MECHANICAL DATA SHEET: VESSEL

R10631606

PLANT ITEM No. 24590-HLW-MV-HDH-VSL-00003

Project:	RPP-WTP	P&ID:	24590-HLW-M6-HDH-P0002
Project No:	24590	Process Data Sheet:	Deleted
Project Site:	Hanford	Vessel Drawing	24590-HLW-MV-HDH-P0003
Description:	Waste Neutralization Vessel		

~~ISSUED BY RPP-WTP PDC~~

Reference Data

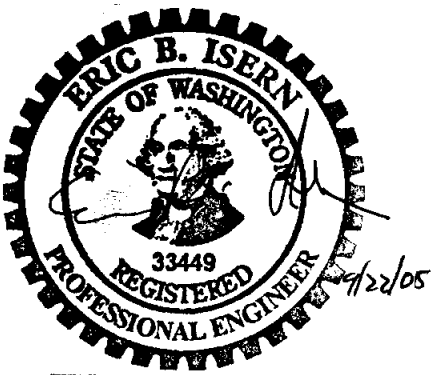
Charge Vessels (Tag Numbers)	N/A
Pulsejet Mixers / Agitators (Tag Numbers)	N/A
RFDs/Pumps (Tag Numbers)	N/A

Design Data

Quality Level	CM	Fabrication Specs	24590-WTP-3PS-MV00-TP001			
Seismic Category	SC-III	Design Code	ASME VIII Div 1			
Service/Contents	0.5 M Cerous Nitrate, 1M Nitric Acid, 5M NaOH, Demin Water	Code Stamp	Yes			
Design Specific Gravity	1.05 (2)	NB Registration	Yes			
Maximum Operating Volume gal	4819 (Note 4)	Weights (lbs)	Empty	Operating	Test	
Total Volume gal	5315 (Note 4)	Estimated	17,500	58,000	62,000	
Environmental Qualification (2)	N/A	Actual *				

Inside Diameter	inch	84			Wind Design	None	
Length/Height (TL-TL)	inch	204			Snow Design	None	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	24590-WTP-3PS-MV00-TP002 24590-WTP-3PS-FB01-T0001	
Internal Pressure	psig	Atm	15	N/A	Seismic Base Moment *	ft*lb	
External Pressure	psig	Atm	FV	N/A	Postweld Heat Treat	None	
Temperature	°F	113	237 (Notes 5 and 6) (2)	N/A	Corrosion Allowance	Inch	0.04
Min. Design Metal Temp.	°F	16			Hydrostatic Test Pressure *	psig	

Note: 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 source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



9/22/05

EXPIRES: 07/28/07

This Bound Document Contains a total of 4 Sheets.

REV	DATE	REASON FOR REVISION	PREPARER	CHECKER	REVIEWER	APPROVER
2	9/22/05	Issued for Permitting Use	K. Brightman	B. Balakrishnan	C. Slater	M. Hoffmann
1	3/24/04	Issued for Permitting Use				
0	10/29/02	Issued for Permitting Use	J. Jackson	C. Slater	N/A	S. Kirk

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Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	***SA-240 304 (Note 2)***	***See Drawing***	***Auxiliary***
Shell	***SA-240 304 (Note 2)***	***See Drawing***	***Primary***
Bottom Head	***SA-240 304 (Note 2)***	***See Drawing***	***Primary***
Support	***SA-240 304 (Note 2)***	***See Drawing***	***N/A***
Jacket/Coils/Half-Pipe Jacket	***SA-240 304 (Note 2)***	***See Drawing***	***N/A***
Internals	***SA-240 304 (Note 2)***	***See Drawing***	***Thermowells Primary***
Pipe	***SA-312 TP304 (Note 2)***	***See Drawing***	***Note 1***
Forgings/ Bar stock	***SA-182 F304 (Note 2)***	***See Drawing***	***N/A***
Bolting/Gaskets	***SA193 B8 CLASS 2, SPIRAL WOUND GRAPHITE FILLED***	***N/A***	***N/A***

Miscellaneous Data

Orientation	***Vertical***	Support Type	***Skirt***
Insulation Function	***Not Applicable***	Insulation Material	***Not Applicable***
Insulation Thickness (inch)	***Not Applicable***	Internal Finish	***Note 3***
		External Finish	***Note 3***

Remarks

* To be determined by the vendor.

Note 1: Nozzle necks below max. operating level are primary, others auxiliary.

Note 2: Maximum carbon content of 0.030% for all welded components.

Note 3: Welds descaled as laid.

Note 4: Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.

Note 5: For inlet nozzles/insert pipes N06/N06A, N07/N07A, N29/N29A, N30/N30A the temperature shall be 343°F at a pressure of 109 psig. △2

Note 6: For inlet nozzles N04 andN32 the temperature shall be 358°F at a pressure of 135 psig. △2

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Equipment Cyclic Data Sheet

Component Plant Item Number:	***HDH-VSL-00003***
Component Description	***Parent Vessel***

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	***SA-240-304 with0.030 % carbon.***
Design Life	***40 Years***
Component Function and Life Cycle Description	***The parent vessel is cyclically loaded and discharged in batch operation. In each batch operation, 2,037 gallons of liquid content is loaded and discharged.***

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***FV***	***15***	***10*** △2	***Nominal assumption*** △2
Operating Pressure	psig	***0***	***0***	***N/A*** △2	
Operating Temperature	°F	***68*** △2	***107*** △2	***N/A*** △2	
Contents Specific Gravity		***1.00***	***1.05*** △2	***N/A*** △2	
Contents Level	inch	***14***	***208***	***87,400*** △2	***A result of six one-hour cycles per day for 40 years*** △2
Localized Features					
Nozzles				***Normal operations will cause steam at 343°F temperature to enter the vessel via the inlet nozzles/insert pipes (N06/N06A, N07/N07A, N29/N29A, N30/N30A) six times per day, 1 hour each cycle.*** ***Normal operations will cause superheated steam at 358°F temperature to enter the vessel via inlet nozzles (N04, N32) twice per day, 8 hours each cycle.*** △2	
Supports					

Notes

- ***Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.***
- ***Contents of this document are Dangerous Waste Permit affecting.***
- ***Nozzles N06/N06A, N07/N07A, N29/N29A, N30/N30A, and associated piping connected to ejectors shall be fatigue assessed/analyzed for pressure/temperature cycles over 40 years from 0 psig at 59°F to 109 psig at 343°F temperature. The pressure cycles shall coincide with temperature cycles.*** 2
- ***Nozzles N04, N32, and associated piping connected to ejectors shall be fatigue assessed/analyzed for pressure/temperature cycles over 40 years from 0 psig at 59°F to 135 psig at 358°F temperature. The pressure cycles shall coincide with temperature cycles.*** 2
- ***Heat Transfer summary for vessel:*** 2
  - 2 ***A. Cell Ambient Temperature: Min. 59 °F, Max. 95 °F***
  - 2 ***B. Headspace temperature: 107 °F***
  - 2 ***C. Ambient and headspace natural convection heat transfer coefficients = 1.63 BTU/h-ft2-°F***
    - **** Ignoring forced convection inside the vessel is bounding assumption.***
  - 2 ***D. Ejector transfers from vessel (Nozzles N06/N06A, N07/N07A, N29/N29A, N30/N30A):***
    - ***Only one of these nozzles will be used at a time during transfers.***
    - ***Transfer frequency: Refer to Equipment Cyclic Data, page 3***
    - ***Steam mass flow rate = 610 lb/hr***
  - 2 ***E. Condensate transfers (Nozzles N04/N32):***
    - ***These nozzles can be utilized simultaneously during transfers.***
    - ***Transfer frequency: Refer to Equipment Cyclic Data, page 3***
    - ***Steam mass flow rate = 230 lb/hr***
  - 2 ***F. During operation, one ejector transfer and one condensate transfer can take place simultaneously.***