Notes/Remarks

Note 1: All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.

Note 2: External design pressure for the shell areas under the jacket shall be rated for the jacket internal design pressure plus 2.0 PSIG (negative) vessel external design pressure to account for ventilation fan pressures. 8

Note 3: - Corrosion allowance for jacket shall be 0.04 inch.

8 - Vessel bottom head - reference 24590-WTP-M0E-50-00014 Attachment 10-11 provides additional vessel erosion allowance of 0.903" (max) for HLP-VSL-00028. This erosion allowance is accounted for via the 1" thick wear plates installed in the vessel bottom head directly under the PJM outlet nozzle.
- PJM additional erosion allowance from reference 24590-WTP-M0C-50-00004 Rev E, Table 10-5, provides an erosion allowance of 0.117" (HLP-28) for the stellite 12 material used in the PJM cones. The minimum thickness requirement for the PJM stellite cone material is 0.4375".

Note 4: Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of all internals, supports and cluster. 8

Note 5: Contents of this document are Dangerous Waste Permit affecting.

Note 6: Deleted.

Note 7: Grind smooth shell welds at shell-jacket welds.

Note 8: Maximum carbon content of 0.030% for all welded components.

Note 9: Deleted. 8

Note 10: This vessel is located in a Black Cell.

Note 11: Deleted per report N0. 24590-WTP-RPT-M-04-00007 dated Nov. 01, 2004

Note 12: 8 (a) The intent is to provide a concrete mix with low chlorides, low moisture, low porosity and inhibits corrosion. The concrete formulation and blending should follow the relevant paragraphs in ASTM C 94, Option B. The Portland cement should be Type I/II conforming to ASTM C 150. Coarse aggregates shall be no larger than 3/4" diameter. The coarse and fine aggregates should be tested for chloride content using ASTM C 1152 and requiring less than 0.01% (100 ppm) acid-soluble chloride, and by limiting the water chloride content to less than 200 ppm. The concrete mix shall include chemical admixtures, follow ASTM C494 for control over admixtures. A final report, see ASTM C494 Section 19, shall be submitted, the report is required to have a precision statement.

Additional WTP requirements:

- Do not use blast furnace slag in the concrete.
- To reduce the permeability, the water-to-cement ratio shall be low, lower than 0.40%, using a Type F admixture in quantities that have no adverse effects on fresh and hardened properties.
- To reduce the corrosion, an admixture shall be used, calcium nitrate is to be added at a concentration no more than 32 lb/yd^3.
- Use Type F fly ash and silica fume, to reduce porosity, add in quantities to minimize porosity with no adverse effects on fresh and hardened properties.

The concrete is to fill the entire cluster volume up to the bottom of the fill nozzle. Concrete shall be poured in a manner that allows for the even distribution of aggregate and mechanically vibrated to assure no major pockets or voids. Concrete is to be poured through more than one nozzle, in lifts. The seam between lifts is not important.

- Because of the unique geometry and inability to rework or repair the concrete, assurance that the fill is complete and 100% filled via in-process observance, boroscope or other methods. Fill report shall be provided.
- Curing: The concrete shall be thoroughly cured (at least 30 days) before the shroud is closed.
- The seller shall submit mix design and complete procedure for concreting for buyer's approval.
- 8 The concrete fill can be purchased commercial

(b). Fill gap completely between PJM shroud and stellite nozzles with Aremco 646-N Ceramacast (or equal), see CCN 156345 for procedure.

Note 13: Deleted. 8

Note 14: Vessel to be designed, fabricated, tested to L-1 and black cell requirements defined in 24590-WTP-3PS-MV00-T0001.

REMARKS CONTINUED:

Note 15: ***Clarification to quality level, revised specific gravity, operating external pressure, revised vessel external design pressure, revised jacket external pressure, revised operating temperature, added Data Reference, revised Note 2, added Note 14 and Note 15, added functional/safety requirements, added section on Seismic, change to parent vessel cyclic data, change to hydrodynamic loads for normal operations, change to PJM cyclic data, added E&NS table and signature, added section for "Hydrodynamic Loads -Pulse Jet Mixers", added section for "Multiple Overblow PJMs" added section for HPAV Load Conditions, added section for nozzle loads, included environmental qualifications data, added DOE disclaimer. If any Sections contain a revision triangle △# next to the Section heading the entire section must be reviewed for changes/additions.***

Note 16: △8 ***Per CCN 193847, replaced ISRS curves with WSGM curves which provide for a lower acceleration value. Removed HPAV loads and Functional/Safety Requirements. Revised entire Equipment Qualification Sections. Replaced PJM Overblow Loads and added Cluster Overblow Loads. Renumbered Equipment Qualification Notes and numbered/revised Nozzle Load Notes. If any Sections contain a revision triangle △# next to the Section heading the entire section must be reviewed for changes/additions.***

Note 17: ***Nozzle material for (4" diameter) N29A and N30A shall be SB622 (N06022) seamless Hastelloy C-22. Nozzles N29 and N30 (both 6" diameter) act as sleeve (material SA-312-TP-316 smls) for N29A and N30A.*** △8

Hydrodynamic Loading - Pulse Jet Mixers (PJMs) 8

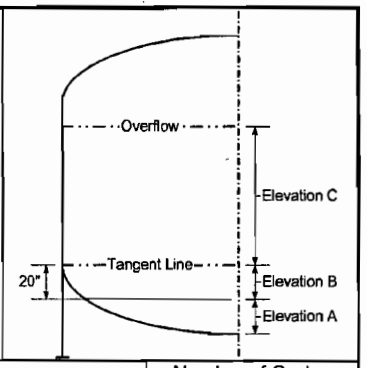
Pulse Jet Mixers (PJMs) are designed to mix the vessel content using a liquid jet discharge. PJM's are driven by compressed air. The mixing is required to enhance the heat transfer from the fluid to the cooling jackets, to homogenize the solution and to release hydrogen from the fluid.
The PJMs operate in the following three cycles: Suction, Drive and Vent. During the suction cycle a vacuum is created in the PJM headspace and the level within the PJM rises to fill the PJM. During the drive cycle the PJM is pressurized and liquid is discharged. During the vent cycle, the pressure in the headspace approaches atmospheric and the level within the PJM is allowed to reach equilibrium.
Vessel components shall be designed to withstand loading induced by PJM operations as described here-in.

Normal Operations : Liquid flows around internal structures within the parent vessel producing hydrodynamic loads such as drag and vortex shedding. Reference the section below for "Normal Operating" loads and "Vortex Shedding" frequencies.

Overblow Condition: Occasionally the drive cycle lasts too long and compressed air is discharged from the PJM. Overblows can also occur during system calibration. One or more multiple PJM's may overblow at any time. These conditions induce acoustic and bubble rise loads on structures and components. Overblow loading conditions are provided in the tables and charts below.

All internal components shall be designed for the combination of normal operations hydrodynamic loads and overblow loads. Single overblows (SOB) act concurrently with the seismic event and other operational loads. Multiple Overblows (MOB) do not act concurrently with the seismic event but are combined with other operational loadings. Figures 1, 2, and 3 below in the "PJM Overblow Loads" section provides the acoustic load intensity and application that encompasses both SOB and MOB.

Normal Operations Loading - PJMs

Description	***Pulse jet mixers (PJM) impose a cyclical hydrodynamic load on all internal components. The components shall be designed and supported against these hydrodynamic loads due to normal operations. The following table indicates the hydrodynamic pressure for normal conditions at ranges of elevations in the vessel and the number of design cycles for this condition. The hydrodynamic forces cycle between the indicated pressure ranges applied across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane. This load combination acts concurrently with seismic loads for normal PJM operations.***	

Condition	Hydrodynamic Pressure Range, psi						Number of Cycles
	Elevation A		Elevation B		Elevation C		
	Radial	Vertical	Radial	Vertical	Radial	Vertical	
Normal Operation	***-0.030 to 0.020***	***-0.030 to 0.020***	***-0.030 to 0.020***	***-0.030 to 0.020***	***-0.025 to 0.057***	***-0.028 to 0.032***	***3.7E6*** 8

8 *Vortex Shedding*

To mitigate the dynamic effects, the following pipe sizes dipped internal to the vessel are required to have a minimum first natural frequency that is double the vortex shedding frequency:

Nominal Pipe Size	*Minimum First Natural Frequency*
1 inch nominal	*4.8 Hz**
2 inch nominal	*2.6 Hz**
3 inch nominal	*1.0 Hz***

* *See 24590-WTP-MVC-50-00006, Section 8.2.2*
** *By extrapolation from 1 inch and 2 inch*

PJM Overblow Loads ⚠8

Discussion: *During normal operation, pulse jet mixers (PJMs) mix the fluid by pulling in (suction) and pushing out (drive) fluid. During an upset condition, designated as an 'overblow', air is discharged following the drive cycle of one or more PJMs. The load consists of acoustic pressure (2Hz to 200Hz) developed in the first 200ms of the event and a load due to the bubble rising through the fluid.*

The acoustic load and the bubble load are design loads as defined by ASME B&PVC, Section 8, Division 1, UG-22, applied statically. The acoustic load is not added to the bubble rise load because they occur at different times during the overblow event.

Acoustic Load

- ***The acoustic design load in Figure 1 is applied to the visible (as viewed from the overblow origin) surface of cylindrical targets such as pipes, charge vessels, and PJMs. The load is applied in the direction normal to the principal axis of the target as illustrated in Figure 2. Note: The intended net effective load on the target is equal to the projected (i.e. cross-sectional) area of the object times the acoustic design load (psi) indicated in Figure 1.***
- ***Each target is considered independent of the surrounding targets: e.g. the surrounding targets do not impede the acoustic wave by casting a shadow, as illustrated in Figure 2.***
- ***The load is <u>not</u> applied to small supports such as gussets, brackets, tabs, clamps, and bolts because they are rigid and the pressure drop across the target is negligible.***
- ***When the vessel contains multiple PJMs, the load from one PJM is independent of the load from other PJMs. The loads are not additive for multiple overblows.***
- ***No internal components shall be placed within 5 PJM nozzle diameters (5 * 4 in = 20 in) of a spherical zone centered at any overblowing PJM nozzle.***

Figure 1: Acoustic Design Load

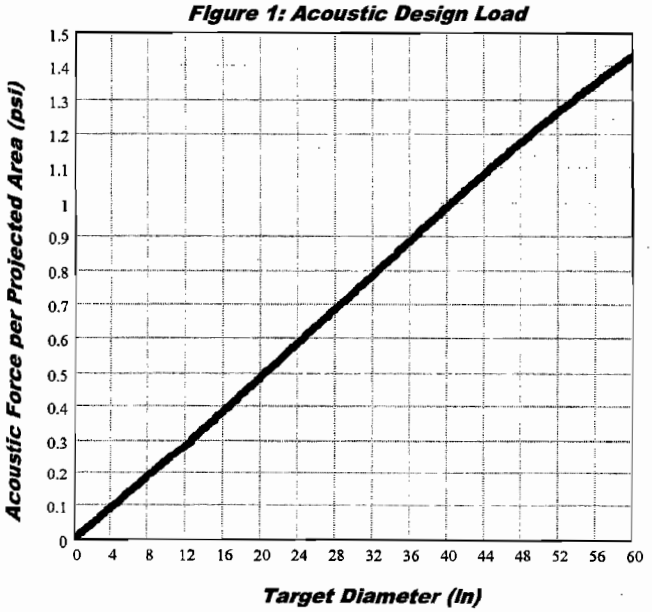
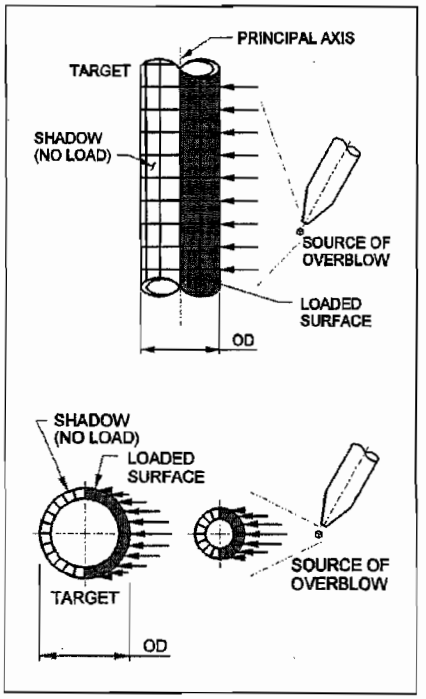


Figure 2: Load Application



The following data is required to determine the load:

- ***Target Diameter***
- ***Target Principal Axis***
- ***Overblow Source Coordinates***

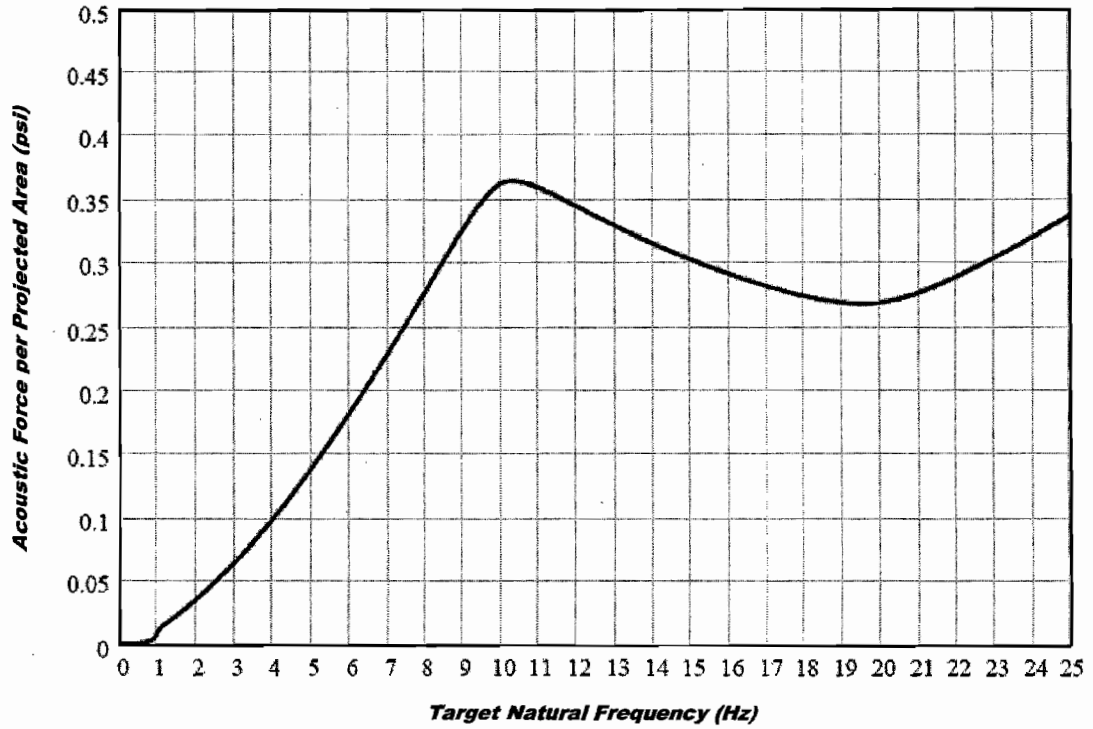
Number of Acoustic Cycles	***1000 events X 40 cycles/event for a total of 40,000 cycles***
Bubble Rise Load	***A vertical force per projected area of 1.7 psi is applied to the surfaces in the 36-inch diameter cylindrical zone centered at the overblowing PJM(s). The bubble can be at any elevation above the overblowing PJM and only affects one zone (36-inch diameter region) at a time. When there are multiple PJMs in a vessel (MOB), each PJM has it's own bubble. To simplify analysis the bubble can be applied in a continuous cylindrical zone above each PJM.***
Number Bubble Rise Cycles	***1000 events X 1 cycle/event for a total of 1,000 cycles***

PJM Cluster Overblow Load 8

Discussion: *The acoustic design pressure on the cluster is determined from equation 5-8 in 24590-WTP-MVC-50-00011, Rev B. The worst-case orientation of the load needs to be determined by the user.*

Acoustic Load	***The following is the load magnitude for the PJM Cluster in HLP-VSL-00027A/B/28 with an outer radius of 89.5 inches measured to the outer most radii of the cluster. Follow the steps described below:*** ***1. Isolate the PJM Cluster and supports from parent vessel*** ***2. Run a modal analysis and determine the first frequency*** ***3. Use Figure 3 (below) to find the acoustic force per projected area*** ***4. Apply the static load in the same orientation as Indicated in Figure 2 (above)***
Number of Acoustic Cycles	***1000 events X 40 cycles/event***

Figure 3: Acoustic Design Pressure on Cluster



BECHTEL	**MECHANICAL DATA SHEET: VESSEL** **EQUIPMENT QUALIFICATION**	**PLANT ITEM No.** ***24590-PTF-MV-HLP-VSL-00028***

Equipment Cyclic Data Sheet - Parent Vessel 8

Plant Item Number	***24590-PTF-MV-HLP-VSL-00028***
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 240 316 with max. Carbon of 0.030 %***
Design Life	***40 years***
Component Function and Life Cycle Description	**This vessel is filled and drained over a period of 8 days, resulting in 2000 cycles over a 40 year life. The vessel is drained and the internals are washed yearly. The temperature is maintained normally at or below 140°F.**

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***-8***	***15***	***10***	***Nominal assumption for testing***
Operating Pressure	psig	***-1.5*** ***-1.5***	***0*** ***2.8***	***7.0E6*** ***40***	***Maximum Operating*** ***Loss of Power***
Operating Temperature	°F	***59***	***140***	***2000***	***Uniform material temperature range, not between two points. Temperature cycling is not required by design.***
Contents Specific Gravity		***1.00***	***1.5***	***2000***	***Nominal assumption. Coincident with contents level cycles***
Contents Level	inch	***24***	***392***	***2000***	***Content level measured from center of bottom head***
Localized Features					
Nozzles **N29A** and **N30A**	°F	***59***	***212***	***2000***	***Localized affect for Nozzles N29A and N30A***
Cooling Jacket 8	°F				***Cooling Water inlet temperature is 50° F (max)***

Notes

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

Equipment Cyclic Data Sheet - PJMs 8

Component Plant Item Number	***HLP-PJM-00076, HLP-PJM-00077, HLP-PJM-00078, HLP-PJM-00079, HLP-PJM-00080, HLP-PJM-00081, HLP-PJM-00082, HLP-PJM-00083***
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	***SA 240 316 with max. Carbon of 0.030 %***
Design Life	***40 Years***
Component Function and Life Cycle Description	***These pulse jet mixers (PJMs) are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs 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 PJM supports shall be designed to cycle between fully buoyant (PJM empty and parent vessel full) and fully loaded (PJM full and parent vessel empty) states. Thrust load shall be applied only to the fully buoyant state. Assume the parent vessel is full for 50% of the number of PJM cycles.***

Load Type		Min	Max	Number of Cycles	Comment
Design Pressure	psig	***FV***	***80***	***100***	***Nominal assumption***
Operating Pressure	psig	***FV***	***49***	***3.7E6***	***Pressure cycles to be at 140° F and non-coincident with temperature cycles***
Operating Temperature	°F	***59***	***140***	***2000***	***Parent Vessel will be operated normally at or below 140°F***
Contents Specific Gravity		***1.00***	***1.5***	***2000***	
Contents Level	inch	***Empty***	***Flooded***	***3.7E6***	
Thrust	lbf	***-394***	***394***	***3.7E6***	
Localized Features					
Supports		***buoyant to loaded***		***3.7E6***	

Notes

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

Nozzle Loads 8

Nozzle	Size	Load Type	Loads - lbs	Moments - ft-lbs

Nozzle Loads 8

Nozzle	Size	Load Type	Loads - lbs			Moments - ft-lbs		
			Fx	Fy	Fz	Mx	My	Mz
N01	24"	Weight	Manway (No loads applied)					
		Seismic						
		Thermal						
N02	8"	Weight	234	373	234	741	464	464
		Seismic	2189	2121	4090	5159	27300	11165
		Thermal	893	1480	1193	3600	7193	14537
N04	6"	Weight	N04 is parent nozzle, nozzle loads are applied via N04A, N04B, N04C					
		Seismic						
		Thermal						
N04A (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	29	40	38	77	77
N04B (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	32	40	38	77	77
N04C (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	26	40	38	77	77
N05	10"	Weight	264	421	264	1410	885	885
		Seismic	2048	956	1432	9634	14438	14438
		Thermal	953	848	1286	6375	12750	12750
N06	4" Spare	Weight	87	140	87	216	135	135
		Seismic	480	320	480	1537	2310	2310
		Thermal	295	263	393	945	1890	1890
N07	2"X1"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N08	6"	Weight	N08 is parent nozzle, nozzle loads are applied via N08A, N08B, N08C					
		Seismic						
		Thermal						
N08A (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	72	96	102
		Thermal	30	26	40	38	77	77
N08B (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	26	40	38	77	77
N08C (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	68	96	96
		Thermal	30	26	40	38	77	77
N09	6"	Weight	N09 parent nozzle, nozzle loads are applied via N09A, N09B, N09C					
		Seismic						
		Thermal						
N09A (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	26	40	38	77	77

Nozzle	Size	Load Type	Loads - lbs			Moments - ft-lbs		
			Fx	Fy	Fz	Mx	My	Mz
N09B (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	26	40	38	77	77
N09C (Note C)	1"	Weight	15	20	15	20	20	20
		Seismic	53	35	53	65	96	96
		Thermal	30	26	40	38	77	77
N10	2"	Weight	50	97	50	75	75	75
		Seismic	194	210	186	277	842	966
		Thermal	114	100	152	169	337	337
N11	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	205	277	415	415
		Thermal	114	134	254	292	337	337
N12	2"	Weight	50	111	50	81	75	75
		Seismic	186	443	186	833	415	415
		Thermal	114	100	152	169	337	337
N13	2"	Weight	50	71	50	75	75	75
		Seismic	186	149	186	378	415	499
		Thermal	114	142	152	175	337	337
N14	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N15	2"	Weight	50	60	50	75	75	75
		Seismic	186	180	186	277	415	415
		Thermal	114	100	152	193	337	337
N16	2"	Weight	50	60	50	75	75	75
		Seismic	186	163	186	277	415	415
		Thermal	114	100	152	195	337	337
N17	2"	Weight	50	63	50	75	75	75
		Seismic	235	154	208	921	415	929
		Thermal	114	100	152	169	337	337
N18	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	756	415	749
		Thermal	114	100	152	169	337	337
N19	2"	Weight	59	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N20	2"	Weight	50	67	50	75	75	75
		Seismic	186	326	186	406	415	415
		Thermal	114	100	152	169	337	337
N21	2"	Weight	50	60	50	75	75	75
		Seismic	186	159	186	277	415	438
		Thermal	114	100	152	169	337	337
N25	2" Spare	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337

Nozzle	Size	Load Type	Loads - lbs			Moments - ft-lbs		
			Fx	Fy	Fz	Mx	My	Mz
N27	3"	Weight	52	193	52	332	75	75
		Seismic	621	634	635	1509	1808	1474
		Thermal	171	153	229	498	998	998
N28	2" Spare	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N29 / N29A	6" / 4"	Weight	20	200	20	100	100	300
		Seismic	175	175	175	438	438	438
		Thermal	650	500	475	750	1200	1200
N30 / N30A	6" / 4"	Weight	20	200	20	100	100	300
		Seismic	175	175	175	438	438	438
		Thermal	650	500	475	750	1200	1200
N31	3" Spare	Weight	52	84	52	119	75	75
		Seismic	284	189	284	819	1227	1227
		Thermal	171	153	229	498	998	998
N32	3"	Weight	52	158	52	129	75	75
		Seismic	445	329	319	845	1227	1227
		Thermal	171	234	229	498	998	998
N33	2"	Weight	50	155	50	75	75	81
		Seismic	186	173	186	497	415	415
		Thermal	114	100	152	169	337	337
N34	3"	Weight	52	127	52	150	75	75
		Seismic	523	415	284	819	1227	1227
		Thermal	171	153	229	498	998	998
N36	4"	Weight	87	160	87	216	135	428
		Seismic	480	320	480	1537	2310	2310
		Thermal	295	263	393	945	1890	1890
N37	3"	Weight	52	107	52	119	75	75
		Seismic	375	249	284	847	1227	1227
		Thermal	171	167	229	498	998	998
N38	3"	Weight	52	84	52	119	75	75
		Seismic	284	189	299	1141	1227	1398
		Thermal	171	153	229	498	998	998
N39	4"	Weight	87	140	87	216	135	350
		Seismic	480	326	781	1537	2503	2310
		Thermal	295	263	393	945	1890	1890
N40	4"	Weight	87	228	87	271	135	593
		Seismic	704	320	480	1537	6069	2310
		Thermal	295	263	393	945	1890	1890
N41	3"	Weight	80	84	52	119	102	75
		Seismic	284	231	347	819	1227	1227
		Thermal	410	457	229	987	998	998
N43	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337

Nozzle	Size	Load Type	Loads - lbs			Moments - ft-lbs		
			Fx	Fy	Fz	Mx	My	Mz
N44	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N45	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N46	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N47	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N48	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N49	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N50	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N51	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N52	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N53	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N54	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N55	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N56	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N57	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N58	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337

Nozzle	Size	Load Type	Loads - lbs			Moments - ft-lbs		
			Fx	Fy	Fz	Mx	My	Mz
N59	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N60	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N61	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N62	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N63	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N64	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N65	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N66	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N67	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N68	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N69	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N70	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N71	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N72	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N73	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337

	MECHANICAL DATA SHEET: VESSEL EQUIPMENT QUALIFICATION	PLANT ITEM No. *24590-PTF-MV-HLP-VSL-00028*

Nozzle	Size	Load Type	Loads - lbs			Moments - ft-lbs		
			Fx	Fy	Fz	Mx	My	Mz
N74	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N75	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N76	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N77	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N78	2"	Weight	50	60	50	75	75	75
		Seismic	186	123	186	277	415	415
		Thermal	114	100	152	169	337	337
N80	8"	Weight	475	475	475	475	475	475
		Seismic	1313	1313	1313	1313	1313	1313
		Thermal	600	600	600	600	600	600
N81	8"	Weight	475	475	475	475	475	475
		Seismic	1313	1313	1313	1313	1313	1313
		Thermal	600	600	600	600	600	600

Notes for Nozzle Loads △8

A. Direction of load application is per diagrams in 24590-WTP-3PS-MV00-T0001 Appendix A.

B. *For nozzles in head: x = North/South, y = Vertical, and z = East/West - Vessel 0° defined as north.*

C. *Values provided at plate on top of parent nozzle. Loads for 6" instrument nozzles are summed from 1" - A, B and C loads.*

D. *Nozzle loads shown are to be used in place of those specified in 24590-WTP-3PS-MV00-T0001 – do not apply any thermal reduction factors.*

E. *All Pretreatment RGM Seismic Piping Nozzle loads from Plant Design have a 1.75 load factor applied to all seismic loads to address coupling effects between the flexible vessels and piping in accordance with the Seismic Classification and Evaluation for the Pretreatment Facility Piping and Vessels 24590-WTP-RPT-ENG-09-040. (BNI use only, see CCN 229865 for nozzle load management).*

F. *Apply loads at the vessel head to 6" nozzle junction*

EQUIPMENT QUALIFICATION DATASHEET (EQD)

Equipment Identification

Component Tag Number	24590-PTF-MV-HLP-VSL-00028	Safety Classification	☒ SC ☐ SS ☐ APC ☐ SDC ☐ SDS ☐ RRC
Manufacturer / Supplier	Harris Thermal		
Requisition Number	24590-QL-MRB-MVA0-00001		
Model	Custom	Seismic Category	☒ SC-I ☐ SC-II ☐ SC-III ☐ SC-IV
Description (Include descriptive text [e.g., location, elevation])	HLW Lag Storage Vessel. Elevation 0'-0", Column Lines J and 20. 8		
Safety Function(s)	HLP-VSL-00028 (parent vessel) is considered a high active process vessel credited to prevent spills of large quantities of high activity process liquid and provide primary confinement for radioactive releases. Pulse Jet Mixers (PJMs) provide a mixing function in the vessel to prevent hydrogen accumulation. Air sparger piping provides air to mix solids and dilute hydrogen to prevent hydrogen accumulation. Vessel level instrumentation provides level monitoring to prevent overflows of non-Newtonian fluids into Newtonian overflow vessels and ensure proper headspace volumes are maintained for hydrogen dilution. (24590-WTP-PSAR-ESH-01-002-02 Rev 4q, Section 4.3.4, 4.3.5, and Table 4A-1) 8		

Seismic Safety Function	☒ Yes ☐ No	Room Number(s): P-0102A	
Maintenance Accessible	☐ Yes ☒ No	Method of Maintenance Access:	☐ Remote ☐ Hands On ☒ None
Seismic Operability Requirements:	☒ During Seismic Event	☒ After Seismic Event	
ITS Equipment Type:	☒ Passive Mechanical	☐ Active Mechanical	☐ Electrical

Equipment Environmental Qualification (EEQ)

Environment ☒ Mild ☐ Harsh Contamination Class: C5 Radiation Class: R5	Hi Rad Service ☒ Yes ☐ No	Design Life (yrs) ☒ 40 ☐ Other ____

Parameter Type/Units	Parameter Value	Time Duration (number)	Time Units	WTP Document Number (BUYER)	Submittal Number (SELLER)
Normal					
Normal High Temperature (°F)	113	40	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Normal Low Temperature (°F)	59	40	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Normal High Relative Humidity (%RH)	90	40	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Normal Low Relative Humidity (%RH)	5	40	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Normal High Pressure (in.-w.g.)	0 (E-Note 2)	40	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Normal Low Pressure (in.-w.g.)	(-) 1.4	40	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Normal Radiation Dose Rate (mR/hr)	991000 (E-Note 2)	40 (E-Note 5)	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Vibration Magnitude (g)	N/A	N/A	N/A	N/A	N/A
Vibration Frequency (Hz)	N/A	N/A	N/A	N/A	N/A
Additional Normal Information:	N/A				

Equipment Environmental Qualification (EEQ) *(continued)*

Parameter Type/Units	Parameter Value	Time Duration (number)	Time units	WTP Document Number (BUYER)	Submittal Number (SELLER)
Abnormal					
Abnormal High Temperature (°F)	127	8	hrs/yr	24590-PTF-U0D-W16T-00001	E-Note 1
Abnormal Low Temperature (°F)	40	8	hrs/yr	24590-PTF-U0D-W16T-00001	E-Note 1
Abnormal High Relative Humidity (%RH)	100c	1	hrs/yr	24590-PTF-U0D-W16T-00001	E-Note 1
Abnormal Low Relative Humidity (%RH)	6	24	hrs/yr	24590-PTF-U0D-W16T-00001	E-Note 1
Abnormal High Pressure (in.-w.g.)	4 (E-Note 2)	8	hrs/yr	24590-PTF-U0D-W16T-00001	E-Note 1
Abnormal Low Pressure (in.-w.g.)	(-) 7.3 (E-Note 2)	8	hrs/yr	24590-PTF-U0D-W16T-00001	E-Note 1
Abnormal Radiation Dose Rate (mR/hr)	991000 (E-Note 4)	0 (E-Note 5)	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Wet Sprinkler System Present	No	N/A	N/A	24590-PTF-U0D-W16T-00001	E-Note 1
Additional Abnormal Information	100c = 100% RH condensing				
Design Basis Events (DBE)					
DBE High Temperature (°F)	138	1000	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
DBE Low Temperature (°F)	40	1000	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
DBE High Relative Humidity (%RH)	100c	40	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
DBE Low Relative Humidity (%RH)	4	1000	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
DBE High Pressure (in.-w.g.)	4 (E-Note 2)	1000	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
DBE Low Pressure (in.-w.g.)	(-) 7.3 (E-Note 2)	1000	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
DBE Radiation Dose Rate (mR/hr)	991000 (E-Note 4)	0 (E-Note 5)	yrs	24590-PTF-U0D-W16T-00001	E-Note 1
Flood Height (ft)	2.08	1000	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
Submergence (ft)	N/A	N/A	N/A	N/A	E-Note 6
Chemical/Spray Exposure	Yes	12.5	hrs	24590-PTF-U0D-W16T-00001	E-Note 1
Additional DBE Information	100c = 100% RH condensing				

DBE Chemical Exposure Details	
DBE Chemical Types/Concentrations	Process Rad Condensate Nitric Acid 2M Sodium Hydroxide 2M Water

Interfaces (Electrical)	
Power Supply Voltage (VAC, VDC)	N/A
Power Supply Frequency (Hz)	N/A
Power Connection Method	N/A
I/O Signals to/from Equipment	N/A
I/O Connection Method	N/A

Interfaces (Mechanical)	
Mounting Configuration (orientation)	Vertical Mounted , Skirt
Mounting Method (bolts, welds, etc.)	Welded skirt to ring beams welded to embedment plates. Embedment plate details per 24590-PTF-DD-S13T-00039, 24590-PTF-DD-S13T-00036, 24590-PTF-DD-S13T-00042 and 24590-PTF-DD-S13T-00045 provided to the vendor in the material requisition
Auxiliary Devices	Pulse Jet Mixers - HLP-PJM-00076, HLP-PJM-00077, HLP-PJM-00078, HLP-PJM-00079, HLP-PJM-00080, HLP-PJM-00081, HLP PJM-00082, HLP-PJM-00083. Auxiliary Devices are located within the vessel.

Equipment Seismic Qualification (ESQ)

Parameter	Title	Reference/Document Number	Version / Revision	Remarks
WTP Seismic Design Specification (BUYER)	Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks Engineering Specification for Seismic Qualification Criteria for Pressure Vessels	24590-WTP-3PS-SS90-T0001 24590-WTP-3PS-MV00-T0002	2 3	N/A
Specified Seismic Load (BUYER)	Seismic Analysis of Pretreatment Building - WSGM In-Structure Response Spectra (ISRS)	24590-PTF-S0C-S15T-00057	A	CCN 185271: WSGM ISRS Curves; Figures 21E, 22E, and 24E
Design Seismic Load (SELLER	TBD	TBD	TBD	E-Note 3
Qualification Method (SELLER)	TBD	TBD	TBD	Dynamic Analysis utilizing response spectra curves
Qualification Report Number (SELLER)	TBD	TBD	TBD	E-Note 3
Submittal Number (BUYER)	TBD	TBD	TBD	N/A

EQUIPMENT QUALIFICATION DATASHEET (EQD)

Equipment Qualification Notes and Additional Information

E-Note 1: BNI (BUYER) shall perform Equipment Environmental Qualification.

E-Note 2: Where pressure is given in inches of water column (in-w.c.) in the source document, it is generally assumed that this is in reference to atmospheric pressure and is therefore equivalent to inches of water gage (in-w.g.).

E-Note 3: SELLER shall perform Equipment Seismic Qualification.

E-Note 4: Radiation Dose Rates are for determining shielding requirements only for the black cell and are not at the source (vessel). Since the vessel is all metallic and the source has no neutron components for material embrittlement, the dose rates are of no concern on the vessel or its subcomponents.

E-Note 5: Normal, Abnormal, and DBE dose rates are the same, therefore, abnormal & DBE doses do not add to total integrated dose based on normal dose rates over 40 years.

E-Note 6: Flood height is 2.08 ft above the floor, bottom of vessel is above this level, therefore, no submergence evaluation is required.

DOE Radioactive Materials Disclaimer:

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the US 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.

Screening / Evaluation Required? If yes per 24590-WTP-GPP-SREG-002, E&NS signature required below	X	Yes		No

Approval

Rev	Description	System Engineer	Vessel Engineer	Checked	Reviewed/ MET	E&NS	Approved	Date
0	Issued for Purchase	R. Rider	Suharto	U. Sen C. Slater	N/A	N/A	S. Kirk	10/03/02
1	Revised as Marked, Delete Charge Vessel and RFD per Rev. 0 P&ID	R. Rider	Suharto	S. Arora/ C. Slater	N/A	N/A	M. Hoffmann	07/10/03
2	Revised Parent Vessel Component Function and Life Cycle Description, Vessel Operating and Design Temperatures, Jacket Design Temperature and Content Cyclic Data. Other Revisions are for Clarity and Consistency.	R. Rider	R. Simmons	Y. Hovanski C. Slater	R. Stevens	N/A	M. Hoffmann	11/14/03
3	Added Black Cell Requirements	R. Rider	R. Simmons	Y. Hovanski C. Slater	N/A	N/A	M. Hoffmann	02/04/04
4	Added Non-Newtonian Mixing Requirements	R. Rider	R. Simmons	Y. Hovanski C. Slater	J. Julyk	N/A	M. Hoffmann	04/28/04
5	Revised concrete for cluster fill per note 12. Deleted note 11. Revised overblow condition loads. Number of overblow cycles revised to 1000 from 100.	R. Rider	R. Simmons	M. Arulampalam	R. Stevens	N/A	S.V./ M. Hoffmann	06/30/05
6	Revised per note 13 on sheet 2 of 5	R. Rider	H. Khurana	J. Polani	C. Slater/ D. Adler	N/A	J. Julyk	10/28/05
7	Revised per Note 15 and as noted.	R. Rider	M. Arulampalam	R. Peters/ M. Seed	D. Adler	G Hendricks for J. Hinckley	J. Julyk	02/13/08
8	Incorporated 24590-QL-MRB-MVA0-00001-T0001 and T0002. Revised per Note 16 & 17. Incorporate 24590-QL-MRB-MVA0-00001-T0007	D. Evans	B. Makadia	M. Seed	D. Adler	J. Hinckley	J. Julyk	3/14/11

MHS 3/15/11

REFERENCES for Data Sheets: 24590-PTF-MVD-HLP-00007, 00008, 00009 *(For BNI Use only)*
Vessel Tags: HLP-VSL-00027A/27B and 28

Data	Document #	Rev	Document Title/ Comments
Quality Level	24590-PTF-M6-HLP-00001001	0	*P&ID - PTF HLW LAG Storage and Feed Blending Process System Vessel HLP-VSL-00027A*
	24590-PTF-M6-HLP-00001002	0	*P&ID - PTF HLW LAG Storage and Feed Blending Process System Vessel HLP-VSL-00027B*
	24590-PTF-M6-HLP-00003001	0	*P&ID - PTF HLW LAG Storage and Feed Blending Process System Vessel HLP-VSL-00028*
Seismic Category	24590-PTF-M6-HLP-00001001	0	*P&ID - PTF HLW LAG Storage and Feed Blending Process System Vessel HLP-VSL-00027A*
	24590-PTF-M6-HLP-00001002	0	*P&ID - PTF HLW LAG Storage and Feed Blending Process System Vessel HLP-VSL-00027B*
	24590-PTF-M6-HLP-00003001	0	*P&ID - PTF HLW LAG Storage and Feed Blending Process System Vessel HLP-VSL-00028*
Design Specific Gravity	24590-WTP-RPT-ENG-07-007	0	*Process Stream Properties,* Table 4.20
Max Operating Volume	24590-PTF-M6C-HLP-00003	F	*Vessel Sizing Calculation for HLW LAG Storage Vessels (HLP-VSL-00027A/B)*
	24590-PTF-M6C-HLP-00004	F	*Vessel Sizing Calculation for HLW Feed Blending Process Vessel (HLP-VSL-00028)*
Total Volume	24590-PTF-M6C-HLP-00003	F	*Vessel Sizing Calculation for HLW LAG Storage Vessels (HLP-VSL-00027A/B)*
	24590-PTF-M6C-HLP-00004	F	*Vessel Sizing Calculation for HLW Feed Blending Process Vessel (HLP-VSL-00028)*
Inside Diameter	24590-PTF-M6C-HLP-00003	F	*Vessel Sizing Calculation for HLW LAG Storage Vessels (HLP-VSL-00027A/B)*
	24590-PTF-M6C-HLP-00004	F	*Vessel Sizing Calculation for HLW Feed Blending Process Vessel (HLP-VSL-00028)*
Length TL-TL	24590-PTF-M6C-HLP-00003	F	*Vessel Sizing Calculation for HLW LAG Storage Vessels (HLP-VSL-00027A/B)*
	24590-PTF-M6C-HLP-00004	F	*Vessel Sizing Calculation for HLW Feed Blending Process Vessel (HLP-VSL-00028)*
Operating Pressure (external)	24590-PTF-M6C-PVP-00017	A	*HADCRT Analysis of PTF PVP System at Various Operating Scenarios,* Scrubber controlled at -35 in wg (1.3 psig) with an additional margin.
Operating Pressure (internal)	24590-PTF-MVC-10-00003	C	*PTF Vessel Cyclic Datasheet Inputs*
Design Pressure (external)	24590-PTF-M6C-PVP-00017	A	*HADCRT Analysis of PTF PVP System at Various Operating Scenarios,* Scrubber controlled at -35 in wg (1.3 psig) with an additional margin.
Design Pressure (internal)	24590-WTP-DB-ENG-01-001	1O	*Basis of Design*
Jacket Design Pressure (internal)	24590-PTF-MVC-10-00003	C	*PTF Vessel Cyclic Datasheet Inputs*
Operating Temp	24590-PTF-MVC-10-00003	C	*PTF Vessel Cyclic Datasheet Inputs*
	24590-PTF-MVC-HLP-00010	E	*Design of Cooling Jacket for HLW LAG Storage Vessels (HLP-VSL-00027A/B), Section 7.3*
	24590-PTF-MVE-HLP-00009	N/A	*Transient Cool-down Calculation of HLP-VSL-00027B for Different Levels (applies to HLP-27A & 27B)*
	24590-PTF-MVC-HLP-00011	E	*Design of Cooling Jacket for HLW Feed Blending Vessel (HLP-VSL-00028), Section 7.3*
	24590-PTF-MVE-HLP-00011	N/A	*Transient Cool-down Calculation of HLP-VSL-00028 for Different Levels*
Design Temp	24590-WTP-GPG-M-050	2	*Pressure Vessel and Heat Exchanger Design*

REFERENCES for Data Sheets: 24590-PTF-MVD-HLP-00007, 00008, 00009 *(For BNI Use only)*
Vessel Tags: HLP-VSL-00027A/27B and 28

Data	Document #	Rev	Document Title/ Comments
Jacket Design Temp	24590-WTP-GPG-M-050	2	*Pressure Vessel and Heat Exchanger Design*
Corrosion Allowance, Erosion Allowance (Note 1 and Note 2)	24590-PTF-N1D-HLP-00007 24590-PTF-N1D-HLP-00010	6 6	*HLP-VSL-00027A&B (PTF) HLW LAG Storage Vessel* *HLP-VSL-00028 (PTF) HLW Feed Blending Vessel*
Materials of Construction	24590-PTF-N1D-HLP-00007 24590-PTF-MV-HLP-00006 24590-PTF-MV-HLP-00005 24590-PTF-N1D-HLP-00010 24590-PTF-MV-HLP-00004	6 2 2 6 2	*HLP-VSL-00027A&B (PTF) HLW LAG Storage Vessel* *Equipment Assembly HLW LAG Storage Vessel HLP-VSL-00027A* *Equipment Assembly HLW LAG Storage Vessel HLP-VSL-00027B* *HLP-VSL-00028 (PTF) HLW Feed Blending Vessel* *Equipment Assembly HLW Feed Blend vessel HLP-VSL-00028*
Design Pressure (PJM)	24590-BOF-M6C-PSA-00001 24590-PTF-MVE-10-00012	B N/A	*Plant Service Air System Sizing* *Update PJM Cyclic Data and supporting assumptions*
Operating Pressure (PJM)	24590-PTF-MVC-10-00003 24590-PTF-MVE-10-00012	C N/A	*PTF Vessel Cyclic Datasheet Inputs* *Update PJM Cyclic Data and supporting assumptions*
Operating Temperature (PJM)	24590-PTF-M6C-HLP-00003 24590-PTF-M6C-HLP-00004	F F	*Vessel Sizing Calculation for HLW LAG Storage Vessels (HLP-VSL-00027A/B)* *Vessel Sizing Calculation for HLW Feed Blending Process Vessel (HLP-VSL-00028)*
Cyclic Data (Vessel)	24590-PTF-MVC-10-00003 24590-PTF-MVE-10-00006	C N/A	*PTF Vessel Cyclic Datasheet Inputs* *Change assumed number of cycles for HLP-VSL-00027B and HLP-VSL-00028*
Cyclic Data (PJM)	24590-PTF-MVC-10-00003 24590-PTF-MVE-10-00012 24590-WTP-M6C-50-00011	C N/A A	*PTF Vessel Cyclic Datasheet Inputs* *Update PJM Cyclic Data and supporting assumptions* *Pulse Jet Mixer Internal Pressures and Thrust*
Hydrodynamic Loads Vortex Shedding	24590-WTP-MVC-50-00006 24590-WTP-MVC-50-00006	A A	*Hydrodynamic Loads for Normal PJM Operation in Vessels With Non-Newtonian Fluids* *Hydrodynamic Loads for Normal PJM Operation in Vessels With Non-Newtonian Fluids*
Hydrodynamic Loads (Cycles)	24590-PTF-MVE-10-00012	N/A	*DCN to 24590-PTF-MVC-10-00003, Update PJM Cyclic Data and supporting assumptions,* hydrodynamic load cycles are based on PJM operating cycles.
Single PJM Overblow Loads	24590-WTP-MVC-50-00008	C	*Hydrodynamic Loads for PJM Overblow in Vessels With Non-Newtonian Fluids*
PJM Overblow Loads	24590-WTP-MVC-50-00011	B	*Pulse Jet Mixer Overblow Vessel Loads*
Single Overblow Cycles	24590-PTF-MVC-10-00003 24590-PTF-MVE-10-00004	C N/A	*PTF Vessel Cyclic Datasheet Inputs* *Add PJM Overblow Frequency Assumption*

REFERENCES for Data Sheets: 24590-PTF-MVD-HLP-00007, 00008, 00009 *(For BNI Use only)*
Vessel Tags: HLP-VSL-00027A/27B and 28

Data	Document #	Rev	Document Title/ Comments
Multiple Overblow Cycles	24590-PTF-MVC-10-00003	C	*PTF Vessel Cyclic Datasheet Inputs*
	24590-PTF-MVE-10-00004	N/A	*Add PJM Overblow Frequency Assumption*
Nozzle Loads	CCN 124018 (HLP-27A)	N/A	*Nozzle Design Loads for HLP-VSL-00027A*
	CCN 204141 (HLP-27A)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00027A N29, N30, N33, N34, N37*
	CCN 230850 (HLP-27A)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00027A Camera Port Nozzles (N76, N77)*
	CCN 151556 (HLP-27B)	N/A	*Nozzle Design Loads for HLP-VSL-00027B*
	CCN 204151 (HLP-27B)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00027B N29 and N30 revised*
	CCN 229174 (HLP-27B	N/A	*Supplemental Nozzle Loads for HLP-VSL-00027B Nozzle N02*
	CCN 229176 (HLP-27B)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00027B N32, N38, N41*
	CCN 230851 (HLP-27B)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00027B Camera Port Nozzles (N80, N81)*
	CCN 126208 (HLP-28)	N/A	*Nozzle Design Loads for HLP-VSL-00028*
	CCN 191682 (HLP-28)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00028 N29 and N30 revised*
	CCN 230852 (HLP-28)	N/A	*Supplemental Nozzle Loads for HLP-VSL-00028 Camera Port Nozzles (N80, N81)*
	24590-WTP-RPT-ENG-09-040	0	*Seismic Classification and Evaluation for the PTF Facility Piping and Vessels* / Section 3.2 page 19, for 1.75 seismic factor to RGM nozzle loads

Notes:
1. Vessel bottom head - additional erosion allowance from reference 24590-WTP-M0C-50-00004 Rev E, Table 10-7 (24590-WTP-M0E-50-00014 Attachment 10-11) shows a vessel erosion allowance of 0.768" (max) for HLP-VSL-000027A/B and 0.903" (max) for HLP-VSL-00028. This erosion allowance is accounted for via the 1" thick wear plates installed in the vessel bottom head directly under the PJM outlet nozzle.
2. PJM additional erosion allowance from reference 24590-WTP-M0C-50-00004 Rev E, Table 10-5, show an erosion allowance of 0.093" (HLP-27A/B) and 0.117" (HLP-28) for the stellite 12 material used in the PJM cones. The minimum thickness requirement for the PJM stellite cone material is 0.4375".