.00 from \$472,649,525.21 to \$492,649,525.21.
- The total amount of funds obligated to Direct Feed Low Activity Waste 1111243 is increased by \$20,000,000.00 from \$82,063,073.13 to \$102,063,073.13.
- The total amount of funds obligated to High Level Waste 1111244 is increased by \$10,000,000.00 from \$1,004,573,076.81 to \$1,014,573,076.81.
- The total amount of funds obligated to Pre Treatment 1111245 is increased by \$16,500,000.00 from \$1,434,170,497.24 to \$1,450,670,497.24.
- The total amount of funds obligated to Analytical Laboratory 1111242 is increased by \$4,000,000.00 from \$324,312,452.11 to \$328,312,452.11.

- The total amount of funds obligated to Low Activity Waste 1111241 is increased by \$54,000,000.00 from \$1,359,240,597.50 to \$1,413,240,597.50.
- The total funding obligated to the Budgetary Control Points, is increased by \$124,500,000.00 from \$10,190,638,865.34 to \$10,315,138,865.34.
- The total funding obligated to the Budgetary Control Points, including Program Direction funding, is increased by \$124,500,000.00 from \$10,193,128,865.34 to \$10,317,628,865.34.
- IEWO M0FTV00117 (NETL) is updated to Amendment No. 4 and funding is increased by \$100,000.00 from \$310,000.00 to \$410,000.00.
- The total IEWO funding is increased by \$100,000.00 from \$86,344,769.54 to \$86,444,769.54.
- The total funding obligated to the Budgetary Control Points, including Program Direction, Inter-Entity Work Order Funding and Request for Service Funding, is increased by \$124,600,000.00 from \$10,279,490,080.88 to \$10,404,090,080.88.

2. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a), is deleted in its entirety and replaced in full as follows:

<b>BUDGETARY CONTROL POINTS FOR WTP PROJECT</b>			
<b>Description</b>	<b>Appropriation Symbol</b>	<b>B&amp;R No. (Control Point)</b>	<b>Budget Authority</b>
	1250	1110401	\$3,006,205,907.70
LAW	1250	1111183	\$637,537,062.71
LAB	1250	1111184	\$207,817,505.32
BOF	1250	1111185	\$261,722,260.48
HLW	1250	1111186	\$559,580,100.04
PT	1250	1111187	\$840,766,807.09
LAW	1250 and 1260	1111241	\$1,413,240,597.50
DFLAW	1250 and 1260	1111243	\$102,063,073.13
LAB	1250 and 1260	1111242	\$328,312,452.11
BOF	1250 and 1260	1111243	\$492,649,525.21
HLW	1250 and 1260	1111244	\$1,014,573,076.81
PT	1250 and 1260	1111245	\$1,450,670,497.24
Subtotal - Budgetary Controls Points for WTP Project thru Contract Modification 379			\$10,315,138,865.34

<b>BUDGETARY CONTROL POINTS FOR PROGRAM DIRECTION</b>			
<b>Description</b>	<b>Appropriation Symbol</b>	<b>B&amp;R No. (Control Point)</b>	<b>Budget Authority</b>
PD	1250	1110462	\$1,280,000.00
PD	1250	1110458	\$1,210,000.00
Subtotal - Budgetary Controls Points, including Project Direction, thru Contract Modification 379			<b>\$10,317,628,865.34</b>
<b>INTER-ENTITY WORK ORDER FUNDING</b>			
<b>IEWO Identification Numbers</b>	<b>IEWO Amendment No.</b>	<b>Funding</b>	
M0SRLE60 Funding (SRNS/SRNL)	40	\$73,957,217.82	
M0SRV00028 Funding (SRNS)	42	\$7,083,536.09	
M0SRV00036 Funding (WSRC)	2	\$186,500.00	
M0SRV00042 Funding (ORNL)	2	\$27,599.05	
M0IDV00061 Funding (BEA)	1	\$21,277.60	
M0ORV00088 Funding (ORNL)	2	\$150,848.30	
M0NSV00089 Funding (SNL)	1	\$18,030.68	
M0SRV00105 Funding (SRNS)	8	\$4,589,760.00	
M0FTV00117 Funding (NETL)	4	<b>\$410,000.00</b>	
Total - IEWO Funding 379			<b>\$86,444,769.54</b>
<b>REQUEST FOR SERVICE FUNDING</b>			
<b>RFS Number</b>	<b>Supplement No.</b>	<b>Funding</b>	
M14009 Funding (MSA)	0	\$16,446.00	
Total - RFS Funding 367			<b>\$16,446.00</b>
<b>Total Budgetary Control Points for WTP Project 379</b>			<b>\$10,404,090,080.88</b>

2. All other terms and conditions remain unchanged.

**(End of Modification)**



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**OCT 27 2016**

16-CPM-0154

Ms. L. W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT MODIFICATION NO. 380 – REVISION TO THE NOT-TO-EXCEED VALUE FOR THE FUNDING LIMITATION ESTABLISHED IN THE CHANGE ORDER FOR THE PROCUREMENT OF THE EFFLUENT MANAGEMENT FACILITY (EMF) EQUIPMENT AND EFFLUENT TRANSFER LINES AND LIMITED EMF CONSTRUCTION PREVIOUSLY INCORPORATED IN MODIFICATION 354**

The purpose of this letter is to transmit a signed original of Contract Modification No. 380. The modification increases the not-to-exceed (NTE) value for the procurement of the EFFLUENT MANAGEMENT FACILITY (EMF) equipment and effluent transfer lines and limited EMF construction to support the Direct Feed Low Activity Waste effort from \$24,337,000 by \$6,085,065 to \$30,422,065 consistent with the other contract terms and conditions and pending definitization of this change.

BNI is requested to provide notification to the Contracting Officer at which time the total costs are expected to reach 75% of the NTE value as detailed in the attached contract modification.

If you have any project-related questions, please contact William F. Hamel at (509) 376-6727. For contract-related questions, please contact Katie Mair at (509) 376-4427.

A handwritten signature in blue ink that reads "George F. Champlain".

George F. Champlain  
Contracting Officer

CPM:KAM

Attachment

cc w/attach:  
BNI Correspondence

**Attachment  
to  
16-CPM-0154**

**Contract Modification 380**

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE  
PAGE 1 OF 6 PAGES

2. AMENDMENT/MODIFICATION NO. **380**  
3. EFFECTIVE DATE (M/D/Y) **See Block 16C**  
4. REQUISITION/PURCHASE REQ. NO.  
5. PROJECT NO. (If applicable)

6. ISSUED BY CODE  
**U.S. Department of Energy  
Office of River Protection  
P. O. Box 450, MS H6-60  
Richland, WA 99352**

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.  
9B. DATED (SEE ITEM 11)  
10A. MODIFICATION OF CONTRACT/ ORDER NO.  
**DE-AC27-01RV14136**  
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)**

**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.  
Clause 1.82, FAR 52.243-2 Changes – Cost Reimbursement (AUG 1987) – Alternate III (APR 1984)

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).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO THE AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

**E. IMPORTANT: Contractor  is not,  is required to sign this document and return 0 copies to the issuing office.**

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

See following page(s)

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)  
15B. CONTRACTOR/OFFEROR  
15C. DATE SIGNED  
16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  
**George F. Champlain  
Contracting Officer**  
16B. UNITED STATES OF AMERICA  
BY *George F. Champlain*  
(Signature of Contracting Officer)  
16C. DATE SIGNED  
**27 Oct 2016**

**Purpose of Modification:**

The purpose of this modification is to make the following changes:

1. Issue a revision for the Not To Exceed (NTE) value established in the change order for the procurement of the Effluent Management Facility (EMF) equipment and effluent transfer lines and limited EMF construction to support the Direct Feed Low Activity Waste (DFLAW) effort incorporated in modification 354 as follows:
  - a. The Contractor is authorized to incur costs up to a NTE value that is changed from \$24,337,000 by \$6,085,065 to \$30,422,065 consistent with the other contract terms and conditions and pending definitization of this change.
  - b. Contractor shall continue following change order accounting in accordance with Clause I.83, FAR 52.243-6, Change Order Accounting (APR 1984).
  - c. This modification does not add additional funds to the contract. Accordingly, work under the contract, such as that described herein, must be performed within the amount of funds which have been incrementally allotted to the contract in accordance with clause B.3, *Obligation and Availability of Funds and Contract Value*, and clause I.66, FAR 52.232-22 Limitation of Funds (Apr 1984).

**Modification Description**

1. A Not-to-Exceed value of \$30,422,065 is hereby established. As a result, the table in Section B, *Supplies or Services and Prices/Costs*, Section B.3, *Obligation and Availability of Funds and Contract Value*, paragraph (c) is revised as follows:
  - The Cost Category (A) Total Estimated Contract Cost (TECC) is increased by \$6,085,065 from \$10,879,654,464 to \$10,885,739,529.
  - The revised Total Estimated Contract Cost (TECC) is increased by \$6,085,065 from \$10,922,223,020 to \$10,928,308,085.
  - The Total Estimated Contract Price (TECP) is increased by \$6,085,065 from \$11,517,521,560 to \$11,523,606,625.

2. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a), is deleted in its entirety and replaced in full as follows:

**Cost:**

A	Total Estimated Contract Cost (TECC) through <b>Mod 380</b>		<b><u>\$10,885,739,529</u></b>
B	Total Estimated Contract Cost (350)		
B.1	CLIN 2: DFLAW Facility Modifications (350)	TBD	
	SUB-CLIN 2.1: DFLAW Design (Target Cost)	\$75,000,000	\$42,568,556 *

**Revised Total Estimated Contract Cost through Mod 380**

**\$10,928,308,085**

**Fee:**

A	Final Fee Determination – Pre-Mod No. A143		\$102,622,325
B	Maximum Available Award Fee (See Table B-2-B-1)		\$105,676,215
B.1	Project Management Incentive	\$63,630,997	
B.2	Cost Incentive	\$36,647,560	
B.3	REA Settlement	\$5,397,658	
C	Schedule Incentive Fee		\$227,000,000
C.1	Activity Milestone Completion	\$173,000,000	
C.2	Facility Milestone Completion	\$54,000,000	
D	Operational Incentive Fee		\$91,000,000
D.1	Cold Commissioning	\$45,000,000	
D.2	Hot Commissioning	\$46,000,000	
E	Enhancement Incentive Fee		\$60,000,000
E.1	Enhanced Plant Capacity	\$15,000,000	
E.2	Sodium Reduction	\$15,000,000	
E.3	Enhanced Plant Turnover	\$15,000,000	
E.4	Sustained Production Achievement	\$15,000,000	
F	Performance-Based Incentive for DFLAW Design Completion (350)		\$9,000,000
	<b>Total Maximum Available Fee (346) (350) (369)</b>		<b><u>\$595,298,540</u></b>
	<b>Total Estimated Contract Price (TECP) (380)</b>		<b><u>\$11,523,606,625</u></b>

\* Sub-CLIN 2.1 DFLAW (Target Cost) amount decreased by total amount of Change Orders 329, 330 & 339 (\$32,431,444) definitized in Modification 350. \$75,000,000 - \$32,431,444 = \$42,568,556.

3. Contract Section J, *List of Attachments*, Attachment J, *Advance Understanding on Costs*, Table 13-B, *Not-to-Exceeds Not Included in Modification No. A143 Definitization (M155)*, is deleted in its entirety and replaced in full as follows:

13-B. Not-To-Exceeds Not Included in Modification No. A143 Definitization (M155)		
DOCUMENT ID.	TITLE	DEFINITIZATION MODIFICATION NO.
BCP-24590-06-02279	Expansion of DWP Requirements (permit Modifications) (M122) (M130)	A193
ORP 08-NSD-011 (05/20/08) (CCN 179512) TN 24590-06-03487	ORP Direction to Implement New Preliminary Safety Analysis Report (PSAR) Updates (M136)	A164
ORP 08-NSD-057 (10/09/08) (CCN 188218) TN 24590-06-03752	Direction to Implement New Safety Classification Process for the Waste Treatment and Immobilization Plant (WTP) (M141)	276
ORP 08-NSD-059 (10/15/08) (CCN 188217) TN 24590-06-03753	Direction to Implement New Justification for Continued Design, Procurement, and Installation (JCDPI) (M152)	A164
Modification M090 & 09-AMD-205 (07/18/08) (CCN 202423) TN 24590-06-02145 & -02381	Direction to Implement DOE 205.1A, Cyber Security Management Program (M155)	217
Modification M154 TN 24590-06-04133	Direction to Implement Pretreatment Engineering Platform (PEP) dry layup (M155)	A167
Modification M196 BCP 24590-06-04489 BCP 24590-06-04784 BCP 24590-06-05085	Direction to Implement Multiple Operational Readiness Strategy (218)	282
Modification M196 BCP 24590-06-04853 ORP 10-AMD-139 (05/06/10; CCN 218244)	Direction to Implement CXP Equipment Option (218)	317
Modification 221 ORP 11-WTP-219 (06/17/11; CCN 236247); Modification 247 ORP 11-WTP-437 (12/01/11; CCN 242351); Modification 264 ORP 12-WTP-0109 (03/15/12;	Direction to Proceed with Large Scale Testing (MOD 221, MOD 247, MOD 264, MOD 286)	299 - Partial

CCN 245985); Modification 286 ORP 12-WTP-317 (09/24/12)		
Modification 273	Direction to participate in the Hanford Site Organizational Climate and Safety Conscious Work Environment (SCWE) Survey	290
Modification 245 ORP 11-WTP-429	Direction to proceed with the implementation of DOE Order (O) 420.1B, <i>Facility Safety, Chapter V, Systems Engineer Program.</i> (245)	276
Modification 300 ORP 13-CPM-0099 (05/06/13); Mod 304 ORP 13-CPM-0133 (06/05/13); Modification 313 ORP 13-CPM-0299 (11/25/13)	Direction to Proceed with Full Scale Vessel Testing Program in lieu of the existing Computational Fluid Dynamics and Large Scale Vessel testing Program as a Design Verification Tool (300, 304, 313)	
Modification 329 ORP 14-CPM-0172	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (i) Design of BOF Utility Modifications	350
Modification 330 ORP 14-CPM-0181	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (j) Design of BOF Effluent Management Facility	350
Modification 334 ORP 14-CPM-0228, ORP 15-CPM-0300 (358) 16-CPM-0088 (372)	Direction to proceed with Pretreatment Facility vessel mixing design verification.	
Modification 339 ORP 15-CPM-0008	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (k) Design of Balance of Facilities Underground and Site-Wide Modifications necessary to support the Direct Feed of LAW (DFLAW)	350
Modification 342 ORP 15-CPM-0064, ORP 16-CPM 0012 (364)	Direction to proceed with the implementation of DOE Order (O) 433.1B, Maintenance Management Program for DOE Facilities and DOE/RL-92-36, Hoisting and Rigging Manual. (342)	
Modification 344 ORP 15-CPM-0092	Direction to proceed with initiation of procurement of BOF modifications and LAW Valve Vault materials to support DFLAW; add Interface Control Documents 30 and 31	
Modification 348 ORP 15-CPM-0128	Direction to proceed with initiation of BOF isolation construction to support DFLAW	
Modification 349 ORP 15-CPM-0136	Direction to proceed with the implementation of DOE Order (O) 414.1D, CRD, Chg. 1, Quality Assurance. (349)	
Modification 354 ORP 15-CPM-0195, ORP 16-CPM-0154 (380)	Direction to proceed with procurement of Effluent Management Facility (EMF) equipment and effluent transfer lines and limited EMF construction (354)	

Modification 371 ORP-CPM-0085	Conduct supplementary analysis of vessels RLD-VSL-00007 and RLD-VSL-00008 beyond the WTP Code of Record and modify the RLD-VSL-00007 and RLD-VSL-00008 vessel design.	
Modification 375 ORP-CPM-0111	Update the Natural Phenomena Hazards (NPH) Assessment by generating a revised site-specific response analysis and design response spectra for WTP incorporating Hanford site-wide Probabilistic Seismic Hazard Analysis (PSHA) report from PNNL, dated November 21, 2014. (375)	

4. All other terms and conditions remain unchanged.

**(End of Modification)**



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**NOV 07 2016**

16-CPM-0155

Ms. L. W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT  
MODIFICATION NO. 381 – CHANGE ORDER TO UPGRADE PORTIONS OF THE LOW  
ACTIVITY WASTE CARBON DIOXIDE SYSTEM TO SAFETY SIGNIFICANT**

**Reference:** BNI letter from L.W. Baker to R.L. Dawson, ORP, "Notification of Impacts Due to Upgrade of Portions of the Carbon Dioxide Gas System to Safety Significant," CCN: 289765, dated October 19, 2016.

The purpose of this letter is to transmit a signed original of Contract Modification No. 381. The modification directs Bechtel National, Inc. to proceed with the development of an engineering redraft process. The modification establishes a not-to-exceed (NTE) value of \$199,785 for the change order.

BNI is requested to provide notification to the Contracting Officer at which time the total costs are expected to reach 75 percent of the NTE value as detailed in the attached contract modification.

If you have any project-related questions, please contact William F. Hamel at (509) 438-1176. For contract-related questions, please contact Ron Cone at (509) 376-5583.

A handwritten signature in blue ink that reads "Ronald E. Cone, Jr." with a stylized flourish at the end.

Ronald E. Cone, Jr.  
Contracting Officer

CPM:REC

Attachment

cc w/attach:  
BNI Correspondence

Attachment  
to  
16-CPM-0155

Contract Modification 381



**Purpose of Modification:**

The purpose of this modification is to make the following changes:

1. Section C, *Statement of Work, Standard: 3 Design*, is revised to authorize development and implementation for the engineering redraft process.

This change is based on direction from R.L. Dawson, ORP, to L. W. Baker, BNI, "ORP Concurrence on CO<sub>2</sub> Safety Strategy Summary Document (SSSD)," dated October 11, 2016. And letter from R. L. Dawson and K. W. Smith, ORP, to M. G. McCullough, BNI, "Upgraded Safety Analysis Direction," 15-NSD-0017, dated June 29, 2015.

2. The Contractor is directed to proceed with the work scope in Section C, *Statement of Work, Standard 3: Design*, and paragraph (c) (22). The contractor is authorized to incur costs up to a not-to-exceed (NTE) value of \$199,785 consistent with the other contract terms and conditions and pending definitization of this change.
3. BNI shall submit within 45 days of date of this modification a detailed technical and price proposal. Negotiations will commence within 90 days of the date of this change order. A bi-lateral modification definitizing this change order shall be executed as soon as possible after the date of the change order, not to exceed 180 days.
4. If the anticipated proposed costs are expected to exceed \$750,000 for this change the Contractor shall provide change order accounting in accordance with Clause I.83, FAR 52.243-6, Change Order Accounting (APR 1984).
5. This modification does not add additional funds to the contract. Accordingly, work under the contract, such as that described herein, must be performed within the amount of funds which have been incrementally allotted to the contract in accordance with clause B.3, *Obligation and Availability of Funds and Contract Value*, and clause I.66, FAR 52.232-22 Limitation of Funds (Apr 1984).

**Modification Description**

1. Section C, *Statement of Work, Standard 3: Design*, (c) is revised to incorporate the following language:
  - (22) Develop an engineering redraft process that would apply to already procured Systems, Structures, and Components (SSCs) as non-Safety to be reclassified as Safety Significant. At a minimum, the engineering redraft process should: (381)
    - (i) Define and evaluate the change in functional classification of the SSCs as it relates to technical requirements,
    - (ii) Determine the adequacy of the SSCs to meet the changed requirements

- (iii) and the proposed safety functions, and  
 Identify any actions to be taken, such as additional testing or inspections, to provide reasonable assurance that the SSCs will reliably provide the proposed safety functions.

2. A Not-to-Exceed value of \$199,785 is hereby established. As a result, the table in Section B, *Supplies or Services and Prices/Costs*, Section B.3, *Obligation and Availability of Funds and Contract Value*, paragraph (c) is revised as follows:

- The Cost Category (A) Total Estimated Contract Cost (TECC) is increased by \$199,785 from \$10,885,739,529 to \$10,885,939,314.
- The revised Total Estimated Contract Cost (TECC) is increased by \$199,785 from \$10,928,308,085 to \$10,928,507,870.
- The Total Estimated Contract Price (TECP) is increased by \$199,785 from \$11,523,606,625 to \$11,523,806,410.

3. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a), is deleted in its entirety and replaced in full as follows:

Cost:

A	Total Estimated Contract Cost (TECC) through Mod 381		<b>\$10,885,939,314</b>
B	Total Estimated Contract Cost (350)		
B.1	CLIN 2: DFLAW Facility Modifications (350)	TBD	
	SUB-CLIN 2.1: DFLAW Design (Target Cost)	\$75,000,000	\$42,568,556 *

**Revised Total Estimated Contract Cost through Mod 381**

**\$10,928,507,870**

Fee:

A	Final Fee Determination – Pre-Mod No. A143		\$102,622,325
B	Maximum Available Award Fee (See Table B-2-B-1)		\$105,676,215
B.1	Project Management Incentive	\$63,630,997	
B.2	Cost Incentive	\$36,647,560	
B.3	REA Settlement	\$5,397,658	
C	Schedule Incentive Fee		\$227,000,000
C.1	Activity Milestone Completion	\$173,000,000	
C.2	Facility Milestone Completion	\$54,000,000	
D	Operational Incentive Fee		\$91,000,000
D.1	Cold Commissioning	\$45,000,000	
D.2	Hot Commissioning	\$46,000,000	
E	Enhancement Incentive Fee		\$60,000,000
E.1	Enhanced Plant Capacity	\$15,000,000	
E.2	Sodium Reduction	\$15,000,000	

E.3	Enhanced Plant Turnover	\$15,000,000	
E.4	Sustained Production Achievement	\$15,000,000	
F	Performance-Based Incentive for DFLAW Design Completion (350)		\$9,000,000

Total Maximum Available Fee (346) (350) (369)	<b>\$595,298,540</b>
Total Estimated Contract Price (TECP) (381)	<b>\$11,523,806,410</b>

\* Sub-CLIN 2.1 DFLAW (Target Cost) amount decreased by total amount of Change Orders 329, 330 & 339 (\$32,431,444) definitized in Modification 350. \$75,000,000 - \$32,431,444 = \$42,568,556.

4. Contract Section J, *List of Attachments*, Attachment J, *Advance Understanding on Costs*, Table 13-B, *Not-to-Exceeds Not Included in Modification No. A143 Definitization (M155)*, is deleted in its entirety and replaced in full as follows:

13-B. Not-To-Exceeds Not Included in Modification No. A143 Definitization (M155)		
DOCUMENT ID.	TITLE	DEFINITIZATION MODIFICATION NO.
BCP-24590-06-02279	Expansion of DWP Requirements (permit Modifications) (M122) (M130)	A193
ORP 08-NSD-011 (05/20/08) (CCN 179512) TN 24590-06-03487	ORP Direction to Implement New Preliminary Safety Analysis Report (PSAR) Updates (M136)	A164
ORP 08-NSD-057 (10/09/08) (CCN 188218) TN 24590-06-03752	Direction to Implement New Safety Classification Process for the Waste Treatment and Immobilization Plant (WTP) (M141)	276
ORP 08-NSD-059 (10/15/08) (CCN 188217) TN 24590-06-03753	Direction to Implement New Justification for Continued Design, Procurement, and Installation (JCDPI) (M152)	A164
Modification M090 & 09-AMD-205 (07/18/08) (CCN 202423) TN 24590-06-02145 & -02381	Direction to Implement DOE 205.1A, Cyber Security Management Program (M155)	217
Modification M154 TN 24590-06-04133	Direction to Implement Pretreatment Engineering Platform (PEP) dry layup (M155)	A167
Modification M196 BCP 24590-06-04489	Direction to Implement Multiple Operational Readiness Strategy (218)	282

BCP 24590-06-04784 BCP 24590-06-05085		
Modification M196 BCP 24590-06-04853 ORP 10-AMD-139 (05/06/10; CCN 218244)	Direction to Implement CXP Equipment Option (218)	317
Modification 221 ORP 11-WTP-219 (06/17/11; CCN 236247); Modification 247 ORP 11-WTP-437 (12/01/11; CCN 242351); Modification 264 ORP 12-WTP-0109 (03/15/12; CCN 245985); Modification 286 ORP 12-WTP-317 (09/24/12)	Direction to Proceed with Large Scale Testing (MOD 221, MOD 247, MOD 264, MOD 286)	299 - Partial
Modification 273	Direction to participate in the Hanford Site Organizational Climate and Safety Conscious Work Environment (SCWE) Survey	290
Modification 245 ORP 11-WTP-429	Direction to proceed with the implementation of DOE Order (O) 420.1B, <i>Facility Safety</i> , Chapter V, <i>Systems Engineer Program</i> . (245)	276
Modification 300 ORP 13-CPM-0099 (05/06/13); Mod 304 ORP 13-CPM-0133 (08/05/13); Modification 313 ORP 13-CPM-0299 (11/25/13)	Direction to Proceed with Full Scale Vessel Testing Program in lieu of the existing Computational Fluid Dynamics and Large Scale Vessel testing Program as a Design Verification Tool (300, 304, 313)	
Modification 329 ORP 14-CPM-0172	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (i) Design of BOF Utility Modifications	350
Modification 330 ORP 14-CPM-0181	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (j) Design of BOF Effluent Management Facility	350
Modification 334 ORP 14-CPM-0228, ORP 15-CPM-0300 (358) 16-CPM-0088 (372)	Direction to proceed with Pretreatment Facility vessel mbndg design verification.	
Modification 339 ORP 15-CPM-0008	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (k) Design of Balance of Facilities Underground and Site-Wide Modifications necessary to support the Direct Feed of LAW	350

	(DFLAW)	
Modification 342 ORP 15-CPM-0064, ORP 16-CPM 0012 (364)	Direction to proceed with the implementation of DOE Order (O) 433.1B, Maintenance Management Program for DOE Facilities and DOE/RL-92-36, Hoisting and Rigging Manual. (342)	
Modification 344 ORP 15-CPM-0092	Direction to proceed with initiation of procurement of BOF modifications and LAW Valve Vault materials to support DFLAW; add Interface Control Documents 30 and 31	
Modification 348 ORP 15-CPM-0128	Direction to proceed with initiation of BOF isolation construction to support DFLAW	
Modification 349 ORP 15-CPM-0136	Direction to proceed with the implementation of DOE Order (O) 414.1D, CRD, Chg. 1, Quality Assurance. (349)	
Modification 354 ORP 15-CPM-0195, ORP 16-CPM-0154 (380)	Direction to proceed with procurement of Effluent Management Facility (EMF) equipment and effluent transfer lines and limited EMF construction (354)	
Modification 371 ORP-CPM-0085	Conduct supplementary analysis of vessels RLD-VSL-00007 and RLD-VSL-00008 beyond the WTP Code of Record and modify the RLD-VSL-00007 and RLD-VSL-00008 vessel design.	
Modification 375 ORP-CPM-0111	Update the Natural Phenomena Hazards (NPH) Assessment by generating a revised site-specific response analysis and design response spectra for WTP incorporating Hanford site-wide Probabilistic Seismic Hazard Analysis (PSHA) report from PNNL, dated November 21, 2014. (375)	
Modification 381 ORP-16-CPM-0155 (381)	Authorization to proceed with the development of an engineering redraft process for Standard 3: Design (c) (22).	

5. All other terms and conditions remain unchanged.

(End of Modification)



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**NOV 09 2016**

16-CPM-0158

Ms. L.W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT MODIFICATION NO. 382 – REVISION TO THE NOT-TO-EXCEED VALUE ESTABLISHED IN THE CHANGE ORDER FOR FULL-SCALE VESSEL AND PROOF-OF-CONCEPT TESTING BEYOND RLD-8 PREVIOUSLY INCORPORATED IN MODIFICATION 372

The purpose of this letter is to transmit a signed original of Contract Modification No. 382. The modification increases the not-to-exceed (NTE) value for Full Scale Vessel and Proof-of-Concept testing from \$74,250,000 by \$16,800,000 to \$91,050,000 consistent with the other contract terms and conditions and pending definitization of this change.

BNI is requested to provide notification to the Contracting Officer at which time the total costs are expected to reach 75% of the NTE value as detailed in the enclosed contract modification.

If you have any project-related questions, please contact William F. Hamel at (509) 438-1176. For contract-related questions, please contact me at (509) 376-5583.

A handwritten signature in blue ink, reading "Ronald E. Cone Jr.", is positioned above the printed name and title.

Ronald E. Cone Jr.  
Contracting Officer

CPM:REC

Attachment

cc w/attach:  
BNI Correspondence

Attachment  
to  
16-CPM-0158

CONTRACT MODIFICATION 382

2. AMENDMENT/MODIFICATION NO. <b>382</b>	3. EFFECTIVE DATE (M/D/Y) <b>See Block 16C</b>	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
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6. ISSUED BY <b>U.S. Department of Energy Office of River Protection P. O. Box 450, MS H6-60 Richland, WA 99352</b>	7. ADMINISTERED BY (If other than Item 6)
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8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP code)  <b>Bechtel National, Inc. 2435 Stevens Center Place Richland, WA 99354</b>	<input type="checkbox"/>          <input checked="" type="checkbox"/>	9A. AMENDMENT OF SOLICITATION NO.  9B. DATED (SEE ITEM 11)  10A. MODIFICATION OF CONTRACT/ ORDER NO. <b>DE-AC27-01RV14136</b> 10B. DATED (SEE ITEM 13)  <b>December 11, 2000</b>
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)**

**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 checked="" type="checkbox"/> Clause I.82, FAR 52.243-2 Changes – Cost Reimbursement (AUG 1987) – Alternate III (APR 1984)
<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 type="checkbox"/>	D. OTHER (Specify type of modification and authority)

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

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

Reference Continuation Page(s)

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)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) <b>Ronald E. Cone Jr. Contracting Officer</b>
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED
_____ (Signature of person authorized to sign)	
16B. UNITED STATES OF AMERICA BY <b>Ronald E. Cone Jr.</b> (Signature of Contracting Officer)	16C. DATE SIGNED <b>11-9-2016</b>

**The purpose of this modification is as follows:**

1. Issue a revision for the Not To Exceed (NTE) value established in the change order for full-scale vessel and proof-of-concept testing beyond vessel RLD-8 incorporated in modification 372 as follows:
  - a. The Contractor is authorized to incur costs up to a NTE value that is changed from \$74,250,000 by \$16,800,000 to **\$91,050,000** consistent with the other contract terms and conditions and pending definitization of this change. The NTE only applies to paragraph (h)(2) Pretreatment Vessel Mixing Design Verification.
  - b. Contractor shall continue following change order accounting in accordance with Clause I.83, FAR 52.243-6, Change Order Accounting (APR 1984).
  - c. This modification does not add additional funds to the contract. Accordingly, work under the contract, such as that described herein, must be performed within the amount of funds which have been incrementally allotted to the contract in accordance with clause B.3, *Obligation and Availability of Funds and Contract Value*, and clause I.66, FAR 52.232-22 Limitation of Funds (Apr 1984).

**Modification Description:**

1. A Not-to-Exceed value of \$91,050,000 is hereby established. As a result, the table in Section B, *Supplies or Services and Prices/Costs*, Section B.3, *Obligation and Availability of Funds and Contract Value*, paragraph (c) is revised as follows:
  - The Cost Category (A) Total Estimated Contract Cost (TECC) is increased by \$16,800,000 from \$10,885,939,314 to \$10,902,739,314.
  - The revised Total Estimated Contract Cost (TECC) is increased by \$16,800,000 from \$10,928,507,870 to \$10,945,307,870
  - The Total Estimated Contract Price (TECP) is increased by \$16,800,000 from \$11,523,806,410 to \$11,540,606,410.

2. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a), is deleted in its entirety and replaced in full as follows:

**Cost:**

A	Total Estimated Contract Cost (TECC) through <b>Mod 382</b>		<b><u>\$10,902,739,314</u></b>
B	Total Estimated Contract Cost <b>(350)</b>		
B.1	CLIN 2: DFLAW Facility Modifications <b>(350)</b>	TBD	
	SUB-CLIN 2.1: DFLAW Design (Target Cost)	\$75,000,000	\$42,568,556 *

**Revised Total Estimated Contract Cost through Mod 382**

**\$10,945,307,870**

**Fee:**

A	Final Fee Determination – Pre-Mod No. A143		\$102,622,325
B	Maximum Available Award Fee (See Table B-2-B-1)		\$105,676,215
B.1	Project Management Incentive	\$63,630,997	
B.2	Cost Incentive	\$36,647,560	
B.3	REA Settlement	\$5,397,658	
C	Schedule Incentive Fee		\$227,000,000
C.1	Activity Milestone Completion	\$173,000,000	
C.2	Facility Milestone Completion	\$54,000,000	
D	Operational Incentive Fee		\$91,000,000
D.1	Cold Commissioning	\$45,000,000	
D.2	Hot Commissioning	\$46,000,000	
E	Enhancement Incentive Fee		\$60,000,000
E.1	Enhanced Plant Capacity	\$15,000,000	
E.2	Sodium Reduction	\$15,000,000	
E.3	Enhanced Plant Turnover	\$15,000,000	
E.4	Sustained Production Achievement	\$15,000,000	
F	Performance-Based Incentive for DFLAW Design Completion <b>(350)</b>		\$9,000,000

**Total Maximum Available Fee (346) (350) (369)**

**\$595,298,540**

**Total Estimated Contract  
Price (TECP) (382)**

**\$11,540,606,410**

\* Sub-CLIN 2.1 DFLAW (Target Cost) amount decreased by total amount of Change Orders 329, 330 & 339 (\$32,431,444) definitized in Modification 350. \$75,000,000 - \$32,431,444 = \$42,568,556.

3. Contract Section J, *List of Attachments*, Attachment J, *Advance Understanding on Costs*, Table 13-B, *Not-to-Exceeds Not Included in Modification No. A143 Definitization (M155)*, is deleted in its entirety and replaced in full as follows:

13-B. Not-To-Exceeds Not Included in Modification No. A143 Definitization (M155)		
DOCUMENT ID.	TITLE	DEFINITIZATION MODIFICATION NO.
BCP-24590-06-02279	Expansion of DWP Requirements (permit Modifications) (M122) (M130)	A193
ORP 08-NSD-011 (05/20/08) (CCN 179512) TN 24590-06-03487	ORP Direction to Implement New Preliminary Safety Analysis Report (PSAR) Updates (M136)	A164
ORP 08-NSD-057 (10/09/08) (CCN 188218) TN 24590-06-03752	Direction to Implement New Safety Classification Process for the Waste Treatment and Immobilization Plant (WTP) (M141)	276
ORP 08-NSD-059 (10/15/08) (CCN 188217) TN 24590-06-03753	Direction to Implement New Justification for Continued Design, Procurement, and Installation (JCDPI) (M152)	A164
Modification M090 & 09-AMD-205 (07/18/08) (CCN 202423) TN 24590-06-02145 & -02381	Direction to Implement DOE 205.1A, Cyber Security Management Program (M155)	217
Modification M154 TN 24590-06-04133	Direction to Implement Pretreatment Engineering Platform (PEP) dry layup (M155)	A167
Modification M196 BCP 24590-06-04489 BCP 24590-06-04784 BCP 24590-06-05085	Direction to Implement Multiple Operational Readiness Strategy (218)	282
Modification M196 BCP 24590-06-04853 ORP 10-AMD-139 (05/06/10; CCN 218244)	Direction to Implement CXP Equipment Option (218)	317
Modification 221 ORP 11-WTP-219 (06/17/11; CCN 236247); Modification 247	Direction to Proceed with Large Scale Testing (MOD 221, MOD 247, MOD 264, MOD 286)	299 - Partial

ORP 11-WTP-437 (12/01/11; CCN 242351); Modification 264 ORP 12-WTP-0109 (03/15/12; CCN 245985); Modification 286 ORP 12-WTP-317 (09/24/12)		
Modification 273	Direction to participate in the Hanford Site Organizational Climate and Safety Conscious Work Environment (SCWE) Survey	290
Modification 245 ORP 11-WTP-429	Direction to proceed with the implementation of DOE Order (O) 420.1B, <i>Facility Safety</i> , Chapter V, <i>Systems Engineer Program</i> . (245)	276
Modification 300 ORP 13-CPM-0099 (05/06/13); Mod 304 ORP 13-CPM-0133 (06/05/13); Modification 313 ORP 13-CPM-0299 (11/25/13)	Direction to Proceed with Full Scale Vessel Testing Program in lieu of the existing Computational Fluid Dynamics and Large Scale Vessel testing Program as a Design Verification Tool (300, 304, 313)	
Modification 329 ORP 14-CPM-0172	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (i) Design of BOF Utility Modifications	350
Modification 330 ORP 14-CPM-0181	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (j) Design of BOF Effluent Management Facility	350
Modification 334 ORP 14-CPM-0228, ORP 15-CPM-0300 (358) 16-CPM-0088 (372) ORP-16-CPM-0158 (382)	Direction to proceed with Pretreatment Facility vessel mixing design verification.	
Modification 339 ORP 15-CPM-0008	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (k) Design of Balance of Facilities Underground and Site-Wide Modifications necessary to support the Direct Feed of LAW (DFLAW)	350
Modification 342 ORP 15-CPM-0064, ORP 16-CPM 0012 (364)	Direction to proceed with the implementation of DOE Order (O) 433.1B, Maintenance Management Program for DOE Facilities and DOE/RL-92-36, Hoisting and Rigging Manual. (342)	
Modification 344 ORP 15-CPM-0092	Direction to proceed with initiation of procurement of BOF modifications and LAW Valve Vault materials to support DFLAW; add Interface Control Documents 30 and 31	
Modification 348 ORP 15-CPM-0128	Direction to proceed with initiation of BOF isolation construction to support DFLAW	

Modification 349 ORP 15-CPM-0136	Direction to proceed with the implementation of DOE Order (O) 414.1D, CRD, Chg. 1, Quality Assurance. (349)	
Modification 354 ORP 15-CPM-0195, ORP 16-CPM-0154 (380)	Direction to proceed with procurement of Effluent Management Facility (EMF) equipment and effluent transfer lines and limited EMF construction (354)	
Modification 371 ORP-16-CPM-0085	Conduct supplementary analysis of vessels RLD-VSL-00007 and RLD-VSL-00008 beyond the WTP Code of Record and modify the RLD-VSL-00007 and RLD-VSL-00008 vessel design.	
Modification 375 ORP-16- CPM-0111	Update the Natural Phenomena Hazards (NPH) Assessment by generating a revised site-specific response analysis and design response spectra for WTP incorporating Hanford site-wide Probabilistic Seismic Hazard Analysis (PSHA) report from PNNL, dated November 21, 2014. (375)	
Modification 381 ORP-16-CPM-0155 (381)	Authorization to proceed with the development of an engineering redraft process for Standard 3: Design (c) (22).	

4. All other terms and conditions remain unchanged.

*(End of Modification)*



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**NOV 18 2016**

16-CPM-0160

Ms. L.W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

CONTRACT NO. DE-AC27-01RV14136 – REQUEST FOR SIGNATURE - CONTRACT  
MODIFICATION NO. 383

The purpose of this letter is to transmit the subject modification for signature. This modification revises Contract Section C, Statement of Work, and Section J, List of Attachments. Please sign and return two (2) originals of the attached contract modification to the Contracting Officer. An executed original of the contract modification will be returned for your records once the signed originals are received.

If you have any questions regarding this contract action, please contact me at (509) 376-4427.

A handwritten signature in blue ink that reads "Katie Mair".

Katie A. Mair  
Contracting Officer

CPM:KAM

Attachment

cc w/attach:  
A.D. Trukositz, RL  
BNI Correspondence

**Attachment  
to  
16-CPM-0160**

**Contract Modification 383**

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE \_\_\_\_\_ PAGE **1** OF **13** PAGES

2. AMENDMENT/MODIFICATION NO. **383**

3. EFFECTIVE DATE (M/D/Y) **See Block 16C**

4. REQUISITION/PURCHASE REQ. NO. \_\_\_\_\_

5. PROJECT NO. (If applicable) \_\_\_\_\_

6. ISSUED BY CODE \_\_\_\_\_

7. ADMINISTERED BY (If other than Item 6) CODE \_\_\_\_\_

**U.S. Department of Energy  
Office of River Protection  
P. O. Box 450, MS H6-60  
Richland, WA 99352**

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. \_\_\_\_\_

9B. DATED (SEE ITEM 11) \_\_\_\_\_

10A. MODIFICATION OF CONTRACT/ ORDER NO. **DE-AC27-01RV14136**

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)**

**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.

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).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO THE AUTHORITY OF:  
Clause I.82, FAR 52.243-2 Changes - Cost Reimbursement (AUG 1987) - Alternate III (APR 1984)

D. OTHER (Specify type of modification and authority)

**E. IMPORTANT: Contractor  is not,  is required to sign this document and return 2 copies to the issuing office.**

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

See following page(s)  
Period of Performance: 12/11/2000 to 8/15/2019

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)  
**Margaret G. McCullough  
Project Director**

15B. CONTRACTOR/OFFEROR \_\_\_\_\_

15C. DATE SIGNED \_\_\_\_\_

16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  
**Katie A. Mair  
Contracting Officer**

16B. UNITED STATES OF AMERICA  
BY \_\_\_\_\_

16C. DATE SIGNED \_\_\_\_\_

(Signature of person authorized to sign) (Signature of Contracting Officer)

**Purpose of Modification:**

The purpose of this modification is to make the following changes:

1. Section C, Statement of Work, C.6 Standard 1(a)(2)(i), Scheduling Requirements is revised.
2. Section J, List of Attachments, Attachment M – Davis-Bacon Wage Determination is revised.

These changes are performed under the authority provided by Contract Clause I.82, FAR 52.243-2 *Changes – Cost Reimbursement (AUG 1987) – Alternate III (APR 1984)* at no additional cost to the Government.

**Description of Modification:**

1. Section C, Statement of Work, C.6 Standard 1(a)(2)(i), Scheduling Requirements is revised as follows:

From:

- (i) Scheduling Requirements: The WTP schedule shall be developed using a 24-month rolling schedule concept which is statused monthly and extended semi-annually. The near-term schedule shall be more detailed than activities past the 24-month cutoff.

To:

- (i) Scheduling Requirements: The WTP schedule shall be developed using a rolling wave concept that defines cycles of detailed planning and managed in accordance with the process documented in the Earned Value Management System Description (table C.5-1.1, Deliverable 1.3) (383).
2. Section J, List of Attachments, Attachment M – Davis-Bacon Wage Determination is revised to update the Wage Determination to the most recent July 01, 2016 version and include the Wage Determination in full text instead of by reference.

Attachment M, Davis-Bacon Wage Determination, is revised as follows:

~~General Decision Number WA20080000, dated February 6, 2009 (M147) is hereby incorporated by reference. (M147)~~

General Decision Number WA20150002, dated July 1, 2016 is hereby incorporated as follows: (383)

General Decision Number: WA160002 07/01/2016 WA2

Superseded General Decision Number: WA20150002

State: Washington

Construction Types: Building, Heavy and Highway

Counties: Benton and Franklin Counties in Washington.  
 (D.O.E. HANFORD SITE ONLY)

BENTON AND FRANKLIN COUNTIES (D.O.E. HANFORD SITE ONLY)  
 BUILDING (does not include residential construction consisting  
 of single family homes and apartments up to and including 4  
 stories), HEAVY and HIGHWAY CONSTRUCTION

Note: Under Executive Order (EO) 13658, an hourly minimum wage  
 of \$10.15 for calendar year 2016 applies to all contracts  
 subject to the Davis-Bacon Act for which the solicitation was  
 issued on or after January 1, 2015. If this contract is covered  
 by the EO, the contractor must pay all workers in any  
 classification listed on this wage determination at least  
 \$10.15 (or the applicable wage rate listed on this wage  
 determination, if it is higher) for all hours spent performing  
 on the contract in calendar year 2016. The EO minimum wage rate  
 will be adjusted annually. Additional information on contractor  
 requirements and worker protections under the EO is available  
 at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/08/2016
1	04/29/2016
2	07/01/2016

\* SUWA2001-001 09/03/2001

(D.O.E. HANFORD SITE ONLY)

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 32.92	19.37
BOILERMAKER.....	\$ 36.44	28.41
BRICKLAYER.....	\$ 29.73	14.89
CARPENTER		
Carpenters.....	\$ 31.94	14.00
Divers.....	\$ 36.72	14.00
Millwright & Machine erector.....	\$ 41.86	14.49
Piledriver.....	\$ 32.97	14.00
Tenders.....	\$ 35.02	14.00
CEMENT MASON/CONCRETE FINISHER		
GROUP 1.....	\$ 27.01	12.59
GROUP 2.....	\$ 27.63	12.59

GROUP 3.....	\$ 28.14	12.59
DRYWALL FINISHER/TAPER.....	\$ 23.80	12.20
ELECTRICIAN		
Cable Splicers.....	\$ 40.74	3 <del>8</del> +17.43
Electricians.....	\$ 38.80	3 <del>8</del> +17.43
IRONWORKER.....	\$ 32.76	23.19
LABORER		
GROUP 1.....	\$ 24.78	11.23
GROUP 2.....	\$ 25.05	11.23
GROUP 3.....	\$ 25.32	11.23
GROUP 4.....	\$ 25.60	11.23
GROUP 5 (RATES PER SHIFT)		
Sandhogs-[(1-14 LBS), (6 HRS)].....	\$ 212.16	11.23
Sandhogs-[(14-18 LBS), (6 HRS)].....	\$ 217.09	11.23
Sandhogs-[(18-22 LBS), (6 HRS)].....	\$ 239.23	11.23
Sandhogs-[(18-25 LBS), (4 HRS)].....	\$ 217.37	11.23
Sandhogs-[(22-26 LBS), (4 HRS)].....	\$ 221.69	11.23
Sandhogs-[(26-32 LBS), (4 HRS)].....	\$ 224.31	11.23
Sandhogs-[(32-38 LBS), (3 HRS)].....	\$ 227.27	11.23
Sandhogs-[(38-44 LBS), (2 HRS)].....	\$ 227.68	11.23
GROUP 5		
Outside Lock and Gauge Tender.....	\$ 204.80	11.23
GROUP 6.....	\$ 25.50	11.23
GROUP 7.....	\$ 26.07	11.13
GROUP 8.....	\$ 26.54	11.23
GROUP 9.....	\$ 27.31	11.23
PAINTER (Soft Floor Covers, Glaziers, Spray Painters, Steel Painters, Steam Clean and Acid Etching, Sign Writers).....		
	\$ 24.15	10.73
PLUMBER/PIPEFITTER.....	\$ 41.24	28.79
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 26.16	13.55
GROUP 2.....	\$ 26.48	13.55
GROUP 3.....	\$ 27.09	13.55
GROUP 4.....	\$ 27.41	13.55
GROUP 5.....	\$ 27.69	13.55
GROUP 6.....	\$ 27.96	13.55
GROUP 7.....	\$ 29.06	13.55
GROUP 8.....	\$ 30.40	13.55
ROOFER (Including Waterproofer and Kettleman).....		
	\$ 25.65	10.52

SHEET METAL WORKER.....	\$ 33.53	18.90
SPRINKLER FITTER.....	\$ 30.70	20.65
TRUCK DRIVER		
GROUP 1.....	\$ 22.31	17.31
GROUP 2.....	\$ 24.95	17.31
GROUP 3.....	\$ 25.06	17.31
GROUP 4.....	\$ 25.39	17.31
GROUP 5.....	\$ 25.50	17.31
GROUP 6.....	\$ 25.50	17.31
GROUP 7.....	\$ 26.04	17.31
GROUP 8.....	\$ 26.36	17.31

CEMENT MASON CLASSIFICATIONS

GROUP 1: Rodding, tamping, floating, troweling, patching, stoning, rubbing, sack rubbing; All exposed aggregate finishing and sealing. All architectural finishing, staining, stamping and coloring, washing and power washing of concrete, polymer, latex and composite materials; Setting of screeds, screeds forms, curb and gutter and sidewalk forms; Preparation of all concrete for caulking of the joints and the caulking of expansion joints; Preparation of concrete for the application of hardners, sealers and curing compounds and their application; Grouting and dry packing of machine base; Removal of snap ties and she bolts prior to patching of concrete

GROUP 2: Power troweling machine operator; Troweling of magnesite, torganal or material with epoxy bases of oxichloride base; All power grinders, bushing hammer, chipping gun; Gunite Nozzleman. All sandblasting for architectural finishes, patch preparation and exposing of aggregate for finish; Concrete sawing and cutting for concrete and expansion joints and scoring for decorative patterns; Operating of Clary-type floats, Longitudinal Floats, Rodding Machines and Belting Machines; Scarifiers; Working on scaffolds

GROUP 3: Grinding, bushing or chipping of toxic materials or high density concrete; Operating of power tools on a scaffold

LABORER CLASSIFICATIONS

GROUP 1: Flagman, Landscape Laborer, Scaleman, Traffic Control Supervisor, Asbestos Abatement Worker, Brick Pavers (to include the installation of brick or grass pavers for sidewalks, driveways, streets and parking lots), Brush Hog Feeder; Carpenter Tender; Cement Handler; Concrete Signalman; Concrete Crewman (to include Stripping of forms, hand operating jacks on slip form construction, application of concrete curing compounds, pumpcrete machine, signaling, handling the nozzle of squeezecrete or similar machine- 6 inches and smaller); Confined Space Attendant, Crusher Feeder; Demolition (to include clean-up, burning, loading, wrecking and salvage of all material); Dry Stack Walls (including all dry stack walls, including keystone walls and others using blocks and interlocking pegs.), Dumpman; Traffic Control Laborer (To include but is not limited to,

erection and maintenance of barricades, signs and relief of flag person.), Window Washer/Cleaner, Pilot Car, Hazardous Waster Worker, Erosion Control Laborer, Fence Erector, Guard Rail (to include Guard Rail, guide and reference posts, sign posts, and right-of-way markers); Firewatch. Form cleaning machine feeder; Stacker; General Laborer; Group Machine Header Tender; Miner, Class "A" (to include bull gang, concrete crewman, dumpman and pumpcrete crewman, including distributing pipe, assembly and dismantle, and nipper); Lead Abatement Worker, Mold Abatement Worker, Nipper; Riprap Man; Sandblast Tailhoseman, Scaffold Erector (wood or steel); Stake Jumper; Structural Mover (to include separating foundation, preparation, cribbing, shoring, jacking and unloading of structures); Tailhoseman (water nozzle); Timber Bucker and Faller (by hand); Track Laborer (RR); Truck Loader; Wellpoint Man; (HDPE or similar liner installer).

GROUP 2: Asphalt Roller, walking; Cement Finisher Tender; Concrete Saw, walking; Demolition Torch; Dope Pot Fireman, non-mechanical; Driller Tender (when required to move and position machine); Form Setter, paving; Jackhammer Operator; Miner, Class "B" (to include brakeman, finisher, vibrator, and form setter); Nozzleman (to include squeeze and flow-crete nozzle); Nozzleman, water, (to include fire hose), air or steam; Pavement Breaker (under 90 lbs); Pipelayer, corrugated metal and multi-plate; Pot Tender; Power Buggy Operator; Power Tool Operator, gas, electrical, pneumatic; Rodder and Spreader; Trencher, Shawnee; Tugger Operator; Wagon Drills; Wheelbarrow, power driven; Water Pipe Liner, Rigger/Signalperson, Remote Equipment Operator (i.e., compaction and demolition) Compaction Equipment (to include all hand operated power compaction equipment); Railroad Power Spiker or Puller, dual mobile; Railroad Equipment, power driven, except dual mobile power spiker or puller.

GROUP 3: Air and Hydraulic Track Drill, Asphalt Raker, Brush Machine (to include Horizontal construction joint clean-up brush machine, power propelled); Caisson Worker, free air; Chain Saw Operator and Faller; Concrete Stack (to include Laborers when working on free standing concrete stacks for smoke or fume control above 40 ft high); Gunnite (to include operation of machine and nozzle); High Scaler; Miner, Class "C" (to include miner, nozzleman for concrete, laser beam operator, and Rigger on tunnels); Monitor Operator (air track or similar mounting); Mortar Mixer; Nozzleman (to include jet blasting nozzleman, over 1200 lbs., jet blast machine, power propelled, sandblast nozzle, Squeeze and Flo-crete nozzle); Pavement Breaker, 90 lbs. & over; Pipelayer (to include working topman, caulker, collarman, jointer, mortarman, rigger, jacker, shorer, valve or meter installer, temper, (Including pressurized and non-pressurized ductile pipe, gravity pipe and HDPE (fused and non-fused); Pipewrapper; Plasterer Tender, Trenchless Technology, Vibrators (all); Laser Beam Operator (Elevation Control); Technician)

GROUP 4: Drills with dual masts, Miner, Class "D" (to include Raise and Shaft Miner, Laser Beam Operator on raises and

shafts.) Welder, electric, manual or automatic, Remote Equipment Operator (to include HDPE or similar pipe and liner)

GROUP 5: Sandhogs under compressed air (rates increases are computed by multiplying the increase x 8 hr shift and add total to the previous rate)

GROUP 6: Construction Specialist

GROUP 7: Hod Carrier

GROUP 8: Powderman

GROUP 9: Grade Checker

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Bit Grinders; Bolt Threading Machine; Compressors (under 2000 CFM, gas, diesel or electric power); Crusher Feeder (mechanical); Deck Hand; Drillers Tender; Fireman and Heater Tender; Grade Checker; Tender Mechanic, Welder H.D.; Hydro-seeder, Mulcher, Nozzleman; Oiler; Oiler and Cable Tender, Mucking Machine; Pumpman; Rollers, all types on subgrade (farm type, Case, John Deere and similar, or Compacting Vibrator), except when pulled by Dozer with operable blade; Steam Cleaner; Welding Machine

GROUP 2: A-Frame Truck (single drum); Assistant Refrigeration Plant (under 1000 ton); Assistant Plant Operator, Fireman or Pugmiser (asphalt); Bagley or Stationary Scraper; Belt Finishing Machine; Blower Operator (cement); Cement Hog; Compresor (2000 CFM or over, 2 or more, gas, diesel or electric power); Concrete Saw (multiple cut); Distributor Leverman; Ditch Witch or similar; Elevator, hoisting materials; Dope Pots (power agitated); Fork Lift or Lumber Stacker, Hydra-lift and similar; Gin Trucks (pipeline); Hoist, single drum; Loaders (bucket, elevators and conveyors); Longitudinal Float; Mixer (portable - concrete); Pavement Breaker, Hydra-hammer and similar; Power Broom; Spray Curing Machine (concrete); Spreader Box (self-propelled); Straddle Buggy (Ross and similar on construction job only); Tractor (Farm type R/T with attachments, except Backhoe); Tugger Operator

GROUP 3: A-Frame Truck (2 or more drums); Assistant Refrigeration Plant and Chiller Operator (over 1000 ton); Backfillers (Cleveland and similar); Batch Plant and Wet Mix Operator single unit (concrete); Belt-crete Conveyors with power pack or similar; Belt Loader (Kocal or similar); Bend Machine; Bob Cat; Boring Machine (earth); Boring Machine (rock under 8 inch bit) (Quarry Master, Joy or similar); Bump Cutter (Wayne, Saginaw or similar); Canal Lining Machine (concrete) Chipper (without crane), Cleaning and Doping Machine (pipeline); Curb Extruder (Asphalt and Concrete); Deck Engineer; Elevating Belt-type Loader (Euclid, Barber Green and similar); Elevating Grader-type Loader (Dumor, Adams or similar); Generator Plant Engineers (diesel, electric); Guniting Combination Mixer and Compressor; Locomotive Engineer; Mixermobile; Posthole

Auger or Punch; Pump (grout or jet); Soil Stabilizer (P & H or similar); Spreader Machine; Surface Heater and Planer Machine; Tractor (to D-6 or equivalent) and Traxacavator; Traverse Finish Machine; Turnhead Operator

GROUP 4: Blade Operator (motor patrol and attachments); Concrete Pumps (squeeze-crete, flow-crete, pump-crete, Whitman and similar); Drilling Equipment (8 inch bit and over) (Robbins, reverse circulation and similar); Drills (Churn, Core, Calyx, or Diamond); Equipment Serviceman, Greaser and Oiler; Hoe Ram; Hoist (2 or more drums or Tower Hoist); Loaders (overhead and front-end, under 4 yards R/T); Paving (Dual Drum) Rubber Tire; Refrigeration Plant Engineers (under 1000 ton); Signalman (Whileys, Highline, Hammerheads or similar); Skidders (R/T with or without attachments); Screed Operator; Trenching Machines (under 7 ft depth capacity); Vacuum Drill (reverse circulation drill under 8 inch bit)

GROUP 5: Automatic Subgrader (Ditches and Trimmers) (Autograde, ABC, R.A. Hansen and similar on grade wire); Backhoe (under 1 yd); Batch Plant (over 4 units); Batch and Wet Mix Operator (multiple units, 2 and including 4); Boat Operator; Cableway Controller (dispatcher); Concrete Pump Boom Truck; Conveyor Aggregate Placement Equipment; Cranes (25 tons and under); Derricks and Stifflegs (under 65 tons); Drill Doctor; Multiple Dozer Units with single blade; Paving Machine (asphalt and concrete); Piledriving Engineers; Rollerwoman (finishing pavement); Trenching Machines (7 ft depth and over)

GROUP 6: Asphalt Plant Operator (Backhoes (1 yd to 3 yds); Blade (finish and bluetop) Automatic, CMI, ABC and similar when used as automatic; Boom Cats (side); Cableway Operators; Clamshell Operators (under 3 yds); Concrete Slip Form Paver; Cranes (over 25 tons, including 45 tons); Crusher, Grizzle and Screening Plant Operator; Draglines (under 3 yds); Elevating Belt (holland type); Gradall (1 yd to 3 yds); Loader Operator (front-end and overhead, 4 yards, including 8 yds); Mucking Machine; Quadtrack or similar equipment; Rubber-tired Scrapers; Shovels (under 3 yds); Tractors (D-6 and equivalent and over); Vector Guzzler, Super Sucker; Concrete Cleaning/Decontamination Machine; Ultra High Pressure Waterjet Cutting Tool System (30,000 psi)

GROUP 7: Backhoes (3 yds and over); Cranes (All Cranes over 45 tons, including 100 tons) Climbing, Rail and Tower Cranes up to including 45 tons; Clamshell Operator (3 yds. and over); Derricks and Stifflegs (65 tons and over); Draglines (3 yds and over); Lead Water Well Driller; Loader (360 degrees revolving Koehring Scooper or similar); Loaders (overhead and front-end, over 8 yds); Shovels (3 yds and over); Whirleys and Hammerheads, all; Vacuum Blasting Machine Operator; HD Mechanic/welder

GROUP 8: Cranes (all cranes over 100 tons); Climbing, Rail and Tower Cranes over 45 tons

ALL CRANE BOOMS, INCLUDING TOWER CRANES:

Measure from center of rotation to center of shaft (radius):  
130 ft TO 200 ft .50 hr. additional to classification  
Over 200 ft .80 hr. additional to classification

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Escort Driver or Pilot Car tender and swamper,  
Pickup Hauling Employees or Materials

GROUP 2: Flat Bed Truck, single rear axle; Fork Lift, 3000  
lbs and under; Leverperson Loading Trucks at Bunkers;  
Seeder and Mulcher; Stationary Fuel Operator; Team Driver;  
Tractor (small rubber tired, pulling trailer or similar  
equipment); Trailer Mounted hydro Seeder and Mulcher; Water  
Tank Truck, up to 1800 gallons

GROUP 3: Bus Driver or Employee Haul Driver; Flat Bed Truck,  
dual rear axle; Power Boat hauling employees or material

GROUP 4: Buggy Mobile and similar; Bulk Cement Tanks and  
Spreader; Power Operated Sweeper; Straddle Carrier (Ross,  
Hyster and similar); Water Tank Truck, 1801-4000 gallons

GROUP 5: Auto Crane, 2000 lbs capacity; Dumptor (6 yds and  
under); Flat Bed Truck (with hydraulic system); Fork Lift  
(3001-16,000 lbs); Fuel Truck Driver, steam cleaner and  
washer; Rubber-tired Tunnel Jumbo; Scissors Truck; Slurry  
Truck Driver; Transite Mixers & mixers hauling concrete 3  
yd to and including 6 yd.; Wrecker and Tow Trucks

GROUP 6: A-Frame; Service Greaser; Tireperson; Truck, side,  
end, and bottom & articulated end dump (up to and including  
12 yds); Water Tank Truck, 4001 to 8000 gallons,  
Warehouseperson, to include shipping and receiving

GROUP 7: Dumps, semi-end; Flagerty Spreader Box Driver;  
Flowboys; Fork lift, 16,000 lbs and over; Lowboy, 50 tons  
and under; Mechanic, Field; Oil Distributors Driver (road,  
bootperson, leverperson); and Oil Tank Driver; Self-Loading  
Roll Off and Dumpster over 6 yds; Stringer Truck (cable  
operated trailer); Tractor with Steer Trailer; Transfer  
Truck & Traller; Transit Mixers & Truck Hauling Concrete:  
over 6 yards to and including 20 yards; Truck & Pup;  
Trucks, side, end, bottom, & articulated end dump: over 12  
yards to and including 100 yards; Truck Mounted Crane (with  
load-bearing surface, either mounted or pulled) up to 14  
tons; Turnarocker, DWs & similar, with 2 or or more 4  
wheel-power tractor with trailer, gallonage or yardage  
scale, whichever is greater; Vacuum truck (super sucker,  
guzzler, etc.); Water Tank Truck, 8,001 to 14,000;  
Semi-truck and Trailer, 50 tons and under Lowboy

GROUP 8: Lowboy, over 50 tons; Prime movers & stinger truck;  
Transit Mixers and truck hauling concrete, over 20 yards;  
Trucks, side, end bottom and articulated end dump, over 100  
yards.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

---

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

---

END OF GENERAL DECISION

3. All other terms and conditions remain unchanged.

**(End of Modification)**



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**DEC 30 2016**

16-CPM-0173

Ms. L.W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF 2017 PERFORMANCE  
EVALUATION AND MEASUREMENT PLAN**

Attached is a fully-executed original of the 2017 Performance Evaluation and Measurement Plan (PEMP), effective January 1, 2017. While the U.S. Department of Energy, Office of River Protection (ORP) decided to issue the PEMP unilaterally to protect its rights, ORP will take into consideration any comments provided by Bechtel National, Inc. as long as they are received by January 13, 2017. For those comments that ORP is in agreement with, it is ORP's intent to revise the PEMP and reissue it bilaterally by February 10, 2017.

If you have any questions, please contact me at (509) 376-2760.

A handwritten signature in black ink that reads "Marc T. McCusker".

Marc T. McCusker  
Contracting Officer

CPM:GFC

Attachment

cc w/attach:  
BNI Correspondence

**Attachment  
to  
16-CPM-0173**

**2017 Performance Evaluation and Measurement Plan**

**PERFORMANCE EVALUATION AND  
MEASUREMENT PLAN**

**Incentive B – Award Fee**

**DESIGN, CONSTRUCTION, AND COMMISSIONING OF THE  
HANFORD TANK WASTE TREATMENT AND  
IMMOBILIZATION PLANT**

**CONTRACT NO. DE-AC27-01RV14136**

**Evaluation Period 2017  
January 1, 2017, to December 31, 2017**

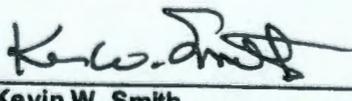
**Bechtel National, Inc.**

**Richland, WA**

**Rev. 0 – Effective January 1, 2017**



**Issued By:**

 12/30/16

**Kevin W. Smith  
Manager, DOE Office of River Protection  
Fee-Determining Official**

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Appendix A Award Fee Rating Guide

## 1.0 AWARD FEE OBJECTIVES

This Performance Evaluation Measurement Plan (PEMP) contains the following seven award fee objectives:

1. Project performance (cost, schedule, and efficiencies)
2. One System, startup and commissioning, and engineering performance
3. Environmental, safety, health, and safety conscious work environment
4. Quality Assurance (QA) Program and quality of performance
5. Nuclear safety
6. Pretreatment (PT) Facility
7. High-Level Waste (HLW) Facility.

### 1.1 EVALUATION PROCESS

The U.S. Department of Energy (DOE), Office of River Protection (ORP) will evaluate and measure performance in each of the seven award fee objectives using the criteria in each objective. The evaluation will assign an adjectival rating and corresponding award fee earned to each award fee objective (see Table 1, "Award Fee – Incentive Ratings and Definitions"). The Fee-Determining Official (FDO) may consider any other pertinent factors in making a final fee determination.

### 1.2 INCENTIVE RATINGS AND DEFINITIONS

ORP will utilize Table 1 to rate performance. ORP will utilize a separate color-coded table (see Appendix A, "Award Fee Rating Guide") for informal periodic evaluations. The final evaluation will reflect the adjectival rating scale in Table 2, "Award Fee – Fee Earnings Calculations."

Adjectival Rating	Definition	Percentage of Award Fee Earned
Excellent	Contractor has exceeded almost all of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.	91% to 100%
Very Good	Contractor has exceeded many of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.	76% to 90%
Good	Contractor has exceeded some of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.	51% to 75%

Adjectival Rating	Definition	Percentage of Award Fee Earned
Satisfactory	Contractor has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.	≤ 50%
Unsatisfactory	Contractor has failed to meet overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.	0%

Table 1. Award Fee – Fee Earnings Calculation.

	Award Fee Objective	Award Fee Available	Adjectival Rating	% of Award Fee Earned	Award Fee Dollars Earned
1	Project Performance (Cost, Schedule, and Efficiencies)	\$1,500,000			
2	One System, Startup and Commissioning, and Engineering Performance	\$1,500,000			
3	Environmental, Safety, Health, and Safety Conscious Work Environment	\$1,500,000			
4	Quality Assurance Program and Quality of Performance	\$1,200,000			
5	Nuclear Safety	\$1,300,000			
6	Pre-Treatment Facility	\$300,000			
7	High-Level Waste Facility	\$572,603			
	<b>Total Award Fee (Period 2017)</b>	<b>\$7,872,603</b>			

### 1.3 AWARD FEE OBJECTIVE 1: PROJECT PERFORMANCE (COST, SCHEDULE, AND EFFICIENCIES)

Award Fee Criteria:

- Project Performance
- Cost Performance and Efficiencies.

#### 1.3.1 Project Cost and Schedule Performance

ORP will evaluate the contractor's cost and schedule performance based upon actual incurred costs compared to the total estimated costs of that work and actual schedule performance as compared to the planned schedule. The analysis of cost control performance will give consideration to changed programmatic requirements, changed statutory requirements, and/or changes beyond the contractor's control, which impact costs. ORP will rely on other objective and/or subjective cost and schedule performance elements, such as critical path and float

analysis, to evaluate the contractor's performance, which includes, but is not limited to the following:

- Contractor Assurance System – Project metrics represent accurate project performance and are used to monitor performance trends. Actions are taken based on performance trends to adjust project performance.
- Cost Control – The contractor maintains cost control (i.e., actual costs incurred for work performed are equal to or less than the estimated costs for that work) and actively pursues cost containment and reduction through innovative approaches and management of resources. Cost control will be monitored against the Performance Measurement Baseline (PMB) for the Low-Activity Waste (LAW) Facility, Balance of Facilities, and Analytical Laboratory (collectively referred to as LBL)/direct-feed low-activity waste (DFLAW), and against the internal forecast for the HLW/PT Facility and Project Services.
- Schedule Control – The contractor maintains an internal forecast schedule reflective of actual schedule performance, problem identification, and corrective action plans. These action plans are tracked for actual schedule performance. Contractor performance will also be evaluated using internal contractor planning documents and performance (e.g., meeting scheduled documented safety analysis development activities, quantity unit rate report, and engineering production rate report).
- Cost and Schedule Reporting – The contractor is proactive in assisting ORP with problem identification. Potential problems are identified, and corrective action is implemented to minimize cost/schedule impacts (e.g., meeting QA requirements while meeting schedule activity completions). The Government is notified immediately of significant problems, and the contractor interacts with the Government to develop viable resolutions and overcome delays.
- Communication – The contractor is expected to communicate clearly and effectively and in a timely manner for the reporting of data and metrics for project performance.
- Variiances – The contractor is expected to promptly take corrective action on negative cost and schedule variiances. Negative variiances are not expected to build but instead be mitigated effectively and with sound business practices.
- Risk Management – The contractor shall identify new threats, opportunities, and risk closures to demonstrate an effective risk program. Risks should be identified early to maximize risk mitigation and risks shall be managed, monitored, and risk mitigation effectiveness reported on for closed threats, open threats, and opportunities realized.
- Available Funding Utilization – The contractor is expected to optimize utilization of funds while planning for an appropriate amount of carryover to cover outstanding year-end commitments and to provide for the first few weeks of continuing operations into the next fiscal year.
- Earned Value Management System (EVMS) Indices, Including Cost Performance Index and Schedule Performance Index – The contractor is expected to effectively use EVMS in managing and reporting their project performance to ensure that actual progress is

reported compared to the PMB for LBL/DFLAW, and against the internal forecast for HLW/PT, and that sound management actions are taken when negative cost and schedule variances and/or cost overruns are projected.

- **Baseline and Contract Alignment** – The contractor shall work closely with ORP to maintain alignment between the baseline and the contract. The contractor shall submit quality and timely documents as required to support the alignment between the baseline and the contract and to support independent reviews.

### **1.3.2 Construction Cost and Schedule Performance**

**Award Fee Criteria:** This performance measure evaluates construction performance as an indicator of the contractor's ability to achieve overall project cost goals. The ORP Waste Treatment and Immobilization Plant (WTP) reserves the right to consider any available information in making this evaluation. Performance considerations include:

- Overcome engineering/procurement/construction challenges, including effective management of emergent trends with proactive and early communication to ORP-WTP from initial identification of an issue through final closure.
- Focus on LAW Facility completion.

**Focus on LAW Facility completion:**

- Complete LAW Facility construction to support timely system and facility turnover to startup. Punch list items are minor and manageable and item work-off rate supports turnover schedule, construction quality is reflected in completed systems and testing results, and construction quality records are available and retrievable to support turnover to startup.
- LAW Facility construction nonconformance reports/construction deficiency reports, condition reports, and other issue items are adequately managed – issue closure packages are developed and implemented in a manner that does not delay turnover, records support issue closures, and long-lead resolutions are prioritized to support system and facility completion.
- LAW equipment is adequately maintained – maintenance is scheduled and completed in a timely manner; plans and materials are in place to support equipment refurbishment to support turnover; and spare parts, vendor information, vendor support is planned and available.

**Meet installation rates:**

- Planned versus actual commodity and major equipment installation rates measured against the baseline for LBL and DFLAW only. HLW and PT will continue to work in accordance with the Internal Forecast.
- Subcontractor performance on all installation work performed on the WTP jobsite by Bechtel National, Inc. (BNI) subcontractors, including the efficient coordination of BNI engineering-supplied documentation and scheduling of work interfaces with BNI direct

hire craft and other BNI subcontractors and timely resolution of nonconformance reports and interferences with a minimum amount of rework. Included in this metric is reporting of correct EVMS data and performance indices by the subcontractors.

- Demonstrate priorities and decision making aligned with critical path and float analysis, as well as metrics identifying performance against secondary metrics of early starts and early finishes against the PMB for LBL/DFLAW, and against the internal forecast for HLW/PT.
- Manage resources (e.g., direct-hire labor, subcontractor, and equipment and materials) available to support construction.
- Timely and consistent communication and reporting of data and metrics against the PMB for LBL/DFLAW, and against the internal forecast for HLW/PT, to identify and facilitate accurate evaluation of the quantitative reporting for Construction Technical Performance.
- Maintain management tools, such as P6 and the Bechtel Procurement System, so that accurate and complete information is flowing between engineering, procurement, and construction related to the construction need date and the supporting procurement process.

#### **1.4 AWARD FEE OBJECTIVE 2: ONE SYSTEM, STARTUP AND COMMISSIONING, AND ENGINEERING PERFORMANCE**

Award Fee Criteria:

- One System
- Startup and Commissioning
- Engineering Performance.

##### **1.4.1 One System**

Performance will be evaluated on progress in meeting the following strategic objectives:

- Establish a prioritized set of activities and timing to fully integrate tank farms, LAWPS, and WTP necessary to meet the contractual dates for startup and commissioning of WTP. Be responsible for coordinating, tracking, measuring, and reporting on these activities.
- Accurately track schedule performance and any schedule slippage for DFLAW.
- Recommend to ORP, Washington River Protection Solutions LLC, and BNI actions needed to more effectively or efficiently conduct the transition to startup, commissioning, and operations.
- Support the establishment of a long-term tank waste disposition integrated flowsheet stewardship and technical management process that involves the national laboratories. Performance will be evaluated against milestones planned for the award fee period that are established by One System.
- Support the integration of tank farms and WTP system planning and modeling, with a focus on the WTP feed vector and waste feed qualification requirements. This includes

support for preparation for DOE review of the gaps, risks, opportunities management plan, and technology roadmap.

- Manage the WTP interface control documents.
- Drive down risk by finding opportunities such as early transition, early turnover, partial system tests, and activations.
- Closely track the activities necessary for startup and commissioning DFLAW and advise the One System Governance Board of any significant risks for the Governance Board milestones defined for BNI.
- Coordinate the alignment of DOE orders between BNI and Washington River Protection Solutions LLC for those DOE orders, DOE directives and contract changes having a direct effect on testing, maintenance, and operations of commissioning phase activities of the WTP. Establish an optimum or necessary time to have each item aligned.
- Ensure integration of plant installed and plant administration software systems between WTP and the Tank Operations Contractor in support of DFLAW startup and commissioning.

#### **1.4.2 Startup and Commissioning**

Completion of design and construction:

- Completion of comprehensive LBL design reviews as scheduled. Performance of comprehensive LAW 90 percent design reviews – assess LAW design against contractual and safety requirements, identify and address any shortcomings, and document system acceptability in a retrieval manner; resulting in a valuable system and facility operational reference resource.
- Completion of quality verification documentation packages for systems prior to turnover to commissioning and operations.
- Address LAW Facility design and operability (D&O) vulnerabilities.

Turnover and startup:

- Completion and maintenance of a startup schedule (Level 5) with a rolling 9-month window (including maintaining the 9-month window). The schedule will include sufficient detail and logic to allow planning of activities necessary for turnover and testing of scoped systems in support of achievement of the Level 4 baseline schedule.
- Definition and implementation of system and area turnover processes that are efficient and ensure systems are successfully turned over with only limited minor open work to go or punch list items.
- Turnover from construction startup completed with minimal issues with equipment aging or other adverse conditions that impact startup work performance.
- Successful turnover planning, preparation, and acceptance of scoped systems – Water Treatment Building process service water system, domestic water system, and demineralized water system. Level 5 schedule activities listed below:

- 5HBC115355, Startup turnover process service water system to commissioning (August 29, 2017)
- 5HBC114355, Startup turnover domestic water system to commissioning (October 12, 2017)
- 5HBC113355, Startup turnover demineralized water system to commissioning (November 28, 2017).

**System testing:**

- Successful performance of component and initial system testing, to include review and approval of a component test results package for scoped systems consistent with the completed Level 5 schedule.
- Preparation and approval of appropriate component and/or system test procedures to support upcoming testing in accordance with 24590-WTP-GPP-MGT-042 *WTP System Turnover*, and the baseline schedule. Completion of test matrices and test indices and associated test requirements and criteria prior to system turnover to Startup from Construction. This will include subjective consideration of procedure quality and review timeliness.
- Initiate potable water service to the cooling tower (ICD-2) Activity ID No. 5HBC108200 (February 23, 2017).
- Energize cooling tower from Building 91 prior to completion of Activity ID No. 5HBC108200 (February 23, 2017).

**Commissioning and operations:**

- Perform contractor integrated safety management system Phase I verification review in order to support the safe and successful turnover of the Water Treatment Building (August 16, 2017).
- Train operators prior to turnover of a system from startup to commissioning.
- Initiate nonradioactive liquid waste disposal system operations, Activity ID No. 5HBC108100B (January 9, 2017).
- Develop and issue the Balance of Facilities readiness plan.

**Engineering performance:**

- Procurement Package Development – Address past procurement issues (implements adequate design completion matrices, requirements verification matrix, material acceptance plans) and results in procurements that clearly specify requirements and ensures adequate oversight of important procurement submittals and activities.
- Configuration Management – Maintain the newly developed technical requirements management system, including system design descriptions, and develops and maintains an adequate SmartPlant system to support LAW system turnover.

- Design Output – Issues adequate calculations and other design products that reflect acceptable quality; manage margin; control unverified assumptions; and adequately flows down requirements to calculations, drawings, specifications, data sheets, and procurement documents.

### **1.5 AWARD FEE OBJECTIVE 3: ENVIRONMENTAL, SAFETY, HEALTH, AND SAFETY CONSCIOUS WORK ENVIRONMENT**

#### **Award Fee Criteria:**

- Nuclear Safety and Quality Culture
- Integrated Safety Management
- Environmental Permitting and Compliance.

Performance will be evaluated on continuous improvement in these areas, which includes, but is not limited to:

- Have an effective safety conscious work environment and culture through implementation of programs and dissemination of expectations in order to establish a work environment in which employees feel free to raise safety concerns to management and/or a regulator without fear of retaliation.
- Conduct business in a manner fully transparent to ORP. Activities are demonstrated by open, clear, and well communicated management actions and technical and project documentation. Identified issues and trends are proactively shared with ORP.
- Foster a culture that rewards proactive self-identification and reporting of issues and proactively identify and takes action on systemic weaknesses leading to sustained continuous self-improvement.
- Implementation of work hazard analysis and controls resulting in (1) improving work injury/illness performance and (2) no unplanned employee exposures to work place hazards.
- Implementation of event investigation (e.g., review, cause analysis, and action implementation) resulting in effective organizational learning with the goal of eliminating recurring events and implementing quality corrective actions in a timely manner.
- Documented periodic management analysis of work site conditions and implementing strategies resulting in improving WTP Project safety.
- Implement a robust and effective integrated safety management program.

#### **1.5.1 Environmental Permitting and Compliance**

Performance will be evaluated on the contractor's programs for environmental stewardship and compliance. ORP will rely on subjective and objective evaluations of the contractor's performance in areas that include but are not limited to documentation and implementation of the contractor's environmental protection and compliance program including initiatives for continuous improvement, establishment of performance metrics and use in improving the environmental protection and compliance program, timeliness and quality (e.g., accuracy,

completeness) of permit documents and compliance to permits and licenses, proactive assessment/evaluation program, and the number and seriousness of any findings or concerns related to noncompliances or violations including the timeliness and quality of related reporting and responses. In addition, specific deliverables which will be evaluated are:

- Submit permitting products with a high degree of quality on the initial submittal, requiring minimal rework and enable schedule efficiencies
- Provision of draft Effluent Management Facility (EMF) process equipment permit modification package for early review by June 5, 2017
- Provision of final EMF secondary containment permit modification package in support of start of construction by February 2017
- Provision of final EMF transfer line permit modification package for transmittal to the Washington State Department of Ecology by February 17, 2017
- Provision of final EMF process equipment permit modification package for transmittal to the Washington State Department of Ecology by September 27, 2017
- Provision of draft radioactive air emissions notice of construction for LAW Facility operations by September 30, 2017
- Provision of draft radioactive air emissions notice of construction for Analytical Laboratory operations by September 30, 2017
- Provision of draft radioactive air emissions notice of construction for EMF operations by September 30, 2017.

#### **1.6 AWARD FEE OBJECTIVE 4: QUALITY ASSURANCE PROGRAM AND QUALITY OF PERFORMANCE**

The QA Program and Quality of Performance Objective has been divided into two subparts. Objective 4a will evaluate the effectiveness of the Contractor Assurance System and Objective 4b will evaluate the contractor's actions to address four significant quality issues. Performance will be judged based on the quality and timeliness of products and services produced during the reporting period and the overall effectiveness of the contractor's assurance system to completely identify, track, correct, and communicate issues. The analysis of quality performance will also give consideration to the contractor's ability to self-identify issues (e.g., nonconforming conditions, legacy issues, emerging negative performance trends) and correct negative performance trends before significant issues occur. In addition, the QA documentation supports the requirements needed for documented safety analysis approval. ORP will rely on objective and subjective evaluations of the contractor's performance.

##### **Award Fee Criteria:**

- Contractor Assurance System
- Actions to Address Significant QA Issues.

### 1.6.1 Objective 4a: Contractor Assurance System

- Assessment Program – Rigorous, risk-informed, highly self-critical, credible self-assessments are conducted to identify issues and improvement opportunities by the line management. These self-assessments should demonstrate the line management's self-critical commitment to quality. The assessment program should also include rigorous independent QA reviews that verify the line management's achievement of quality. The measure of effectiveness of both the self-critical assessments and the QA independent assessments is that all issues are identified.
- Trend Analysis Program – Performance metrics are effectively used to provide an accurate picture of current quality performance against goals. Outcomes of the trend analysis program are leveraged to inform management (contractor and ORP) of emerging issues in a timely manner.
- Cause Analysis and Corrective Action – Performance gaps are identified and analyzed commensurate with their significance. Corrective actions are timely, prioritized by importance, and appropriately targeted to correct negative performance/compliance trends and prevent the development of significant issues. In the case of significant conditions adverse to quality, effective compensatory measures are implemented, the causes of the condition are determined in a timely manner and corrective action taken to preclude recurrence.
- Corrective Action Management System – BNI improvements are implemented to promote a proactive and effective corrective action program ensuring quality issues (including project peer reviews, other reviews, assessments and audits) are correctly identified, appropriately classified, rigorously investigated and resolved to mitigate recurrence.
- Feedback and Improvement – Continuous feedback and improvement, including worker feedback mechanisms are incorporated into the overall work process to measure the effectiveness of continuous improvement. Lessons learned and operational experiences are shared with others.

### 1.6.2 Objective 4b: Actions to Address Significant Quality Assurance Issues

Corrective actions to address the following areas will be evaluated during each review period to determine if BNI's actions have been completed as planned and whether completed corrective actions have been effective. Ongoing status shall be communicated to the ORP QA Division during the weekly interface meetings.

- Commercial Grade Dedication – BNI shall implement, document, and demonstrate an effective commercial grade dedication program in accordance with the contract, associated corrective action plan, compensatory actions, and process improvements.
- Software QA Program – BNI shall issue and implement the Software Quality Improvement Plan to complete actions necessary to close priority level finding U-13-QAT-RPPWTP-001-F01 (U-13-QAT-RPPWTP-001, *BNI Quality Assurance Program Requirements 3, 4, 7, 8, 15, and 16*).

- **QA Program Implementation** – BNI shall complete actions necessary to close Priority Level 1 QA findings (U-13-QAT-RPPWTP-001-F01 and U-13-QAT-RPPWTP-001-F02) (U-13-QAT-RPPWTP-001) and demonstrate that an adequate QA program has been effectively implemented.
- **Procurement Program Improvements** – BNI shall demonstrate effective procurement and property management policies and procedures. This includes subcontractor/vendor related nonconformance report/construction deficiency report identification and disposition processes, and back-charge processes to ensure the contractor is effectively identifying and resolving nonconformances to support project priorities, schedule, and contract requirements.

## 1.7 AWARD FEE OBJECTIVE 5: NUCLEAR SAFETY

### Award Fee Criteria:

Contract No. DE-AC27-01RV14136, *Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant, Section C, "Statement of Work,"* Standard 9 describes contractor requirements to ensure radiological, nuclear, and process safety. This work scope includes implementation of a standards-based safety management program in compliance with the rules provided in 10 CFR 830, "Nuclear Safety Management," on nuclear safety to ensure that WTP safety requirements are defined, implemented, and maintained.

Evaluation criteria to measure performance will include ORP's evaluation of the contractor's progress toward and compliance with contract requirements for nuclear safety performance. Progress will be evaluated against interim project schedules for safety basis submittals and supporting documentation (e.g., hazards analyses) with consideration of any emerging issues. Compliance will be evaluated against guidance found in DOE-STD-3009, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, CN 3 as well as all other contract requirements and clarifying direction from ORP.

ORP-WTP will consider any available information that bears on nuclear safety performance in making this evaluation. Documents to be considered include:

- Nuclear safety products are submitted with a high degree of quality on the initial submittal, require minimal rework, and are ready for approval
- Progress toward interim project schedules and milestones while producing a high quality and compliant preliminary documented safety analysis (PDSA) for the LAW Facility
- Progress toward interim project schedules and milestones while producing a high quality and compliant HLW Facility PDSA revision resolving gaps identified in the HLW safety design strategy/PDSA gap analysis
- Progress toward interim project schedules and milestones and completion of a compliant Analytical Laboratory PDSA to incorporate ORP technical direction and current hazard analysis processes

- Nuclear safety engineering plans, procedures, calculations, engineering studies, and other documents used to support resolution of technical issues, PDSA changes, or safety basis document development
- Effectiveness of the corrective actions resulting from the quality issues identified in 16-NSD-0026, "Contract No. DE-AC27-01RV14136 – Low-Activity Waste Process Hazards Analysis Report Quality Issues"
- Incorporation of lessons learned from the submittal and approval of the initial EMF PDSA reflecting 30 percent design completion
- Effectiveness in self-identifying nuclear safety concerns early and responding to concerns raised both internally and by external stakeholders and review teams
- Development of creative solutions to improve PDSA control suite issue resolution.

### **1.8 AWARD FEE OBJECTIVE 6: PRETREATMENT FACILITY**

This award fee objective applies to the PT Facility program development and technical issues resolution activities as directed by ORP to support a return to production engineering.

#### **Award Fee Criteria:**

- Identified technical and testing deliverables are accomplished on schedule and within budget for the full scale pulse jet mixing (PJM) controls and mixing for the standard high-solids vessel (SHSV) test
- Demonstrate effective project performance reporting consistent with ORP priorities and available funding
- Effectively utilize funding provided to complete the directed work scope
- Demonstrate an effective and integrated WTP program team approach for accountability, leadership, decision making, and ownership
- Maintain an effective, transparent, and integrated line of communication with ORP
- Proactively support ORP in completing and documenting the resolution of technical issues identified by the Defense Nuclear Facilities Safety Board.

#### **Work activities and deliverables are completed on schedule:**

- The contractor will ensure each deliverable is submitted on schedule as defined in the current Internal Forecast (IF).
  - Complete PJM control systems testing in SHSV design test phase 3 and complete all SHSV mixing tests by September 2017.
  - Execute the Joint Test Group approved run sheets for PJM controls testing in SHSV design. Tests are complete and data successfully acquired to achieve the test objectives described in the test plan (24590-WTP-ES-ENG-16-011 *Test Plan for*

*Phase 3 PJM Controls Testing in the Standard High Solids Vessel Design (SHSVD-T Vessel) by September 2017.*

- Complete and approve the SHSV PJM control, qualification, and informational test reports by September 2017.
- Deliverables provided to ORP comply with the BNI/ORP predetermined quality criteria (e.g., completeness, clarity of presentation).
- Support resolution of Defense Nuclear Facilities Safety Board-identified issues on the WTP by completing required analyses, supporting interactions with the Defense Nuclear Facilities Safety Board, and preparing documentation to support the basis for issues resolution.

Manage project performance functions and tools consistent with DOE priorities and available funding:

- The contractor will consistently maintain project management function tools (e.g., cost and schedule reporting, change control, variance reporting, configuration management, risk management function, and procurements as relative to a baseline IF).
- Implement a robust and effective EVMS in managing project performance reporting to ensure that actual progress is reported compared to a baseline IF.
- Proactively identify new threats, opportunities, and risk closures resulting in an effective risk program.

Quality of deliverables meet the BNI/ORP predetermined quality criteria:

- The contractor will collaborate with ORP to fully define quality criteria for each product deliverable required by the contract and to meet requirements as identified by the WTP federal project director.
- Report progress during project area review briefings, weekly and monthly reports.
- Contractor will also submit quality and timely documents as required as defined in the baseline IF.

Effectively maintain an integrated approach to accountability, leadership, decision making, and ownership:

- The contractor will maintain an effective integrated approach and accept responsibility; accountability; leadership and decision making; and ownership for each defined pretreatment role, responsibility, and line of authority per the BNI organizational construct.

Maintain an effective integrated line of communication; sustain transparency:

- The contractor will be expected to communicate clearly and effectively to ORP WTP Project staff, current project deliverables on a weekly and monthly schedule.

- Conduct business in a manner fully transparent and documented.
- Foster a culture that rewards proactive self-identification and reporting issues and take action on systemic weaknesses leading to sustained continuous self-improvement.

### **1.9 AWARD FEE OBJECTIVE 7: HIGH-LEVEL WASTE FACILITY**

This award fee objective applies to the HLW Facility activities performed in support of the full procurement and construction authorization planned to be accomplished by the end of calendar year 2017.

#### **Award Fee Criteria:**

- Management of D&O issue resolution and adequate condition report disposition and closure
- Effective implementation of the updated BNI processes and procedures ensuring sustained improved products
- Deliverables are responsive, timely, and meet the quality requirements
- Achieve full authorization of procurement and construction (Decision 2A)
- All of the requirements are met to resume full HLW engineering, procurement, and construction in 2017.

#### **Management of issue resolution and condition report closures:**

- Submit a D&O summary report meeting ORP expectations for disposition of design comments
- Ensure condition report actions and closure documentation adequately address conditions adverse to quality.

#### **Effective implementation of the updated BNI processes:**

- Demonstrate effective implementation of BNI processes by successfully shipping critical equipment with completed documentation packages
- Update and manage changes to design deliverables using updated design and nuclear safety processes (e.g., backward and forward passes)
- Ensure that design products align with system design descriptions and are documented in the requirements verification matrices
- Demonstrate effective implementation of the quality engineering program.

#### **Deliverables are responsive, timely, and of high quality:**

- Collaborate with DOE-ORP to fully define quality criteria for key deliverables
- Technical and management products are clear, comprehensive, and of adequate technical content withstanding the scrutiny of internal and external stakeholders

- Deliverables meet HLW Facility objectives on or ahead of schedule.

Achieve full authorization of procurement and construction:

- BNI provides notification of completion of criteria for full authorization with objective evidence
- Receive DOE approval of the full authorization of procurement and construction (Decision 2A).

## 2.0 PERFORMANCE EVALUATION AND MEASUREMENT PLAN GENERAL INFORMATION

### A. CONTRACT INCENTIVE FEE STRUCTURE

Contract No. DE-AC27-01RV14136 utilizes multiple, performance-based incentive fee components to drive contractor performance excellence in completing the design, construction, and commissioning of the WTP Contract.

The contract has the following incentive fee elements:

- Incentive Fee A – Final Fee Determination for Work Prior to Modification No. A143
- Incentive Fee B – Final Fee Determination for Work from Modification No. A143 and Modification No. TBD
- Incentive Fee C – Fixed Fee Payment
- Incentive Fee D – Award Fee
- Incentive Fee E – LBL Construction Complete Performance Based Incentives
- Incentive Fee F – Commission LBL in the DFLAW Configuration Performance Based Incentive
- Incentive Fee G – CLIN 1.0 Cost Share Incentives
- Incentive Fee H – CLIN 2.1 DFLAW Design Completion Fee.

This PEMP covers Incentive D, which is updated annually. The fee administration terms and conditions of incentive fee elements A, B, C, E, F, G, and H are self-contained within Contract Section B, and thus, are not addressed in this PEMP.

The award fee provides a performance incentive for the contractor and gives the Government a tool to identify and reward superior performance. The amount of award fee the contractor earns is based on both an objective and subjective evaluation by the Government of the contractor's performance as measured against the criteria contained in this PEMP.

### B. ROLES AND RESPONSIBILITIES

The award fee process utilizes a three-level system to ensure full and fair performance evaluation:

Level 1.0 – FDO

Level 1.1 – WTP Contracting Officer (CO)

Level 2.0 – Performance Evaluation Board (PEB)

Level 3.0 – Performance Evaluation Monitors (PEM).

### **2.1.1 Level 1.0 – Fee-Determining Official: Office of River Protection Manager**

The FDO will:

- Review the recommendation of the PEB, consider all pertinent data, and determine the amount of award fee earned during each evaluation period
- Notify the contractor via the CO of performance strengths, areas for improvement, and future expectations
- Approve this PEMP and any significant changes thereto
- Authorize the CO to make the award fee payment.

Level 1.0 ensures independent, executive-level review of the work of the PEB and PEMs.

### **2.1.2 Level 1.1 – Waste Treatment and Immobilization Contracting Officer**

The WTP CO will:

- Serve as a voting member of the PEB
- Issue the PEMP on an annual basis in accordance with Section B.8, "Award Fee Administration," of the contract
- Ensure that the award fee and contract incentives process is managed consistent with applicable acquisition regulations
- Ensure that the award fee process meets the overall WTP business objectives
- Issue the award fee amount earned determination as authorized by the FDO in accordance with Section B.8.

### **2.1.3 Level 2.0 – Performance Evaluation Board**

- WTP federal project director, Chair
- WTP deputy federal project director, field operations
- WTP CO
- Assistant Manager, Technical and Regulatory Support.

The PEB reviews the PEM evaluations of contractor performance, considers the contractor's self-assessment if submitted, considers all information from pertinent sources, prepares draft and final performance reports, and arrives at an earned award fee recommendation to be presented to the FDO. The PEB may also recommend changes to this PEMP.

### **2.1.4 Performance Evaluation Board Chair**

The PEB Chair will be the assistant manager/federal project director for WTP. The Chair will:

- Review the performance monitors' evaluations and consider the contractor's self-assessment

- Analyze the contractor's performance against the criteria set forth in this PEMP
- Consider any additional relevant contractor performance
- Provide periodic interim performance feedback to the contractor via the CO
- Provide a recommendation to the FDO on the award fee scoring and the amount earned by the contractor
- Recommend any changes to this PEMP.

#### **2.1.5 Level 3.0 – Performance Evaluation Monitors:**

PEMs will consist primarily of WTP sub-federal project directors and ORP division directors. The PEMs will:

- Monitor, evaluate, and assess contractor performance in their assigned areas
- Periodically prepare a contractor performance monitor report for the PEB and recommend verbal performance input as well
- Recommend any needed changes to this PEMP for consideration by the PEB and FDO
- Maintain a performance dialogue with their respective BNI counterparts throughout the evaluation period.

#### **C. PROCESS**

The total available award fee for the 2017 evaluation period is \$7,872,603.

In accordance with FAR 16.401(e)(3)(v), the contractor is prohibited from earning any award fee when the contractor's overall cost, schedule, and technical performance is below satisfactory.

#### **D. PROVISIONAL FEE**

Provisional fee requirements in Contract Section B, Clause B.8 (g), "Provisional Payment of Fee," apply to this PEMP. The clause paragraphs are restated below for emphasis:

(g)(3)(vi) Provisional payment of fee for an incentive means the Government's paying available fee for an incentive to the Contractor for making progress towards meeting the performance measures for the incentive before the Contractor has earned the available fee.

(g)(3)(vii) Provisional payment of fee has no implications for the Government's eventual determination that the Contractor has or has not earned the associated available fee. Provisional payment of fee is a separate and distinct concept from earned fee.

(g)(6) The Contracting Officer, at his/her sole discretion, will determine if the Contractor has met the requirements under which the Government will be obligated to pay fee, provisionally, to the Contractor and for the Contractor to have any right to retain the provisionally paid fee.

(g)(7) If the Contracting Officer determines the Contractor has not met the requirements to retain any provisionally paid fee and notifies the Contractor, the Contractor must return that provisionally paid fee to the Government within 30 days:

(i) the Contractor's obligation to return the provisional paid fee is independent of its intent to dispute or its disputing the Contracting Officer's determination; and

(ii) if the Contractor fails to return the provisionally paid fee within 30 days of the Contracting Officer's determination, the Government, in addition to all other rights that accrue to the Government and all other consequences for the Contractor due to the Contractor's failure, may deduct the amount of the provisionally paid fee from: amounts it owes under invoices; amounts it would otherwise authorize the Contractor to draw down under a Letter of Credit; or any other amount it owes the Contractor for payment, financing, or other obligation.

(g)(8) If the Contractor has earned fee associated with an incentive in an amount greater than the provisional fee the Government paid to the Contractor for the incentive, the Contractor will be entitled to retain the provisional fee and the Government will pay it the difference between the earned fee and the provisional fee.

#### Provisional fee procedures:

The Government and the Contractor will meet monthly to review the Contractor's performance against the PEMP criteria. Subsequent to each monthly meeting and pending satisfactory performance, the Contractor is authorized to invoice for provisional fee once per month, at a rate of \$328,025 per month (calculated as one-twelfth of 50 percent of the \$7,872,603 maximum annual available PEMP fee). However, the Contracting Officer may reduce the amount in accordance with Section B, Clause B.8 (g) Provisional Payment of Fee.

In the event that fee overpayment results from the provisional fee payments provided for in this section exceeding the earned fee, as determined by the FDO, the contractor shall reimburse the unearned fee overpayment within 30 days of notification to the CO.

#### **E. CONTRACTOR SELF-ASSESSMENT**

Contract Section B, Clause B.8 states:

Following each evaluation period, the Contractor may submit a self-assessment, provided such assessment is submitted within ten (10) calendar days after the end of the period. This self-assessment shall address both the strengths and weaknesses of the Contractor's performance during the evaluation period. Where deficiencies in performance are noted, the Contractor shall describe the actions planned or taken to correct such deficiencies and avoid their recurrence. The Contracting Officer will review the Contractor's self-assessment, if submitted, as

part of its independent evaluation of the Contractor's management during the period.

**F. METHOD FOR CHANGING THE PERFORMANCE EVALUATION AND MEASUREMENT PLAN DURING THE EVALUATION PERIOD**

Proposed changes to the current period PEMP may be initiated by either ORP or the contractor. Proposed changes shall be in writing. Both ORP and the contractor must agree to any changes. Once agreement is reached, the FDO and contractor representative will sign the revised PEMP. The revision number (e.g., Rev. 1) will be noted on the PEMP. Subsequently, the revised PEMP will be incorporated into the contract by reference via contract modification.

## ABBREVIATIONS AND ACRONYMS

BNI	Bechtel National, Inc.
CLIN	Contract Line Item Number
CO	contracting officer
DFLAW	direct-feed low-activity waste
DOE	U.S. Department of Energy
D&O	design and operability
EMF	Effluent Management Facility
EVMS	Earned Value Management System
FDO	Fee-Determining Official
HLW	high-level waste
IF	Internal Forecast
LAW	low-activity waste
LBL	low-activity waste, balance of facilities, analytical laboratory
ORP	U.S. Department of Energy, Office of River Protection
PDSA	preliminary documented safety analysis
PEB	Performance Evaluation Board
PEM	performance evaluation monitor
PEMP	Performance Evaluation Measurement Plan
PJM	pulse jet mixing
PMB	Performance Measurement Baseline
PT	pretreatment
QA	quality assurance
SHSV	standard high-solids vessel
WTP	Waste Treatment and Immobilization Plant

## REFERENCES

- 10 CFR 830, "Nuclear Safety Management," *Code of Federal Regulations*, as amended.
- 16-NSD-0026, 2016, "Contract No. DE-AC27-01RV14136 – Low-Activity Waste Process Hazards Analysis Report Quality Issues" (external letter to M. McCullough, Bechtel National, Inc.), from W.F. Hamel, U.S. Department of Energy, Office of River Protection, Richland, Washington, June 23.
- 24590-WTP-ES-ENG-16-011, 2016, , *Test Plan for Phase 3 PJM Controls Testing in the Standard High Solids Vessel Design (SHSVD-T) Vessel*, Bechtel National, Inc., Richland, Washington, September 29.
- 24590-WTP-GPP-MGT-042, 2014, *WTP System Turnover*, Bechtel National, Inc., Richland, Washington, October 30.
- Contract No. DE-AC27-01RV14136, *Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant*, U.S. Department of Energy, Washington, D.C., as amended.
- DOE-STD-3009, 2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, DOE Standard, U.S. Department of Energy, Washington, D.C., November.
- FAR 16.401, "Incentive Contracts," "General," *Federal Acquisitions Regulations*, as amended.
- U-13-QAT-RPPWTP-001, 2013, *BNI Quality Assurance Program Requirements 3, 4, 7, 8, 15, and 16*, U.S. Department of Energy, Office of River Protection, Richland, Washington, October 28.

**APPENDIX A**  
**AWARD FEE RATING GUIDE**

**Appendix A. Award Fee Rating Guide. (2 pages)**

	<b>OBJECTIVE ITEMS</b>	<b>SUBJECTIVE ITEMS</b>
<b>Dark Blue</b> "Excellent" Performance	<ul style="list-style-type: none"> <li>Objective measures are achieved on or ahead of time</li> <li>Very high probability of achieving the outcome</li> <li>Meeting all cost, scope, and schedule objectives</li> <li>Very high degree of transparency</li> </ul>	<ul style="list-style-type: none"> <li>100% of key areas meeting requirements</li> <li>100% of key deliverables will be met on time</li> <li>90% of sub or supporting areas are performing very well</li> <li>No safety, security, or quality issues of note</li> <li>Very high degree of self-identification and reporting deficiencies</li> <li>Very high degree of transparency</li> <li>Strong ISMS practices, timely reporting, critiqued/EOC whenever needed</li> </ul>
<b>Light Blue</b> "Very Good" Performance	<ul style="list-style-type: none"> <li>Objective measures expected to be achieved on time</li> <li>Very good probability of achieving the outcome</li> <li>Expect to meet cost, scope, and schedule objectives</li> <li>High degree of transparency</li> </ul>	<ul style="list-style-type: none"> <li>100% of key areas meeting or close to meeting requirements</li> <li>100% of key deliverables are meeting or expected to meet requirements</li> <li>Majority of sub or supporting areas are performing very well</li> <li>At most minor safety, security, or quality issues of note</li> <li>High degree of self-identification and reporting deficiencies</li> <li>High degree of transparency</li> <li>Strong ISMS practices, timely reporting, critiqued/EOC whenever needed</li> </ul>
<b>Green</b> "Good" Performance	<ul style="list-style-type: none"> <li>Objective measures reasonably expected to be achieved on time</li> <li>Reasonable probability of achieving the outcome</li> <li>Expect to meet or be very close to cost, scope, and schedule</li> <li>Good degree of transparency</li> </ul>	<ul style="list-style-type: none"> <li>Almost all key areas meeting or close to meeting requirements</li> <li>Majority of key deliverables are satisfactory or better</li> <li>Majority of sub or supporting areas are performing satisfactorily</li> <li>Mostly minor safety, security, or quality issues of note</li> <li>Good degree of self-identification and reporting deficiencies</li> <li>Good degree of transparency</li> <li>Infrequent deviation in ISMS practices, timely reporting, critiqued/EOC reviews</li> </ul>

Appendix A. Award Fee Rating Guide. (2 pages)

	OBJECTIVE ITEMS	SUBJECTIVE ITEMS
<p align="center"><b>Yellow</b> "Underperforming" "Needs improvement" "Elevated risk"</p>	<ul style="list-style-type: none"> <li>• Elevated risk of objectives not being achieved on time</li> <li>• Reasonable probability of not achieving the outcome</li> <li>• Expect to not meet cost, scope, or schedule</li> <li>• Partial degree of transparency</li> </ul>	<ul style="list-style-type: none"> <li>• Majority key areas meeting or close to meeting requirements</li> <li>• Notable percentage of key deliverables are satisfactory or better</li> <li>• Notable percentage of sub or supporting areas are performing satisfactorily</li> <li>• Occasional mid-level safety, security, or quality issues of note</li> <li>• ~75% of issues are self-identified with most reporting in a timely manner</li> <li>• Partial degree of transparency</li> <li>• Clear deviations of ISMS practices, reporting, critiques, EOC reviews, safety basis/CONOPS/engineering deviations that are generally infrequent or have minor consequences</li> <li>• Nominal NOV, PAAA, fine, injury, security infraction(s)</li> </ul>
<p align="center"><b>Red</b> "Does not meet reqmts" "Failing or will fail"</p>	<ul style="list-style-type: none"> <li>• Clear (or high) risk of objectives not being achieved on time</li> <li>• High probability of not achieving the outcome</li> <li>• Expect to not meet or significantly miss cost, scope, or schedule</li> <li>• Inadequate degree of transparency</li> </ul>	<ul style="list-style-type: none"> <li>• Overall most key areas meeting or close to meeting requirements</li> <li>• Inadequate percentage of key deliverables are satisfactory or better</li> <li>• Inadequate percentage of sub or supporting areas are performing satisfactorily</li> <li>• Too high a frequency of mid-level safety, security, or quality issues of note</li> <li>• Major safety, security, or quality issue</li> <li>• Less than ~75% of issues are self-identified and reported in a timely manner</li> <li>• Inadequate degree of transparency</li> <li>• Significant deviations of ISMS practices, reporting, critiques, EOC reviews, multiple safety basis/CONOPS/engineering deviations or a significant deviation with nuclear safety or operational implications</li> <li>• Significant NOV, PAAA, fine, injury, security deviation(s)</li> </ul>
<p align="center"><b>Grey</b> "Insufficient data" "Not able to assess"</p>	<ul style="list-style-type: none"> <li>• Insufficient data to assess at this time</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient data to assess at this time</li> <li>• Parties misaligned on the objective</li> </ul>

CONOPS = conduct of operations. ISMS = Integrated Safety Management System. PAAA = Price-Anderson Amendment Act.  
 EOC = extent of condition. NOV = notice of violation.



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Ms. Baker:

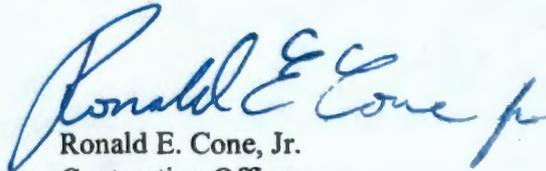
**CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT MODIFICATION NO. 385 – CHANGE ORDER FOR PARTIAL RECLASSIFICATION OF THE LOW-ACTIVITY WASTE FACILITY C5 VENTILATION SYSTEM TO SAFETY SIGNIFICANT**

Reference: BNI letter from L.W. Baker to W.F. Hamel, ORP, "Submittal of 24590-LAW-PL-NS-0005, for Review and Concurrence," CCN: 27632, dated December 21, 2016.

The purpose of this letter is to transmit a signed original of Contract Modification No. 385. The modification directs Bechtel National, Inc. (BNI) to proceed with the engineering redraft process as required to reclassify portions of the Low-Activity Waste Facility C5 Ventilation (C5V) system from non-safety to safety significant. The technical basis for the partial C5V safety reclassification is documented in the Safety Strategy Summary Document transmitted by BNI in the reference. The attached modification establishes a not-to-exceed (NTE) value of \$111,648 for the change order.

BNI is requested to provide notification to the Contracting Officer at which time the total costs are expected to reach 75 percent of the NTE value as detailed in the attached contract modification.

If you have any project-related questions, please contact William F. Hamel at (509) 438-1176. For contract-related questions, please contact me at (509) 376-5583.

  
Ronald E. Cone, Jr.  
Contracting Officer

CPM:REC

Attachment

cc w/attach:  
BNI Correspondence

**Attachment  
to  
16-CPM-0174**

**Contract Modification No. 385**

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE  
PAGE 1 OF 7 PAGES

2. AMENDMENT/MODIFICATION NO. **385**  
3. EFFECTIVE DATE (M/D/Y) **See Block 16C**  
4. REQUISITION/PURCHASE REQ. NO.  
5. PROJECT NO. (If applicable)

6. ISSUED BY CODE  
**U.S. Department of Energy  
Office of River Protection  
P. O. Box 450, MS H6-60  
Richland, WA 99352**  
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.  
9B. DATED (SEE ITEM 11)  
10A. MODIFICATION OF CONTRACT/ ORDER NO.  
**DE-AC27-01RV14136**  
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)

**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.  
**Clause I.82, FAR 52.243-2 Changes - Cost Reimbursement (AUG 1987) - Alternate III (APR 1984)**  
 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).  
 C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO THE AUTHORITY OF:  
 D. OTHER (Specify type of modification and authority)

**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 following page(s)**

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)  
16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  
**Ronald E. Cone Jr.  
Contracting Officer**  
15B. CONTRACTOR/OFFEROR  
**(Signature of person authorized to sign)**  
15C. DATE SIGNED  
16B. UNITED STATES OF AMERICA  
BY **(Signature of Contracting Officer)**  
16C. DATE SIGNED  
**12-22-16**

**Purpose of Modification:**

The purpose of this modification is to make the following changes:

1. Section C, *Statement of Work, Standard: 3 Design*, (c) is revised to incorporate the following:

(23) Utilize the engineering redraft process developed in Standard 3, subparagraph (c) (22) to reclassify the required portions of the LAW C5 ventilation system from non-safety to safety significant as described in 24590-LAW-PL-NS-16-0005 Rev. 0, *Safety Strategy Summary Document (SSSD) – Oxides of Nitrogen/Melter Offgas Releases* (Ref. letter from L.W. Baker, BNI, to W.F. Hamel, ORP, "Submittal of 24590-LAW-PL-NS-0005, for Review and Concurrence", CCN 27632, December 21, 2016). The C5V confinement boundary from C5V exhaust fans to the C5V stack must be credited as safety significant for maintaining confinement of the melter offgas to an elevated release.

2. The Contractor is directed to proceed with the work scope in Section C, *Statement of Work, Standard 3: Design*, and paragraph (c) (23). The contractor is authorized to incur costs up to a not-to-exceed (NTE) value of \$111,648 consistent with the other contract terms and conditions and pending definitization of this change.
3. BNI shall submit within 45 days of date of this modification a detailed technical and price proposal. Negotiations will commence within 90 days of the date of this change order. A bi-lateral modification definitizing this change order shall be executed as soon as possible after the date of the change order, not to exceed 180 days.
4. Contractor shall provide change order accounting in accordance with Clause I.83, FAR 52.243-6, Change Order Accounting (APR 1984).
5. This modification does not add additional funds to the contract. Accordingly, work under the contract, such as that described herein, must be performed within the amount of funds which have been incrementally allotted to the contract in accordance with clause B.3, *Obligation and Availability of Funds and Contract Value*, and clause I.66, FAR 52.232-22 Limitation of Funds (Apr 1984).

**Modification Description**

1. Section C, *Statement of Work, Standard 3: Design*, (c) is revised to incorporate the following language:

- (23) Utilize the engineering redraft process developed in Standard 3, subparagraph (c) (22) to reclassify the required portions of the LAW C5 ventilation system from non-safety to safety significant as described in 24590-LAW-PL-NS-16-0005 Rev. 0, *Safety Strategy Summary Document (SSSD) – Oxides of Nitrogen/Melter Offgas Releases* (Ref. letter from L.W. Baker, BNI, to W.F. Hamel, ORP, "Submittal of 24590-LAW-PL-NS-0005, for Review and Concurrence", CCN 27631, December 13, 2016). The C5V confinement boundary from C5V exhaust fans to the C5V stack must be credited as safety significant for maintaining confinement of the melter offgas to an elevated release.
2. A Not-to-Exceed value of \$111,648 is hereby established. As a result, the table in Section B, *Supplies or Services and Prices/Costs*, Section B.3, *Obligation and Availability of Funds and Contract Value*, paragraph (c) is revised as follows:
- The revised Total Estimated Contract Cost (TECC) is increased by \$111,648 from \$14,079,385,870 to \$14,079,497,518.
  - The revised Total Fee Available is revised from \$360,102,620 by (\$61,667,000) to \$298,435,620 to reflect fee payments made by DOE.
  - The revised Total Fee Earned is revised from \$235,195,878 by \$61,667,000 to \$296,862,878 to reflect fee payments made by DOE.
  - The Total Estimated Contract Price (TECP) is increased by \$111,648 from \$14,674,684,368 to \$14,674,796,052.
3. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a), is deleted in its entirety and replaced in full as follows:

Table B.1 – Total Estimated Contract Price

		Cost			
A	Total Estimated Contract Cost (TECC) through Mod 384				\$14,079,385,870
B	Total Estimated Contract Cost (384)	CLIN Estimated Cost	Increased by Mod (385)	Total CLIN Estimated Cost	
B.1	CLIN 1.0: Design, Construct, and Commission LBL in the DFLAW Configuration	\$6,504,604,000	\$111,648.00	\$6,504,715,648	\$111,648
B.2	CLIN 2.0: WTP Facility Modifications Necessary to Support DFLAW				
	SUB-CLIN 2.1: DFLAW Design (Target Cost)	\$75,000,000	\$0	\$75,000,000	\$0
	SUB-CLINS 2.2 /2.3 DFLAW Procurement/ Construction	\$362,600,000	\$0	\$362,600,000	\$0
B.3	CLIN 3.0 Reserved for HLW Facility	**	0		
B.4	CLIN 4.0: Reserved for PT Facility	**	0		
	<b>Revised Total Estimated Contract Cost (TECC) through Mod 385</b>				<b>\$14,079,497,518</b>

		Cost		
		Fee		
		Available	Earned	Total
A	Earned before modification (384)			
	A1	Final Fee Determination – Pre-Mod No. A143	\$102,622,325	
	A2	Final Fee Earned Mod No. A143 – Mod. No. (384)	\$131,573,553	
B	Fixed Fee Payment (Attachment B-2-C)***		\$0	\$60,000,000
C	Pending Activity Milestones (Attachment B-2-B)		\$5,000,000	\$1,667,000
D	Maximum Available Award Fee (CY 2016–2022) (Attachment B-2-D)		57,435,620	
E	CLIN 1.0: Design, Construct, and Commission LBL in the DFLAW Configuration			
	D1	LBL Construction Complete Performance Based Incentives (Attachment B-2-E)	\$68,400,000	
	D2	Commission LBL in the DFLAW Configuration Performance Based Incentive (Attachment B-2-F)	\$159,600,000	
	D3	Schedule Incentive Hot Commissioning (Attachment B-2-F)	+/- \$60,000,000 (Max)	
	D4	Cost Share Incentive (Attachment B-2-G)	+/- \$50,000,000 (Max)	
F	CLIN 2.1: Performance-Based Incentive for DFLAW Design Completion (Attachment B-2-H)		+/- \$8,000,000	\$1,000,000
	<b>Total Maximum Available Fee****</b>		<b>\$298,435,620</b>	
	<b>Total Fee Earned</b>			<b>\$296,862,878</b>
	<b>Total Estimated Contract Price (TECP) (Total Maximum Available Fee + Total Earned Fee + TECC)</b>			<b>\$14,674,796,016</b>

4. Contract Section J, *List of Attachments*, Attachment J, *Advance Understanding on Costs*, Table 13-B, *Not-to-Exceeds Not Included in Modification No. A143 Definitization (M155)*, is deleted in its entirety and replaced in full as follows:

13-B. Not-To-Exceeds Not Included in Modification No. A143 Definitization (M155)		
DOCUMENT ID.	TITLE	DEFINITIZATION MODIFICATION NO.
BCP-24590-06-02279	Expansion of DWP Requirements (permit Modifications) (122) (130)	A193
ORP 08-NSD-011 (05/20/08) (CCN 179512) TN 24590-06-03487	ORP Direction to Implement New Preliminary Safety Analysis Report (PSAR) Updates (136)	A164
ORP 08-NSD-057 (10/09/08) (CCN 188218) TN 24590-06-03752	Direction to Implement New Safety Classification Process for the Waste Treatment and Immobilization Plant (WTP) (141)	276

<p>ORP 08-NSD-059 (10/15/08) (CCN 188217)</p> <p>TN 24590-06-03753</p>	<p>Direction to Implement New Justification for Continued Design, Procurement, and Installation (JCDPI) (M152)</p>	<p>164</p>
<p>Modification M090 &amp; 09-AMD-205 (07/18/08) (CCN 202423)</p> <p>TN 24590-06-02145 &amp; -02381</p>	<p>Direction to Implement DOE 205.1A, Cyber Security Management Program (155)</p>	<p>217</p>
<p>Modification M154</p> <p>TN 24590-06-04133</p>	<p>Direction to Implement Pretreatment Engineering Platform (PEP) dry layup (155)</p>	<p>167</p>
<p>Modification M196 BCP 24590-06-04489 BCP 24590-06-04784 BCP 24590-06-05085</p>	<p>Direction to Implement Multiple Operational Readiness Strategy (218)</p>	<p>282</p>
<p>Modification M196 BCP 24590-06-04853 ORP 10-AMD-139 (05/06/10; CCN 218244)</p>	<p>Direction to Implement CXP Equipment Option (218)</p>	<p>317</p>
<p>Modification 221 ORP 11-WTP-219 (06/17/11; CCN 236247); Modification 247 ORP 11-WTP-437 (12/01/11; CCN 242351); Modification 264 ORP 12-WTP-0109 (03/15/12; CCN 245985); Modification 286 ORP 12-WTP-317 (09/24/12)</p>	<p>Direction to Proceed with Large Scale Testing (221, 247, 264, 286)</p>	<p>299 - 384</p>
<p>Modification 273</p>	<p>Direction to participate in the Hanford Site Organizational Climate and Safety Conscious Work Environment (SCWE) Survey</p>	<p>290</p>
<p>Modification 245 ORP 11-WTP-429</p>	<p>Direction to proceed with the implementation of DOE Order (O) 420.1B, <i>Facility Safety, Chapter V, Systems Engineer Program.</i> (245)</p>	<p>276</p>
<p>Modification 300 ORP 13-CPM-0099 (05/06/13); Mod 304 ORP 13-CPM-0133 (06/05/13); Modification 313 ORP 13-CPM-0299</p>	<p>Direction to Proceed with Full Scale Vessel Testing Program in lieu of the existing Computational Fluid Dynamics and Large Scale Vessel testing Program as a Design Verification Tool (300, 304, 313)</p>	<p>384</p>

(11/25/13)		
Modification 329 ORP 14-CPM-0172	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (i) Design of BOF Utility Modifications	350
Modification 330 ORP 14-CPM-0181	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (j) Design of BOF Effluent Management Facility	350
Modification 334 ORP 14-CPM-0228, ORP 15-CPM-0300 (358) 16-CPM-0088 (372)	Direction to proceed with Pretreatment Facility vessel mixing design verification.	384
Modification 339 ORP 15-CPM-0008	Direction to proceed with Section C, Statement of Work, Standard 3 Design, paragraph (k) Design of Balance of Facilities Underground and Site-Wide Modifications necessary to support the Direct Feed of LAW (DFLAW)	350
Modification 342 ORP 15-CPM-0064, ORP 16-CPM 0012 (364)	Direction to proceed with the implementation of DOE Order (O) 433.1B, Maintenance Management Program for DOE Facilities and DOE/RL-92-36, Hoisting and Rigging Manual. (342)	384
Modification 344 ORP 15-CPM-0092	Direction to proceed with initiation of procurement of BOF modifications and LAW Valve Vault materials to support DFLAW; add Interface Control Documents 30 and 31	384
Modification 348 ORP 15-CPM-0128	Direction to proceed with initiation of BOF isolation construction to support DFLAW	384
Modification 349 ORP 15-CPM-0136	Direction to proceed with the implementation of DOE Order (O) 414.1D, CRD, Chg. 1, Quality Assurance. (349)	
Modification 354 ORP 15-CPM-0195, ORP 16-CPM-0154 (380)	Direction to proceed with procurement of Effluent Management Facility (EMF) equipment and effluent transfer lines and limited EMF construction (354)	384
Modification 371 ORP-CPM-0085	Conduct supplementary analysis of vessels RLD-VSL-00007 and RLD-VSL-00008 beyond the WTP Code of Record and modify the RLD-VSL-00007 and RLD-VSL-00008 vessel design.	
Modification 375 ORP-CPM-0111	Update the Natural Phenomena Hazards (NPH) Assessment by generating a revised site-specific response analysis and design response spectra for WTP incorporating Hanford site-wide Probabilistic Seismic Hazard Analysis (PSHA) report from PNNL, dated November 21, 2014. (375)	
Modification 381 ORP-16-CPM-0155 (381)	Authorization to proceed with the development of an engineering redraft process for Standard 3: Design (c) (22).	
Modification 385 ORP-16-0174 (385)	Authorization to proceed with the engineering redraft process developed in Standard 3, subparagraph (c) (22) to reclassify the required portions of the LAW C5 ventilation	

	system from non-safety to safety significant as described in 24590-LAW-PL-NS-16-0005 Rev. 0, <i>Safety Strategy Summary Document (SSSD) – Oxides of Nitrogen/Melter Offgas Releases.</i>	
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5. All other terms and conditions remain unchanged.

**(End of Modification)**



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

DEC 29 2016

16-CPM-0176

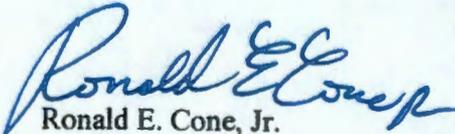
Ms. L.W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF CONTRACT  
MODIFICATION NO. 386

The purpose of this letter is to transmit an executed original of the subject modification. This modification revises Contract Section B, *Supplies or Services and Prices/Costs*, to obligate incremental funding. The updated conformed contract section can be accessed from the U.S. Department of Energy, Office of River Protection website.

If you have any questions regarding this contract action, please contact Katie Mair at (509) 376-4427.

  
Ronald E. Cone, Jr.  
Contracting Officer

CPM:REC

Attachment

cc w/attach:  
BNI Correspondence

**Attachment  
to  
16-CPM-0176**

**Contract Modification 386**

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE  
PAGE 1 OF 4 PAGES

2. AMENDMENT/MODIFICATION NO. **386**  
3. EFFECTIVE DATE (M/D/Y) **See Block 16C**  
4. REQUISITION/PURCHASE REQ. NO. **17EM000586**  
5. PROJECT NO. (If applicable)

6. ISSUED BY CODE  
**U.S. Department of Energy  
Office of River Protection  
P. O. Box 450, MS H6-60  
Richland, WA 99352**  
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.  
9B. DATED (SEE ITEM 11)  
10A. MODIFICATION OF CONTRACT/ ORDER NO.  
**DE-AC27-01RV14136**  
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)**

**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.
  - 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).
  - C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO THE AUTHORITY OF:
  - D. OTHER (Specify type of modification and authority)  
Clause B.3. "Obligation and Availability of Funds." Clause I.66 "Limitation of Funds"

**E. IMPORTANT: Contractor  is not,  is required to sign this document and return 2 copies to the issuing office.**

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

See following 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)  
16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  
**Ronald E. Cone Jr.  
Contracting Officer**  
15B. CONTRACTOR/OFFEROR  
15C. DATE SIGNED  
16B. UNITED STATES OF AMERICA  
BY **Ronald E. Cone Jr.**  
(Signature of Contracting Officer)  
16C. DATE SIGNED  
**12-29-16**  
(Signature of person authorized to sign)

**Purpose of Modification:**

The purpose of this modification is to make the following changes:

1. The purpose of this modification is to update Contract Section B, *Supplies or Services and Prices/Costs*, to obligate incremental funding provided under Purchase Requisition Number 17EM000586. Incremental funding provided herein is as follows:

Description	Control Point	Appropriation Year	Funded Amount
BOF	1111243	2017	\$64,000,000.00
DFLAW	1111243	2017	\$40,000,000.00
HLW	1111244	2017	\$10,000,000.00
PT	1111245	2017	\$33,872,724.00
LAB	1111242	2017	\$4,000,000.00
LAW	1111241	2017	\$101,308,112.00
		<b>Total</b>	<b>\$253,180,836.00</b>

**Description of Modification:**

1. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a) is revised as follows:
  - The total amount of funds obligated to Balance of Facilities 1111243 is increased by \$64,000,000.00 from \$492,649,525.21 to \$556,649,525.21.
  - The total amount of funds obligated to Direct Feed Low Activity Waste 1111243 is increased by \$40,000,000.00 from \$102,063,073.13 to \$142,063,073.13.
  - The total amount of funds obligated to High Level Waste 1111244 is increased by \$10,000,000.00 from \$1,014,573,076.81 to \$1,024,573,076.81.
  - The total amount of funds obligated to Pre Treatment 1111245 is increased by \$33,872,724.00 from \$1,450,670,497.24 to \$1,484,543,221.24.
  - The total amount of funds obligated to Analytical Laboratory 1111242 is increased by \$4,000,000.00 from \$328,312,452.11 to \$332,312,452.11.
  - The total amount of funds obligated to Low Activity Waste 1111241 is increased by \$101,308,112.00 from \$1,413,240,597.50 to \$1,514,548,709.50.
  - The total funding obligated to the Budgetary Control Points, is increased by \$253,180,836.00 from \$10,315,138,865.34 to \$10,568,319,701.34.

- The total funding obligated to the Budgetary Control Points, including Program Direction funding, is increased by \$253,180,836.00 from \$10,317,628,865.34 to \$10,570,809,701.34.
- The total funding obligated to the Budgetary Control Points, including Program Direction, Inter-Entity Work Order Funding and Request for Service Funding, is increased by \$253,180,836.00 from \$10,404,090,080.88 to \$10,657,270,916.88.

2. The table in Section B, *Supplies or Services and Prices/Costs*, Contract Section B.3 *Obligation and Availability of Funds and Contract Value*, paragraph (a), is deleted in its entirety and replaced in full as follows:

<b>BUDGETARY CONTROL POINTS FOR WTP PROJECT</b>			
<b>Description</b>	<b>Appropriation Symbol</b>	<b>B&amp;R No. (Control Point)</b>	<b>Budget Authority</b>
	1250	1110401	\$3,006,205,907.70
LAW	1250	1111183	\$637,537,062.71
LAB	1250	1111184	\$207,817,505.32
BOF	1250	1111185	\$261,722,260.48
HLW	1250	1111186	\$559,580,100.04
PT	1250	1111187	\$840,766,807.09
LAW	1250 and 1260	1111241	\$1,514,548,709.50
DFLAW	1250 and 1260	1111243	\$142,063,073.13
LAB	1250 and 1260	1111242	\$332,312,452.11
BOF	1250 and 1260	1111243	\$556,649,525.21
HLW	1250 and 1260	1111244	\$1,024,573,076.81
PT	1250 and 1260	1111245	\$1,484,543,221.24
Subtotal - Budgetary Controls Points for WTP Project thru Contract Modification 386			<b>\$10,568,319,701.34</b>
<b>BUDGETARY CONTROL POINTS FOR PROGRAM DIRECTION</b>			
<b>Description</b>	<b>Appropriation Symbol</b>	<b>B&amp;R No. (Control Point)</b>	<b>Budget Authority</b>
PD	1250	1110462	\$1,280,000.00
PD	1250	1110458	\$1,210,000.00
Subtotal - Budgetary Controls Points, including Project Direction, thru Contract Modification 386			<b>\$10,570,809,701.34</b>
<b>INTER-ENTITY WORK ORDER FUNDING</b>			
<b>IEWO Identification Numbers</b>	<b>IEWO Amendment No.</b>	<b>Funding</b>	

M0SRLE60 Funding (SRNS/SRNL)	40	\$73,957,217.82
M0SRV00028 Funding (SRNS)	42	\$7,083,536.09
M0SRV00036 Funding (WSRC)	2	\$186,500.00
M0SRV00042 Funding (ORNL)	2	\$27,599.05
M0IDV00061 Funding (BEA)	1	\$21,277.60
M0ORV00088 Funding (ORNL)	2	\$150,848.30
M0NSV00089 Funding (SNL)	1	\$18,030.68
M0SRV00105 Funding (SRNS)	8	\$4,589,760.00
M0FTV00117 Funding (NETL)	4	\$410,000.00
Total - IEWO Funding 379		\$86,444,769.54
<b>REQUEST FOR SERVICE FUNDING</b>		
<b>RFS Number</b>	<b>Supplement No.</b>	<b>Funding</b>
M14009 Funding (MSA)	0	\$16,446.00
Total - RFS Funding 367		\$16,446.00
<b>Total Budgetary Control Points for WTP Project 386</b>		<b>\$10,657,270,916.88</b>

BEA = Battelle Energy Alliance	SRNL = Savannah River National Laboratory.
NETL = National Energy Technology Laboratory.	SRNS = Savannah River Nuclear Solutions.
ORNL = Oak Ridge National Laboratory..	WSRC = Washington Savannah River Company.

2. All other terms and conditions remain unchanged.

**(End of Modification)**



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**NOV 09 2016**

16-NSD-0044

Ms. L.W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

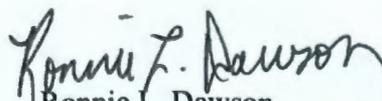
Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 –AGREEMENT WITH IMPLEMENTATION PLAN  
REVISION FOR WASTE TREATMENT AND IMMOBILIZATION PLANT CONTRACT,  
SECTION C, STANDARD 9, NUCLEAR SAFETY**

- References:
1. BNI letter from L.W. Baker to R.L. Dawson, ORP, "Submittal of the Implementation Plan for Revision of WTP Contract, Section C, Standard 9, Nuclear Safety," CCN: 289741, dated October 4, 2016.
  2. ORP letter from R.L. Dawson and W.F. Hamel to L.W. Baker, BNI, "Response to Bechtel National, Inc. Proposed Revisions to Waste Treatment and Immobilization Plant Contract, Section C, Standard 9, Nuclear Safety," 16-NSD-0021, dated May 16, 2016.
  3. BNI letter from L.W. Baker to R.L. Dawson, ORP, "BNI Proposed Revisions to WTP Contract, Section C, Standard 9, Nuclear Safety," CCN: 284102, dated April 19, 2016.

The U.S. Department of Energy, Office of River Protection (ORP), Waste Treatment and Immobilization Plant is transmitting this letter to document its agreement with Rev. 1 of 24590-WTP-PL-NS-14-0002, *Implementation Plan for the WTP Contract DE-AC27-01RV14136, Section C, Standard 9 and 10 CFR 830 Subpart B*, as submitted in Reference 1. As indicated in Reference 2, ORP will execute a contract modification incorporating Standard 9 into Contract No. DE-AC27-01RV14136 as documented in Reference 3. After completion of the contract modification please finalize the implementation plan by inserting the contract modification number, sign the implementation plan, and transmit the signed implementation plan to ORP.

If you have any questions, please contact me, or your staff may contact John P. Harris, Director, Nuclear Safety Division, (509) 376-8128.

  
Ronnie L. Dawson  
Contracting Officer

NSD:KRS

cc: R.T. Brock, BNI  
BNI Correspondence



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**DEC 17 2016**

16-NSD-0058

Mr. J.M. St. Julian  
Project Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Mr. St. Julian:

**CONTRACT NO. DE-AC27-01RV14136 – APPROVAL OF PRELIMINARY DOCUMENTED SAFETY ANALYSIS CHANGE PACKAGE TO REFLECT UPDATED UNMITIGATED CONSEQUENCE CALCULATIONS AND ASSOCIATED FUNCTIONAL CLASSIFICATION FOR STRUCTURES, SYSTEMS, AND COMPONENTS ASSOCIATED WITH HYDROGEN IN PIPING AND ANCILLARY VESSEL**

**Reference:** BNI letter from L.W. Baker to W.F. Hamel, ORP, “Contract Deliverable 9.1 – Preliminary Documented Safety Analysis Change Package 24590-PTF-PDACP-NS-15-0004, Proposed Changes to the Preliminary Documented Safety Analysis to Support Construction Authorization; Pretreatment Facility Specific Information,” CCN: 290777, dated July 29, 2016.

This letter provides the U.S. Department of Energy, Office of River Protection (ORP) approval of 24590-HLW-PDACP-NS-15-0002, *Preliminary Documented Safety Analysis Package to Reflect Updated Unmitigated Consequence Calculations and Associated Functional Classification for SSC's Associated with HPAV*, as submitted by Bechtel National, Inc. (BNI) via CCN: 290777 (Reference).

The change package was developed as a component of Technical Issue Resolution Endpoint 3: Hydrogen in Piping and Ancillary Vessels as defined in 15-WTP-0050, “Contract No. DE-AC27-01RV14136 – Direction to Revise Planning and Requirements to Support Resolution of Technical Issues with the Pretreatment Facility.” The proposed Preliminary Documented Safety Analysis (PDSA) changes incorporate the results of BNI’s revised calculation, 24590-PTF-Z0C-H01T-00003, *Unmitigated Consequences for Pretreatment Hydrogen in Piping and Ancillary Vessel Events*, Rev. F. The unmitigated consequences for hydrogen explosions in piping and non-process vessels was initially established by applying the consequences of relevant process vessel events. Earlier assumed high consequence level events are replaced with the results obtained from the revised calculation.

An integrated safety basis review team was formed by ORP to perform the review and evaluation of the BNI proposed PDSA changes. The review, evaluation, and preparation of this safety evaluation report was conducted in accordance with ORP implementing procedure TRS-ENG-IP-01, *Waste Treatment and Immobilization Plant Safety Basis Management*, Rev. 7. Changes to the PDSA change package to incorporate the results of review comments were agreed to by ORP, and those changes are correctly incorporated in the change package submittal with the exception of the below listed conditions of approval.

Following a technical review, it has been determined that the proposed changes are acceptable upon incorporation of the following conditions of approval:

1. Sections 3.4.1.2.2.6, 3.4.1.2.3.6, 3.4.1.4.1.6, 3.4.1.4.4.6 (two instances), 4.3.5.3 and 4.4.42.3 require piping to be designed to ASME/ANSI B31.3 as augmented by the requirements in 24590-WTP-RPT-ENG-07-011 to address loads from hydrogen explosions. In cases where final design cannot or does not demonstrate that piping will withstand hydrogen explosions, separate preventive controls are needed. Some piping, particularly piping greater than 4 inches in diameter, cannot be demonstrated to survive hydrogen explosions via the established methodology. Active controls to limit accumulation of hydrogen are required to protect the integrity of this safety designated piping, affording a comparable preventive control. Therefore, the following additional language is to be added to the above sections

Where piping analysis does not show that the specified ASME/ANSI B31.3 criteria for piping design withstands hydrogen related loads, at least one active control sufficient to limit hydrogen accumulation below the threshold for assured piping integrity will be applied to the piping. Such controls will be at the same safety classification level as the piping they are protecting.

2. The following corrections are directed to be incorporated into the PDSA revision:
  - a. Summary Table 3-2 identifies "C5V Confinement" as the primary credited control for pipe sprays and pipe leaks. Consistent with footnote 2, and the selected controls discussion in Sections 3.4.1.2.3.6 and 3.4.1.4.1.6, add "Piping" as a primary control for the "Pipe Sprays" and "Pipe Leaks" bounding unmitigated severity level analysis entries. This control applies to process piping that can contain waste, which includes waste streams that did not require a credited control for bounding radiological or chemical consequences of hydrogen explosions.
  - b. Table 3-5 provides the consequence value for dose to the CLW as 2.1E-12 rem. In the source calculation, 24590-PTF-Z0C-W14T-00002, Rev. F it was identified that the 2.1E-12 value was incorrect and the calculation is being updated. Update the CLW consequence (in rem) for stream TCP03 from 2.1E-12 to the determined value of 2.4E-2.

- c. A footnote was added to Table 4A-3, "PTF Hydrogen Event Controls," for three controls related to the pump suction lines to provide the source calculation. To be consistent with the other table entries and to avoid additional updates whenever the calculation is revised, remove the footnote:

Vessel pump suction line Safety Classification based on public SL-1 (SC) or SL-2 (SS) identification in the 24590-PTF-Z0C-W14T-00002, Rev F, *Revised Severity Level Calculations for the Pretreatment Facility*

Based on the information provided in the Reference letter and the attached safety evaluation report, the proposed changes with the above conditions of approval are determined to be acceptable. The changes comply with applicable laws, regulations, and Waste Treatment and Immobilization Plant contractual requirements. There is reasonable assurance that the health and safety of the public, workers, and the environment will not be adversely affected by these changes.

The specific proposed changes to the Pretreatment Facility PDSA associated with hydrogen explosions in piping, historically referred to as "T3," are to be incorporated into the Pretreatment Facility PDSA within 60 days of ORP approval. Approval of the proposed changes, as provided in the Reference, does not independently authorize the procurement of materials, fabrication, and/or installation.

The action taken herein is considered to be within the scope of work of the existing contract and does not authorize the Contractor to incur any additional costs (either direct or indirect) or delay delivery to the Government. If the Contractor considers that carrying out this action will increase contract/project costs or delay of delivery, the Contractor shall promptly notify the Contracting Officer orally, confirming and explaining the notification in writing within ten (10) calendar days, and otherwise comply with the requirements of the Contract clause I.84 FAR 52.243-7, - "Notification of Changes (APR 1984)." Following submission of the written notice of impacts, the Contractor shall await further direction from the Contracting Officer.

If you have any questions, please contact John P. Harris, Director, Nuclear Safety Division, (509) 376-8128.



Kevin W. Smith  
Manager

NSD:DJL

Attachment

cc w/attach:  
P.K. Fox, DNFSB  
D.M. Gutowski, DNFSB  
BNI Correspondence

**Attachment  
to  
16-NSD-0058**

**Safety Evaluation Report of  
Proposed Preliminary Documented Safety Analysis Change Package,  
24590-PTF-PDACP-NS-15-0004, Proposed Changes to the Preliminary Documented Safety  
Analysis to Support Construction Authorization; Pretreatment Facility Specific Information**

**(total number of pages, 20)**

**ATTACHMENT to 16-NSD-0058**

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**Safety Evaluation Report**

**Contract No. DE-AC27-01RV14136**

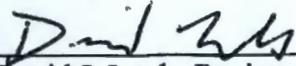
**Safety Evaluation Report of  
Proposed Preliminary Documented Safety Analysis Change Package,  
24590-PTF-PDACP-NS-15-0004, Proposed Changes to the Preliminary  
Documented Safety Analysis to Support Construction Authorization;  
Pretreatment Facility Specific Information**

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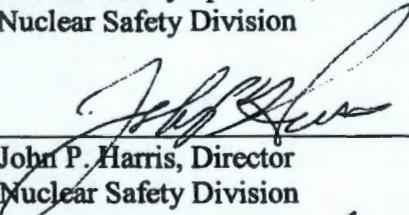
**December 2016**

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U.S. Department of Energy, Office of River Protection  
Safety Basis Review Team Review and Approval

  
\_\_\_\_\_  
David J. Lords, Review Team Lead  
Nuclear Safety Specialist, In-Training  
Nuclear Safety Division

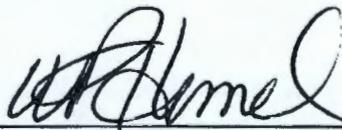
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John P. Harris, Director  
Nuclear Safety Division

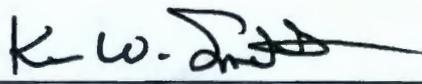
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\_\_\_\_\_  
Robert G. Hastings, Assistant Manager  
Technical and Regulatory Support

12/16/16  
\_\_\_\_\_  
Date

Concurred:   
\_\_\_\_\_  
William F. Hamel, Federal Project Director  
Waste Treatment and Immobilization Plant

12/17/16  
\_\_\_\_\_  
Date

Approved:   
\_\_\_\_\_  
Kevin W. Smith, Manager  
U.S. Department of Energy  
Office of River Protection

12/17/16  
\_\_\_\_\_  
Date

## EXECUTIVE SUMMARY

The Pretreatment (PT) Facility is one of the three major processing facilities within the Waste Treatment and Immobilization Plant. The purpose of the PT Facility is to receive waste from tank farms, treat (e.g., separate, mix, concentrate, and filter) waste, and temporarily store the waste for delivery to the High-Level Waste and Low-Activity Waste facilities for vitrification.

In Bechtel National, Inc. (BNI) correspondence CCN: 290777, "Contract No. DE-AC27-01RV14136 – Contract Deliverable 9.1 – Preliminary Documented Safety Analysis Change Package 24590-PTF-PDACP-NS-15-0004, Proposed Changes to the Preliminary Documented Safety Analysis to Support Construction Authorization; Pretreatment Facility Specific Information," BNI requested approval of proposed changes to the PT Facility-specific Preliminary Documented Safety Analysis (PDSA), 24590-WTP-PSAR-ESH-01-002-02, *Preliminary Documented Safety Analysis to Support Construction Authorization; PT Facility Specific Information*. The PDSA changes incorporate the results of a deterministic calculation to estimate radiological dose and chemical consequences to the public and co-located worker (CLW) from analyzed releases due to process piping failures caused by a hydrogen explosion. Functional classification for hydrogen control safety systems have been revised as a result of the updated consequence calculations. This change addresses releases from explosions in piping only.

An integrated safety basis review team was formed by the U.S. Department of Energy, Office of River Protection (ORP) to perform the review and evaluation of the BNI proposed PDSA changes, as provided in CCN: 290777. The review, evaluation, and preparation of this SER was conducted in accordance with ORP implementing procedure TRS ENG IP 01, Waste Treatment and Immobilization Plant Safety Basis Management. Safety basis review team evaluation activities included independent review of supporting documents. ORP comments were resolved prior to BNI submittal of CCN: 290777.

The new consequence analysis performed in 24590-PTF-Z0C-H011T-00003, *Unmitigated Consequences for Pretreatment Hydrogen in Piping and Non-Process Vessel Events*, Rev. F (Attachment 2 of CCN: 29077) uses a deterministic methodology with conservative assumptions that includes a range of radioactive and chemical source terms and a range of pipe volumes selected to bound pipe designs anticipated in the Waste Treatment Immobilization Plant PT and High-Level Waste Facility designs.

A hydrogen explosion with associated waste release is assumed to occur following 1,000 hours of hydrogen generation in stagnant piping. The airborne release from the explosion is calculated, together with the spill of waste from the depressurized pipe and subsequent entrainment. A sensitivity analysis is included up to 5,000 hours to show how dose consequences change as the hydrogen generation time increases. From this analysis it was determined that:

- Unmitigated chemical and radiological consequences were low to the public and low-to-moderate to the CLW with the exception of one waste stream pipe where the unmitigated radiological consequences exceeded 100 rem to the CLW after 1,500 hours

- Unmitigated facility worker consequences were qualitatively determined to be high for all piping explosions.

Based on these dose consequences, no controls are identified or required for protection of the public for hydrogen hazards in piping. It was determined that protection of the CLW would be provided by the C5 confinement boundary to contain the release, and the C5 ventilation system to filter particulate and elevate the release of any unfiltered chemical constituents; these systems are classified as safety-class based on other more severe hazards. While preventive controls, to also be credited for spill and spray events as discussed below, afford defense-in-depth, they cannot suffice to preclude piping failure.. This mitigative strategy is appropriate based on the low-to-moderate consequences to the CLW. The facility worker is also protected by the C5 confinement boundary and the cascading airflow provided by the ventilation system (air flows from occupied areas into the C5 unoccupied areas). These systems are already credited in the PDSA (24590-WTP-PSAR-ESH-01-002-02), and fully protect the receptors for hydrogen explosions in piping throughout the PT Facility. Additionally, a commitment was added to section 3.6.2 of the PDSA to develop worker protection controls for maintenance access to the C5 boundaries (e.g. bulges) when the hazards analysis for these activities is completed.

Table ES-1 summarizes the bounding radiological and chemical consequences and proposed controls by waste stream.

Table ES-1. Bounding Radiological and Chemical Consequences and Proposed Controls.

Accident Scenario- Hydrogen explosion in piping by Waste Stream	Material at Risk (Liters)	Frequency of Accident	Unmitigated Consequences MOI <sup>1</sup> (rem/PAC level)	Unmitigated Consequences CLW <sup>1</sup> (rem/PAC level)	Credited SC/SS SSCs (for CLW protection)	Mitigated Consequences
UFP07	7746.9	Unlikely	1.0E-01/<PAC-1	20.1/PAC-2	C5 Boundary, Filtration, and Elevated Release	Not calculated; qualitatively determined to be low to all receptors.
HLP09	1683.7		1.5E-02/<PAC-1	3.02/<PAC-2		
FRP01	1035.3		3.2E-04/<PAC-1	6.2E-02/<PAC-2		
CNP10	4717.9		1.5E-01/<PAC-1	62.4/<PAC-2		
FEP19	12956.7		8.9E-03/<PAC-1	1.74/<PAC-2		
TLP02	12377.6		6.6E-04/<PAC-1	1.3E-01/<PAC-2		
UFP33	5073.0		6.1E-05/<PAC-1	1.4E-02/<PAC-2		

<sup>1</sup> Consequences displayed are at 1,000 hours of hydrogen generation. Sensitivity analysis calculated consequences out to 5,000 hours. Radiological consequences at 5,000 hours are approximately 4.5 times the consequences at 1,000 hours. Waste stream CNP10 exceeds 100 rem to the CLW after 1,500 hours. Chemical consequences at 5,000 hours exceed PAC-2 for some streams, but remain below PAC-3.

CLW = co-located worker.

SC = safety class.

MOI = maximally-exposed offsite individual.

SS = safety significant.

PAC = protective action criteria.

SSC = structures, systems, and components.

The use of a bounding deterministic model as the basis for functional classification of piping and related hydrogen controls ensures that these aspects of the safety basis are not dependent upon

probabilistic modeling as part of the design methodology being used by BNI to demonstrate ASME/ANSI B31.3 code compliance with respect to hydrogen hazards.

The proposed PDSA changes (CCN: 290777) now identify hydrogen explosions in piping as potential initiators for a subsequent bounding pipe spill and spray accident assuming the pipe is subsequently returned to service with the explosion undetected. As such, functional requirements and performance criteria associated with the piping's ability to withstand loads associated with hydrogen explosions were added as a preventive control to the spill and spray accidents in Chapter 3.0, "Hazard and Accident Analysis," and the piping requirements for passive piping design to withstand explosions are included in Chapter 4.0, "Important to Safety SSCs." Requirements for active controls to limit accumulation of hydrogen in piping that cannot meet the passive performance criteria were not provided in the submitted PDSA change package, but are to be included in the PDSA by this safety evaluation report (SER) as a condition of approval.

Similar active controls to prevent hydrogen accumulation in piping meeting the passive performance criteria are no longer credited for the hydrogen in piping explosion in the PDSA; these controls which are needed to support planned operations remain in the document, but are identified as providing uncredited defense in depth for hydrogen explosion prevention.

Final review of the document identified several clarifications needed in the PDSA. Consequently, this safety evaluation report contains two conditions of approval described below:

NSD-0058-1:

Sections 3.4.1.2.2.6, 3.4.1.2.3.6, 3.4.1.4.1.6, 3.4.1.4.4.6 (two instances), 4.3.5.3 and 4.4.42.3 require piping to be designed to ASME/ANSI B31.3 as augmented by the requirements in 24590-WTP-RPT-ENG-07-011 to address loads from hydrogen explosions. In cases where final design cannot or does not demonstrate that piping will withstand hydrogen explosions, separate preventive controls are needed. Some piping, particularly piping greater than 4 inches in diameter, cannot be demonstrated to survive hydrogen explosions via the established methodology. Active controls to limit accumulation of hydrogen are required to protect the integrity of this safety designated piping, affording a comparable preventive control. Therefore, the following additional language is to be added to the above sections:

Where piping analysis does not show that the specified ASME/ANSI B31.3 criteria for piping design withstands hydrogen related loads, at least one active control sufficient to limit hydrogen accumulation below the threshold for assured piping integrity will be applied to the piping. Such controls will be at the same safety classification level as the piping they are protecting.

NSD-0058-2:

- a. Summary Table 3-2 identifies "C5V Confinement" as the primary credited control for pipe sprays and pipe leaks. Consistent with footnote 2, and the selected controls discussion in Sections 3.4.1.2.3.6 and 3.4.1.4.1.6, add "Piping" as a primary control for the "Pipe Sprays" and "Pipe Leaks" bounding unmitigated severity level analysis

entries. This control applies to process piping that can contain waste, which includes waste streams that did not require a credited control for bounding radiological or chemical consequences of hydrogen explosions.

- b. Table 3-5 provides the consequence value for dose to the CLW as  $2.1E-12$  rem. In the source calculation, 24590-PTF-Z0C-W14T-00002, Rev. F it was identified that the  $2.1E-12$  value was incorrect and the calculation is being updated. Update the CLW consequence (in rem) for stream TCP03 from  $2.1E-12$  to the determined value of  $2.4E-2$ .
- c. A footnote was added to Table 4A-3, "PTF Hydrogen Event Controls," for three controls related to the pump suction lines to provide the source calculation. To be consistent with the other table entries and to avoid additional updates whenever the calculation is revised, remove the footnote:

Vessel pump suction line Safety Classification based on public SL-1 (SC) or SL-2 (SS) identification in the 24590-PTF-Z0C-W14T-00002, Rev F, *Revised Severity Level Calculations for the Pretreatment Facility*.

Based on the evaluation described above, ORP has concluded there is reasonable assurance that the health and safety of the public, the workers, and the environment will not be adversely affected by the changes proposed in CCN: 290777. ORP conditionally accepts the proposed changes in the change package as discussed in Sections 3.1 and 3.2 of this SER. These changes shall be included in the revised PDSA upon issue. The accepted proposed changes are judged to ensure effective control of the hydrogen hazards posed by PT waste streams through the design, construction, and operation of the Waste Treatment and Immobilization Plant facilities.

Accordingly, the proposed changes to the PT Facility PDSA as submitted (CCN: 290777 are acceptable subject to incorporation of the conditions of approval included above and in Section 3.0 of this SER. These changes are necessary to ensure clarity and accuracy of consequences and potential additional controls. The changes proposed in 24590-PTF-PDACP-NS-15-0004 to the PT Facility PDSA associated with the hydrogen in piping accident scenarios are to be incorporated into the PT Facility PDSA, including the satisfactory closure of the conditions of approval, within the next 60 days following ORP approval.

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## ABBREVIATIONS AND ACRONYMS

ARF	Airborne Release Fraction
BNI	Bechtel National, Inc.
C5V	Cascading Ventilation System (for highest air contamination)
CLW	co-located worker
COA	conditions of approval
DID	defense-in-depth
ORP	Office of River Protection
PDSA	preliminary documented safety analysis
PT	pretreatment
SBRT	Safety Basis Review Team
SC	safety class
SER	safety evaluation report
SS	safety significant
SSC	structures, systems, and components
UFP	ultrafiltration process system
WTP	Waste Treatment and Immobilization Plant

## 1.0 INTRODUCTION

The Pretreatment (PT) Facility is one of the three major processing facilities within the Waste Treatment and Immobilization Plant (WTP). The purpose of the PT Facility is to receive waste from Tank Farms, treat (e.g. separate, mix, concentrate, and filter), temporarily store, and deliver the waste to the High-Level Waste and Low-Activity Waste vitrification facilities.

A safety basis review team (SBRT) was selected by the U.S. Department of Energy, Office of River Protection (ORP) Nuclear Safety Division to perform the review and evaluation of the proposed preliminary documented safety analysis (PDSA), 24590-WTP-PSAR-ESH-01-002-02, *Preliminary Documented Safety Analysis to Support Construction Authorization; PT Facility Specific Information*, changes as provided in letter CCN: 290777, "Contract No. DE-AC27-01RV14136 – Contract Deliverable 9.1 – Preliminary Documented Safety Analysis Change Package 24590-PTF-PDACP-NS-15-0004, Proposed Changes to the Preliminary Documented Safety Analysis to Support Construction Authorization; Pretreatment Facility Specific Information."

The SBRT evaluation activities included independent reviews of submitted engineering design and nuclear safety documents. ORP provided extensive comments on previous submittals of this PDSA change package. These previous change package submittals were retracted by Bechtel National, Inc. (BNI) and revised to address ORP comments. In-process reviews on the final draft change package were then performed via meetings with ORP and BNI management and technical staff in order to reach concurrence on comment resolution prior to BNI submittal of CCN: 290777.

## 2.0 BACKGROUND

BNI's PDSA is the composite of information provided by WTP Contractor, BNI, to describe the analyzed safety design bases for the WTP facilities. The PDSA demonstrates that the nuclear safety design criteria requirements are identified. The PDSA contains the contractor's commitments regarding safety features of the WTP facility design.

## 3.0 EVALUATION

The review, evaluation, and preparation of this Safety Evaluation Report (SER) was conducted in accordance with ORP implementing procedure TRS-ENG-IP-01, *Waste Treatment and Immobilization Plant Safety Basis Management*, Rev. 8. This procedure establishes the process by which ORP reviews and approves safety design basis documents in compliance with 10 CFR 830, "Nuclear Safety Management," Subpart B, "Safety Basis Requirements; DOE O 420.1B, *Facility Safety* (as tailored in 24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II*); the WTP Prime Contract No. DE-AC27-01RV14136, *Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant*, and is consistent with guidance provided in DOE-STD-3009-94, *DOE Standard Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, Chg 3; and DOE-STD-1104-2014, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*. The ORP safety evaluation

was performed using an integrated review process including the following ORP personnel as SBRT members, with core team members (i.e., expertise in process hazards analysis and accident analysis) indicated with a "\*" before their name:

- \*Steve Additon, Consultant (General Support Services Contractor)
- \*Vic Callahan, Senior Technical Advisor
- Brad Eccleston, Facility Representative
- Joel Fox, Facility Representative
- \*Fred Hidden, Nuclear Safety Engineer
- Langdon Holton, Senior Technical Authority
- Dan Knight, Acting Federal Project Director
- \*Kathy Lehew, Consultant (General Services Support Contractor)
- \*David Lords, Nuclear Safety Engineer (in training), Review Team Lead
- Kris Thomas, Mechanical Safety System Oversight Engineer
- \*Bruce Zimmerman, Consultant (General Services Support Contractor).

### 3.1 SUMMARY OF PROPOSED CHANGES

BNI performed a deterministic calculation of the radiological and chemical consequences due to a release from piping caused by a hydrogen explosion in the PT Facility in order to more appropriately functionally classify hydrogen controls. This calculation was performed in 24590-PTF-Z0C-H011T-00003, *Unmitigated Consequences for Pretreatment Hydrogen in Piping and Non-Process Vessel Events*, Rev. F. Prior to this analysis, hydrogen explosions in piping were assumed to result in high radiological consequences to the public, and were either determined to be fully prevented by safety controls, or the explosions were shown by design analysis to not fail the piping.

The new calculation analyzed hydrogen explosions in piping for all major waste streams in the PT Facility. Calculations were performed following 1,000 hours of hydrogen generation, with sensitivity analyses performed out to 5,000 hours. In all cases, for explosions in piping, radiological and chemical consequences were determined to be low to the public. At 1,000 hours, consequences to the co-located worker (CLW) from piping explosions were low except radiological consequences from stream CNP10 and chemical consequences from stream UFP07, which were both moderate. Unmitigated consequences to the facility worker were qualitatively determined to be high for all explosions (facility worker consequences were not addressed in the calculation).

As a result of the revised consequence results, several control strategies for hydrogen explosions in piping were revised. In general, most preventive hydrogen control strategies were downgraded from safety class (SC) or safety-significant (SS) to defense-in-depth (DID) (DID as discussed in more detail in follow-on sections of this SER). In order to protect the facility worker and the CLW, a mitigative control strategy consisting of the C5 boundary, in conjunction with C5 ventilation and an elevated release, was credited and determined to be appropriate. The C5 boundary and ventilation systems are classified as SC based on other more severe hazards.

Additionally, a hydrogen explosion event was added as a precursor for the bounding spill and spray accidents which may occur upon the resumption of operations assuming the explosion is

not detected. As such, functional requirements and performance criteria associated with the piping's ability to withstand loads associated with hydrogen explosions were added as a preventive control to appropriate sections in Chapter 3.0, "Hazard and Accident Analysis" and Chapter 4.0, "Important to Safety SSC" (CCN: 290777). Requirements for active controls to limit accumulation of hydrogen in piping that cannot or do not meet the passive performance criteria (especially piping greater than 4 inches in diameter) were not provided, but are identified as required by a condition of approval (COA) for this SER.

Although the calculation included explosions in non-process vessels, these results were not included in the PDSA change package (original analysis results from 24590-PTF-ZOC-H011T-00003, Rev. B and controls were retained).

Note: The PDSA change package eliminated use of the term "ancillary vessel," and replaced it with "non-process vessel" (CCN: 290777). The acronym "HPAV" is no longer used.

### **3.2 PROPOSED SPECIFIC CHANGES**

Changes to the PT Facility PDSA to incorporate the results of calculation 24590-PTF-ZOC-H011T-00003, Rev. F and revised control strategy, were reviewed by ORP and those changes are documented in the change package submittal (CCN: 290777). The submittal includes the closed "Review Comment Record" dispositions. All specific changes are accepted and approved by this SER, subject to the conditions of approval provided.

#### **3.2.1 Chapter 2.0, "Facility Description"**

Chapter 2.0, "Facility Description" of the PDSA was revised to replace the term "HPAV" with in-context replacement wording (e.g., hydrogen event, hydrogen, non-process vessel event), as appropriate (CCN: 290777). Also, the term "ancillary vessels" was replaced with "non-process vessels."

Appendix 2C, "Hydrogen in Piping and Non-Process Vessels," was completely rewritten. The purpose of the section is to identify those systems that contain piping and non-process vessels subject to a hydrogen concern. The appendix had contained detailed descriptions of systems, structures, and components (SSC) and associated controls not typically found in Chapter 2.0 of a PDSA. Appendix 2C was simplified to provide the systems and components of concern for hydrogen explosions in piping and non-process vessels. Control selection and system description information has been relocated to the appropriate locations as described in DOE-STD-3009-94. The change package also removes or relocates many system details from this safety document to more appropriate design documents (CCN: 290777).

Examples of significant changes to Appendix 2C are:

- Discussion on pulse jet mixer operation was relocated to Section 2.5.1.1.4.1.
- Discussion on Cesium Ion Exchange Process System was appropriately relocated to Section 2.5.7. Some discussion of piping evaluation and applicable design requirements has been moved to Section 3.4.1.8.
- Sections have been deleted when the discussion was included elsewhere in the PDSA such as in Section 2.5 subsections.

- Where discussion and/or level of detail (e.g., many figures and tables) were beyond that normally included in a safety document such as a PDSA, the information has been deleted.

The SBRT concurs with the changes described above since the changes better match guidance in DOE-STD-3009-94 CN3 and no important information has been deleted.

### 3.2.2 Chapter 3.0, "Hazard and Accident Analysis"

Chapter 3.0 of the PDSA was revised to incorporate the results of calculation 24590-PTF-Z0C-H011T-00003, Rev. F. The results of this consequence calculation were used to justify a modification to the credited controls in the PDSA (24590-WTP-PSAR-ESH-01-002-02) for piping.

Significant changes in Chapter 3.0 are:

- A hydrogen explosion event was added as a precursor for the spill and spray accidents (Sections 3.4.1.2 and 3.4.1.4, respectively). The explosion (determined to be unlikely) is postulated to occur while the piping is isolated, breaching the line, and subsequently resulting in a spill or spray when the piping is next pressurized. The selected control strategy credits the piping confinement boundary as a preventive control. The pipe's design criterion of ASME/ANSI B31.3, "Process Piping," is augmented by the requirements in 24590-WTP-DB-ENG-01-001, *Basis of Design* and 24590-WTP-RPT-ENG-07-011, *HPAV Engineering Analysis Methods and Criteria*, to address the occasional loads imposed by a hydrogen explosion.

In cases where it cannot be or is not demonstrated that the piping will withstand hydrogen explosions (in accordance with analysis described in 24590-WTP-RPT-ENG-07-011), a separate preventive control based on active systems is required. Some piping, particularly piping greater than 4 inches in diameter, will not be demonstrated to survive explosions. At least one active control to limit accumulation of hydrogen below the threshold for assured piping integrity is required to protect the integrity of this safety designated piping. Therefore, a change to the wording in the PDSA is directed and included at the end of this section as a condition of approval.

- For the spill and spray events, the "Selected Control Strategy" and "Credited SSCs" are not consistently described in the PDSA. The piping and vessels are identified in the "Selected Control Strategies" sections, but only the cells and C5 ventilation system (C5V) are identified in the "Credited SSCs" sections (see Section 3.4.1.2.3.6 for spills and Section 3.4.1.4.4.6 for sprays). Also, Table 3-2 only lists C5V confinement as the primary control strategy for spills and sprays. PDSA Sections 4.3.5 and 4.4.42, both titled: "Waste Transfer/Process Piping, and Process Vessel Isolation Valves," identify transfer piping between the PT Facility and tank farms and between the PT Facility and the High-Level Waste Facility as SC, and much facility piping as SS with a safety function requiring code compliant design, ensuring as reliable as practical a confinement barrier for radioactive liquids. These sections are not specific as to which accidents the piping is credited for. ORP considers systems identified as part of the "Selected Control Strategy" for spills and sprays, including process and transfer piping, to be credited SSCs for these events. A change to the PDSA, Table 3-2, to add "piping" to the primary

control strategies for spills and sprays is directed and included at the end of this section as a condition of approval.

- Section 3.4.1.8.8 was significantly revised. Calculation 24590-PTF-Z0C-H011T-00003, Rev. F, analyzed hydrogen explosions in piping and non-process vessels for all major waste streams in the PT Facility. The analysis methods were chosen to be deterministically bounding without reliance upon probabilistic evaluation. The analysis assumed the piping or the non-process vessel is completely filled with waste stream material, which then produces hydrogen for 1,000 hours. The resulting hydrogen is assumed to explosively react with a stoichiometric quantity of  $N_2O$  (a hydrogen explosion with  $N_2O$  produces more energy than an explosion with air). The "TNT Equivalent" methodology as described in DOE-HDBK-3010-94, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities*, was then used to determine the amount of waste stream material (the "source term") that is aerosolized in the explosion resulting in radiological and chemical consequences. For the analysis of an explosion in piping, two additional source terms were added to the source term produced directly by the hydrogen explosion. The first was a spill source term, where it was assumed that additional waste aerosol is produced when the waste material in the breached pipe falls to the hard floor surface ("splash and splatter" aerosol). The second additional source term is air entrainment of aerosol from the surface of the leaked pool of waste that forms on the floor.

The consequence calculations for hydrogen explosions in piping presented in 24590-PTF-Z0C-H01T-00003, Rev. F deviated from the methodology recommended in DOE-HDBK-3010-94 in one respect. DOE-HDBK-3010-94, Section 3.2.3, "Free-Fall Spill," recommends a specific methodology for selecting the Airborne Release Fraction (ARF), which quantifies the fraction of the splash and splatter liquid that becomes aerosolized. Calculation 24590-PTF-Z0C-H01T-00003, Rev. F used a fixed ARF value of  $2E-5$ , rather than a value based on the fall height of the leaking waste as recommended in DOE-HDBK-3010-94. This fixed value was based on a study performed by BNI of airborne release fraction test data originally generated by Pacific Northwest National Laboratory for use by tank farms (Bamberger, JA, JA Glissmeyer, 2004, *Release Fraction Evaluation*, PNNL-14545). ORP has not endorsed the general use of this ARF value for splash and splatter aerosol calculations for accident analysis. However, for the data presented in this calculation, the splash and splatter aerosol contribution to the source term is small (less than 1 percent for the sample calculation based on the Cesium Nitric Acid Recovery Process System waste stream, and approximately 10 percent for the sample calculation based on the UFP07 waste stream). The difference in calculated consequences based in part on use of this ARF value versus use of the "standard" ARF values from DOE-HDBK-3010-94 does not affect any control selections.

Calculations were performed following 1,000 hours of hydrogen generation, with sensitivity analyses performed out to 5,000 hours. In all cases, for explosions in piping, unmitigated radiological and chemical consequences were determined to be low to the public. At 1,000 hours, unmitigated consequences to the CLW from piping explosions were low except radiological consequences from stream CNP10 and chemical consequences from stream UFP07, which were both moderate. As hydrogen generation times increased from 1,000 hours to 2,000 hours, the unmitigated radiological

consequences to the CLW from stream CNP10 increased from moderate-to-high, and from stream UFP07 increased from low to moderate. No other radiological consequences exceeded low over the 5,000 hours analyzed. Unmitigated chemical consequences to the CLW increased from low to moderate for streams CNP10, HLP09, TLP02, and FEP19. No high chemical consequences were achieved. Unmitigated consequences to the facility worker were qualitatively determined to be high for all explosions (facility worker consequences were not addressed in the calculation).

As a result of the new consequence determination, preventive controls currently credited in the PDSA to prevent accumulation of hydrogen in piping were downgraded from SC or SS to DID. Most of these design features will remain necessary for normal operations and will be included in the design. As such they afford DID, but will no longer be credited controls. These include:

- Newtonian pump suction line high point vents (the pump suction line vents for the Waste Feed Receipt Process System vessels (FRP system) were retained as SC to ensure the mixing function of the vessels was not impaired by the explosion, but all other Newtonian vessels' pump suction line vents were downgraded).
- Newtonian pump discharge line high point vents.
- Newtonian transfer line high point vents.
- Engineered line slope in ultrafiltration process (UFP) system.
- Pump timers and interlocks and piping flush requirements to limit hydrogen accumulation in system dead legs during recirculation and in transfer piping from tank farms.
- Administrative controls to flush or purge lines.

The filtered C5V (for radiological consequences) and elevated release point (for chemical consequences) were credited as SS to protect the CLW. Though mitigated consequences were not calculated, these controls were qualitatively determined to bring the moderate consequences to low. The C5 boundary and C5 cascade airflow are credited to keep the facility worker separated from the hazard. While preventive controls are being credited for defense-in-depth, they cannot suffice to preclude piping failure. Thus the chosen mitigative controls are appropriate considering the unlikely frequency of the event, and primarily moderate consequences to the CLW. The C5 boundary was designed to separate the worker from the hazards associated with PT Facility operations; these controls are appropriate to protect the worker from hydrogen explosion hazards. Note that the C5 boundary and C5 ventilation remain SC based on other more severe hazards. Additionally, a commitment was added to section 3.6.2 of the PDSA to develop worker protection controls for maintenance access to the C5 boundaries (e.g. bulges) when the hazards analysis for these activities is completed.

- Section 3.6 was added to the PDSA. This section includes a general description of expected design changes, analyses that may require revision or are yet to be performed, and major changes to the PDSA by revision. This section adds value to the document, especially considering the evolving nature of the PT Facility design. The future design decisions implied by the first COA are to be added to this discussion.

Other changes include:

- Appendix 2C, "Hydrogen Mitigation for Hydrogen in Piping and Ancillary Vessels (HPAV)" of the PDSA previously had a considerable amount of information not generally found in PDSA Chapter 2.0. This appendix was simplified, and some of the information was moved into Chapters 2.0, 3.0, and 4.0. Information associated with hydrogen hazards and control strategies was moved into appropriate sections of Chapter 3.0. Except as noted above, this information was substantially unchanged.
- Since the controls for non-process (ancillary) vessels were not changed in this transmittal, several hydrogen events were split into two components. For example, what was previously "Explosion in UFP Loop" is now one event for non-process vessels, and an additional event, "UFP Piping Hydrogen Explosion" has been added. Similar additions were made for the Cesium Nitric Acid Recovery Process System and Spent Resin Collection and Dewatering Process System.

Considerable DID is provided in the hydrogen control strategy for piping. The preventive controls no longer being credited afford DID preventive limitations on the accumulation of hydrogen in piping. In most cases (particularly for piping less than 4 inches in diameter) the piping itself is expected to withstand a hydrogen explosion. Finally, the C5 confinement boundary and C5V system will mitigate any potential release from the piping (these systems are designated as SS to protect the workers in the hydrogen explosion in piping event, however, they are SC in the PDSA to mitigate higher hazard accidents). These layers of DID described in Chapter 3.0 provide assurance that a release from a hydrogen explosion in piping is unlikely, but if one was to occur then the credited controls ensure the mitigated consequences would be low to all receptors.

The SBRT concurs that the changes made to Chapter 3.0 are appropriate, technically accurate, and consistent with the remainder of the document. The hazards and accident analysis is consistent with DOE-STD-3009-94, Chg 3 and 15-NSD-0017, "Contract No. DE-AC27-01RV14136 – Updated Safety Analysis Direction." The description of how selected controls provide DID is adequate. However, two COAs are specified below to ensure clarity and accuracy of consequences and controls (COA 2.c. is discussed in section 3.2.3 of this SER since it concerns Chapter 4.0, "Important to Safety SSC"):

- NSD-0058-1:

Sections 3.4.1.2.2.6, 3.4.1.2.3.6, 3.4.1.4.1.6, 3.4.1.4.4.6 (two instances), 4.3.5.3, and 4.4.42.3 require piping to be designed to ASME/ANSI B31.3 as augmented by the requirements in 24590-WTP-RPT-ENG-07-011 to address loads from hydrogen explosions. In cases where final design cannot or does not demonstrate that piping will withstand hydrogen explosions, separate preventive controls are needed. Some piping, particularly piping greater than 4 inches in diameter, cannot be demonstrated to survive hydrogen explosions via the established methodology. Active controls to limit accumulation of hydrogen are required to protect the integrity of this safety designated piping, affording a comparable preventive control. Therefore, the following additional language is to be added to the above sections:

Where piping analysis does not show that the specified ASME/ANSI B31.3 criteria for piping design withstands hydrogen related loads, at least one active control sufficient to limit hydrogen accumulation below the threshold for assured piping integrity will be applied to the piping. Such controls will be at the same safety classification level as the piping they are protecting.

- NSD-0058-2:
  - a. Summary Table 3-2, "Bounding Unmitigated Accident Credited Control Strategies," identifies "C5V Confinement" as the primary credited control strategy for pipe sprays and pipe leaks. Consistent with footnote 2, and the selected controls discussion in Sections 3.4.1.2.3.6 and 3.4.1.4.1.6, add "Piping" as a primary control for the "Pipe Sprays" and "Pipe Leaks" bounding unmitigated severity level analysis entries. This control applies to process piping that can contain waste, which includes waste streams that did not require a credited control for bounding radiological or chemical consequences of hydrogen explosions.
  - b. Table 3-5, "Unmitigated Dose Consequence Levels for Hydrogen Events in Pipes," provides the consequence value for dose to the CLW as  $2.1E-12$  rem. In the source calculation, 24590-PTF-Z0C-W14T-00002, *Revised Severity Level Calculations for the Pretreatment Facility*, Rev F, it was identified that the  $2.1E-12$  value is incorrect and the calculation is being updated. Update the CLW consequence (in rem) for stream TCP03 from  $2.1E-12$  to  $2.4E-2$ , the determined value.

The SBRT agrees that the proposed changes to Chapter 3.0, as modified by the COAs above, are acceptable.

### 3.2.3 Chapter 4.0, "Important to Safety SSCs"

The revised unmitigated consequence calculation, 24590-PTF-Z0C-H01T-00003, Rev. F, resulted in reduction of consequences to the public and CLW for many analyzed hydrogen explosions in piping. As a result, several control strategies were revised. No controls were deleted from the PDSA; however, several preventive hydrogen control strategies were down-graded from SC or SS to DID. Changes to the control safety classification, based on the analysis in Chapter 3.0, were applied to the control information in Chapter 4.0, including the summary tables and Appendix 4A of Chapter 4.0.

Significant changes are:

- Control applicability information was added for SS process piping. The crediting of C5 areas and the C5V system as the primary controls to protect the CLW and facility worker for hydrogen explosions was added to Section 4.3.2.5, the system evaluation for the SC C5 system.
- Section 4.3.29, *Control of Hydrogen in Piping and Non-Process Vessels*, was revised to incorporate the following changes:
  - Information concerning operation of pulse jet mixers deleted from Appendix 2C of the PDSA, was added.

- Non-Newtonian vessels pump suction line purge and Newtonian vessels FRP-VSL-00002A/B/C/D pump suction line high point vents were included as SC controls.
- Controls downgraded from SC to DID were deleted from this section.
- Section 4.3.30, *Non-Newtonian and PT to HLW Transfer Line Flush System*, was deleted. This system was downgraded to DID based on the analysis in Chapter 3.0 for hydrogen explosions in piping.
- Section 4.4.35, *Control of Hydrogen in Piping and Non-Process Vessels*, was revised to delete controls that had been downgraded from SS to DID (as described in section 3.2.2 above).
- Sections 4.3.5 and 4.4.42 both titled *Waste Transfer/Process Piping, and Process Vessel Isolation Valves*, were revised to include the functional requirements for the SS and SC pipe to withstand hydrogen explosions (a credited control for spill and spray prevention). A COA, as described in Section 3.2.2 above, requires additional criteria for active preventive controls to limit hydrogen accumulation in piping where piping analysis does not show that loads generated by hydrogen remain within pipe design criteria.
- Appendix 4A was significantly updated, correcting references to sections for controls as well as updating controls themselves based upon changes described in Section 3.4.1.8.8 of the PDSA.

Table 4A-3 contains an incorrect footnote (24590-WTP-PSAR-ESH-01-002-02). It references Rev. F of calculation 24590-PTF-Z0C-H011T-00003 for designating the Waste Feed Receipt Process System vessel pump suction line vents as SC. This actually references Rev. B of the calculation. The footnote shall be removed with the COA described below:

- NSD-0058-2:
  - c. A footnote was added to Table 4A-3, "PTF Hydrogen Event Controls," for three controls related to the pump suction lines to provide the source calculation. To be consistent with the other table entries and to avoid additional updates whenever the calculation is revised, remove the footnote:

Vessel pump suction line Safety Classification based on public SL-1 (SC) or SL-2 (SS) identification in the 24590-PTF-Z0C-W14T-00002, Rev F, *Revised Severity Level Calculations for the Pretreatment Facility*

Appropriate changes have been made to Chapter 4.0. Safety SSCs are identified and their performance requirements are clearly stated. The safety SSCs are defined and their functional classifications are consistent with the bases derived from the new consequence calculation 24590-PTF-Z0C-H011T-00003, Rev. F. Credited preventive controls are recognized as not precluding pipe failure. For failures that may occur, a mitigative control strategy was evaluated as adequate for protecting the workers. The proposed changes to Chapter 4.0 are acceptable.

### 3.2.4 Chapter 5.0, "Derivation of Technical Safety Requirements"

Several changes were made to Chapter 5.0, "Derivation of Technical Safety Requirements" of the PDSA (24590-WTP-PSAR-ESH-01-002-02). Chapter 5.0 of the PDSA was revised to incorporate the results of calculation 24590-PTF-ZOC-H011T-00003, Rev. F. The results of the consequence calculation were used to justify a modification to technical safety requirement controls described in the PDSA.

Significant changes are:

- Section 5.5.22.14 was deleted. This control required development and maintenance of records for piping characteristics and design parameters by pipe segment. For most cases, piping configurations are no longer credited to prevent hydrogen accumulation. The design requirements for the piping with respect to loads from hydrogen explosions have been included in Sections 4.3.5 and 4.4.42 as described above. A more general requirement to control configuration of SSCs to limit accumulation of hydrogen in piping and non-process vessels remains in Section 5.5.22.25.
- In Section 5.5.22.25 several administrative controls governing operator actions have been deleted. These controls are no longer credited in the analysis in Chapter 3.0. Administrative controls deleted include line flush requirements, pump run times, and waste temperature monitoring.
- Section 5.5.35 was updated to specify pump suction lines requiring this control. Non-Newtonian vessels pump suction line purge and Newtonian vessels FRP-VSL-00002A/B/C/D pump suction line high point vents are identified as SC to ensure an explosion in the line would not interrupt the mixing function in the vessels (pulse jet mixers). This requirement is based on Rev. B of the consequence calculation. Section 5.5.36 has been deleted due to reclassification as DID; a corresponding addition was made to Table 3A-34 to reflect this change.
- Piping design requirements for hydrogen explosion control were deleted from the table in Section 5.6.23 consistent with the analysis in Chapter 3.0 of the PDSA.

Appropriate detail has been incorporated into Chapter 5.0. The unmitigated consequence results, documented in calculation 24590-PTF-ZOC-H011T-00003, Rev. F, used to support the changes in functional classification of SSCs also resulted in the proposed changes to the technical safety requirements. Chapter 5.0 is technically accurate and consistent with the remainder of the document. The proposed changes to Chapter 5.0 are acceptable.

### 3.2.5 Preliminary Documented Safety Analysis Volume 1, "General"

The proposed PDSA change package did not propose any revisions to 24590-WTP-PSAR-ESH-01-002-01, Rev. 6a. The SBRT evaluated if the changes described in Section 3.1 of this SER would impact 24590-WTP-PSAR-ESH-01-002-01 and concurred that it is unaffected by the PT Facility PDSA change package (CCN: 290777). The basic elements of the institutional safety management programs depended upon for ensuring facility safety are adequate, and these elements can and will be implemented.

#### 4.0 CONCLUSION

Based on the evaluation described above and the review comment dispositions, ORP has concluded there is reasonable assurance that the health and safety of the public, the workers, and the environment will not be adversely affected by the changes proposed in 24590-PTF-PDACP-NS-15-0004, provided in CCN: 290777. ORP accepts the proposed changes in the change package as discussed in Section 3.1 and Section 3.2 of this SER. The accepted proposed changes are approved and are judged to ensure effective control of the hydrogen hazards posed by PT waste streams through the design, construction, and operation of the WTP facilities.

The specific proposed changes, including satisfactory closure of the COAs, to the PT Facility PDSA associated with the hydrogen in piping accident scenarios are to be incorporated within the next 60 days following ORP approval.

#### 5.0 REFERENCES

- 10 CFR 830, "Nuclear Safety Management," Subpart B, "Safety Basis Requirements," *Code of Federal Regulations*, as amended.
- 15-NSD-0017, 2015, "Contract No. DE-AC27-01RV14136 – Updated Safety Analysis Direction" (external letter to M. McCullough, Bechtel National, Inc. ), from R.L. Dawson and K.W. Smith, U.S. Department of Energy, Office of River Protection, Richland, Washington, June 29.
- 24590-PTF-Z0C-H011T-00003, 2016, *Unmitigated Consequences for Pretreatment Hydrogen in Piping and Non-Process Vessel Events*, Rev. F, Bechtel National, Inc., Richland, Washington.
- 24590-PTF-Z0C-H011T-00003, 2007, *Design Basis Event: PTF Hydrogen Explosions in Piping and Ancillary Vessels*, Rev. B, Bechtel National, Inc., Richland, Washington.
- 24590-WTP-DB-ENG-01-001, 2015, *Basis of Design*, Rev. 3, Bechtel National, Inc., Richland, Washington, December 11.
- 24590-WTP-PSAR-ESH-01-002-01, 2016, *Preliminary Documented Safety Analysis to Support Construction Authorization; General Information*, Rev. 5e, Bechtel National, Inc., Richland, Washington, July 10, 2015.
- 24590-WTP-PSAR-ESH-01-002-02, 2016, *Preliminary Documented Safety Analysis to Support Construction Authorization; PT Facility Specific Information*, Rev. 6, Bechtel National, Inc., Richland, Washington, April 28, 2016.
- 24590-WTP-RPT-ENG-07-011, 2012, *HPAV Engineering Methods and Criteria*, Rev. 7, Bechtel National, Inc., Richland, Washington,

24590-WTP-SRD-ESH-01-001-02, 2015, *Safety Requirements Document Volume II*, Rev. 7f, Bechtel National, Inc., Richland, Washington.

ASME/ANSI B31.3, 2009, "Process Piping," ASME/ANSI Standards Manual PD342, American Society of Mechanical Engineers, as amended.

CCN: 290777, 2016, "Contract Deliverable 9.1 – Preliminary Documented Safety Analysis Change Package 24590-PTF-PDACP-NS-15-0004, proposed changes to the Preliminary Documented Safety Analysis to Support Construction Authorization; Pretreatment Facility Specific Information" (external letter to W.F. Hamel, U.S. Department of Energy, Office of River Protection) from L.W. Baker, Bechtel National, Inc., Richland, Washington, July 29.

Contract No. DE-AC27-01RV14136, *Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant*, U.S. Department of Energy, Washington, D.C., as amended.

DOE O 420.1B, 2005, *Facility Safety*, U.S. Department of Energy, Washington, D.C.

DOE-HDBK-3010-94, 1994, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities*, U.S. Department of Energy, Washington, D.C., December.

DOE-STD-1104-2014, 2014, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*, U.S. Department of Energy, Washington, D.C.

DOE-STD-3009-94, 2009, *DOE Standard Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, Chg 3, U.S. Department of Energy, Washington, D.C.

TRS-ENG-IP-01, 2016, *Waste Treatment and Immobilization Plant Safety Management*, Rev. 8, U.S. Department of Energy, Office of River Protection, Richland, Washington, February 9.

Bamberger, JA, JA Glissmeyer, 2004, *Release Fraction Evaluation*, PNNL-14545, Pacific Northwest national Laboratory, Richland, Washington.



**OFFICE OF RIVER PROTECTION**

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**DEC 12 2016**

16-SHD-0073

Mrs. Margaret McCullough, Project Director  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Mrs. McCullough:

**CONTRACT NO. DE-AC27-01RV14136 – APPROVAL OF FISCAL YEAR 2017  
PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS AND REVISED  
INTEGRATED SAFETY MANAGEMENT SYSTEM DESCRIPTION**

Reference: BNI letter from L.W. Baker to R.L. Dawson, ORP, "Fiscal Year 2016 Annual Integrated Safety Management System and Quality Assurance Effectiveness Review Declaration," CCN: 281760, dated November 16, 2016.

The U.S. Department of Energy, Office of River Protection (ORP) has reviewed and approves the Bechtel National, Inc. (BNI), 24590-WTP-ISMSD-ESH-01-001, *BNI Project Integrated Safety Management System Description*, Rev. 15, dated October 6, 2016. ORP also reviewed and approves BNI's fiscal year (FY) 2017 Performance Objectives, Measures, and Commitments through the second quarter of FY 2017. ORP requests BNI expand on FY 2017 Performance Objectives, Measures, and Commitments for the remainder of FY 2017 to ensure stronger predictors of BNI performance.

ORP appreciates BNI's development and completion of the FY 2016 Integrated Safety Management System and Quality Assurance Effectiveness Review Declaration.

If you have any questions, please contact me, or your staff may contact Ricky Bang, Director, Safety and Health Division, (509) 376-4151.

A handwritten signature in black ink that reads "Ronnie L. Dawson".

Ronnie L. Dawson  
Contracting Officer

SHD:PKB

Attachment:  
WTP Proposed Fiscal Year 2017 POMCs

cc w/attach:  
D.E. Gergely, BNI  
P.D. Worley, BNI  
BNI Correspondence

**Attachment  
16-SHD-0073  
(4 Pages Excluding Cover Sheet)**

**WTP Project Proposed Fiscal Year 2017 POMCs**

## **WTP Project Proposed Fiscal Year 2017 POMCs**

Measuring the safety culture of an organization is an evolving endeavor that requires both data and management perspectives. Metrics are a useful tool towards accomplishing this effort.

There are three objectives associated with the 2017 POMCs:

- Continuously improve safety performance at the WTP
- Continuously improve quality performance at the WTP
- Continuously improve overall performance at the WTP

The WTP has made 5 commitments to improve key performance and will monitor progress towards meeting those commitments with 9 measures, identified in the table below.

**WTP Performance Objective – Continuously Improve Safety Performance at the WTP**

**Project management promotes a “Zero Accident” policy as a fundamental value for a culture dedicated to the belief that all accidents are preventable. Project management empowers Project personnel, including subcontractors, to identify, report, and resolve safety issues as soon as they are discovered and to continuously improve the Project safety program through a fully engaged workforce.**

<b>ID. No.</b>	<b>Performance Commitment</b>	<b>ID. No.</b>	<b>Performance Measure</b>	<b>Goal</b>	<b>Reporting Frequency</b>	<b>Org. Contact</b>
C-1.1	Achieve and maintain the Total Recordable Case (TRC) rate performance goals for the WTP Project and construction site workers.	M-1.1.1	WTP Project TRC Rate - Measure the TRC rate (as defined by 29 CFR 1904) experienced by entire WTP Project	Meets: < 1.00 (cumulative) Alert range: ≥ 1.00 and < 1.25 (cumulative) or a statistically significant declining trend exists	Monthly Complete: ongoing	Safety Assurance
		M-1.1.2	Construction Site TRC Rate - Measure the TRC rate (as defined by 29 CFR 1904) experienced by construction site workers	Meets: < 1.60 (cumulative) Alert range: ≥ 1.60 and < 2.00 (cumulative) or a statistically significant declining trend exists	Monthly Complete: ongoing	Safety Assurance
C-1.2	Achieve and maintain the Days Away, Restricted, or Transferred (DART) case rate performance goals for the WTP Project and construction site workers.	M-1.2.1	WTP Project DART Rate - Measure the DART case rate (as defined by 29 CFR 1904) experienced by entire WTP Project	Meets: < 0.45 (cumulative) Alert range: ≥ 0.45 and < 0.65 (cumulative) or a statistically significant declining trend exists	Monthly Complete: ongoing	Safety Assurance
		M-1.2.2	Construction Site DART Rate - Measure the DART case rate (as defined by 29 CFR 1904) experienced by construction site workers	Meets: < 0.75 (cumulative) Alert range: ≥ 0.75 and < 1.07 (cumulative) or a statistically significant declining trend exists	Monthly Complete: ongoing	Safety Assurance

**WTP Performance Objective – Continuously Improve Quality Performance at the WTP**

**Reinforce the value and commitment to continuous improvement in quality processes that support early detection, prevention, mitigation, and correction of errors or non-conformances that could adversely affect the WTP's performance in achieving its mission.**

<b>LD. No.</b>	<b>Performance Commitment</b>	<b>I.D. No.</b>	<b>Performance Measure</b>	<b>Goal</b>	<b>Reporting Frequency</b>	<b>Org Contact</b>
C-2	Maintain the issues management system at or above the performance goals for the Project	*M-2.1	Level B CAP Approval Average Age – Measure of cycle time from Condition Report Review Committee validation to completion of the corrective action plan	Meets: < average 60 days Alert range: ≥ 60 days and <90 days	Monthly Complete: ongoing	Organizational Effectiveness
		*M-2.2	CR Closure Quality - Measures results of CR closure reviews of all Level B and sample of Level C Condition Reports that have been closed by the responsible organization	Meets: ≥ 0.9 Alert range: ≥ 0.8 days and < 0.9 days	Monthly Complete: ongoing	Organizational Effectiveness
		M-2.3	Condition Report (CR) Backlog Corrective Action Age – Measure the timeliness of actions focused on understanding the condition and preventing recurrence	Meets: < 180 days (corrective action average) Alert range: ≥ 180 days and < 270 days	Monthly Complete: ongoing	Organizational Effectiveness

\* Leading Indicators

3

**WIP Performance Objective – Continuously Improve the Safety Culture and Overall Performance at the WIP**

**Planning, implementing, and performing hazardous work requires being constantly alert to opportunities to improve programs, systems and processes, and ensuring that all improvements continue to drive integration of the core functions and principles of an ISMS in administrative and work practices at all levels of the organization.**

<b>I.D. No.</b>	<b>Performance Commitment</b>	<b>I.D. No:</b>	<b>Performance Measure</b>	<b>Goal</b>	<b>Reporting Frequency</b>	<b>Org Contact</b>
C-3.1	Achieve improved performance at the activity level of work planning and control, job hazard identification, analysis, and hazard controls	M-3.1	Conduct an assessment of the Hazard Identification/ Analysis processes (From AJHA development through STARRT Card and conduct of work) to determine effectiveness in hazard identification and mitigation and identify opportunities for improvement.	Goal: Complete the assessment and issue report by September 30, 2017	Once	Combined effort of Construction, ES&H & C&O
C-3.2	Attain and sustain a strong safety culture posture	M-3.2	Conduct project-wide NSQC survey of BNI and AECOM manuals and non-manuals to identify strengths and areas for improvement.	Goal: Complete the survey and issue report by September 30, 2017	Once	NSQC

4



OFFICE OF RIVER PROTECTION  
P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

DEC 06 2016

16-WSC-0064

Ms. L.W. Baker  
Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

CONTRACT NO. DE-AC27-01RV14136 – CONTRACT DELIVERABLE 1.4 – INTERFACE  
MANAGEMENT PLAN, REV. 9

Reference: BNI letter from L.W. Baker to W. F. Hamel, ORP, "Contract Deliverable 1.4 –  
Interface Management Plan, Rev. 9," CCN: 283289, dated November 1, 2016.

The Waste Treatment and Immobilization Plant Contract Deliverable 1.4, *Interface Management Plan*, requires periodic updates be prepared for the U.S. Department of Energy, Office of River Protection (ORP) approval. A recent revision requires update and approval of the Plan, Rev. 9. ORP approves the 24590-WTP-PL-MG-01-001, Rev. 9, *Interface Management Plan*. The revised Plan was prepared by Bechtel National, Inc. and incorporated comments from ORP. The Plan describes the process for preparation and issuance of Interface Control Documents.

If you have any questions, please contact me, or your staff may contact Joanne F. Grindstaff,  
Deputy Federal Project Director, Waste Treatment and Immobilization Plant, (509) 376-6202.

George F. Champlain  
Contracting Officer

WSC:WRW

cc: R.P. Henckel, BNI  
BNI Correspondence



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**OCT 26 2016**

16-WTP-0190

Ms. L.W. Baker  
Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – DIRECTION TO CANCEL DOE RISK ID: 619  
(LEGACY RISK NUMBERS: DOE-049 AND CON-052) – “RECOVERY OF EQUIPMENT  
SALVAGE VALUE”**

- References:
1. BNI letter from R.W. Bradford to G.A. Girard, ORP, “BNI Response to ORP Comments on Baseline Risk Plan Risk Sheets,” CCN: 217441, dated April 29, 2010.
  2. ORP letter from R.L. Dawson to N.F. Grover, BNI, “U.S. Department of Energy (DOE) Waste Treatment and Immobilization Plant (WTP) Project Risk Assignment Decisions,” 10-WTP-224, dated September 21, 2010.

This letter provides direction to Bechtel National, Inc. to cancel DOE Risk ID: 619, “Recovery of Equipment Salvage Value.” Waste Treatment and Immobilization Plant Contract Number DE-AC27-01RV14136, Modification Number 372, Section B.11 (f) “Disposition of Government Property Credit,” addresses how costs or credits shall be addressed with respect to equipment salvage value.

Section B.11(f) states, in part: “The estimated cost of the contract assumes that the acquisition cost or salvage value, as applicable, of government property, such as and including spare parts and supplies not consumed during commissioning and limited operations and construction equipment purchased as a direct cost to support the project, would be credited against the final actual cost in accordance with FAR 52.245-5(i).”

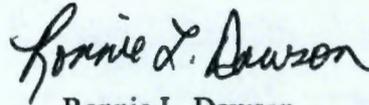
The U.S. Department of Energy, Office of River Protection no longer has a reasonable basis for carrying salvage value as a risk, and therefore directs Bechtel National, Inc. to cancel DOE RISK ID: 619, “Recovery of Equipment Salvage Value.” Salvage value, if any, will be handled according to the contract provision outside of the risk program at contract closeout.

Ms. L.W. Baker  
16-WTP-0190

-2-

OCT 26 2016

If you have any questions, please contact me, or you may contact Dennis A. Brown, Director,  
Waste Treatment and Immobilization Plant, Project Controls Division, at (509) 376-4441.



Ronnie L. Dawson  
Contracting Officer  
Waste Treatment and Immobilization Plant

WTP:EPM

cc: M.W. Costas, BNI  
J.H. Dunkirk, BNI  
R.S. Hajner, BNI  
J.M. St. Julian, BNI  
E.A. Winkelman, BNI  
S.P. Wood, BNI  
BNI Correspondence



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**NOV - 1 2016**

16-WTP-0202

Mrs. Margaret McCullough, Project Director  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Mrs. McCullough:

**CONTRACT NO. DE-AC27-01RV14136 – NEW DIRECTION RELATED TO USE OF  
AUTHORIZED UNPRICED WORK**

**Reference:** ORP letter from R.L. Dawson to F.M. Russo, BNI, "Authorized Unpriced Work (A UW) Definition and Direction," 12-WTP-0105, date April 02, 2012.

In April 2012, the U.S. Department of Energy, Office of River Protection (ORP), provided direction (Reference) to Bechtel National, Inc. (BNI) related to the definition and use of Authorized Unpriced Work (A UW). The U.S. Department of Energy, Office of Environmental Management, has updated the policy related to the use of A UW (Attachment). ORP directs BNI to use the new A UW policy- which supersedes the prior direction to BNI contained in the Reference letter - and directs BNI to revise any project control procedures as appropriate and use the new A UW direction for any subsequent new contract work scope direction provided by the ORP Contracting Officer.

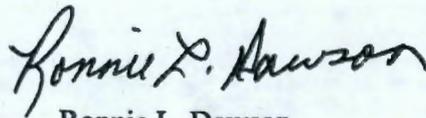
The action taken herein is considered to be within the scope of work of the existing contract and does not authorize the Contractor to incur any additional costs (either direct or indirect) or delay delivery to the Government. If the Contractor considers that carrying out this action will increase contract/project costs or delay of delivery, the Contractor shall promptly notify the Contracting Officer orally, confirming and explaining the notification in writing within ten (10) calendar days, and otherwise comply with the requirements of the Contract clause I.84 FAR 52.243-7, -- "Notification of Changes (APR 1984)." Following submission of the written notice of impacts, the Contractor shall await further direction from the Contracting Officer.

Mrs. Margaret McCullough  
16-WTP-0202

-2-

NOV - 1 2016

If you have any questions, please contact me, or you may contact Dennis A. Brown, Division Director, Waste Treatment and Immobilization Plant, Project & Controls, (509) 376-4441.



Ronnie L. Dawson  
Contracting Officer

WTP:RLC

Attachment

cc w/attach:  
BNI Correspondence

**Attachment  
to  
16-WTP-0202  
Memo for Distribution from  
J.E. Surash Deputy Assistant Secretary  
For Acquisition and Project Management  
(total pages including this cover sheet, 5)**



## Department of Energy

Washington, DC 20585

February 2, 2015

### MEMORANDUM FOR DISTRIBUTION

THRU: MARK WHITNEY *Mark Whitney*  
PRINCIPAL DEPUTY ASSISTANT SECRETARY FOR  
ENVIRONMENTAL MANAGEMENT

FROM: J. E. SURASH *J. E. Surash*  
DEPUTY ASSISTANT SECRETARY FOR  
ACQUISITION AND PROJECT MANAGEMENT

SUBJECT: Office of Environmental Management Clarifying Guidance for Contract  
and Project Alignment

The Department of Energy (DOE) Office of Environmental Management utilizes Earned Value Management Systems (EVMS) in accordance with the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA) 748 Standard guidelines. During recent EVMS reviews, questions have been raised about incorporating Authorized Unpriced Work (AUW) into project baselines.

The attached guidance is provided to clarify the policy regarding contract and project alignment and for incorporating AUW in the baseline for EVMS measurement purposes. This guidance was sent for comment on December 29, 2014, and changes were incorporated based on comments.

If you have any questions, please feel free to contact me or Mr. Christopher Honkomp, Director, Office of Project Assessment, at (202) 586-8162.

Attachments



**Distribution:**

**Stacy Charboneau, Manager, Richland Operations Office**  
**Kevin Smith, Manager, Office of River Protection**  
**David C. Moody, Manager, Savannah River Operations Office**  
**Jose Franco, Manager, Carlsbad Field Office**  
**William E. Murphie, Manager, Portsmouth/Paducah Project Office**  
**Jack Craig, Director, Environmental Management Consolidated Business Center**  
**John P. Zimmerman, Deputy Manager for Idaho Cleanup Project**  
**Susan Cange, Manager, Oak Ridge Office of Environmental Management**

**cc: Scott Wade, NSO**  
**Pete Maggiore, NA-00-LA**  
**Monica Regalbuto, EM-2.1**  
**Mark Gilbertson, EM-10**  
**Kenneth Picha, Jr., EM-20**  
**Frank Marcinowski, EM-30**  
**James Hutton, EM-40 (Acting)**  
**J. E. Surash, EM-50**  
**Connie Flohr, EM-60 (Acting)**  
**Melody Bell, EM-70 (Acting)**  
**Christopher Honkomp, EM-53**

## Attachment 1: Supplement EM Clarifying Guidance for Contract and Project Alignment

The National Defense Industrial Association Integrated Program Management Division Earned Value Management Systems Intent Guide guidelines 8, 9, 15, and 28 outline the acceptable use and application of Authorized Unpriced Work (AUW). Additional instruction can be found within Integrated Program Management Report Data Item Description DI-MGMT-81861 if established as a contractual requirement.

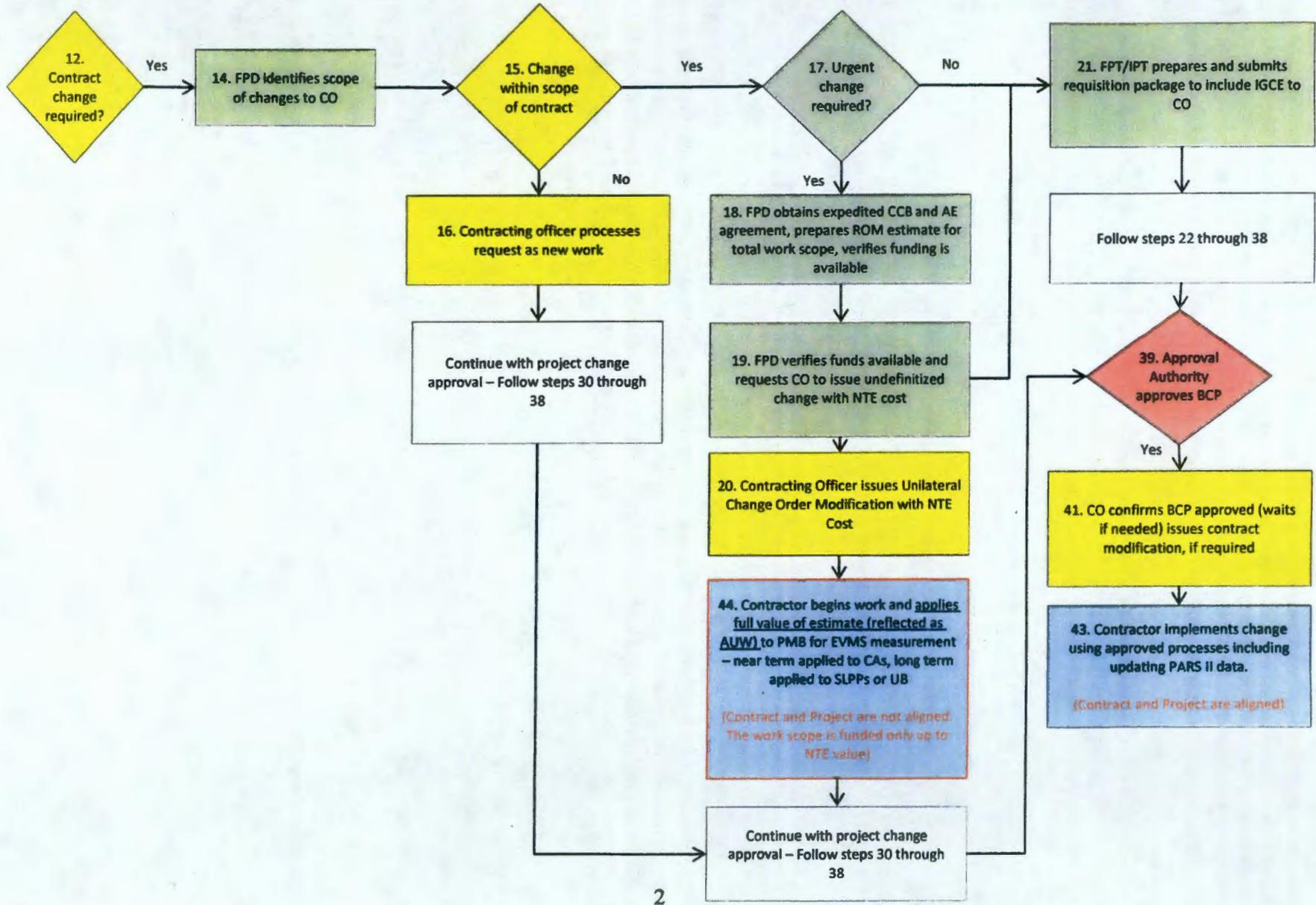
As stated in the Department of Energy (DOE) Acquisition and Project Management Glossary of Terms Handbook, AUW is: work that the customer has authorized to be performed, but for which a formal proposal has not been negotiated. When the contracting officer (CO) formally authorizes the contractor to proceed with not yet negotiated work, a not-to-exceed (NTE) value is often established. The NTE is a spending limit, and a contractor is required to observe the limit as the not yet negotiated work is underway. The full estimate associated with the authorized but not yet negotiated work is reflected as AUW. Near term effort should be planned with detailed scope and cost reflected in control account(s). Far term effort that cannot be reasonably planned in the near term may be placed in summary level planning packages or maintained in Undistributed Budget until negotiations are complete and the contract modification is issued. When this additional work is authorized the ANSI/EIA 748 Standard requires the budget to be updated as well as the EAC.

Applying AUW to the project will temporarily cause the Contract Budget Base (CBB) to be out of alignment with the contract. In order to remain compliant with the DOE Acquisition Guide Chapter 43.3, the CO must definitize the unilateral modification in order to realign the contract and the CBB. These changes must be applied in accordance with DOE Acquisition Guide 43.3, *Maintaining Alignment of Project Management with and Contract Management for Non-Management and Operating (M&O) Cost Reimbursement Contracts for Capital Asset Projects, Environmental Remediation, Decontamination and Decommissioning, Facility Operations, and Other Major Projects.*

### Additional guidance on AUW:

- Clarification to DOE G 413.3-20. See Figures 3-4A and 3-4D.
- DOE Acquisition and Project Management Glossary of Terms Handbook, dated Sept. 5, 2014 is available at <http://www.energy.gov/management/office-management/operational-management/project-management/policy-and-guidance>
- DOE Office of Acquisition Project Management Snippet 4.5 AUW available at DOE's Powerpedia ([https://powerpedia.energy.gov/wiki/EVMS\\_Training\\_Snippets](https://powerpedia.energy.gov/wiki/EVMS_Training_Snippets)); Project Assessment Reporting System II (<https://pars2e.doe.gov/policy/Lists/EVMS%20Snippets/AllItems.aspx> - Policy & Guidance section in EVMS Training Snippets library), and the EFCOG website ([http://www.efcog.org/wg/pm\\_evmssg/EVMS\\_Snippets.htm](http://www.efcog.org/wg/pm_evmssg/EVMS_Snippets.htm)).
- NDIA\_IPMD\_Intent\_Guide\_Ver\_C\_Appendix April 29 2014 available at ([http://www.ndia.org/Divisions/Divisions/IPMD/Documents/ComplementsANSI/NDIA\\_IPMD\\_Intent\\_Guide\\_Ver\\_C\\_April292014.pdf](http://www.ndia.org/Divisions/Divisions/IPMD/Documents/ComplementsANSI/NDIA_IPMD_Intent_Guide_Ver_C_April292014.pdf)) DOD DI-MGMT-81861 available at ([http://everyspec.com/DATA-ITEM-DESC-DIDs/DI-MGMT/DI-MGMT-81861\\_42561/](http://everyspec.com/DATA-ITEM-DESC-DIDs/DI-MGMT/DI-MGMT-81861_42561/))

Attachment 2: Excerpt from DOE Guide 413.3-20, Figure 4-1





**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**NOV 18 2016**

16-WTP-0218

Ms. L. W. Baker, Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – POTENTIAL DIRECT FEED LOW-ACTIVITY  
WASTE PROJECT IMPACTS DUE TO EFFLUENT MANAGEMENT FACILITY  
PERMITTING DELAYS**

Reference: BNI letter from L.W. Baker to R.L. Dawson, ORP, "Notification of Potential  
DFLAW Project Impacts Due to Permitting Comment Delays," CCN: 289628,  
dated October 14, 2016.

The U.S. Department of Energy, Office of River Protection (ORP) Waste Treatment and Immobilization Plant (WTP) Project understands and shares the direct feed low-activity waste (DFLAW) project schedule impact concerns outlined in the Reference. ORP recognizes that timely completion of the Effluent Management Facility (EMF) permitting process is important to successful implementation of the DFLAW capability at WTP. Please continue to communicate frequently as challenges to the DFLAW implementation schedule arise. To more clearly illustrate the specific schedule challenges associated with the EMF permitting schedule ORP requests the following deliverables within 30 days:

1. Please provide a WTP schedule critical path analysis clearly documenting the current EMF permitting impacts to the WTP schedule. Ensure that the deliverable includes a float analysis and an evaluation of other concurrent delays within the WTP schedule.
2. Please identify the actions that have been taken to-date to address EMF permitting schedule challenges and discuss the success or failure of these mitigating activities.

ORP will continue to facilitate communications with the Washington State Department of Ecology in a manner that supports timely review and approval of permit documents. It is the expectation of ORP that permit submittal documents be held to a high standard of quality in an effort to minimize the document review effort and associated duration for comment disposition.

Ms. L.W. Baker  
16-WTP-0218

-2-

NOV 18 2016

The action taken herein is considered to be within the scope of work of the existing contract and does not authorize the Contractor to incur any additional costs (either direct or indirect) or delay delivery to the Government. If the Contractor considers that carrying out this action will increase contract/project costs or delay of delivery, the Contractor shall promptly notify the Contracting Officer orally, confirming and explaining the notification in writing within ten (10) calendar days, and otherwise comply with the requirements of the Contract clause I.84 FAR 52.243-7, -- "Notification of Changes (APR 1984)." Following submission of the written notice of impacts, the Contractor shall await further direction from the Contracting Officer.

If you have any questions please contact me, or your staff may contact Jason Young, Federal Project Director WTP Balance of Facilities, at (509) 376-0375.



William F. Hamel  
Assistant Manager, Federal Project Director  
Waste Treatment and Immobilization Plant

WTP:JDY

cc: BNI Correspondence



**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**DEC 12 2016**

16-WTP-0238

Ms. L. W. Baker, Business Services Manager  
Business Services  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – ACCEPTANCE OF COMPLETION OF  
ACTIVITY MILESTONE BOF-05, COMPLETE ELECTRICAL DISTRIBUTION SYSTEM  
TESTING MVE (SITE ENERGIZATION)**

Reference: BNI letter from L.W. Baker to R. L. Dawson, ORP, "Notification of Completion of Activity Milestone BOF-05, Complete Electrical Distribution System Testing MVE (Site Energization)," CCN: 291533, dated November 15, 2016.

On November 15, 2016, Bechtel National, Inc. (BNI) notified the U.S. Department of Energy, Office of River Protection (ORP) that Activity Milestone BOF-05, "Complete Electrical Distribution System Testing MVE (Site Energization)" had been completed. ORP has reviewed the information provided and concurs that BNI has completed the Activity Milestone BOF-05, "Complete Electrical Distribution System Testing MVE (Site Energization)."

ORP approves completion of the milestone and authorizes BNI to invoice for the milestone completion value of \$1,667,000. For tracking purposes, it is requested that a separate invoice be submitted for this milestone.

If you have any questions, please contact George F. Champlain, Contracting Officer, (509) 376-6678, Bill Hamel, Federal Project Director (509) 376-6727, or your staff may contact Jason Young, Federal Project Director, Analytical Laboratory and Balance of Facilities, (509) 376-0375.

Handwritten signature of George F. Champlain in blue ink.

George F. Champlain  
Contracting Officer

Handwritten signature of William F. Hamel in black ink.

William F. Hamel  
Assistant Manager, Federal Project Director  
Waste Treatment and Immobilization Plant

WTP:JDY

cc: BNI Correspondence



**OFFICE OF RIVER PROTECTION**  
P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

**DEC 22 2016**

16-WTP-0250

Ms. L.W. Baker  
Business Services Manager  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Ms. Baker:

**CONTRACT NO. DE-AC27-01RV14136 – CONCURRENCE WITH SAFETY STRATEGY SUMMARY DOCUMENT FOR LOW-ACTIVITY WASTE FACILITY MELTER OFFGAS/ OXIDES OF NITROGEN RELEASES**

- References:
1. BNI letter from L.W. Baker to W.F. Hamel, ORP, "Submittal of 24590-LAW-PL-NS-0005 for Review and Concurrence," CCN: 293417, dated December 13, 2016.
  2. ORP letter from G.F. Champlain to L.W. Baker, BNI, "Transmittal of Contract Modification No. 385 – Change Order for Partial Reclassification of the Low-Activity Waste Facility C5 Ventilation System to Safety Significant," 16-CPM-0174, dated December 22, 2016.

The purpose of this letter is to:

1. Provide U.S. Department of Energy, Office of River Protection (ORP) concurrence with Bechtel National, Inc. (BNI) proposed safety controls associated with Oxides of Nitrogen (NO<sub>x</sub>) / melter offgas hazards in the Low-Activity Waste (LAW) Facility, as documented in 24590-LAW-PL-NS-0005, Rev. 0, *Safety Strategy Summary Document – Oxides of Nitrogen/Melter Offgas Releases*, submitted to ORP for review and approval by Reference 1.
2. Address BNI's concerns in Reference 1 related to cost and schedule impacts, and proposed mitigating actions.

ORP concurrence on the NO<sub>x</sub> Safety Strategy Summary Document (SSSD) is an important project risk mitigation step in the development of the LAW Preliminary Documented Safety Analysis (PDSA) change package. The significant hazard of concern to the co-located worker and facility worker is chemical exposure from the NO<sub>x</sub> generated during melter operation and cold cap burn off. The melter offgas (NO<sub>x</sub>) release safety strategy is based on a three-tier approach: a credited safety significant active primary confinement system, reliable credited safety significant indication of the availability of a secondary active confinement system, and a tertiary defense in depth (non-credited) passive confinement function in the event that the two active systems fail. The NO<sub>x</sub> SSSD documents a viable strategy for controlling

Ms. L.W. Baker  
16-WTP-0250

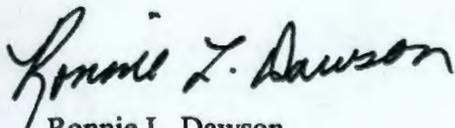
-2-

DEC 22 2016

potential release of NO<sub>x</sub> from the LAW melters or melter offgas system to protect the facility worker and co-located worker from the chemical hazards associated with LAW melter operations. The attachment to this letter is a review comment record that documents understandings and conditions associated with the ORP concurrence, and identifies expectations for items that will be addressed in the future as the LAW PDSA is developed. Comments provided in the review comment record do not require a formal response, nor is BNI expected to update the SSSD to incorporate comments.

ORP acknowledges that BNI met with ORP on December 7, 2016, and again on December 21, 2016, to discuss impact of changes to the safety controls from those documented in the previously approved PDSA, including those that had been agreed upon in a joint ORP-BNI working team chartered to develop the NO<sub>x</sub> SSSD. BNI is asserting in the reference and in the two meetings that the cost and schedule impacts from most if not all changes in the controls between the previous PDSA and those documented in the NO<sub>x</sub> SSSD are considered to be a contract scope change with an approximately \$7.6 million direct cost impact. ORP does not have sufficient information to acknowledge the merit of any potential contract scope change, with the exception of the partial reclassification of the C5V system from non-safety to safety significant, addressed by the contract change order, Reference 2. However, ORP does concur with implementing BNI's proposed schedule mitigation actions to accelerate completion of piping and instrumentation diagrams and datasheets at risk in order to avoid further schedule impacts in the completion of the LAW Programmable Protection System.

If you have any project-related questions, please contact William F. Hamel at (509) 376-6727 or Jeff Bruggeman at (509) 438-0444. For contract-related questions, please contact Ronnie L. Dawson at (509) 372-0098.



Ronnie L. Dawson  
Contracting Officer



William F. Hamel  
Assistant Manager, Federal Project Director  
Waste Treatment and Immobilization Plant

WTP:JST

Attachment

cc w/attach:  
BNI Correspondence

<b>OFFICE OF RIVER PROTECTION (ORP) SAFETY BASIS REVIEW TEAM (SBRT) REVIEW COMMENT RECORD (RCR)</b>		<u>Review No.:</u> SBRT SSSD – NO <sub>x</sub> /Offgas	<u>Date:</u> 11/17/2016
		<u>Document Number(s)/Title(s) Reviewed:</u> Safety Strategy Summary Document – NO <sub>x</sub> /Offgas (Received 11/10/16)	Page 1
<b>Organization/Group</b>	<b>Reviewer(s)</b>		<b>Review Lead Phone</b>
ORP SAFETY BASIS REVIEW TEAM	MG Al-Wazani, ET Berg, MA Danna, AM Horner, KS Lehew, RJ Poche, AL Ramble, BD Zimmerman		MG Al-Wazani / 376-4784
<b>Comment Approval</b>	<b>Comment Disposition Approval</b>		<b>CLOSED</b>
John Harris    DATE	John Harris    DATE		John Harris    DATE

This RCR documents ORP technical concurrence with the major controls in the hazard control strategy for NO<sub>x</sub>/Offgas hazards described in the Safety Strategy Summary Document (SSSD) provided to ORP in an e-mail from BNI (Wyatt) dated November 10, 2016.

The technical concurrence on this SSSD is provided with the understanding that the hazard controls in the SSSD were not derived using the hazards analysis and control selection processes specified in BNI procedures. As such, when BNI executes its formal hazards analysis and control selection process there may be a need for BNI to adjust the hazard controls from those identified in the SSSD to provide appropriate controls for specific hazardous events. Also, since the SSSD was not based on a completed hazards analysis or control selection process, and a formal approval has not been made by ORP, there is the possibility that new information (e.g., supporting analyses) may arise prior to approval of the LAW PDSA that may necessitate changes to the selected hazards controls identified in the SSSD. ORP requests they be informed where changes from the hazard controls in this SSSD are made so that ORP can specifically consider the impacts of these changes on the overarching hazard control strategy.

This technical concurrence RCR also documents expected changes and evaluations that will be performed and documented in the LAW PDSA or supporting documents in order for the ORP concurrence on this SSSD to be valid. BNI may seek reconsideration or alteration in these specific RCR changes by contacting the Director, ORP-NSD. There is no expectation for revision and resubmission of the SSSD as a result of addressing these comments.

All previous comments regarding the NO<sub>x</sub>/Offgas SSSD are considered closed with the exception of those provided on this RCR. The comments provided on this RCR will need to be addressed in the PDSA or supporting documents prior to completion of the LAW PDSA review.

Item	Comment
1.	<p><b>Comment:</b> Additional information is required to understand how the credited controls ensure the safety function of the C5V system is met. Specific areas of concern are:</p> <ul style="list-style-type: none"> <li>a. In order to show C5V will be capable of handling the offgas release, it may be necessary to monitor flow as well as dP. If only dP is monitored, an explanation of how sufficient flow is ensured should be provided.</li> <li>b. There is no explanation as to how monitoring the annuli dP ensures the process cells are negative to the surrounding areas. The SSSD states that the need for a pressure interlock on the process cell is under evaluation. Results of this evaluation and any potential additional controls will need to be included in the PDSA.</li> </ul> <p><b>Basis:</b> Control Effectiveness</p> <p><b>Expectation:</b> Fully justify and develop controls in the PDSA so it is clear how the C5V design function to confine an offgas release is achieved.</p>
2.	<p><b>Comment:</b> Maintenance requirements that protect the reliability of the C5V system should be credited and described in a TSR (administrative control or key element of an SMP).</p> <p><b>Basis:</b> Protection of Assumptions</p> <p><b>Expectation:</b> Provide an administrative control or key element of an SMP that requires maintenance and surveillance of the C5V system sufficient to ensure reliability is not compromised.</p>
3.	<p><b>Comment:</b> Control Strategy/Risk Reduction – It's not clear how Risk Bin III/IV is achieved. Examples</p> <ul style="list-style-type: none"> <li>a. Section 2.1.1, subsection Internal Offgas Fire/Explosion evaluates combustible gas fires or explosions inside the confinement boundary. This scenario credits the melter inbleeds (passive) and the feed chemistry SAC with 2 bins of frequency reduction (Unlikely to BEU). These controls must work together in order to ensure the offgas is below the LFL. For example, with no inbleeds, the mixture may be flammable even with chemistry controls, and with inbleeds, chemistry control is still required to keep the offgas below the LFL. It appears inappropriate to take 2 risk bins of reduction when the control relies on a SAC.</li> <li>b. The SBS low level event results in a release of offgas presumably at the location of system failure. The SBS low level interlock is the only identified control. It's unclear how this preventive control alone achieves Risk Bin III (there is no discussion of frequency in the scenario).</li> </ul> <p><b>Basis:</b> Accuracy</p> <p><b>Expectation:</b> Describe risk accurately in the PDSA and demonstrate appropriate risk reduction is taken for controls. Demonstrate how Risk Bins are achieved.</p>

Item	Comment
4.	<p><b>Comment:</b> PPJ Strategy – It is not shown that the PPJ will ensure feed is shut down to both melters in the case of PPJ degradation (relying on C5V during the cold cap burn-off). Protection of the panel from the fire may become less important if this capability can be demonstrated. If, however, the failure mode cannot be reliably predicted, protection from fire and smoke is crucial to the control strategy. In particular:</p> <ul style="list-style-type: none"> <li>a. The effects of smoke on PPJ are analyzed in the SSSD, however the effects of a fire on the PPJ are not identified or analyzed. Include a fire analysis for PPJ.</li> <li>b. Fire area LV201 (includes PPJ room) fire barriers are not credited. There is no discussion on fire hazards in this area (e.g., batteries, cable, offgas equipment).</li> <li>c. The heat and smoke from internal or external fire can potentially put a PPJ controller into an indeterminate state. Therefore, a PPJ controller could be indicating that it is functioning normally when actually it may be malfunctioning or inoperative. See references NUREG-CR-7123, NUREG-1635 Vol. 11, NUREG-CR-6476 and NRC REG Guide 1.209.</li> </ul> <p><b>Basis:</b> Control Effectiveness</p> <p><b>Expectation:</b> Describe in the PDSA how PPJ will reliably ensure melter feed is secured in the case of its degradation due to fire, heat and smoke.</p>
5.	<p><b>Comment:</b> Seismic – The seismic strategy in the SSSD appears to assume non-seismically qualified SSCs in the melter will continue to function during and after the seismic event. No analysis or discussion of SSCs or hazardous events is presented in the SSSD. Discussions with BNI indicated that components of concern (melter lid, refractory, cooling panels, jack bolts, electrodes, etc.) have all been shown through calculation to withstand the seismic event, however the SSSD does not present this argument. Similarly it must be shown that components inside the SBS, WESP and other components in the exhaust pathway cannot fail in a manner to block flow. The SSSD credits the unobstructed pathway, but there is no discussion of component internals. Discussion is largely focused on confinement boundary.</p> <p><b>Basis:</b> Demonstrate the Safety Function of the offgas system to provide unobstructed flow is supported by design.</p> <p><b>Expectation:</b> Provide a summary of the seismic response of the melter components and penetrations in the PDSA. This is needed to ensure the event is accurately described and controls will be effective. Additionally, provide basis that there are no seismic failures in offgas equipment that would block offgas flow.</p>

Item	Comment
6.	<p><b>Comment:</b> There is no technical justification provided for the assumption that the cold cap will burn off within 2 hours.</p> <p><b>Basis:</b> Incomplete design parameter definition</p> <p><b>Expectation:</b> Provide a discussion of the basis for a 2 hour cold cap burn-off in the PDSA. The discussion should include any assumptions or test parameters used in determining this time (e.g. bubbler operation, cooling water availability, joule heating availability, inbleeds). Ensure any assumptions or initial conditions requiring protection have established controls.</p>
7.	<p><b>Comment:</b> Section 2.1.1, subsection Internal Offgas Fire/Explosion evaluates combustible gas fires or explosions inside the confinement boundary. The control strategy is to limit total organic carbons (TOCs) in the feed stream such that flammability levels in the offgas stream is avoided. The ability to maintain flammable constituents below the LFL will need to be analytically demonstrated. TOC concentration will increase in the offgas stream following quenching of steam in the SBS. Additionally, inbleed flow may be restricted during normal melter surges. Using this strategy that prevents combustion of TOCs in the melter, will require TOCs to be sufficiently low to ensure concentrations below the LFL throughout the stream. If this control strategy is actually viable, these details will need to be addressed in the PDSA.</p> <p><b>Basis:</b> Control Effectiveness</p> <p><b>Expectation:</b> Provide justification (referenced calculation in the PDSA) that TOC concentration can be maintained below the LFL with the proposed control strategy.</p>
8.	<p><b>Comment:</b> Comments on calculation 24590-LAW-Z0C-LOP-00001, Rev. F:</p> <ul style="list-style-type: none"> <li>a. Table 11, PAC Values, gives many PAC values for individual cations in aqueous solution. However, the SCAPA tables do not give PAC values for cations, only for compounds. As a result, Table 11 appears to have assumed the cations would exist as pure elements rather than as part of compounds. This is not typically conservative. For example, the PAC-1 value assumed for Na<sup>+</sup> is the PAC-1 value listed for Na (13 mg/m<sup>3</sup>), rather than for, say, NaOH (0.5 mg/m<sup>3</sup>) [Rev. 27 PAC values].</li> <li>b. Assumption 5 contains the statement "APPS model calculations need to be completed with contract maximum feeds that produce the maximum possible NO constituent." Assumption 6 contains a similar statement for NO<sub>2</sub>. This implies that the NO and NO<sub>2</sub> values used in this calculation may not be maximum values.</li> </ul> <p><b>Basis:</b> Inadequate technical basis for chemical source term</p> <p><b>Expectation:</b> Discuss and provide basis in the PDSA or revise calculation (24590-LAW-Z0C-LOP-00001) to address proper development of USOF values for process stream.</p>

Item	Comment
9.	<p><b>Comment:</b> The consumable replacement SAC and associated discussion was deleted from the SSSD. There is no description in the SSSD of whether consumable replacement constitutes a NO<sub>x</sub> release hazard, other than a DiD Consumable Change-Out Box/Gamma Gate which support confinement during consumable replacement. The SSSD states that this will be managed by modes in the PDSA.</p> <p><b>Basis:</b> Potential missed hazard</p> <p><b>Expectation:</b> Include consumable replacement controls in the mode definitions, i.e., melter must be idle with no cold cap present, in Chapter 5 of the PDSA.</p>
10.	<p><b>Comment:</b> Section 4 of the SSSD identifies 13 open items (some discussed in above comments) that require closure in the PDSA.</p> <p><b>Basis:</b> Review expectation is a complete document.</p> <p><b>Expectation:</b> The PDSA submittal will identify which of the open items have been closed and which remain open.</p>