



MECHANICAL SYSTEMS DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-UFP-VSL-00002B

R10146465

Project:	RPP-WTP	P&ID:	24590-PTF-M6-UFP-P0003IP0011IP0015
Project No:	24590	Process Data Sheet:	24590-PTF-MVC-UFP-00002
Project Site:	Hanford	Vessel Drawing	24590-PTF-MV-UFP-P0004
Description:	Ultrafiltration Feed Vessel		

ISSUED BY
RPP-WTP PDC
KC 10/21/03
DATE

Reference Data

Charge Vessels (Tag Numbers)	DELETED
Pulse Jet Mixers / Agitators (Tag Numbers)	UFP-PJM-00012, UFP-PJM-00013, UFP-PJM-00014, UFP-PJM-00015, UFP-PJM-00016, UFP-PJM-00017
RFDs/Pumps (Tag Numbers)	DELETED

Design Data

Quality Level	QL-1	Fabrication Specs	24590-WTP-3PS-MV00-TP001		
Seismic Category	SC-1	Design Code	ASME VIII Div 1		
Service/Contents	Radioactive Liquid	Code Stamp	Yes		
Design Specific Gravity	1.42	NB Registration	Yes		
Maximum Operating Volume	gal 36,561	Weights (lbs)	Empty	Operating	Test
Total Volume	gal 40,783	Estimated	121,500	584,000	462,000
		Actual *			

Inside Diameter	Inch	168			Wind Design	Not Required	
Length/Height (TL-TL)	Inch	369			Snow Design	Not Required	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	24590-WTP-3PS-MV00-TP002 24590-WTP-3PS-SS90-T0001	
Internal Pressure	psig	ATM	15	35	Seismic Base Moment *	ft*lb	
External Pressure Note 3	psig	0.217	12	0	Postweld Heat Treat	Not Required	
Temperature	*F	194	225	40	Corrosion Allowance	Inch	0.040
Min. Design Metal Temp.	*F	40			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 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.



10/8/03

EXPIRES 12/10/04

This Bound Document Contains a total of 4 pages.

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10/20/03

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Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	SA 240 304 <i>Note 1</i>	<i>See Drawing</i>	Auxiliary
Shell	SA 240 304 <i>Note 1</i>	<i>See Drawing</i>	Primary
Bottom Head	SA 240 304 <i>Note 1</i>	<i>See Drawing</i>	Primary
Support	SA 240 304 <i>Note 1</i>	<i>See Drawing</i>	NIA
Jacket/Coils/Half-Pipe Jacket	SA 240 304 <i>Note 1</i>	<i>See Drawing</i>	NIA
Internals	SA 240 304 <i>Note 1</i>	<i>See Drawing</i>	Thermowells Primary
Pipe	SA 312 TP304 <i>Note 1</i>	<i>See Drawing</i>	Note 3
Forgings/ Bar stock	SA 182 F304 <i>Note 1</i>	<i>See Drawing</i>	NIA
Wash Ring Pipe	SA 312 TP304 <i>Note 1</i>	<i>See Drawing</i>	NIA
Bolting/Gaskets	NIA	NIA	NIA

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Internal Finish	Note 4
		External Finish	Note 4

Remarks

* To be determined by the vendor.

Note 1. Maximum 0.030% carbon. Note 4. Welds descaled as laid.

Note 3. For vessel jacketed portion, external design pressure is 35 psi.

Note 4. Shell Nozzle Necks including the overflow nozzle are primary. Others are auxiliary.

Note 5. Vessel volumes are approximate and do not account for the manufacturing tolerances, nozzles, and displacement of internals.



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Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-UFP-UFP-VSL-00002B
Component Description	Ultrafiltration Feed 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	ASME SA240 304 with 0.030 % max carbon.
Design Life	40 Years
Component Function and Life Cycle Description	The system receives waste from Ultrafiltration Feed Preparation Vessels. This vessel is a high solids vessel in the 20% range. The waste will be cooled using the vessel cooling jacket, and solids will be kept suspended using the pulse jet mixers. The cycle time for this vessel is 239.4 hours.

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	-12	15	10	Nominal Assumption
Operating Pressure	psig	-0.217	0	N/A	The vessel will remain under constant pressure depending upon the plant HVAC
Operating Temperature	°F	50	194	1465	
Contents Specific Gravity		1.0	1.42	1465	
Contents Level	inch	27	395	1465	Based on 40 years life expectancy
Localized Features					
Nozzles		Within 9°F of operating temperature range.			
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.**



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Equipment Cyclic Data Sheet

Component Plant Item Number:	UFP-PJM-00012, UFP-PJM-00013, UFP-PJM-00014, UFP-PJM-00015, UFP-PJM-00016, UFP-PJM-00017
Component Description	Pulse Jet Mixers

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

Materials of Construction	ASME SA240 304 with 0.030 % max carbon.
Design Life	40 Years
Component Function and Life Cycle Description	These pulse jet mixers are cyclically loaded using vacuum to fully fill the vessel with process liquid and compressed air to fully empty the vessel. The pulse jet mixers are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum design pressure and the minimum design pressure plus the external static head imposed by the parent vessel. The pulse jet mixer supports shall be designed to cycle between fully buoyant (pulse jet mixer empty and parent vessel full) and fully loaded (pulse jet mixer full and parent vessel empty) in addition to thrust.

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	FV	80	10	Nominal assumption for testing
Operating Pressure	psig	FV	72.5	8.6x10⁶	
Operating Temperature	°F	50	194	1465	Parent Vessel will be operating normally at a temperature of 77 °F
Contents Specific Gravity		1.00	1.42	1465	
Contents Level	inch	Empty	Flooded	8.6 X 10⁶	
Localized Features					
Nozzles		Within 9°F of operating temperature range.		As above.	
Supports		Buoyant	Loaded	8.6X 10⁶	

Notes

- Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.**