Job No. 24590

Bechtel National, Inc.

SUPPLIER DOCUMENT STATUS

1. [X] **Work may proceed.**
2. [ ] **Revise and resubmit. Work may proceed subject to resolution of indicated comments.**
3. [ ] **Revise and resubmit. Work may not proceed.**
4. [ ] **Review not required. Work may proceed.**

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier and does not relieve supplier from full compliance with contractual obligations.

REVIEWED									

G-321 Document Category N/A
[From Supplement A to G-321-E (E) or G-321-V (V), as applicable, or "N/A" if SSRS is used]

Supersedes BNI Document No. N/A Rev. _____
[When applicable]

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Released by N/A (Print Name) _____ (Signature) _____ (Date)
[When applicable]

416 GP&S 7-03

24590-CM-HC4-HXYG-00138-02-00020
REV. 00A

PURCHASE ORDER SUBMITTAL

Best Available Copy

R10273686

IQRPE REVIEW
OF
PRETREATMENT FACILITY (PTF) WASTE FEED EVAPORATION PROCESS SYSTEM (FEP) PLANT ITEMS
(FEP-VSL-00017A/B, FEP-VSL-00005, FEP-SEP-00001A/B, AND FEP-RBLR-00001A/B)

"I, Tarlok S. 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 Pretreatment Facility (PTF) Waste Feed Evaporation Process System (FEP) Plant Items (FEP-VSL-00017A/B, FEP-VSL-00005, FEP-SEP-00001A/B, AND FEP-RBLR-00001A/B) as required by the Dangerous Waste Regulations, namely, WAC 173-303-640(3) applicable paragraphs, i.e., (a) through (g)."

"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 intent fully satisfies the requirements of the WAC.

The attached review is 22 pages numbered 1 through 22.

TARLOK SINGH HUNDAL
STATE OF WASHINGTON
20213
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES: 02/15/06

TSHundal 3/22/04

Signature Date

24590-CM-HXYG-00138-02-00020, REV. 00A

STRUCTURAL INTEGRITY ASSESSMENT OF THE PRETREATMENT FACILITY (PTF) WASTE FEED EVAPORATION PROCESS SYSTEM (FEP) PLANT ITEMS

(FEP-VSL-00017A/B, FEP-VSL-00005, FEP-SEP-00001A/B, AND FEP-RBLR-00001A/B)

COGEMA-IA-044
REV. 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.

Scope	Scope of this Integrity Assessment	This Integrity Assessment includes the following seven (7) Plant Items (Vessels, Separators, and Reboilers) in the Pretreatment Facility at Elevation 0'-0": - Two FEP Waste Feed Evaporator Feed Vessels (FEP-VSL-00017A/B), located in cell (P-0106) – see pp. 3 thru 7 - One FEP Waste Feed Evaporator Condensate Vessel (FEP-VSL-00005), located in cell (P-0105B) – see pp. 8 thru 12 - Two Waste Feed Evaporator Separators (FEP-SEP-00001A/B), located in cell (P-0106)- see pp. 13 thru 17 - Two Waste Feed Evaporator Reboilers (FEP-RBLR-00001A/B), located in cell (P-0123)- see pp. 18 thru 22 Note: For References see page 2.
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 controls and requirements to ensure the design intent fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, *Dangerous Waste Regulations* for Tank Systems.

References	Material Requisitions, Specifications, Drawings, and Mechanical Data Sheets	Material Requisitions: 24590-QL-MRE-MVA0-00001, Rev. 1 (including Material Requisition Supplement Nos. S01 thru S05 to Rev. 1 of the MR): 24590-QL-MRA-MEVV-00001, Rev. 2 (including Material Requisition Supplement No. S01 to Rev. 2 of the MR): The following Specifications with their appropriate number and revision are included in the above listed Material Requisitions: Engineering Specification for Pressure Vessel Design and Fabrication; Engineering Specification for Seismic Qualification Criteria for Pressure Vessels; Specification for Shell and Tube Heat Exchangers Specification for Welding of Pressure Vessels, Heat Exchangers, and Boilers; General Specification for Supplier Quality Assurance Program Requirements; Specification for Positive Material Identification (PMI); General Specification for Packing, Shipping, Handling, and Storage; Engineering Specification for Pressure Vessel Fatigue Analysis; Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks; Engineering Specification for Structural Design Loads for Seismic Category III/IV Equipment and Tanks; Engineering Specification for Forced Circulation Vacuum Evaporator System. Drawings: 24590-PTF-MV-FEP-00001, Rev. 0, Equipment Assembly Waste Feed Evaporator Feed Vessel FEP-VSL-00017A (Q); 24590-PTF-MV-FEP-00002, Rev. 0, Equipment Assembly Waste Feed Evaporator Feed Vessel FEP-VSL-00017B (Q); 24590-PTF-P1-P01T-P0001, Rev. 2, Pretreatment Facility General Arrangement Plan at El. 0'-0"; 24590-PTF-P1-P01T-P0007, Rev. 3, Pretreatment Facility General Arrangement Section A-A; 24590-PTF-P1-P01T-P0008, Rev. 3, Pretreatment Facility General Arrangement Section B-B; 24590-PTF-P1-P01T-P0009, Rev. 6, Pretreatment Facility General Arrangement Section C-C; 24590-PTF-P1-P01T-P0016, Rev. 3, Pretreatment Facility General Arrangement Sect. P-P and Q-Q; 24590-PTF-M6-FEP-P0001, Rev. 0, P&ID-PTF Waste Feed Evaporation Process System Evaporator Feed Vessels FEP-VSL-00017A/B; 24590-PTF-M6-FEP-P0002, Rev. 0, P&ID-PTF Waste Feed Evaporation Process System Separator FEP-SEP-00001A; 24590-PTF-M6-FEP-P0003, Rev. 0, P&ID-PTF Waste Feed Evaporation Process System Condensers and Condensate Collection FEP-VSL-00005; 24590-PTF-M6-FEP-P0004, Rev. 0, P&ID-PTF Waste Feed Evaporation Process System Separator FEP-SEP-00001B; 24590-PTF-M5-V17T-P0004001, Rev. 0, Process Flow Diagram Waste Feed Evaporation Sheet 1 of 2, System FEP; 24590-PTF-M5-V17T-P0004002, Rev. 0, Process Flow Diagram Waste Feed Evaporation Sheet 2 of 2, System FEP; Mechanical Data Sheets: 24590-PTF-MVD-FEP-00001, Rev. 2, Mechanical Data Sheet Waste Feed Evaporator Feed Vessel, (FEP-VSL-00017A); 24590-PTF-MVD-FEP-00002, Rev. 2, Mechanical Data Sheet Waste Feed Evaporator Feed Vessel, (FEP-VSL-00017B); 24590-PTF-MVD-FEP-00003, Rev. 0, Mechanical Data Sheet Waste Feed Evaporator Condensate Vessel, (FEP-VSL-00005); 24590-PTF-MVD-FEP-00006, Rev. 0, Mechanical Data Sheet Waste Feed Evaporator Separator, (FEP-SEP-00001A); 24590-PTF-MVD-FEP-00007, Rev. 0, Mechanical Data Sheet Waste Feed Evaporator Separator, (FEP-SEP-00001B). 24590-PTF-MED-FEP-00009, Rev. 0, Mechanical Data Sheet Waste Feed Evaporator Reboiler, (FEP-RBLR-00001A); 24590-PTF-MED-FEP-00010, Rev. 0, Mechanical Data Sheet Waste Feed Evaporator Reboiler, (FEP-RBLR-00001B);

	Information Assessed	Source of Information	Assessment
Design	Plant Items design standards are appropriate and adequate for the Plant Item's intended use.	Specifications listed under Material Requisitions, Drawings, and Mechanical Data Sheets listed above under References; ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Nuclear Power Plant Components, 1995; ASME Boiler and Pressure Vessel Code, Section VIII, Division 2, Alternative Rules; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Specification for Vessel Design and Fabrication requires the FEP system Waste Feed Evaporator Vessels, FEP-VSL-00017A/B and all appurtenances to be designed to the ASME Section VIII, Division 1 rules which are appropriate for the pressure Plant Items operating with mixed waste solutions over the pressure and temperature ranges specified for these Plant Items. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure vessel fatigue analysis, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the Plant Item and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These Plant Items are subjected to cyclic loading. The Specification for Fatigue Analysis requires the use of ASME Section VIII, Division 2 rules for the Plant Item components with a high number of load cycles. These are adequate and acceptable design standards for the intended use of the Plant Item. Each Plant Item is vertical with a 264 in. ID and a height of 273 in. from bottom tangent line to top tangent line supported on a cylindrical skirt (3/4" thick plate x approx. 7'-6" high) which in turn is supported on a ring beam anchored to the concrete floor at Elev. 0'-0". The Plant Item's top and bottom heads are semi-elliptical, built with 3/4" minimum thick plate. The shell is specified to be made of 1" minimum thick plate. The Plant Item has internal equipment including eight pulse jet mixers and one charge vessel supported from the top head. Material for the Plant Item's shell, heads, and internal equipment is SA-240 316 stainless steel (0.030% maximum carbon content, dual certified) and is hereafter referred to as 316. The supporting skirt is SA-240 304 stainless steel (0.030% maximum carbon content, dual certified) and is hereafter referred to as 304. The operating Plant Item volume is to be about 71,300 gallons and the total internal volume is to be about 85,500 gallons.

	Information Assessed	Source of Information	Assessment
Design	If a non-standard Plant Item is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications listed under Material Requisitions, Drawings, and Mechanical Data Sheets listed above under References.	The FEP Waste Feed Evaporator Feed Vessels, FEP-VSL-00017A/B are standard ASME Section VIII, Div. 1 vessels. The Mechanical Data Sheets require that the ASME Section VIII, Division 1 Plant Items be delivered after design, fabrication, inspection and testing with an ASME code stamp and that the Plant Item be nationally registered. Supplemental design information is provided by the reference documents listed in the Source of Information column for utilizing sound engineering principles of construction of the Plant Items.
	Plant Item has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications listed under Material Requisitions, Drawings, and Mechanical Data Sheets listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Mechanical Data Sheets identify the Plant Items' operating pressure and temperature ranges, the materials selected for the Plant Items, the corrosion allowance, and the Plant Items quality level and seismic category which determine the requirements for seismic design. The design specifications for the Plant Items require specific consideration of the operating pressures and temperatures and seismic loads in the design process. ASME Section VIII, Division 1 requires that the corrosion allowance thickness be excluded from the nominal Plant Item thickness when evaluating the adequacy of Plant Item components for these loads at the end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels adopts ASME Section VIII, Division 2 design rules to address seismic design and analysis of the Plant Item and ASME Section VIII, Division 1 for the Plant Item supports. Detailed requirements for seismic load determination are furnished in the specification for Seismic Category I/II Equipment and Tanks. These codes and standards are adequate and appropriate for the design of the FEP Plant Items to withstand operating pressure and temperature loads and seismic loads for the specified design life.

	Information Assessed	Source of Information	Assessment
Foundation	Plant Item foundation will maintain the load of a full Plant Item.	Specifications listed under Material Requisition above under References; AISC Manual of Steel Construction, 9th Edition, American Institute of Steel Construction; 24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME BPV Code, Section VIII, Division 1 and AISC Manual of Steel Construction for the design of the Plant Item supports. This code ensures an adequate design for the Plant Item supports. Chapter 14 of the Basis of Design document requires that the Plant Item foundation design must be adequate to support the loads from full Plant Items.
	If in an area subject to flooding, the Plant Item is anchored.	Specifications listed under Material Requisition under References.	Buoyant forces on an empty Plant Item in a flooded room are mandatory standard design loads in the Specification for Pressure Vessel Design and Fabrication.
	Plant Item system will withstand the effects of frost heave.	24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. These Plant Items are located inside/interior of the building at (Elevation 0'-0" level with 8 ft thick foundation mat), therefore, the Plant Item foundation is 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 (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)	Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0002, Rev. 0, FEP-VSL-000017A/B (PTF) Waste Feed Evaporator Feed Vessel; 24590-WTP-PSAR-ESH-01-002-02, Rev. 1a, Preliminary Safety Analysis Report to Support Construction Authorization: PT Facility Specific Information; Department of Ecology Permit # WA7890008967, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* Chapter 10, and Attachment 51, "Hanford Tank Waste Treatment and Immobilization Plant."	The Mechanical Data Sheets present the waste specific gravity, storage temperatures and pressures. The Plant Item Material Selection Data Sheet addresses the pH range and chemical composition of the waste to select appropriate Plant Item materials and specify the corrosion allowance. Other waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are addressed by the Preliminary Safety Analysis Report for the PTF Building and in Part A of the Permit as an integral part of the design process. The FEP Plant Items provide primary containment of the waste during normal operations, abnormal operations, and during and after a Design Basis Earthquake. The Plant Item vent system draws air into the vapor space while removing gases to maintain hydrogen concentration below the lower flammability limit (LFL). Forced purge air is also supplied to each Plant Item. Each Plant Item also has eight pulse jet mixers to blend and maintain solids suspension in the waste. The Plant Items are grounded to control ignition sources.
	Plant Item is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0002, Rev. 0, FEP-VSL-000017A/B (PTF) Waste Feed Evaporator Feed Vessel; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet demonstrates that the Plant Item is designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the FEP Plant Item. Waste feed at low sodium molarity can be blended with recycled and concentrated to approximately 5 molar for optimization of down stream unit operations. Acid and water will be used for flushing/rinsing.
	The waste types are compatible with each other.	24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The System Description for the PTF FEP system does not describe any operations where incompatible wastes are mixed in these Plant Items for processing. The primary function of this Plant Item is to receive waste feed and recycles from various process systems FRP, PWD, RDP, and UPF of the PT facility and HLP of HLW facility. These Plant Items blend the received waste and recycle stream to feed the evaporator.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Plant Item material and protective coatings ensure the Plant Item 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)	Drawings and Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0002, Rev. 0, FEP-VSL-000017A/B (PTF) Waste Feed Evaporator Feed Vessel; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet shows that the FEP Waste Feed Evaporator Vessels, FEP-VSL-00017A/B normally operate at a pH of 13 and at a temperature of 75°F. The Plant Items are designed for 15 psig pressure and a temperature of 237°F. Other pertinent Plant Item operation and design information is provided in the Mechanical Data Sheets. Potential acid and water cleaning operations of the Plant Items were also considered. The material selected is 316 and a corrosion allowance of 0.04 in. These Plant Items are located in cell (P-0106) at Elevation 0'-0". The cell is equipped with a sump to pump out any leaks. Therefore, the cell should remain dry during normal operations which will limit external corrosion of the Plant Item over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the Plant Item.	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0002, Rev. 0, FEP-VSL-000017A/B (PTF) Waste Feed Evaporator Feed Vessel.	The bases for the FEP Plant Items' material selection and corrosion allowance are furnished in the Plant Item Material Selection Data Sheet. Selection of 316 materials with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selection and corrosion allowance are carried forward to the Mechanical Data Sheets.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the Plant Item are exceeded.	Drawings listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP).	The FEP Waste Feed Evaporator Feed Vessels, FEP-VSL-00017A/B, are designed to overflow into the ultimate overflow Plant Item (PWD-VSL-00033) through an 8" diameter unrestricted line. Plant Item (PWD-VSL-00033) is located in the PTF at Elevation (-) 45'-0", as shown on the drawings and described in the System Description document. These FEP Plant Items are also connected to the PTF vessels vent system to prevent their over pressurization.

	Information Assessed	Source of Information	Assessment
Design	Plant Item design standards are appropriate and adequate for the Plant Item's intended use.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheet listed above under References; ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Nuclear Power Plant Components, 1995; ASME Boiler and Pressure Vessel Code, Section VIII, Division 2, Alternative Rules; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Specification for Vessel Design and Fabrication requires the FEP system Waste Feed Evaporator Condensate Vessel, FEP-VSL-00005 and all appurtenances to be designed to the ASME Section VIII, Division 1 rules which are appropriate for the pressure Plant Item operating with mixed waste solutions over the pressure and temperature ranges specified for this Plant Item. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure Plant Item fatigue analysis, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the Plant Item and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of the Plant Item. The Plant Item is vertical with a 96 in. ID and a height of 128 in. from bottom tangent line to top tangent line supported on a cylindrical skirt which in turn is supported anchored to the concrete floor at Elev. 0'-0". The Plant Item's top and bottom heads and shell are specified to be built with 1/4" thick plate. Material specified for the Plant Item's shell and heads, is SA-240 316 stainless steel (0.030% maximum carbon content, dual certified) and is hereafter referred to as 316. The support skirt material for the Plant Item is specified to be stainless steel with maximum carbon content of 0.030% and is hereafter referred to as 304. The operating Plant Item volume is to be about 4,144 gallons and the total internal volume is to be about 5,022 gallons.
	If a non-standard Plant Item is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheet listed above under References.	The FEP Waste Feed Evaporator Condensate Vessel, FEP-VSL-00005 is a standard ASME Section VIII, Div. 1 vessel. The Mechanical Data Sheet requires that the ASME Section VIII, Division 1 Plant Item be delivered after design, fabrication, inspection and testing with an ASME code stamp and that the Plant Item be nationally registered. Supplemental design information is provided by the reference documents listed in the Source of Information column for utilizing sound engineering principles of construction of the Plant Item.

	Information Assessed	Source of Information	Assessment
Design	Plant Item has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheet listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Mechanical Data Sheet identifies the Plant Item's operating pressure and temperature ranges, the materials selected for the Plant Item, the corrosion allowance, and the Plant Item quality level and seismic category which determine the requirements for seismic design. The design specifications for the Plant Item require specific consideration of the operating pressures and temperatures and seismic loads in the design process. ASME Section VIII, Division 1 requires that the corrosion allowance thickness be excluded from the nominal Plant Item thickness when evaluating the adequacy of Plant Item components for these loads at the end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessel adopts ASME Section VIII, Division 2 design rules to address seismic design and analysis of the Plant Item and ASME Section VIII, Division 1 for the Plant Item supports. Detailed requirements for seismic load determination are furnished in the specification for Seismic Category III/IV Equipment and Tanks. These codes and standards are adequate and appropriate for the design of the FEP Plant Item to withstand operating pressure and temperature loads and seismic loads for the specified design life.

	Information Assessed	Source of Information	Assessment
Foundation	Plant Item foundation will maintain the load of a full Plant Item.	Specifications listed under Material Requisition above under References; AISC Manual of Steel Construction, 9th Edition, American Institute of Steel Construction; 24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME BPV Code, Section VIII, Division 1 and AISC Manual of Steel Construction for the design of the Plant Item supports. This code ensures an adequate design for the Plant Item supports. Chapter 14 of the Basis of Design document requires that the Plant Item foundation design must be adequate to support the loads from full Plant Item.
	If in an area subject to flooding, the Plant Item is anchored.	Specifications listed under Material Requisition under References.	Buoyant forces on an empty Plant Item in a flooded room are mandatory standard design loads in the Specification for Pressure Vessel Design and Fabrication.
	Plant Item system will withstand the effects of frost heave.	24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. This Plant Item is located inside/interior of the building at (Elevation 0'-0" level with 8 ft thick foundation mat), therefore, the Plant Item foundation is 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 (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)	Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0003, Rev. 0, FEP-VSL-000005 (PTF) Waste Feed Evaporator Condensate Vessel; 24590-WTP-PSAR-ESH-01-002-02, Rev. 1a, Preliminary Safety Analysis Report to Support Construction Authorization: PT Facility Specific Information; Department of Ecology Permit # WA7890008967, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* Chapter 10, and Attachment 51, "Hanford Tank Waste Treatment and Immobilization Plant."	The Mechanical Data Sheet presents the waste specific gravity, storage temperatures and pressures. The Plant Item Material Selection Data Sheet addresses the pH range and chemical composition of the waste to select appropriate Plant Item materials and specify the corrosion allowance. Other waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are addressed by the Preliminary Safety Analysis Report for the PTF Building and in Part A of the Permit as an integral part of the design process. The FEP Plant Item provides primary containment of the waste during normal operations, abnormal operations, and during and after a Design Basis Earthquake. The Plant Item vent system draws air into the vapor space while removing gases to maintain hydrogen concentration below the lower flammability limit (LFL).
	Plant Item is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0003, Rev. 0, FEP-VSL-000005 (PTF) Waste Feed Evaporator Condensate Vessel; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet demonstrates that the Plant Item is designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the FEP Plant Item. Acid and water will be used for flushing/rinsing.
	The waste types are compatible with each other.	24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The System Description for the PTF FEP system does not describe any operations where incompatible wastes are mixed in this Plant Item for processing. The Plant Item is to be compatible with 5M nitric acid used for separator Plant Item decontamination.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Plant Item material and protective coatings ensure the Plant Item 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)	Drawings and Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0003, Rev. 0, FEP-VSL-000005 (PTF) Waste Feed Evaporator Condensate Vessel; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet shows that the FEP Waste Feed Evaporator Condensate Vessel, FEP-VSL-00005 normally operates at a pH of 11 and at a temperature of 110°F. The Plant Item is designed for 15 psig pressure and a temperature of 150°F. Other pertinent Plant Item operation and design information is provided in the Mechanical Data Sheet. Potential acid and water cleaning operations of the Plant Item were also considered. The material selected is 316 and a corrosion allowance of 0.04 in. The Plant Item is located in cell (P-0105B) at Elevation 0'-0". The cell is accessible to pump out any spillage or leaks, therefore, it should remain dry during normal operations which will limit external corrosion of the Plant Item over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the Plant Item.	Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0003, Rev. 0, FEP-VSL-000005 (PTF) Waste Feed Evaporator Condensate Vessel.	The bases for the FEP Plant Item's material selection and corrosion allowance are furnished in the Plant Item Material Selection Data Sheet. Selection of 316 material with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selection and corrosion allowance are carried forward to the Mechanical Data Sheet.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the Plant Item are exceeded.	Drawings listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The FEP Waste Feed Evaporator Condensate Vessel, FEP-VSL-00005, is designed to have an overflow nozzle as described in the Engineering Specification for Forced Circulation Vacuum Evaporator System and in the System Description document. The condensate Plant Item overflows to PWD Plant Item (PWD-VSL-00033) located at Elev. (-) 45'-0" as shown on the drawings. This Plant Item is also connected to the PTF vessels vent system to prevent their over pressurization.

	Information Assessed	Source of Information	Assessment
Design	Plant Items design standards are appropriate and adequate for the Plant Item's intended use.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheets listed above under References; ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Nuclear Power Plant Components, 1995; ASME Boiler and Pressure Vessel Code, Section VIII, Division 2, Alternative Rules; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Specification for Vessel Design and Fabrication requires the FEP system Waste Feed Evaporator Separators, FEP-SEP-00001A/B and all appurtenances to be designed to the ASME Section VIII, Division 1 rules which are appropriate for pressure Plant Items operating with mixed waste solutions over the pressure and temperature ranges specified for these Plant Items. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure Plant Item fatigue analysis, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the Plant Items and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of the Separators. Each Separator is vertical having an operating volume of about 3,700 gallons and a total volume of about 11,400 gallons. The Separators heads and shells are specified to be built with 1/4" thick plate. The Separator material including support legs, is specified to be as SA 240 304 stainless steel (0.030% maximum carbon content, dual certified) and is hereafter referred to as 304.
	If a non-standard Plant Item is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheets listed above under References.	The FEP Waste Feed Evaporator Separators, FEP-SEP-00001A/B are standard ASME Section VIII, Div. 1 vessels. The Mechanical Data Sheets require that the ASME Section VIII, Division 1 Plant Items be delivered after design, fabrication, inspection, and testing with an ASME code stamp and that these Plant Items be nationally registered. Supplemental design information is provided by the reference documents listed in the Source of Information column for utilizing sound engineering principles of construction of the Plant Items.

	Information Assessed	Source of Information	Assessment
Design	Plant Item has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheets listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Mechanical Data Sheets identify the Separators' operating pressure and temperature ranges, the materials selected for the Plant Items, the corrosion allowance, and the Plant Item quality level and seismic category which determine the requirements for the seismic design. The design specifications for the Plant Items require specific consideration of the operating pressures and temperatures and seismic loads in the design process. ASME Section VIII, Division 1 requires that the corrosion allowance thickness be excluded from the nominal wall thickness when evaluating the adequacy of components for the applicable loads at the end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels adopts ASME Section VIII, Division 2 design rules to address seismic design and analysis of the Plant Items and ASME Section VIII, Division 1 for their supports. Detailed requirements for seismic load determination are furnished in the specification for Seismic Category I/II Equipment and Tanks. These codes and standards are adequate and appropriate for the design of the FEP Plant Items to withstand operating pressure and temperature loads and seismic loads for the specified design life.

	Information Assessed	Source of Information	Assessment
Foundation	Plant Item foundation will maintain the load of a full Plant Item.	Specifications listed under Material Requisition above under References; AISC Manual of Steel Construction, 9th Edition, American Institute of Steel Construction; 24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME BPV Code, Section VIII, Division 1 and AISC Manual of Steel Construction for the design of these Plant Item supports. This code ensures an adequate design for the Plant Item supports. Chapter 14 of the Basis of Design document requires that the Plant Item foundation design must be adequate to support the loads from full Plant Item.
	If in an area subject to flooding, the Plant Item is anchored.	Specifications listed under Material Requisition under References.	Buoyant forces on an empty Plant Item in a flooded room are mandatory standard design loads in the Specification for Pressure Vessel Design and Fabrication.
	Plant Item system will withstand the effects of frost heave.	24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. These Plant Items are located inside/interior of the building at (Elevation 0'-0" level with 8 ft thick foundation mat), therefore, the Plant Item foundation is 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 (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0007, Rev. 0, FEP-SEP-00001A/B (PTF) Waste Feed Evaporator Separators; 24590-WTP-PSAR-ESH-01-002-02, Rev. 1a, Preliminary Safety Analysis Report to Support Construction Authorization: PT Facility Specific Information; Department of Ecology Permit # WA7890008967, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* Chapter 10, and Attachment 51, "Hanford Tank Waste Treatment and Immobilization Plant."	The Mechanical Data Sheets present the waste specific gravity, storage temperatures and pressures. The Plant Item Material Selection Data Sheet addresses the pH range and chemical composition of the waste to select appropriate component materials and specify the corrosion allowance. Other waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are addressed by the Preliminary Safety Analysis Report for the PTF Building and in Part A of the Permit as an integral part of the design process. These FEP Plant Items provide primary containment of the waste during normal operations, abnormal operations, and during and after a Design Basis Earthquake. These Separators are to have 2" inlet nozzle to supply dilution air to negate hydrogen buildup.
	Plant Item is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0007, Rev. 0, FEP-SEP-00001A/B (PTF) Waste Feed Evaporator Separators; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet demonstrates that the Separators are designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the FEP Plant Items. Acid and water will be used for flushing/rinsing.
	The waste types are compatible with each other.	24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The System Description for the PTF FEP system does not describe any operations where incompatible wastes are mixed in these Plant Items for processing. These Separators as part of the evaporations process provide optimum conditions for waste processing via ultrafiltration and ion exchange.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Plant Item material and protective coatings ensure the Plant Item 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)	Drawings and Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0007, Rev. 0, FEP-SEP-00001A/B (PTF) Waste Feed Evaporator Separators; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet shows that the FEP Waste Feed Evaporator Separators, FEP-SEP-00001A/B normally operate at a pH of 13 and at a temperature of 122°F. These Plant Items are designed for 15 psig pressure and a temperature of 250°F. Other pertinent Plant Item operation and design information is provided in the Mechanical Data Sheets. Potential acid and water cleaning operations of the Plant Items were also considered. The material selected is 304 and a corrosion allowance of 0.04 in. These Plant Items are located in cell (P-0105B) at Elevation 0'-0". The cell is equipped with a sump to pump out any leaks, therefore, the cell should remain dry during normal operations which will limit external corrosion of the Separators over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the Plant Item.	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0007, Rev. 0, FEP-SEP-00001A/B (PTF) Waste Feed Evaporator Separators.	The bases for the Separators material selection and corrosion allowance are furnished in the Plant Item Material Selection Data Sheet. Selection of 304 material with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selection and corrosion allowance are carried forward to the Mechanical Data Sheets.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the Plant Item are exceeded.	Drawings listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The FEP Waste Feed Evaporator Separators, FEP-SEP-00001A/B, are connected to the PTF PVP system, which will prevent their over-pressurization.

	Information Assessed	Source of Information	Assessment
Design	Plant Items design standards are appropriate and adequate for the Plant Item's intended use.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheets listed above under References; ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Nuclear Power Plant Components, 1995; ASME Boiler and Pressure Vessel Code, Section VIII, Division 2, Alternative Rules; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Specification for Forced Circulation Vacuum Evaporator System requires the FEP system Waste Feed Evaporator Reboilers, FEP-RBLR-00001A/B and all appurtenances to be designed per the Specification for Shell and Tube Heat Exchangers. This Specification supplements the Specification for Vessel Design and Fabrication which requires using the ASME Section VIII, Division 1 rules which are appropriate for the Plant Items operating with mixed waste solutions over the pressure and temperature ranges specified for these Plant Items. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure Plant Item fatigue analysis, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the Plant Items and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of the Reboilers. Each Reboiler is vertical having an operating heat exchange area of 2582 ft^2 with 18,350,000 Btu/hr heat exchange duty. The Reboiler shell material is specified to be as SA 240 304 stainless steel (0.030% maximum carbon content, dual certified) and is hereafter referred to as 304. The tubes material is to be Hastelloy G-30 alloy and is hereafter referred to as G-30. The Reboiler shell side is to be 72" OD and the tube side is to be 72" x 72" x 180" overall dimensions. The size, configuration, and other design information for each Reboiler are specified in the Specification for Forced Circulation Vacuum Evaporator System and the Mechanical Data Sheets.

	Information Assessed	Source of Information	Assessment
Design	If a non-standard Plant Item is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheets listed above under References.	The FEP Waste Feed Evaporator Reboilers, FEP-RBLR-00001A/B are standard ASME Section VIII, Div. 1 vessels. The Mechanical Data Sheets require that the ASME Section VIII, Division 1 Plant Items be delivered after design, fabrication, inspection and testing with an ASME code stamp and that the Plant Items be nationally registered. Supplemental design information is provided by the reference documents listed in the Source of Information column for utilizing sound engineering principles of construction of the Plant Items.
	Plant Item has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications listed under Material Requisition, Drawings, and Mechanical Data Sheets listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Mechanical Data Sheets identify the Reboilers' operating pressure and temperature ranges, the materials selected for the Plant Items, the corrosion allowance, and the Plant Item quality level and seismic category which determine the requirements for seismic design. The design specifications for the Plant Items require specific consideration of the operating pressures and temperatures and seismic loads in the design process. ASME Section VIII, Division 1 requires that the corrosion allowance thickness be excluded from the nominal wall thickness when evaluating the adequacy of components for the applicable loads at the end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels adopts ASME Section VIII, Division 2 design rules to address seismic design and analysis of these Plant Items and ASME Section VIII, Division 1 for their supports. Detailed requirements for seismic load determination are furnished in the specification for Seismic Category I/II Equipment and Tanks. These codes and standards are adequate and appropriate for the design of the FEP Plant Items to withstand operating pressure and temperature loads and seismic loads for the specified design life.

	Information Assessed	Source of Information	Assessment
Foundation	Plant Item foundation will maintain the load of a full Plant Item.	Specifications listed under Material Requisition above under References; AISC Manual of Steel Construction, 9th Edition, American Institute of Steel Construction; 24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME BPV Code, Section VIII, Division 1 and AISC Manual of Steel Construction for the design of the Plant Items supports. This code ensures an adequate design for the Plant Item supports. Chapter 14 of the Basis of Design document requires that the Plant Item foundation design must be adequate to support the loads from full Plant Item.
	If in an area subject to flooding, the Plant Item is anchored.	Specifications listed under Material Requisition under References.	Buoyant forces on an empty Plant Item in a flooded room are mandatory standard design loads in the Specification for Pressure Vessel Design and Fabrication.
	Plant Item system will withstand the effects of frost heave.	24590-WTP-DB-ENG-01-001, Rev. 1A, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. These Plant Items are located inside/interior of the building at (Elevation 0'-0" level with 8 ft thick foundation mat), therefore, the Plant Item foundation is 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 (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0008, Rev. 0, FEP-RBLR-00001A/B (PTF) Waste Feed Evaporator Reboilers; 24590-WTP-PSAR-ESH-01-002-02, Rev. 1a, Preliminary Safety Analysis Report to Support Construction Authorization: PT Facility Specific Information; Department of Ecology Permit # WA7890008967, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* Chapter 10, and Attachment 51, "Hanford Tank Waste Treatment and Immobilization Plant."	The Mechanical Data Sheets present the waste specific gravity, storage temperatures and pressures. The Plant Item Material Selection Data Sheet addresses the pH range and chemical composition of the waste to select appropriate component materials and specify the corrosion allowance. Other waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are addressed by the Preliminary Safety Analysis Report for the PTF Building and in Part A of the Permit as an integral part of the design process. The FEP Plant Items provide primary containment of the waste during normal operations, abnormal operations, and during and after a Design Basis Earthquake.
	Plant Item is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0008, Rev. 0, FEP-RBLR-00001A/B (PTF) Waste Feed Evaporator Reboilers; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet demonstrates that the Reboilers are designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the FEP Plant Items. Acid and water will be used for flushing/rinsing.
	The waste types are compatible with each other.	24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The System Description for the PTF FEP system does not describe any operations where incompatible wastes are mixed in these Plant Items for processing. These Reboilers as part of the evaporations process provide optimum conditions for waste processing via ultrafiltration and ion exchange.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Plant Item material and protective coatings ensure the Plant Item 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)	Drawings and Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0008, Rev. 0, FEP-RBLR-00001A/B (PTF) Waste Feed Evaporator Reboilers; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The Plant Item Material Selection Data Sheet shows that the FEP Waste Feed Evaporator Reboilers, FEP-RBLR-00001A/B normally operate at a pH of 13 and at a temperature of 142°F. The Reboilers are designed for 50/FV psig pressure and a temperature of 311°F. Other pertinent Plant Item operation and design information is provided in the Mechanical Data Sheets. Potential acid and water cleaning operations of the Plant Items were also considered. The material selected is 304 with no corrosion allowance for the shell and G-30 for the tubes with a corrosion allowance of 0.04 in. These Plant Items are located in cell (P-0123) at Elevation 0'-0". The cell is equipped with a sump/pump to pump out any leaks, therefore, the cell should remain dry during normal operations which will limit external corrosion of the Plant Item over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the Plant Item.	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-PTF-N1D-FEP-P0008, Rev. 0, FEP-RBLR-00001A/B (PTF) Waste Feed Evaporator Reboilers.	The bases for the Reboilers material selection and corrosion allowance are furnished in the Plant Item Material Selection Data Sheet. Material selection of 304 for shell (no corrosion allowance) and G-30 for tubes with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selection and corrosion allowance are carried forward to the Mechanical Data Sheets.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the Plant Item are exceeded.	Drawings listed above under References; 24590-PTF-3YD-FEP-00001, Rev. 0, System Description for Waste Feed Evaporation Process (FEP), (Including SDCN No. 24590-PTF-3YN-FEP-00001).	The FEP Waste Feed Evaporator Reboilers, FEP-RBLR-00001A/B, are vented at their high points which will prevent over-pressurization and mitigate hydrogen buildup.