AFS-15-0433

December 8, 2015

Ms. Tess Klatt
Subcontract Administrator
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Klatt:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00240 IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LMP MISCELLANEOUS UNIT MELTERS (LMP-MLTR-00001/2) (IA-3014936-000)

The integrity assessment of the subject LAW LMP Miscellaneous Unit Melters (LMP-MLTR-00001/2) 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 LAW LMP Miscellaneous Unit Melters (LMP-MLTR-00001/2) are adequately designed and have sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that they 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,

Elizabeth W. Smith, C.P.M
Contract Administrator
AREVA Federal Services LLC
Richland Office

Enclosure (1)

LP

cc: D. C. Pfluger, MS 12-2A w/enclosure (2)

AREVA

IA-3014936-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LMP MISCELLANEOUS UNIT MELTERS (LMP-MLTR-00001/2)

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.

AREVA

IA-3014936-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT
FOR LAW LMP
MISCELLANEOUS UNIT MELTERS
(LMP-MLTR-00001/2)

"I, Tarlok Singh 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 LAW LMP Miscellaneous Unit Melters (LMP-MLTR-00001/2), 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 sixteen (16) pages numbered one (1) through sixteen (16).

Signature

12/8/2015
Date

Scope	Scope of this Integrity Assessment	This Integrity Assessment includes the evaluation of two LAW Melters (LMP-MLTR-00001/2), including their appurtenances located at Elevation 3'-0" in Room L-0112 of the LAW Vitrification Building as shown on plant general arrangement plan drawing 24590-LAW-P1-P01T-00002. In this report, the Melters are also interchangeably referred to be as miscellaneous units, vessels, or plant items.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the documents 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,* Section WAC-173-303-640 (3) (a) through (g) applicable elements of the *Tank Systems.*

References	Material Requisition and Specifications	Material Requisition (MR): 24590-QL-MRA-MEEM-00001, Rev. 10, Melter, Fabrication and Assembly, LAW (ML007), including SDDR No. 24590-WTP-ML-SDDR-10-00091. Specifications Listed in MR: The following Specifications with their respective revision and Specification Change Notices (SCNs) are listed in the above listed Material Requisition: 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI); 24590-WTP-3PS-G000-T0003, Engineering Specification for Packaging, Handling, and Storage Requirements; 24590-WTP-3PS-G000-T0006, Engineering Specification for Preserving, and Preparing Melter and Melter Components for Shipping, Handling, and Storage; 24590-WTP-3PS-G000-T0019, Engineering Specification for Acquisition of Commercial Items and Services for use in Safety Application at WTP. Specifications: 24590-LAW-3PS-AE00-T0001, Rev. 6, Engineering Specification for Low Activity Waste Melters; 24590-WTP-3PS-MQR0-T0004, Rev.1, Engineering Specification for LAW Facility Melter Rails, including 24590-WTP-3PN-MQR0-00033, 24590-WTP-FC-M-08-0114, 24590-WTP-SDDR-MH-07-00014, and 24590-WTP-SDDR-08-00011; 24590-LAW-3PS-M000-T0001, Rev. 1, Engineering Specification for LAW Pour Spout and Seal Head, including 24590-WTP-SDDR-M-05-00601; 24590-WTP-3PS-FB01-T0001, Rev. 6, Engineering Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks, including 24590-WTP-3PN-FB01-00011, 24590-WTP-SDDR-E-15-00002, -00004, -00011, and 24590-WTP-SDDR-J-15-00003.

References (cont'd)	Plant Drawings	Plant Drawings including Drawing Change Notices (DCNs) listed in the above listed Material Requisition 24590-LAW-P1-P01T-00002, Rev. 7, LAW Vitrification Building General Arrangement Plan at El. 3'-0"; 24590-LAW-M6-LMP-00001001 (CBI), Rev. 0, P & ID-LAW Melter Process System Melter 1 Agitation Zone 1 & Zone 2 LMP-RK-0040A/B; 24590-LAW-M6-LMP-00031001(CBI), Rev. 0, P & ID-LAW Melter Process System Melter 2 Agitation Zone 1 & Zone 2; 24590-LAW-M6-LMP-00002001 (CBI), Rev. 0, P & ID-LAW Melter Process System Melter 1 Agitation Zone 3 and Level Detection LMP-RK-00040B and PPJ-RK-00001; 24590-LAW-M6-LMP-00002002 (CBI), Rev. 0, P & ID-LAW Melter Process System Melter 1 Agitation Zone 3 and Level Detection LMP-RK-00040C; 24590-LAW-M6-LMP-00032001 (CBI), Rev. 0, P & ID-LAW Melter Process System Melter 2 Agitation Zone 3 & Level Detection LMP-RK-00041B and PPJ-RK-00002; 24590-LAW-M6-LMP-00032002 (CBI), Rev. 0, P & ID-LAW Melter Process System Melter 2 Agitation Zone 3 & Level Detection LMP-RK-00041C; 24590-LAW-M5-V17T-00004, Rev. 4, Process Flow Diagram LAW Vitrification Melter 1 (System LMP & LOP); 24590-LAW-M5-V17T-00005, Rev. 4, Process Flow Diagram LAW Vitrification Melter 2 (System LMP & LOP); 24590-LAW-DB-S13T-00158, Rev. 3, LAW Vitrification Building Main Building Melter Rail Anchorage Enlarged Plan; 24590-LAW-DB-S13T-00014, Rev. 6, LAW Vitrification Building Main Building Partial Conc. Forming Plan Zone 1 @ El (+) 3'-0"; 24590-WTP-DD-S13T-00004, Rev. 5, Civil/Structural Standards Standard Embedded Anchor Bolt Details. 24590-LAW-DB-S13T-00018, Rev. 5, LAW Vitrification Building Main Building Partial Conc. Forming Plan Zone 5 @ El (+) 3'-0"; 24590-LAW-M0-LMH-00002001, Rev. 3, Vitrification System LMH Design Proposal Drawing LSM Rail Assembly; 24590-LAW-M0-LMH-00002002, Rev. 3, Vitrification System LMH Design Proposal Drawing LSM Rail Assembly Details; 24590-LAW-M0-LMH-00002003, Rev. 2, Vitrification System LMH Design Proposal Drawing LSM Rail Assembly Details; 24590-LAW-MF-LMP-000001, Rev. 0, LAW Melter Assembly-LAW-MLTR-00001/00002 Isometric View; 24590-LAW-MF-LMP-000002, Rev. 0, LAW Melter Assembly-LAW-MLTR-00001/00002 Plan View; 24590-LAW-MF-LMP-000003, Rev. 0, LAW Melter Assembly-LAW-MLTR-00001/00002 East, West and North Elevation; 24590-LAW-MF-LMP-000004, Rev. 0, LAW Melter Assembly-LAW-MLTR-00001/00002 Section A-A; 24590-LAW-MX-LMP-00009001, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009002, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009003, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009004, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009005, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009006, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009007, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009008, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750); 24590-LAW-MX-LMP-00009009, Rev. 0; LAW Melter Shield Lid Assembly (WTP-M-11750);

References (cont'd)	Plant Drawings	24590-LAW-MX-LMP-00010001, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010002, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010003, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010004, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010005, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010006, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010007, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010008, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010009, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010010, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010011, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806); 24590-LAW-MX-LMP-00010012, Rev. 0; LAW Melter Gas Barrier Lid Frame Assembly (WTP-M-11806).

References (cont'd)	Vendor Drawings	Vendor Fabrication Drawings (* Bechtel Status Code 1 Drawings): **Note**: Many of the following drawings have been changed via various design change media documents, however, instead of listing all of them herein due to their very high number, they have been identified in the Redlined Drawings listed in Attachment L of 24590-LAW-M2C-LMP-00002, Rev. A, Structural and Seismic Analysis document. Each Redlined Drawing listed therein includes the list of change documents and shows the associated changes. All design changes issued against a drawing have been accounted for in the aforementioned analysis document. During the aforementioned analysis process, additional changes were recommended and incorporated as listed in the Vendor Design Change Notice (VDCN) # 24590-LAW-VDCN-ML-15-00018. This Integrity Assessment Report has been prepared inclusive of the review of the applicable drawings and design media. 24590-QL-HC4-W000-00011-03-32, Rev. 00C, South Wall Module Assembly; 24590-QL-HC4-W000-00011-03-33, Rev. 00A, South Wall Module Assembly; 24590-101-TSA-W000-0010-409-122, Rev. 00C, South Wall Module Assembly; 24590-101-TSA-W000-0010-409-123, Rev. 00C, South Wall Module Assembly; 24590-101-TSA-W000-0010-409-124, Rev. 00C, South Wall Module Assembly; 24590-101-TSA-W000-0010-409-125, Rev. 00C, South Wall Module Assembly; 24590-101-TSA-W000-0010-409-128, Rev. 00C, South Wall Module Assembly; 24590-101-TSA-W000-0010-409-111, Rev. 00B, South Wall Module Details; 24590-101-TSA-W000-0010-409-112, Rev. 00B, South Wall Module Details; 24590-101-TSA-W000-0010-409-113, Rev. 00C, South Wall Module Details; 24590-101-TSA-W000-0010-409-114, Rev. 00B, South Wall Module Details; 24590-101-TSA-W000-0010-409-955, Rev. 00B, South Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00286, Rev. 00A, South Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00309, Rev. 00A, North Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00310, Rev. 00A, North Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00312, Rev. 00A, North Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00313, Rev. 00A, North Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00314, Rev. 00A, North Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00315, Rev. 00A, North Wall Module Assembly; 24590-QL-HC4-W000-00011-03-00316, Rev. 00B, North Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00319, Rev. 00B, North Wall Module Shielding Assembly; 24590-101-TSA-W000-0010-409-167, Rev. 00B, North Wall Module Shielding Details; 24590-QL-HC4-W000-00011-03-00320, Rev. 00A, North Wall Module Details; 24590-QL-HC4-W000-00011-03-00321, Rev. 00A, North Wall Module Details; 24590-QL-HC4-W000-00011-03-00323, Rev. 00A, North Wall Module Details; 24590-101-TSA-W000-0010-409-131, Rev. 00C, South Wall Module Gas Barrier Assembly; 24590-101-TSA-W000-0010-409-888, Rev. 00B, South Wall Module Gas Barrier Assembly;

References (cont'd)	Vendor Drawings	24590-101-TSA-W000-0010-409-140, Rev. 00C, South Wall Module Shielding Assembly; 24590-101-TSA-W000-0010-409-141, Rev. 00C, South Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-38, Rev. 00A, North Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-39, Rev. 00A, North Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-40, Rev. 00A, North Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-43, Rev. 00A, North Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00324, Rev. 00A, West Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00325, Rev. 00A, West Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00326, Rev. 00A, West Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00327, Rev. 00A, West Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00328, Rev. 00A, West Wall Assembly Module; 24590-101-TSA-W000-0010-409-186, Rev. 00E, West Wall Module Gas Barrier Assembly; 24590-101-TSA-W000-0010-409-187, Rev. 00C, West Wall Module Gas Barrier Assembly; 24590-101-TSA-W000-0010-409-188, Rev. 00E, West Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00332, Rev. 00A, West Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00335, Rev. 00A, West Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00336, Rev. 00A, West Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00337, Rev. 00A, West Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00338, Rev. 00A, West Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00339, Rev. 00A, West Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00340, Rev. 00A, West Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00341, Rev. 00A, West Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00342, Rev. 00A, West Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00343, Rev. 00A, West Wall Module Shielding Assembly; 24590-QL-HC4-W000-00011-03-00349, Rev. 00B, East Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00350, Rev. 00B, East Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00351, Rev. 00B, East Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00352, Rev. 00A, East Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00355, Rev. 00A, East Wall Assembly Module; 24590-QL-HC4-W000-00011-03-00357, Rev. 00A, East Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00358, Rev. 00A, East Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00359, Rev. 00A, East Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00360, Rev. 00A, East Wall Module Gas Barrier Assembly; 24590-QL-HC4-W000-00011-03-00345, Rev. 00A, West and East Wall Module Details; 24590-QL-HC4-W000-00011-03-00346, Rev. 00A, West and East Wall Module Details;

References (cont'd)	Vendor Drawings	24590-QL-HC4-W000-00011-03-00347, Rev. 00A, West and East Wall Module Details; 24590-QL-HC4-W000-00011-03-00348, Rev. 00A, West and East Wall Module Details; 24590-QL-HC4-W000-00011-03-00235, Rev. 00C, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00236, Rev. 00A, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00274, Rev. 00B, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00624, Rev. 00A, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00625, Rev. 00A, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00626, Rev. 00A, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00627, Rev. 00A, Lower Containment Box Liner (Pour Spout); 24590-101-TSA-W000-0010-409-1387, Rev. 00B, Lower Containment Box Liner (Pour Spout); 24590-101-TSA-W000-0010-409-1388, Rev. 00B, Lower Containment Box Liner (Pour Spout); 24590-QL-HC4-W000-00011-03-00428, Rev. 00A, Base Assembly; 24590-QL-HC4-W000-00011-03-00429, Rev. 00A, Base Assembly; 24590-QL-HC4-W000-00011-03-00430, Rev. 00A, Base Assembly; 24590-QL-HC4-W000-00011-03-00431, Rev. 00A, Base Assembly; 24590-QL-HC4-W000-00011-03-00432, Rev. 00A, Base Assembly; 24590-QL-HC4-W000-00011-03-00433, Rev. 00A, Base Assembly; 24590-QL-HC4-W000-00011-03-00434, Rev. 00A, Base Frame Assembly; 24590-QL-HC4-W000-00011-03-00435, Rev. 00A, Base Frame Assembly; 24590-QL-HC4-W000-00011-03-00436, Rev. 00A, Base Frame Assembly; 24590-QL-HC4-W000-00011-03-00437, Rev. 00A, Base Frame Assembly; 24590-QL-HC4-W000-00011-03-00438, Rev. 00A, Base Frame Assembly; 24590-QL-HC4-W000-00011-03-00439, Rev. 00A, Base Frame Assembly; 24590-QL-HC4-W000-00011-03-00445, Rev. 00A, Base Frame Details; 24590-QL-HC4-W000-00011-03-00446, Rev. 00A, Base Frame Details; 24590-101-TSA-W000-0010-409-1063, Rev. 00A, Base Frame Details; 24590-101-TSA-W000-0010-409-1057, Rev. 00A, Base Seismic Clamp Assembly; 24590-101-TSA-W000-0010-409-1058, Rev. 00A, Base Seismic Clamp Assembly; 24590-101-TSA-W000-0010-409-1059, Rev. 00A, Base Seismic Clamp Assembly; 24590-101-TSA-W000-0010-409-450, Rev. 00B, Base Seismic Clamp Assembly; 24590-101-TSA-W000-0010-409-451, Rev. 00B, Base Seismic Clamp Frame; 24590-101-TSA-W000-0010-409-452, Rev. 00B, Base Seismic Clamp Details; 24590-101-TSA-W000-0010-409-453, Rev. 00C, Seismic Pin Support Frame; 24590-101-TSA-W000-0010-409-454, Rev. 00C, Rail Guide Details; 24590-101-TSA-W000-0010-409-455, Rev. 00B, Rail Guide Details;

References (cont'd)	Vendor Drawings	24590-101-TSA-W000-0010-409-430, Rev. 00B, Base Roller Assembly; 24590-101-TSA-W000-0010-409-432, Rev. 00B, Roller Frame Details; 24590-101-TSA-W000-0010-409-456, Rev. 00B, Pulley Assembly; 24590-QL-HC4-W000-00011-03-00447, Rev. 00A, Gas Barrier Plate Details; 24590-QL-HC4-W000-00011-03-00448, Rev. 00A, Gas Barrier Plate Details; 24590-QL-HC4-W000-00011-03-00451, Rev. 00B, Base Center Assembly; 24590-QL-HC4-W000-00011-03-00452, Rev. 00B, Base Center Assembly; 24590-QL-HC4-W000-00011-03-00453, Rev. 00B, Base Center Assembly; 24590-QL-HC4-W000-00011-03-00454, Rev. 00A, Base Center Assembly; 24590-QL-HC4-W000-00011-03-00455, Rev. 00B, Base Center Assembly; 24590-QL-HC4-W000-00011-03-00456, Rev. 00B, Pulley Assembly; 24590-QL-HC4-W000-00011-03-00578, Rev. 00A, Melter Assembly Base and Wall Module; 24590-QL-HC4-W000-00011-03-00587, Rev. 00A, Melter Assembly Base and Wall Module; 24590-QL-HC4-W000-00011-03-00579, Rev. 00A, Melter Assembly Base and Wall Module;+- 24590-QL-HC4-W000-00011-03-00580, Rev. 00A, Melter Assembly Base and Wall Module; 24590-101-TSA-W000-0010-409-651, Rev. 00B, Refractory Assembly; 24590-101-TSA-W000-0010-409-652, Rev. 00B, Refractory Assembly; 24590-101-TSA-W000-0010-409-528, Rev. B02, Gas Barrier Lid Assembly; 24590-101-TSA-W000-0010-409-529, Rev. B00, Gas Barrier Lid Assembly; 24590-101-TSA-W000-0010-409-540, Rev. B02, Gas Barrier Lid Assembly; 24590-101-TSA-W000-0010-409-541, Rev. B01, Gas Barrier Lid Assembly; 24590-101-TSA-W000-0010-409-550, Rev. B01, Gas Barrier Lid Assembly; 24590-101-TSA-W000-0010-409-551, Rev. B01, Gas Barrier Lid Assembly; 24590-101-TSA-W000-0010-409-562, Rev. 00C, East and West Lid Castable Forms Assembly; 24590- QL-HC4-W000-0011-03-00540, Rev. 00A, Melter Assembly Gas Barrier Lids; 24590-101-TSA-W000-0010-409-228, Rev. 00C, Jackbolt Assembly; 24590-101-TSA-W000-0010-409-229, Rev. 00C, Jackbolt Assembly; 24590-101-TSA-W000-0010-409-230, Rev. 00C, Jackbolt Assembly; 24590-QL-HC4-W000-00011-03-00546, Rev. 00A, Melter Assembly Glass Pool; 24590-QL-HC4-W000-00011-03-00558, Rev. 00A, Melter Assembly Glass Pool; 24590-QL-HC4-W000-00011-03-00523, Rev. 00A, Melter Assembly Shielded Lid; 24590-QL-HC4-W000-00011-03-00524, Rev. 00A, Melter Assembly Shielded Lid; 24590-QL-HC4-W000-00011-03-00525, Rev. 00A, Melter Assembly Shielded Lid; 24590-QL-HC4-W000-00011-03-00526, Rev. 00A, Melter Assembly Shielded Lid; 24590-QL-HC4-W000-00011-03-00527, Rev. 00A, Melter Assembly Shielded Lid; 24590-QL-HC4-W000-00011-03-00531, Rev. 00A, Melter Assembly Shielded Lid;

References (cont'd)	Vendor Drawings, Mechanical Data Sheets, and System Design Description	24590-QL-HC4-W000-00011-03-65, Rev. 00C, Shielded Lid Support Structure Assembly; 24590-QL-HC4-W000-00011-03-66, Rev. 00B, Shielded Lid Support Structure Assembly; 24590-QL-HC4-W000-00011-03-67, Rev. 00C, Shielded Lid Support Structure Assembly; 24590-QL-HC4-W000-00011-03-70, Rev. 00B, Shielded Lid Support Structure Assembly; 24590-QL-HC4-W000-00011-03-78, Rev. 00A, Shielded Lid Support Structure Assembly. * Bechtel Status Code 1 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel. Mechanical Data Sheets: 24590-LAW-M0D-LMP-00001, Rev. 3, LAW Melter 1 (LMP-MLTR-00001); 24590-LAW-M0D-LMP-00002, Rev. 3, LAW Melter 2 (LMP-MLTR-00002). System Design Description: 24590-LAW-3ZD-LMP-00001, Rev. 0, Low-Activity Waste Melter Process System Design Description.

	Information Assessed	Source of Information	Assessment
Design	Vessel design standards are appropriate and adequate for the vessel's intended use.	Material Requisition, Mechanical Data Sheets, Specifications, and Drawings listed above under References; ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 2, Alternate Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code (BPV), Section II, Part D, Materials Properties, American Society of Mechanical Engineers; ASME NQA-1, Quality Assurance Requirements for Nuclear Facilities, American Society of Mechanical Engineers; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers; AISC N690-1994, Specification for the Design, Fabrication, and Erection of the Steel Safety-Related Structures for Nuclear Facilities, American Institute of Steel Construction; AISC M016-89, Manual of Steel Construction-Allowable Stress Design, 9th Edition, American Institute of Steel Construction; AWS D1.1, Structural Welding Code-Steel, American Welding Society; AWS D1.6, Structural Welding Code-Stainless Steel, American Welding Society; ASCE-7, Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers; UBC 1997, Uniform Building Code, International Conference of Building Officials.	The Mechanical Data Sheets and Engineering Specification for LAW Melters require that LMP Melter 1 and Melter 2 (LMP-MLTR-00001/2) and their appurtenances are to be designed for the design parameters listed therein and to be in compliance with the applicable requirements of various codes and standards listed in the Source of Information column. The requirements of the listed codes and standards are appropriate for these plant items operating with mixed waste solutions over the pressure and temperature ranges specified for them. Additional supplementary requirements are also specified in Material Requisition and other listed Specifications. Supplementary requirements address vessels' positive material identification, lifting attachment design, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, packaging, handling and storage requirements. The Mechanical Data Sheets and drawings show that the overall dimensions of LMP-MLTR-00001/2 outer shell are 256" W x 367" L x 190" H. Each vessel is supported on 12 wheel assemblies which roll on two carbon steel rails anchored to the concrete floor slab. Each plant item has internal equipment such as a bubbler and thermal couple wells that are supported from the top lid are made of Inconel 690 (Alloy 690) material. The Mechanical Data Sheets list the materials for the shell comprising of base, external walls, lid and lid cover as a mixture of various types such as A36, A500, Hastelloy C276 (Alloy C276), Alloy 690, Alloy 625, and 316L stainless steel. The design standards and codes listed in the Source of Information column are appropriate and adequate for the design, construction, and intended use of the Melters.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications, Mechanical Data Sheets, Material Requisition, and Drawings listed above under References; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code (BPV), Section II, Part D, Materials Properties, American Society of Mechanical Engineers; UBC 1997, Uniform Building Code, International Conference of Building Officials; ASCE 7, Minimum Design Loads in Building and Other structures (1998), American Society of Civil Engineers; AISC 1989, Manual of Steel Construction ADS, Ninth Edition, American Institute of Steel Construction; 24590-LAW-M2C-LMP-00001, Rev. 0, Thermal Analysis of Gas Barrier Lid; Law Melter Lid CFD Analysis; 24590-LAW-M2C-M80T-00003, Rev. B, LAW Melter Lid Refractory Thermal/Structural Finite Element Analysis Using ANSYS; 24590-LAW-M2C-LMP-00002, Rev. A, LMP-MLTR-00001 & LMP-MLTR-00002, LAW Melter Units, Structural and Seismic Analysis with ANSYS; CCN 159372, ISM Review-Revised LAW Melter Lid Cooling Design; 24590-QL-HC4-W000-00094-05-00001, Rev. 00B, LAW Melter Thermal Profile Analysis; 24590-QL-HC4-W000-00011-03-00647, Rev. 00A, Seismic Analysis of LAW Pour Spout; 24590-QL-HC4-W000-00011-03-00257, Rev. 00B, LAW Pour Spout Bolted and Welded Connection Structural Analysis; 24590-QL-HC4-W000-00011-03-00258, Rev. 00B, LAW Pour Spout Thermal Stress Calculation; 24590-WTP-DC-PS-01-001, Rev. 8, Pipe Stress Design Criteria; 24590-LAW-P61C-LMP-00002, Rev. A, LAW Melter Process Piping and Discharge Chamber Vent Piping Analysis with ANSYS; 24590-LAW-P61C-LOP-00002, Rev. C, LAW Main/Standby Offgas Piping.	The LAW Melter 1 and Melter 2 (LMP-MLTR-00001/2) are unique non-standard vessels. The Specification for LAW Melters states that these plant items are to be designed to the applicable requirements of the combination of various codes and standards listed in the Source of Information column. The Mechanical Data Sheets refer to use Specification for LAW Melters that requires these miscellaneous units and their components to be delivered after design, fabrication, inspection, and testing. Review of the Design Calculation documents of these Melters including its components show that they have been designed as required per above listed codes and standards and other documents listed in the Material Requisition for these units. The aforementioned statements and the vendor fabrication drawings reviewed demonstrate that sound engineering principles of construction and fabrication have been used for these Melters.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications, Mechanical Data Sheets, and Material Requisition, listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; UBC 1997, Uniform Building Code, International Conference of Building Officials; ASCE 7, Minimum Design Loads in Building and Other structures (1998), American Society of Civil Engineers; 24590-WTP-DC-ST-04-001, Rev. 4A, Seismic Analysis and Design Criteria; AISC 1989, Manual of Steel Construction ADS, Ninth Edition, American Institute of Steel Construction; 24590-LAW-M2C-M80T-00003, Rev. B, LAW Melter Lid Refractory Thermal/Structural Finite Element Analysis Using ANSYS; 24590-LAW-M2C-LMP-00002, Rev. A, LMP-MLTR-00001 & LMP-MLTR-00002, LAW Melter Units, Structural and Seismic Analysis with ANSYS; CCN 159372, ISM Review-Revised LAW Melter Lid Cooling Design; 24590-LAW-M2C-LMP-00001, Rev. 0, Thermal Analysis of Gas Barrier Lid; Law Melter Lid CFD Analysis.	The Specification for LAW Melters identifies their operating pressure and temperature ranges, the materials selected, the melter quality level, and its seismic category. The Mechanical Data Sheets refer to use Specification for LAW Melters that requires these Melters to be delivered after design, fabrication, inspection, and testing. Review of the Design Calculation documents of these melters show that they have been designed as required per above listed documents and specifications listed in the Material Requisition document and additional Specifications. The Mechanical Data Sheets list LAW Milters' Seismic Category as SC- III. For SC-III plant items, the detailed requirements for seismic load determination (per UBC 1997) are furnished in the Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks to provide for the seismic design analysis. The outer Melter enclosure structure is not exposed to any corrosive environment inside or outside, therefore, no corrosion allowance is required for it. However, some other components have been evaluated for corrosion as reported below in the Corrosion Protection and Corrosion Allowance sections. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels provides pertinent requirements for determination of seismic loads, analysis, and acceptance criteria for the vessels and their supports. Review of the Design Calculation documents demonstrates that all components of the Melter units after consideration of applicable corrosion allowances have adequate strength to withstand the applicable operating pressure, temperature, and seismic loads for the specified design life of the vessels. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements stated above and as described in documents (including daughter documents) listed in Material Requisition and various Specifications for the plant items have been met.

	Information Assessed	Source of Information	Assessment
Foundation	Vessel foundation will maintain the load of a full vessel.	Specifications listed above under References; 24590-WTP-DC-ST-04-001, Rev. 4A, Seismic Analysis and Design Criteria; 24590-WTP-DC-ST-01-001, Rev. 13, Structural Design Criteria. 24590-WTP-DB-ENG-01-001, Rev. 2, Basis of Design; 24590-LAW-M2C-LMP-00003, Rev. 0, LAW Melter Seismic Restraint Capacity; 24590-LAW-S0C-S15T-00032, Rev. A, LAW Melter Rail Seismic Anchor Pin Analysis; 24590-LAW-DDC-S13T-00014, Rev. 0A, Melter Seismic Restraint; 24590-LAW-S0C-S15T-00031, Rev. 0A, Seismic Qualification of the LAW Facility Melter Rails; 24590-LAW-M2C-LMP-00002, Rev. A, LMP-MLTR-00001 & LMP-MLTR-00002, LAW Melter Units, Structural and Seismic Analysis with ANSYS.	The Engineering Specification for LAW Melters provides the structural requirements for the design of Melter shell components inclusive of supports that they will be designed per Seismic Analysis and Design Criteria and Structural Design Criteria documents, ensuring an adequate design for the Melter supports. Review of the Design Calculation documents of the vessels show that the plant items supports have adequate strength to maintain the loads of full Melters. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the loads from full vessel, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation is part of a separate integrity assessment report for the Secondary Containment of the vessels.
	If in an area subject to flooding, the vessel is anchored.	Drawings, Mechanical Data Sheets listed under References; 24590-LAW-PER-M-02-002, Rev. 7, Dangerous Waste Permit (DWP) Liner Heights in LAW Facility.	Drawings show that the Melters are located in Room L-0112 at floor Elev. 3'-0" of the LAW facility building. The Mechanical Data Sheets and the Liner Heights documents do not list any flooding in Room L-0112; therefore, the flooding consideration does not apply.
	Vessel system will withstand the effects of frost heave.	24590-WTP-DC-ST-01-001, Rev. 13, Structural Design Criteria.	The Structural Design Criteria document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. The vessels are located inside/interior of the building at Elev. 3'-0" level, and the building's lower level floor is at Elev. (-) 21'-0", therefore, the melters' foundations are not subject to frost heave.

	Information Assessed	Source of Information	Assessment
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (dangerous waste characteristics, specific gravity, vapor pressure, flash point, storage temperature).	System Design Description and Specifications listed above under References; 24590-LAW-N1D-LMP-00001, Rev. 1, Corrosion Evaluation, LAW Melter 1 & Melter 2 (LMP-MLTR-00001/2) Gas-barrier and Cooling Panels; 24590-101-TSA-W000-0010-42-02, Rev. 00B, LAW Melter Materials Selection Report; 24590-WTP-PER-PR-03-002, Rev. 3, Control of Toxic Vapors and Emissions from WTP Tank and Miscellaneous Unit Systems; CCN 280210, LAW Miscellaneous Treatment Unit Hydrogen Accumulation Documentation for the DWP Administrative Record.	The System Design Description, Specification for Melters, Corrosion Evaluation, and Melter Materials Selection Report documents identify the process conditions and design parameters of the melters, such as the waste chemical composition, temperatures, and pressures. The Melter Materials Selection Report document evaluates numerous material used for various components of the Melter units. The Corrosion Evaluation document appropriately addresses the pH value and chemical composition of the condensate and selects appropriate material for the melter gas barrier shell and cooling panels. Waste characteristics that are hazardous, such as ignitability, reactivity, toxicity, and hydrogen accumulation are appropriately addressed in the Control of Toxic Vapors and Emissions and CCN 280210 documents. Review of these documents show that the Melter units do not pose any dangerous or hazardous conditions.
	Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	System Design Description listed above under References; 24590-101-TSA-W000-0010-42-02, Rev. 00B, LAW Melter Materials Selection Report.	The Melter Materials Selection Report document demonstrates in depth that the Melter units are designed to handle the process discussed in the System Design Description. The System Design Description document discusses the normal and off-normal operations for the Melter units. The System Design Description document describes that the Melter system is designed to convert the mixture of pretreated LAW and glass-forming chemicals into glass or immobilized low activity waste (ILAW).
	The waste types are compatible with each other.	System Design Description listed above under References.	The System Design Description for the LAW LMP system does not describe any operations where incompatible wastes are mixed in these Melters for processing. These Melters are part of LAW LMP system for producing the LAW waste containers.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system).	Mechanical Data Sheets and Drawings listed above under References; 24590-101-TSA-W000-0010-42-02, Rev. 00B, LAW Melter Materials Selection Report; 24590-LAW-N1D-LMP-00001, Rev. 1, Corrosion Evaluation, LAW Melter 1 & Melter 2 (LMP-MLTR-00001/2) Gas-barrier and Cooling Panels. 24590-LAW-PER-M-02-002, Rev. 7, Dangerous Waste Permit (DWP) Liner Heights in LAW Facility.	The Melter Materials Selection Report extensively evaluates the selects various corrosion resistant material for the Melter and its components. The five-sided glass pool open top box in lined with refractory to withstand molten glass corrosion. The gas space plenum above the glass pool is also a five-side open bottom box is also lined with refractory to withstand hot corrosive gases, thermal shock, and glass splatter. The Metallic Gas-barrier and Cooling Panels are evaluated in Corrosion Evaluation document which recommends 0.125" corrosion allowance for components within the Gas-barrier and 0.031" for the Cooling Panels inside the Gas-barrier. The other pertinent Melter operation and design information is provided in the Mechanical Data Sheets and Specification for LAW Melters. Each Melter is built up with a mix of Inconel 690, Hastelloy C-276, 316L stainless steel, and A36/A500 carbon steel materials. The Liner Heights document does not indicate any flooding problem in the Melters room area (Room L-0112); therefore, it should remain dry during normal operations which will prevent external corrosion of the Melters for their service life of 5 years. Careful selection of internal and external materials, provide adequate protection from waste stream and external environment.

	Information Assessed	Source of Information	Assessment
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the vessel.	Mechanical Data Sheets listed above under References; 24590-101-TSA-W000-0010-42-02, Rev. 00B, LAW Melter Materials Selection Report; 24590-LAW-N1D-LMP-00001, Rev. 1, Corrosion Evaluation, LAW Melter 1 & Melter 2 (LMP-MLTR-00001/2) Gas-barrier and Cooling Panels.	The Melter Materials Selection Report evaluates numerous components materials of the Melter in detail and it recommends specific type of corrosion resistant material for specific component, compartment or area. The areas included are glass pool, cold cap, plenum, discharge chamber, gas-barrier annulus, and shielding annulus areas. The Corrosion Evaluation, Melter Materials Selection Report, and Mechanical Data Sheets documents list the Cooling Panels are made up of Alloy 276 (UNS N10276) material and the Gas-barrier components are made up of Alloy 690 (UNS N10690). The Corrosion Evaluation report recommends 0.125" corrosion allowance for components within the Gas-barrier and 0.031" for the Cooling Panels inside the Gas-barrier. Based on the review of Corrosion Evaluation and Melter Materials Selection Report, the corrosion allowance for materials selected for various components are adequate for their intended service during the 5-year design life of the Melters.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.	Drawings and System Design Description listed above under References.	The LMP Melter 1 and Melter 2 (LMP-MLTR-00001/2) receive blend of LAW concentrate and glass former additives from the LFP system. The drawings show that the Melters are fed from the top. To avoid the pressurization and high level in the Melters, appropriate controls are provided at the control station in addition to exhaust vent and overflow thru spout. The System Design Description document also describes that the pressure relief valves are provided for each Melter, which will prevent their over pressurization.