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AFS-09-0140

April 7, 2009

Ms. Jennifer Broadbent
Subcontract Administrator
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Broadbent:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211 IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR PTF SECONDARY CONTAINMENT UP TO FLOOR ELEV. 56'-0" (IA-3001630-000)

The structural integrity assessment of the subject secondary containment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the secondary containment is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 371-1975, or via email at tarlok.hundal@areva.com.

Sincerely,

Fred R. Renz
Contract Management
AREVA Federal Services LLC
Richland Office

llm

Enclosure (1)

cc: D. C. Pfluger, MS 5-L w/enclosure (2)

AREVA Federal Services LLC
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IA-3001630-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR PTF SECONDARY CONTAINMENT UP TO FLOOR ELEV. 56'-0"

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

IA-3001630-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR PTF SECONDARY CONTAINMENT UP TO FLOOR ELEV. 56'-0"

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the PTF Secondary Containment, as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is fourteen (14) pages numbered one (1) through fourteen (14).

T S Hundal

Signature

4/7/09

Date

Scope	Scope of this Integrity Assessment	This Integrity Assessment addresses the Pretreatment Facility Secondary Containment rooms from Elevation (-) 45'-0" to Elevation 56'-0" as listed in CCN # 184401 and as shown on General Arrangement Drawings listed in References below. The specific rooms at various floor elevations considered in this assessment report are: **Elevation (-) 45'-0"**: P-B001A, P-B002, P-B003, and P-B004. **Elevation (-) 21'-0":** P-B001 **Elevation (-) 19'-0":** P-B005 **Elevation 0'-0"**: P-0101, P-0101A, P-0102, P-0102A, P-0104, P-0105, P-0105A, P-0105B, P-0105C, P-0106, P-0108, P-0108A, P-0108B, P-0108C, P-0109, P-0110, P-0110A, P-0110B, P-0110C, P-0110D, P-0111, P-0112, P-0113, P-0114, P-0116, P-0117, P-0117A, P-0118, P-0119, P-0121A, P-0122A, P-0123, P-0123A, P-0124, P-0124A, and P-0128A. **Elevation 28'-0"**; P-0201, P-0201A, P-0203, P-0203A, P-0203B, P-0204, P-0206, P-0207, P-0208, P-0209, P-0210, P-0212, and P-0223. **Elevation 56'-0"**; P-0301, P-0302, P-0303, P-0303B, P-0304, P-0307, P-0311, P-0311A, P-0311B, P-0311C, P-0317, P-0320, P-0324, P-0325, P-0326, P-0328, P-0332B, P-0335, P-0335A, P-0336, and PC0311.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations,* WAC-173-303-640, *Tank Systems.*

References	Drawings and Correspondence Control Number	Drawings: 24590-PTF- P1- P01T- 00001, Rev. 6, Pretreatment Facility General Arrangement Plan at El. 0'-0"; 24590-PTF- P1- P01T- 00002, Rev. 6, Pretreatment Facility General Arrangement Plan at El. 28'-0"; 24590-PTF- P1- P01T- 00003, Rev. 4, Pretreatment Facility General Arrangement Plan at El. 56'-0"; 24590-PTF- P1- P01T- 00006, Rev. 4, Pretreatment Facility General Arrangement Plan at El. (-) 45'-0"; 24590-PTF- P1- P01T- 00007, Rev. 9, Pretreatment Facility General Arrangement Plan at El. A-A; 24590-PTF-D0-S13T-00008, Rev. 15, Pretreatment Facility Structural Concrete Notes & Legend Sh. 1; 24590-PTF-DB-S13T-00001, Rev. 1, Pretreatment Facility Structural Concrete Forming Overall Pit Plan; 24590-PTF-DB-S13T-00002, Rev. 6, Pretreatment Facility Structural Concrete Forming Main Pit Plan; 24590-PTF-DB-S13T-00005, Rev. 9, Pretreatment Facility Structural Concrete Forming , El. 0'-0" Base Mat; 24590-PTF-DB-S13T-00008, Rev. 5, Pretreatment Facility Structural Concrete Forming , El. 0'-0" & Below Section A; 24590-PTF-DB-S13T-00014, Rev. 2, Pretreatment Facility Structural Concrete Walls Key Plan , El. 0'-0"; 24590-PTF-DB-S13T-00015, Rev. 4, Pretreatment Facility Structural Concrete Wall Forming Partial Plan , El. 0'-0", Sh. 1; 24590-PTF-DB-S13T-00030, Rev. 3, Pretreatment Facility Structural Concrete Forming Key Plan , El. 28'-0"; 24590-PTF-DB-S13T-00034, Rev. 4, Pretreatment Facility Structural Concrete Forming Partial Plan , El. 28'-0", Sh. 4; 24590-PTF-DB-S13T-00045, Rev. 2, Pretreatment Facility Structural Concrete Slab Key Plan , El. 56'-0"; 24590-PTF-DB-S13T-00048, Rev. 11, Pretreatment Facility Structural Concrete Embedments Partial Plan , El. 56'-0", Sh. 3; 24590-PTF-DB-S13T-00055, Rev. 5, Pretreatment Facility Structural Concrete Forming Embed Layout Details , El. 56'-0", Sh. 2, 24590-PTF-DB-S13T-00100, Rev. 17, Pretreatment Facility Structural Concrete Wall Key Plan , Key Plan El. 0'-0" to 56'-0"; 24590-PTF-DB-S13T-00111, Rev. 10, Pretreatment Facility Structural Concrete Walls Section CE-Sh.1; 24590-PTF-DB-S13T-00147, Rev. 7, Pretreatment Facility Structural Concrete Walls Section AN-Sh.1; 24590-PTF-DB-S13T-00183, Rev. 9, Pretreatment Facility Structural Concrete Walls Section CN, HN; 24590-PTF-DB-S13T-00215, Rev.14, Pretreatment Facility Structural Concrete Walls Layout Details , Sh. 15, 24590-PTF-DB-S13T-00300, Rev.15, Pretreatment Facility Structural Concrete Walls Key Plan El. 56'-0", 24590-PTF-DB-S13T-00307, Rev. 5, Pretreatment Facility Structural Concrete Walls Section BE-Sh.3; 24590-PTF-SS-S15T-00009, Rev. 0, Pretreatment Facility Structural Steel Framing Key Plan El. 28'-0"; 24590-PTF-SS-S15T-00015, Rev. 5, Pretreatment Facility Structural Steel Framing Plan El. 28'-0", Sh. 6; 24590-PTF-SS-S15T-00049, Rev. 6, Pretreatment Facility Structural Steel Framing El. 56'-0", Partial Plans Sh.1; 24590-PTF-DG-S13T-00001, Rev. 0, Pretreatment Facility Structural Concrete Reinforcement El. 0'-0", Key Plan; 24590-PTF-DG-S13T-00002, Rev. 4, Pretreatment Facility Structural Concrete Reinforcement Main Pit Plan; 24590-PTF-DG-S13T-00006, Rev. 9, Pretreatment Facility Structural Concrete Reinforcement Pit Sections A & B; 24590-PTF-DG-S13T-00025, Rev. 7, Pretreatment Facility Structural Concrete Reinforcement Sections; 24590-PTF-DG-S13T-00026, Rev. 14, Pretreatment Facility Structural Concrete Reinforcing Details Sh.1; 24590-PTF-DG-S13T-00036, Rev. 3, Pretreatment Facility Structural Concrete Reinforcement Partial Plan El. 28'-0", Sh. 6; 24590-PTF-DG-S13T-00046, Rev. 5, Pretreatment Facility Structural Concrete Reinforcement Partial Plan El. 56'-0", Sh. 1; 24590-PTF-DG-S13T-00048, Rev. 3, Pretreatment Facility Structural Concrete Reinforcement Partial Plan El. 56'-0", Sh. 3; 24590-PTF-DG-S13T-00050, Rev. 4, Pretreatment Facility Structural Concrete Reinforcement Partial Plan El. 56'-0", Sh. 5; 24590-PTF-DG-S13T-00051, Rev. 4, Pretreatment Facility Structural Concrete Reinforcement Partial Plan El. 56'-0", Sh. 6; 24590-PTF-DG-S13T-00054, Rev. 3, Pretreatment Facility Structural Concrete Reinforcement Partial Plan & Sections; 24590-PTF-DG-S13T-00140, Rev. 11, Pretreatment Facility Structural Concrete Reinforcement Sections AA, AB, AC, AD. Correspondence Control Number: CCN # 184401, PT Room lists for Elevations (-) 45' to 56' re: secondary containment IQRPE report.

Information Assessed		Source of Information	Assessment
Foundation Design	Description of subsurface conditions and soil bearing capacity are adequate.	24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-BOF-3PS-CE01-T0001, Rev. 6, Engineering Specification for Excavation and Backfill; 24590-BOF-3PS-C000-T0001, Rev. 4, Engineering Specification for Material Testing Services; 24590-PTF-DGC-S13T-00001, Rev. 0, Verification of PT Basemat Thickness for Purposes of Determining Excavation (Calculations); 24590-PTF-S0C-S15T-00012, Rev. 1B, Structural Analysis for the PT Building (Calculations); 24590-PTF-S0C-S15T-00010, Rev. 1, Pretreatment Building-Soil Springs; WTSC99-1036-42-17, RPP-WTP Final Report Geotechnical Investigation, Shannon & Wilson Inc. (H-1616-51), May 2000; 24590-BOF-3PS-CE00-T0001, Rev. 0, Site Work.	The Structural Design Criteria adequately presents design guidance for both mat and spread footings based on the Geotechnical Investigation report for the site. Bearing capacity and settlement design parameters are furnished for the dense Hanford Upper and Lower Sand Units and Structural Fill. Use of the loose wind blown (dune) sands for foundations is precluded. The Verification of PT Basemat Thickness calculations reviewed indicates that the allowable bearing of subsurface soil below the foundation mat is more than the maximum computed value. The Excavation and Backfill Specification provides structural backfill requirements based on the Geotechnical Investigation report and adequate current codes and standards for selection, placing, and compacting structural backfill including testing of candidate fill materials and completed backfills. The Specification for Material Testing Services provides current adequate codes and standards for testing of candidate structural fill materials and in-situ testing of structural fills as they are constructed. The codes and standards are consistent with those called out in the Excavation and Backfill Specification. The review of the calculations show that appropriate values of the soil parameters including allowable bearing capacity, were used for the secondary containment structures' design.

Information Assessed		Source of Information	Assessment
Foundation Design (cont'd)	Foundation design loads (including full tanks) and estimated settlement are adequately considered.	24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; ASCE 7-98, Minimum Design Loads for Buildings and Other Structures; ACI 349-01, Code Requirements for Nuclear Safety-Related Concrete Structures; ACI 318-99, Building Code Requirements for Structural Concrete; 24590-PTF-DGC-S13T-00001, Rev. 0, Verification of PT Basement Thickness for Purposes of Determining Excavation (Calculations); 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building (Calculations).	The Structural Design Criteria uses current adequate standards to define design loads and load combinations (ASCE 7-98, ACI 349-01 and ACI 318-99). Dead and fluid loads are included in these loads and load combinations. Settlement design parameters are included in the Structural Design Criteria subsection on "geotechnical design parameters and foundation design." Review of the Calculations for various floor elevation slabs shows that the full loads of the tanks and other equipment have been appropriately considered in the foundation design.

Information Assessed		Source of Information	Assessment
Foundation Design (cont'd)	Design calculation approach and design basis of footings with design standard references (e.g., ACI) are adequate.	24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; ACI 349-01, Code Requirements for Nuclear Safety-Related Concrete Structures; ACI 318-99, Building Code Requirements for Structural Concrete; 24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design; 24590-PTF-DGC-S13T-00001, Rev. 0, Verification of PT Basemat Thickness for Purposes of Determining Excavation (Calculations); 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building (Calculations); 24590-PTF-SSC-S15T-00004, Rev. C, Pretreatment Bldg-Structural Design of 28'-0" Level Typical Floor Framing; 24590-PTF-SSC-S15T-00005, Rev. E, Design of Steel Framing at Cell-Tops Above Black Cell and Hot Cell Areas; 24590-WTP-VV-ST-01-001, Rev. 5A, Verification and Validation Test Plan and Test Report for GTSTRUDL; 24590-PTF-DBC-S15T-00001, Rev. 0, Structural Drop Load Analysis for PT Building (Calculations).	The Structural Design Criteria references current adequate design criteria for the design of concrete foundations and footings. ACI 349-01 is referenced for design of "safety" grade structures and ACI 318-99 is referenced for the strength design of "commercial grade" structures. The Secondary Containment Design document provides the design approach, basis, and methodology used for the design of the secondary containment foundations/footings. The input parameters used in the GTSTRUDL computer code utilized for this secondary containment design are appropriates and the output results have been appropriately validated via the Verification and Validation Test Plan and Test Report document. The above mentioned codes and standards, design approach, methodology, and basis delineated are appropriate and adequate for the foundations design.

Information Assessed		Source of Information	Assessment
Foundation Design (cont'd)	Foundation material is compatible with the soil.	24590-WTP-3PS-DB01-T0001, Rev. 8, Engineering Specification for Furnishing and Delivering Ready-Mix Concrete; 24590-BOF-3PS-C000-T0001, Rev. 4, Engineering Specification for Material Testing Services; 24590-WTP-DB-ENG-01-001, Rev. 1M, Basis of Design. 24590-WTP-3PS-DG00-T0001, Rev. 4, Engineering Specification for Reinforcing Steel.	The specification for Furnishing and Delivering Ready-Mix Concrete provides adequate current testing requirements for the selection of coarse and fine aggregates and the procurement of cementitious materials. Adequate test procedures are provided in the Material Testing Services specification for testing candidate aggregates for chemical reactivity. Instructions for mixing and delivering Ready-Mix Concrete are adequate and current. As noted in the Basis of Design document (section 4.7), the water table lies about 200 feet below the deepest PTF Facility foundations so there is little reason to expect compatibility problems between the concrete foundations and the site soils.
	Foundation will withstand the effects of frost heave	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.	The Structural Design Criteria includes adequate provisions to preclude frost heave in the section addressing lateral earth pressure loads. All structural foundations are required to extend into the soil below the frost line to preclude frost heave. The frost line is 30 inches below the finished grade (@ El. 0'-0"), however, the drawings show that majority of the bottom of PTF foundation mat is at (-) 8'-0" and some sections are even lower than this. Therefore, the secondary containment foundations will not be subjected to frost heave effects.

Information Assessed		Source of Information	Assessment
Seismic Design	Seismic considerations have been adequately addressed.	24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; ACI 349-01, Code Requirements for Nuclear Safety-Related Concrete Structures; ACI 318-99, Building Code Requirements for Structural Concrete; ANSI/AISC N690, Specification for the Design, Fabrication and Erection of Steel Safety-Related Structures for Nuclear Facilities; AISC MO16-89, Manual of Steel Construction - Allowable Stress Design, Ninth Edition; ASCE 4-98, Seismic Analysis of Safety Related Nuclear Structures and Commentary; 24590-PTF-S0C-S15T-00012, Rev. 1B, Structural Analysis for the PT Building (Calculations); 24590-PTF-DGC-S13T-00021, Rev. A, Design of Slab at 28' Elevation (Including ECCN # 00042); 24590-PTF-DGC-S13T-00022, Rev. C, PTF- El. 56' Slab Bounded by Column Lines 1 to 8 - RGM; 24590-PTF-DGC-S13T-00005, Rev. A, Design of Wall at Col. Lines, 1, 4. 6, 7, B, E, H, & L From El. 0 to 28; 24590-PTF-DGC-S13T-00047, Rev. A, PTF-Validation of Placed Concrete for Above Grade and Below Grade Wall for RGM ; 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building. 24590-PTF-SSC-S15T-00004, Rev. C, Pretreatment Bldg-Structural Design of 28'-0" Level Typical Floor Framing; 24590-PTF-SSC-S15T-00005, Rev. E, Design of Steel Framing at Cell-Tops Above Black Cell and Hot Cell Areas.	The Secondary Containment Design document describes and provides references for the design methodology, materials, loads, and load combinations (including seismic loads) for the PTF Building secondary containment. The Structural Design Criteria provides detailed discipline specific codes and standards for the design of Seismic Category (SC-I/II) PTF secondary containment foundations and structures by the design engineers. ACI-349-01 and ACI 318-99 provide the design codes and load combinations for design of the secondary containment reinforced concrete foundations and structures. Structural steel components of the secondary containment structures and stainless steel liners are designed using ANSI/AISC N690 and the AISC Allowable Stress Design code. ASCE 4-98 is used for guidance on seismic analysis of safety-related nuclear structures. These codes and standards listed above are adequate and acceptable for addressing seismic considerations. Review of the sample calculations show that the requirements of the applicable codes and standards are appropriately incorporated in these documents.

Information Assessed		Source of Information	Assessment
Compatibility	The stored waste is compatible with its Secondary Containment and leak detection hardware based on a detailed chemical and physical analysis of the wastes used and other information sources.	24590-WTP-DB-ENG-01-001, Rev. 1M, Basis of Design; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design; 24590-WTP-3PS-AFPS-T0006, Rev. 0, Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment Areas; 24590-PTF-PER-M-03-002, Rev. 0, Sump and Drain Data at 28Ft Level for PT Facility; 24590-PTF-PER-M-04-002, Rev. 0, Sump and Drain Data at 56 Ft Level for PT Facility; 24590-PTF-PER-M-02-006, Rev. 5, Sump Data for PT Facility. 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-PTF-PER-M-02-005, Rev. 8, Flooding Volume for Below Grade and 0 ft Level in PT Facility; 24590-PTF-PER-M-03-001, Rev. 0, Flooding Volume for 28 ft Level in PT Facility. 24590-PTF-PER-M-04-001, Rev. 0, Flooding Volume for 56 ft Level in PT Facility. 24590-PTF-PER-M-04-0005, Rev. 0, Flooding Volume for Room P-0119 in the PT Facility; 24590-PTF-PER-M-04-0007, Rev. 0, Flooding Volume for Room P-0123A in the PT Facility.	The Basis of Design states that cells and sumps are appropriately lined and any spills are removed and flushed within 24-hrs or as timely as possible. Secondary Containment liner design for cells and process areas requires both stainless steel liners and special protective coatings depending on the service conditions. Secondary Containment liner design for various rooms at different elevations requires stainless steel liner or special protective coatings liner. Flood Volume documents provide required specific liner height is various rooms. Based on detailed analysis of the corrosive properties of expected waste process operations and evaluation of potential leak scenarios, the Material Selection report identifies appropriate and adequate corrosion resistant materials requirements for Secondary Containment liners, sumps and leak detection equipment. The Engineering Specification for Field Applied Special Protective Coatings (SPCs) provides the selection test criteria used to determine acceptable approved coating systems. These test criteria include chemical resistance endurance requirements and wear abrasion resistance criteria which provides liners compatibility with the wastes considered. The Secondary Containment Design report provides adequate typical construction details for liners including tank anchorage details, stainless steel liner installation details and SPC installation details to be used for Secondary Containment. Rooms at various elevations are provided with floor drains as itemized in the Sump and Drain Data documents for the PTF. All sumps are equipped with leak detection; however, individual floor drains are not equipped with leak detection.

Information Assessed		Source of Information	Assessment
Strength	The design shows that the Secondary Containment has sufficient strength and thickness to prevent failure owing to pressure gradients, static head during a release, physical contact with the waste, climatic conditions, and the stress of daily operations (e.g., vehicular traffic).	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design; 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection. 24590-PTF-DGC-S13T-00001, Rev. 0, Verification of PT Basemat Thickness for Purposes of Determining Excavation (Calculations); 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building (Calculations); 24590-PTF-DGC-S13T-00005, Rev. A, Design of Walls at Col. Lines 1,4, 6, 7, B, E, H, & L from El. 0 to 28 (Calculations); 24590-PTF-DGC-S13T-00047, Rev. A, PTF-Validation of Placed Concrete for Above Grade and Below Grade Wall for RGM (Calculations); 24590-PTF-SSC-S15T-00005, Rev. E, Design of Steel Framing at Cell -Tops Above the Black Cell and Hot-cell Areas (Calculations); 24590-PTF-DGC-S13T-00021, Rev. A, Design of Slab at 28' Elevation (including ECCN # 00042) - (Calculations); 24590-PTF-DGC-S13T-00022, Rev. C, PTF-El. 56' Slab - Bounded by Column Lines 1 to 8 - RGM (Calculations).	Because the Secondary Containment structures being considered are installed inside the Pretreatment Facility as shown on the general arrangement drawings, climatic conditions and vehicular traffic are not applicable load cases. The Secondary Containment Design requirements document identifies adequate and appropriate design codes and standards and all applicable load cases (operational stresses) from site specific conditions that must be considered in the design. The Engineering Specification for Furnishing Stainless Steel Liner Plates includes specific provisions for protection of and repair of completed liners during the construction process. Review of the referenced sample Calculations shows that the secondary containment structures are designed appropriately with sufficient strength to sustain the applicable loads. Factors that were considered during stainless steel liner material selection and special protective coating (SPC) material selection are adequately discussed in the Material Selections for Building Secondary Containment/Leak Detection document.

Information Assessed		Source of Information	Assessment
Strength (cont'd)	The Secondary Containment system has sufficient strength in the presence of operational stresses from site-specific conditions (i.e., traffic, heavy equipment, precipitation, frost).	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-WTP-PER-CSA-02-001, Rev.8, Secondary Containment Design; 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-PTF-DBC-S15T-00001, Rev. 0, Structural Drop Load Analysis for PT Building. 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building (Calculations); 24590-PTF-DGC-S13T-00005, Rev. A, Design of Walls at Col. Lines 1, 4, 6, 7, B, E, H, & L from El. 0 to 28 (Calculations); 24590-PTF-DGC-S13T-00047, Rev. A, PTF-Validation of Placed Concrete for Above Grade and Below Grade Wall for RGM (Calculations); 24590-PTF-SSC-S15T-00005, Rev. E, Design of Steel Framing at Cell -Tops Above the Black Cell and Hot-cell Areas (Calculations); 24590-PTF-DGC-S13T-00021, Rev. A, Design of Slab at 28' Elevation (including ECCN # 00042) - (Calculations); 24590-PTF-DGC-S13T-00022, Rev. C, PTF-El. 56' Slab - Bounded by Column Lines 1 to 8 - RGM (Calculations).	The Secondary Containment Design requirements document identifies adequate and appropriate design codes and standards and all applicable load cases (operational stresses) from site specific conditions that must be considered in the design. Because the Secondary Containment structures being considered are installed inside the Pretreatment Facility Building as shown on the drawings, therefore, traffic, heavy equipment, precipitation, and frost are not applicable load cases. The Engineering Specification for Furnishing Stainless Steel Liner Plates includes specific provisions for protection of and repair of completed liners during the construction process. Review of the referenced sample Calculations shows that the secondary containment structures are designed appropriately with sufficient strength to sustain the applicable loads from the specific conditions. Factors that were considered during stainless steel liner material selection and SPC material selection are adequately discussed in the Material Selections for Building Secondary Containment/Leak Detection document.

Information Assessed		Source of Information	Assessment
Foundation Integrity	The Secondary Containment is properly supported by a foundation or base in order to prevent failure from settlement, compression, or uplift, including the residual effects of installation.	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria; 24590-BOF-3PS-CE00-T0001, Rev. 0, Site Work. 24590-BOF-3PS-CE01-T0001, Rev. 6, Engineering Specification for Excavation and Backfill; 24590-BOF-3PS-C000-T0001, Rev. 4, Engineering Specification for Material Testing Services; 24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design. 24590-PTF-DGC-S13T-00001, Rev. 0, Verification of PT Basemat Thickness for Purposes of Determining Excavation (Calculations); 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building (Calculations); 24590-PTF-DGC-S13T-00030, Rev. A, PT Concrete Subsidence Evaluation in the Below Grade Foundation and Walls at Lap Splices (Calculations). 24590-PTF-SSC-S15T-00005, Rev. E, 24590-24590-PTF-DGC-S13T-00021, Rev. A, Design of Slab at 28' Elevation (including ECCN # 00042) - (Calculations); 24590-PTF-DGC-S13T-00022, Rev. C, PTF-El. 56' Slab - Bounded by Column Lines 1 to 8 - RGM (Calculations).	These conditions are fully addressed in the Structural Design Criteria and the Secondary Containment Design requirements documents. The design requirements and codes and standards specified are adequate to satisfy these performance goals. The procurement and construction specifications adequately provide for proper foundation construction and installation of the Secondary Containment. The general arrangement plans and the associated cross-section drawings show the Secondary Containment boundaries. The sample Calculations reviewed show that the foundation slabs are appropriately designed and will not fail when subjected loads such as uplift, installation, settlement or residual effects.

Information Assessed		Source of Information	Assessment
Foundation Integrity (cont'd)	The placement, structural support, and type of material used for backfill around and below the Secondary Containment are appropriate.	Drawings listed above under References; 24590-BOF-3PS-CE01-T0001, Rev. 6, Engineering Specification for Excavation and Backfill; 24590-BOF-3PS-C000-T0001, Rev. 4, Engineering Specification for Material Testing Services. 24590-PTF-DGC-S13T-00001, Rev. 0, Verification of PT Basemat Thickness for Purposes of Determining Excavation (Calculations); 24590-PTF-DGC-S13T-00003, Rev. 0, Design of Foundation Basemat for PT Building (Calculations).	The Excavation and Backfill and Material Testing specifications contain current adequate industry standards for selecting and testing fill materials, placing and compacting backfills, and testing not less than once each lift to assure adequate compaction. Requirements for testing and record keeping are current and adequate for both "safety grade" fills and "commercial grade" fills. Drawings show that backfill requirements are properly applied, tested, documented, and accepted and approved by BNI. Review of sample Calculations shows that appropriate parameters for backfill are used in design.
Infiltration	The design or operation (e.g., diking & curbing) prevents run-on or infiltration of precipitation into the Secondary Containment system unless the collection system has sufficient excess capacity (25 yr rainfall) to contain the run-on precipitation.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1M, Basis of Design.	This requirement is specified in the Basis of Design document. All Secondary Containment structure rooms being reviewed in this Integrity Assessment are located at various levels inside the Pretreatment Facility building where they are protected from precipitation as shown in the general arrangement plans and other associated drawings. Therefore, this requirement is not applicable to these rooms. The Basis of Design document also describes that the ground water table under the WTP site is about 250 ft below the ground surface which makes it unlikely event for water infiltration or intrusion into the building.

Information Assessed		Source of Information	Assessment
Infiltration (cont'd)	The design includes an external moisture barrier or other means to prevent moisture from entering the cell.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1M, Basis of Design. W24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-3PS-AFPS-T0006, Rev. 0, Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment Areas.	The Secondary Containments shown on the general arrangement plans at elevations (-) 45'-0", 0'-0", 28'-0" and 56"-0" are inside the Pretreatment Facility Building which shields them from precipitation and surface water percolation. The ground water table is located about 200 feet below the floors of the inaccessible process cells at elevation (-) 45'-0" as noted in the Basis of Design document, therefore it's not a credible event for infiltration of external moisture into the interior of the building. And furthermore the rooms are lined with stainless steel plates or special protective coating material as an added insurance against moisture infiltration.
Liner System	The containment area is free of cracks or gaps and the design discusses methods of their minimization.	Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design; 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-3PS-AFPS-T0006, Rev. 0, Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment Areas.	The Secondary Containment Design requirements document provides adequate and appropriate codes and standards for design of leak-tight liners. This report includes appropriate details for design and installation of stainless steel and special protective coating liners and sumps free of cracks and gaps. The Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates provides detailed information on design, fabrication, installation, and inspection of stainless steel liners and sumps. The Engineering Specification for Field Applied Special Protective Coatings provides detailed information on the tested and approved coating systems. This information includes directions for surface preparation, patching materials and application methods, and specific directions for application of multi-layer coatings.

Information Assessed		Source of Information	Assessment
Liner System (cont'd)	The design has considered the compatibility of the concrete liner or coatings and waste and presents information on coatings planning to be used from the manufacturer addressing compatibility with the stored waste. The lining or coating must prevent the waste from migrating into the concrete.	Drawings listed above under References; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection; 24590-WTP-PER-CSA-02-001, Rev. 8, Secondary Containment Design; 24590-WTP-3PS-NLLR-T0002, Rev. 1, Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates; 24590-WTP-3PS-AFPS-T0006, Rev. 0, Engineering Specification for Field Applied Special Protective Coatings for Secondary Containment Areas.	The Material Selections document contains adequate and appropriate general information on the compatibility of planned Secondary Containment stainless steel and special protective coating liners with the waste. The Secondary Containment Design report provides adequate and appropriate standard details for design and installation of stainless steel and special protective coating liners that will prevent migration of the waste into the concrete. The Engineering Specification for Furnishing, Detailing, Fabrication, Delivery and Installation of Stainless Steel Liner Plates provides detailed information on design, fabrication, installation, and inspection of stainless steel liners and sumps. The Engineering Specification for Field Applied Special Protective Coatings provides detailed information on the tested and approved coating systems. This information includes directions for surface preparation, patching materials and application methods, and specific directions for application of multi-layer coatings.

Master Distribution Schedule for WTP Project Subcontract Management Group

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Subcontract Number:	24590-CM-HC4-HXYG-00211
Subcontract Title:	Tank Integrity Design Assessments
Subcontractor Name:	AREVA Federal Services LLC
Subcontract Administrator:	Jennifer Broadbent

PDC Document Number	Rev	Document Title	Rev
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