	Exhauster Data Sheet:			MR No. **24590-QL-MRA-MACS-00007**			
				Plant Item No.			Rev. No.
	24590-LAW-MAD-LVP-00006			**24590-LAW-MA-LVP-EXHR-00001A/B/C**			**9**
1	Project	RPP-WTP	Bldg./Room #	LAW/ L-0304 C, D, E			
2	Project #	24590	Supporting Calculations	24590-LAW-M4C-LOP-00001			
3				24590-LAW-M6C-LVP-00004			
4	Site	DOE Hanford		24590-LAW-MEC-LVP-00003			
5	Safety Class	**SS**	Supporting Drawings	24590-LAW-M6-LVP-00001004, 24590-LAW-M6-LVP-00001005, 24590-LAW-M6-LVP-00001006	Quantity Required		**3**
6	Seismic Category	**SC-III**					
7	System No.	**LVP**	System Description	24590-LAW-3YD-LOP-00001	Quality Level		**Q**
8							
9	Description: **LAW Offgas Exhauster**						
10	**EXHAUSTER LOCATION DESIGN CONDITIONS**						
11	Indoor Design Temperature	Minimum **50 °F**	Maximum **113 °F**	Relative Humidity	**10%** (min)		
12	Contamination Classification Area	**C2**		Elevation	**661 ft above MSL**		
13	Environmental Qualification	(See Attachment 2)	Hanford Standard Atmospheric Pressure		**399**	inches WC	
14							
15	**EXHAUSTER DESIGN / MAXIMUM OPERATING CONDITIONS (FLOW CONDITIONS, EACH EXHAUSTER)**						
16	Design / Maximum Exhauster Inlet Flow (NOTE 19)	**4,449/4,075**	ACFM	Exhauster Design Temp	**315**	°F	
17	Design / Maximum Pressure Relative to Atm (Inlet)	**-166/-160**	inches WC	Inlet Gas Temperature at Maximum Flow (Note 12)	**122**	°F	
18	Design / Maximum Pressure Relative to Atm (Outlet)	**+14/+14**	inches WC	Design / Maximum Inlet Gas Density (Note 15)	**0.037/ 0.037**	lbs/cubic foot	
19	Exhauster Efficiency at Design Conditions	***58**	%	Power at Design Conditions	***186**	BHP	
20	Exhauster Speed at Design Conditions	***3425**	RPM	Exhauster Motor Operating Weight	***2253**	pounds	
21	Maximum Discharge Temperature Note 9	***315**	°F	Assembly Weight (Motor + Exhauster + Base) Note 17	***13,000**	pounds	
22	Discharge Temperature at Design Conditions Note 9	***290**	°F	Natural Frequencies (Note 8)	*** Note 8A**	RPM	
23				Deleted	***Deleted**	°F	
24	**EXHAUSTER NORMAL & MINIMUM OPERATING CONDITIONS (FLOW CONDITIONS, EACH EXHAUSTER)**						
25	Normal Exhauster Flow	**3447**	ACFM	Inlet Gas Temperature at Normal Flow (Note 12)	**122**	°F	
26	Pressure Relative to Atm at Normal flow (Inlet)	**-127**	inches WC	Inlet Gas Density at Normal Conditions (Note 15)	**0.042**	lbs/cubic foot	
27	Discharge Temperature at Normal Conditions Note 14	**243**	°F				
28	Minimum Exhauster Flow	**1,516**	ACFM	Inlet Gas Temperature at Minimum flow	**107**	°F	
29	Pressure Relative to Atm at Minimum flow (Inlet)	**-90**	inches WC	Inlet Gas Density at Minimum Conditions (Note 15)	**0.049**	lbs/cubic foot	
30	Discharge Temperature at Minimum Conditions	**185**	°F				
31							
32	**EXHAUSTER CONSTRUCTION**						
33	Exhauster Manufacturer	***Spencer Turbine**		Exhauster Model Number	***GS 42307**		
34	Drive Arrangement	***Coupled**		Inlet Orientation	***Vertical up #5**		
35	Motor Position	**Direct drive**		Discharge Orientation	***Vertical up #1**		
36	Motor Rotation (Note 6)	***CW**		Exhauster Type	***Multi-Stage Centrifugal Blower**		
37	Dimensions (Note 11)	***168.25 x 69.42 x 77**					
38	Exhauster RPM (Design)	***3550**		Exhauster Shaft Diameter	***5 inch under fans**		
39	Brake Horsepower (Design)	***200**		Actual Brake Horsepower	***186**		
40	Exhauster Bearing Type	***Deep Groove Ball**		Exhauster Bearing Designator	***313 Tandem inlet end / 313 KS outlet end**		
41							
42	**EXHAUSTER MATERIALS**						
43	Housing (Note 7)	**316 L stainless steel (Note 18)**		Impellor/ lobes / screw	**316 L stainless steel (Note 18)**		
44	Deleted			Mounting frame	***Structural Steel A36**		
45	Shaft	**410 stainless steel**		Inlet check valve	**None**		
46	Deleted			Discharge check valve	**By Buyer**		
47	Inlet Screen	**None**		Bearing Special Feature (Note 4)	**L10 service rating 100khr**		
48	Shaft Coupling	***Carbon Steel with SS Disc Packs**		Safety Guards	**OSHA Compatible**		
49							
50	**EXHAUSTER ACCESSORIES**						
51	Flanged Inlet	**Yes**		Flanged Inlet Dimensions	**12 inch ANSI B16.5 RF 150#**		
52	Flanged Discharge	**Yes**		Flanged Discharge Dimensions	**12 inch ANSI B16.5 RF 150#**		
53	Drain Connection	**Yes**		Drain Connection Size (Note 5)	***(8) 1 inch drains**		
54	Shaft Seals	**Yes**		Seal Type	**Double Mechanical w/ purge and control panel**		

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 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.

	Exhauster Data Sheet:			MR No. **24590-QL-MRA-MACS-00007**		
				Plant Item No.		Rev. No.
	24590-LAW-MAD-LVP-00006			**24590-LAW-MA-LVP-EXHR-00001A/B/C**		**9**
1	Project	RPP-WTP	Bldg./Room #	LAW/ L-0304 C, D, E		
2	Project #	24590	Supporting Calculations	24590-LAW-M4C-LOP-00001 24590-LAW-M6C-LVP-00004 24590-LAW-MEC-LVP-00003		
3						
4	Site	DOE Hanford				
5	Safety Class	**SS**	Supporting Drawings	24590-LAW-M6-LVP-00001004, 24590-LAW-M6-LVP-00001005, 24590-LAW-M6-LVP-00001006	Quantity Required	**3**
6	Seismic Category	**SC-III**				
7	System No.	**LVP**	System Description	24590-LAW-3YD-LOP-00001	Quality Level	**Q**
8						
9	Description: **LAW Offgas Exhauster**					
55						
56	**EXHAUSTER ACCESSORIES (continued)**					
57	Isolation base	**No**	Isolation Pad Mfg and Model No	***N/A**		
58	Vibration Isolation	*** N/A**				
59	Flexible Inlet Connection	**Yes**	**Removable insulation (Note 13)**	**Yes**		
60	Flexible Inlet Connection Type	**Flexible Metal Hose**	**Metal Bellows**			
61	Flexible Inlet Connection Material	***316L SS**	**316L flex hose, 12", ANSI 16.5 RF 150# 316 L flgs**			
62	Flexible Connection Manufacturer	***DME, INC**				
63	Flexible Outlet Connection	**Yes**	**Removable insulation (Note 13)**	**Yes**		
64	Flexible Outlet Connection Type	**Flexible Metal Hose**	**Metal Bellows**			
65	Flexible Outlet Connection Material	***316L SS**	**316L flex hose, 12", ANSI 16.5 RF 150# 316 L flanges**			
66	Flexible Connection Manufacturer	***DME, INC**				
67	Insulation (Note 13)	***Fiberglass Tape 1/8 inch**	**Thick Double wrapped with 50% overlap**			
68	Silencer	**No**				
69	Seal purge hose	**Flexible Metal Hose**	**316L flex hose, 1/2", ANSI 16.5 RF 150# 316 L flanges, 304 hose braid**			
70	**EXHAUSTER MOTOR AND DRIVE REQUIREMENTS**					
71	Driven Equipment / Motor / ASD relationship is as follows::					
72	**Exhauster Tag Number**	**Motor Tag Number**	**ASD Tag Number**			
73	LVP-EXHR-00001A	LVP-MTR-00001A	LVP-ASD-00001A			
74	LVP-EXHR-00001B	LVP-MTR-00001B	LVP-ASD-00001B			
75	LVP-EXHR-00001C	LVP-MTR-00001C	LVP-ASD-00001C			
76	Variable Speed Drive	**Yes**	**Provided by others**			
77	Special Drive Features	**1. ASD to operate motor from 30% to 100% of required RPM within a 30 second time frame (max). (Note 8)**				
78						
79	**PROCESS OFFGAS STREAM COMPOSITION (TOTAL - 2 FANS IN OPERATION)**					
80		NOMINAL	MAXIMUM			
81	N_2	**5.32E+03**	**5.40E+03**	kg/hour		
82	O_2	**1.60E+03**	**1.61E+03**	kg/hour		
83	H_2O	**8.93E+02**	**1.04E+03**	kg/hour		
84	CO_2	**1.01E+02**	**1.14E+02**	kg/hour		
85	Ar	**9.01E+01**	**9.11E+01**	kg/hour		
86	NH_3	**5.65E-01**	**9.36E-01**	kg/hour		
87	NO	**2.99E-01**	**4.25E-01**	kg/hour		
88	N_20	**3.97E+00**	**6.38E+00**	kg/hour		
89	NO_2	**3.74E-01**	**7.76E-01**	kg/hour		
90	CO	**1.59E-01**	**5.46E-01**	kg/hour		
91	H_2	**3.83E-02**	**5.01E-02**	kg/hour		
92	HCl	**4.60E-05**	**1.23E-04**	kg/hour		
93	HF	**2.49E-06**	**3.66E-06**	kg/hour		
94	I_2	**5.56E-05**	**5.56E-05**	kg/hour		
95	SO_2	**9.49E-04**	**1.84E-03**	kg/hour		
96	VOC	**2.82E-02**	**5.85E-02**	kg/hour		
97	Particulate	**1.24E-05**	**3.65E-05**	kg/hour		
98	Hg	**1.97E-04**	**2.01E-04**	kg/hour		
99	Total	**8.01E+03**	**8.27E+03**	kg/hour		
100	Gas Density	**0.0424**	**0.0371**	lbs/cubic foot		
101						

	Exhauster Data Sheet:			MR No. **24590-QL-MRA-MACS-00007**		
	24590-LAW-MAD-LVP-00006			Plant Item No. **24590-LAW-MA-LVP-EXHR-00001A/B/C**		Rev. No. **9**
1	Project	RPP-WTP	Bldg./Room #	LAW/ L-0304 C, D, E		
2	Project #	24590	Supporting Calculations	24590-LAW-M4C-LOP-00001		
3				24590-LAW-M6C-LVP-00004		
4	Site	DOE Hanford		24590-LAW-MEC-LVP-00003		
5	Safety Class	**SS**	Supporting Drawings	24590-LAW-M6-LVP-00001004, 24590-LAW-M6-LVP-00001005, 24590-LAW-M6-LVP-00001006	Quantity Required	**3**
6	Seismic Category	**SC-III**				
7	System No.	**LVP**	System Description	24590-LAW-3YD-LOP-00001	Quality Level	**Q**
8						
9	Description: **LAW Offgas Exhauster**					

102	**Notes**	
103	1)	* Denotes data to be provided / verified by SELLER.
104	2)	N/A denotes "Not Applicable".
105	3)	TBD denotes "To Be Determined" at a later date.
106	4)	Provide each bearing pillow blocks with RTDs for remote indication
107	5)	See Specification 24590-LAW-3PS-MACS-T0001
108	6)	Rotation is listed as viewed from drive side.
109	7)	Gaskets must withstand chemical constituents listed above.
110	8)	Natural frequencies within operating ranges to be blocked in ASD programming
		(A) Calculated Natural Frequencies: 1,348 RPM and 1,377 RPM Natural frequencies to be verified during factory testing.
111	9)	Maximum Discharge Temperature is the maximum sustainable discharge temperature which is above the discharge temperature at design flow conditions.
112	10)	Contents of this document are dangerous waste permit (DWP) affecting.
113	11)	Bounding exhauster unit dimensions: 175 inches long X 70 inches wide X 84 inches high
114	12)	Normal and maximum temperatures are for material selection and corrosion analysis. Changes to these values are not required to be transmitted to the vendor.
115	13)	Removable insulation to be provided by SELLER
116	14)	Normal discharge temperature up to 282°F
117	15)	Normal, minimum, maximum and design gas densities are based on the density for air (Reference 24590-LAW-M6C-LVP-00004).
118	16)	Discharge pressure assumed to be 0.0 inches W.C. and minimum operating conditions
119	17)	Assembly WGT (motor + exhauster + base) is an estimate
120	18)	Maximum 0.030% C; dual certified.
121	19)	Required design inlet flow of 4,449 ACFM is bounded by supplied design inlet flow of 4760 ACFM as shown on vendor supplied performance curves and reflected on referenced P&Ids.
120	**SAFETY SCREENING**	
121	**Safety Screening/Evaluation Required? If yes per 24590-WTP-GPP-SREG-002, E&NS Signature required below.**	X Yes ___No
122		

Rev	Reason for Revision	System Engineer	Responsible Engineer	E&NS	Checker	Reviewer	Approver	Date
9	Revised to update Supporting Drawings Field and to add Note 19.	M. O'Neill	D. J. Rickettson	D. Krahn 5-29-13	S. Austen	P. Snider 5/29/2013	P. Omel	5/29/13
8	Revised to align normal and maximum data with referenced calculation and corrosion analysis. Design impacts negligible. Transmittal to vendor not required.	M. O'Neill	D J Rickettson	D. Krahn	M. Sanvictores	P Snider	D Mildon	2/25/2013
7	Incorporated 24590-QL-MRA-MACS-00007-T0002, 24590-WTP-SDDR-MS-11-00072, 24590-QL-POA-MACS-00007-04-00001, 24590-QL-POA-MACS-00007-04-00002. Incorporated by reference: 24590-WTP-SDDR-MS-11-00047	M O'Neill	D J Rickettson	B Niemi	M O'Neill	P Snider	D Mildon	12/13/2011
6	Incorp supplier exceptions	M. O'Neill	D J Rickettson	D. Krahn	N Whitcomb	G Goolsby	J Roth	8/25/2010
5	DCN 24590-WTP-M6N-M80T-00005 incorporated. Reissue for purchase	M. O'Neill	D J Rickettson	D. Krahn	T Valenti	G Goolsby	J Roth	2/12/2010
4	Reissued for purchase. Incorp of Vendor exceptions.	M. O'Neill	S. E. Anderson	D. Krahn	C. Knauss	S. Kretzschmar	R. Stevens	9/8/2008
3	Re-issued with updated design conditions, reformatted mechanical datasheet for clarity, attached motor and EQ datasheets. This document supersedes 24590-LAW-MAD-LVP-00009	M. O'Neill	S. E. Anderson	D. Krahn	C. Knauss	S. Kretzschmar	R. Stevens	3/26/2008
2	Re-issued for purchase	SS	N/A	N/A	RLH	N/A	SS	2/1/2005
1	Issued for purchase	SS	N/A	N/A	RLH	N/A	ED	12/14/2004
0	Issued for bids	SS	N/A	N/A	RLH	N/A	ED	8/18/2004

BECHTEL	**ATTACHMENT 1** **24590-LAW-MAD-LVP-00006** **ELECTRICAL DATA SHEET** **LOW VOLTAGE INDUCTION MOTOR**	MR No. **24590-QL-MRA-MACS-00007**	
		Plant Item No. **24590-LAW-EM-LVP-MTR-00001A/B/C**	Rev. No. **9**

Motor Tag No.: 24590-LAW-EM-LVP-MTR-00001A/B/C

Driven Equipment No.: 24590-LAW-LVP-EXHR-00001A/B/C

Service: LAW Offgas Exhauster

Refer to "Primary Specification": 24590-LAW-3PS-MACS-T0001

LINE NO.	DESCRIPTION	USER SPECIFIED	SUPPLIER FURNISHED	UNITS
	BASIC DATA:		*N/A	
1	RATED HORSEPOWER	-	*200	HP
2	SYNCHRONOUS SPEED	-	*3600	RPM
3	VOLTAGE	460	*460	V
4	PHASE	3	*3	-
5	FREQUENCY	60	*60	Hz
6	INSULATION CLASS	F	*H	-
7	TEMPERATURE RISE ABOVE 40°C AMBIENT	80	*80	deg. C
8	NEMA DESIGN TYPE (B, C, OTHER)	B	*B	-
9	EFFICIENCY (STANDARD, PREMIUM)	PREMIUM	*PREMIUM	-
10	ENCLOSURE TYPE (TEFC - SEVERE DUTY PER IEEE Std. 841, TENV, WP1I)	TEFC IEEE Std. 841	*TEFC IEEE STD 841	-
11	SERVICE FACTOR	1.15	*1.15	-
12	COUPLED DRIVE (DIRECT, BELT, GEAR)	Direct	*Direct	-
13	BEARING (ANTI-FRICTION, SLEEVE)	Anti-Friction	*Anti-Friction	-
14	BEARING SEAL (ONE END, BOTH ENDS)	Both Ends	*Both Ends	-
15	SPACE HEATER (FOR MOTORS > 20 HP)	Yes	*Note 5	W
16	RTD FOR SLEEVE BEARING : 1 per bearing for Belt drive only	N/A	*N/A	Ω
17	TERMINAL BOX LOCATION		*F-1/ F-2	-
18	WARRANTY (2 YEARS, 3 YEARS, 5 YEARS)	2	*2	-
19	SHOP TESTS			
	- MFR STANDARD TEST (Yes / No)	Yes	*Yes	
	- ROUTINE TEST (Yes / No)	Yes	*Yes	
	- FULL TEST (Yes / No)	(Note 4)	*Yes (MTR)	
	UNUSUAL SERVICE CONDITIONS:	Inverter Duty	*VT@1.0SF	
20	FLAMMABLE OR EXPLOSIVE GASES	No	*Note 4	
21	COMBUSTIBLE, EXPLOSIVE, ABRASIVE OR CONDUCTIVE DUST	No	*Note 4	
22	WET OR DRY OPERATING CONDITIONS	Dry	*Note 4	
23	NUCLEAR RADIATION	0.5 mrad/hr.		
24	SPECIAL PAINTING REQUIREMENTS PER IEEE Std. 841		*Primer only	
25	OTHER (SC,SS, APC, Non-ITS)	SS	*SS	
26	OTHER (SEISMIC CATEGORY I , II, III or IV) Subject to shake-table test	SC-III	*SC-III	

BECHTEL	**ATTACHEMENT 1** **24590-LAW-MAD-LVP-00006** **ELECTRICAL DATA SHEET** **LOW VOLTAGE INDUCTION MOTOR**	MR No. **24590-QL-MRA-MACS-00007** Plant Item No.: **24590-LAW-EM-LVP-MTR-00001A/B/C** Rev. No.: **9**

Motor Tag No.: 24590-LAW-EM-LVP-MTR-00001A/B/C

Driven Equipment No.: 24590-LAW-LVP-EXHR-00001A/B/C

Service: LAW Offgas Exhauster

Refer to "Primary Specification": 24590-LAW-3PS-MACS-T0001

LINE NO.	DESCRIPTION	USER SPECIFIED	SUPPLIER FURNISHED	UNITS
27	MANUFACTURER	-	*Reliance	-
28	NEMA FRAME	-	*447TS	-
29	MODEL NUMBER	-	*N/A	-
30	SERIAL NUMBER / MANUFACTURER DATE	-	*B658247-010T1	-
31	FULL LOAD CURRENT	-	*215	A
32	FULL LOAD TORQUE	-	*294	ft-lb
33	POWER FACTOR : - @ 50 % LOAD	-	*87.7	%
34	- @ 75 % LOAD	-	*90.9	%
	- @ 100 % LOAD	-	*91.7	%
	EFFICIENCY : - @ 50% LOAD	-	*94.4	%
35	- @ 75% LOAD	-	*95.1	%
	- @ 100% LOAD	-	*95.1	%
	LOCKED ROTOR CURRENT @ 100 % of RATED VOLTAGE	-	*1423	A
36	LOCKED ROTOR CURRENT @ 80% of RATED VOLTAGE	-	*1140	A
37	ALLOWABLE STALL TIME @ FULL VOLTAGE	-	*27	SEC
38	ALLOWABLE STALL TIME @ 80% of VOLTAGE	-	*41	SEC
39	LOSSES @ FULL LOAD	-	*7642	W
40	ROTOR WK2 @ MOTOR SHAFT SPEED (For > 250 hp only)	-	*N/A	lb-ft²
41	STARTING POWER FACTOR (For > 75 hp only)	-	*30.9	-
42	SUB TRANSIENT REACTANCE AND X/R (For > 250 hp only)	-	*N/A	-
43	WEIGHT	-	*2253	lbs
44	ROTATION (CW, CCW, BI-DIR.) FACING DRIVEN EQUIPMENT	-	*BI-DIR	-
45	MEAN TIME BETWEEN FAILURE (MOTOR 100 HP AND ABOVE)		*N/A	
46	STARTING METHOD (FULL/REDUCED VOLTAGE, ASD APPLICATION)	ASD	*ASD	-
47				
48	RECOMMENDED BEARING LUBRICANT	-	*Exxon Polyrex EM	
49				

NOTES:

(1) DELETED

(2) Motor should be applied within its rating based on service factor of 1.0.

(3) Data Sheet Line no. from 34 to 46 are applicable for motor 100 HP and above.

(4) The exhauster and motor are subjected to the same environmental conditions.

(5) Equipped with 245w, 129v space heater. Not required for indoor applications.

EQUIPMENT QUALIFICATION DATASHEET (EQD)

Equipment Identification		
Full Component Tag Number or BNI Stock Code Number	24590-LAW-MA-LVP-EXHR-00001A/B/C 24590-LAW-EM-LVP-MTR-00001A/B/C	Safety Classification ☐ SC ☒ SS ☐ APC-PAM
Equipment Datasheet Number	N/A	
Description	Secondary Offgas Exhausters	Seismic Category ☐ SC-I ☐ SC-II ☒ SC-III ☐ SC-IV ☐ SC-III Seismic Interaction only
Location (Facility / Building and Room No.)	LAW / Building 20/ Rooms L-0304 C/D/E / Elevation 48'-0"	
Safety Function(s)	Provide negative pressure on the LAW melters, primary and secondary offgas systems. Provides both confinement as well as motive force for offgas flow through all the offgas equipment up to and including discharge at stack. Exhausters shall remain functional (i.e., able to support their required safety function) following an SC-III event. Ref 24590-WTP-PSAR-ESH-01-002-03, rev 4o, Sect 4.4.3 & 5.6.3	

Equipment Safety Function Type	☒ Passive Mechanical	☒ Active Mechanical	☒ Electrical
	24590-LAW-MA-LVP-EXHR-00001A/B/C	24590-LAW-MA-LVP-EXHR-00001A/B/C	24590-LAW-EM-LVP-MTR-00001A/B/C

Seismic Safety Function	Seismic Operability Requirements		
☒ Yes ☐ No	☒ During Seismic Event	☒ After Seismic Event	☐ None

Equipment Environmental Qualification (EEQ)

(Parameter values stated in this section do not include process conditions or operation induced conditions)

Classification of Environment ☒ Mild ☐ Harsh

Qualified Life (years) ☒ 40 ☐ Other with required maintenance

Parameter Type/Units	Parameter Value	Parameter Duration (number)	Duration Units	WTP Source Document Number
Normal Ambients				
High Temperature (°F)	95	Note 1a	Years	24590-LAW-U0D-W16T-00001, Rev 2
Low Temperature (°F)	50	Note 1b	N/A	Note 2
High Relative Humidity (%RH)	90	Note 1c	N/A	24590-LAW-U0D-W16T-00001, Rev 2
Low Relative Humidity (%RH)	10	Note 1c	N/A	24590-LAW-U0D-W16T-00001, Rev 2
High Pressure (in.-w.g.)	0	Note 1d	N/A	24590-LAW-U0D-W16T-00001, Rev 2
Low Pressure (in.-w.g.)	-0.4	Note 1d	N/A	24590-LAW-U0D-W16T-00001, Rev 2
Radiation Dose Rate (mRad/hr)	0.5	40	Years (Note 1e)	24590-LAW-P1N-P01T-00050, Rev N/A
Plant/Process Induced Vibration	☐ Yes ☒ No			
Additional Normal Ambient Information:	N/A			

EQUIPMENT QUALIFICATION DATASHEET (EQD)

Equipment Environmental Qualification (EEQ) *(continued)*

Parameter Type/Units	Parameter Value	Parameter Duration (number)	Duration Units	WTP Source Document Number
Abnormal Ambients				
High Temperature (°F)	113	8	hours / year	Note 3
Low Temperature (°F)	50	Note 1b	N/A	Note 2
High Relative Humidity (%RH)	95	Note 1c	N/A	24590-LAW-U0D-W16T-00001, Rev 2
Low Relative Humidity (%RH)	10	Note 1c	N/A	24590-LAW-U0D-W16T-00001, Rev 2
High Pressure (in.-w.g)	4	Note 1d	N/A	24590-LAW-U0D-W16T-00001, Rev 2
Low Pressure (in.-w.g)	-2.4	Note 1d	N/A	24590-LAW-U0D-W16T-00001, Rev 2
Radiation Dose Rate (mR/hr)	0.5	0	Years (Note 1e)	24590-LAW-P1N-P01T-00050, Rev N/A
Exposure to Wet Sprinkler System	☒ Yes ☐ No	2	hours	24590-LAW-U0D-W16T-00001, Rev 2
Additional Abnormal Ambient Information				
Design Basis Events (DBE) Ambients				
High Temperature (°F)	113	2	hours	Note 3
Low Temperature (°F)	50	Note 1b	N/A	Note 2
High Relative Humidity (%RH)	95	2	hours	24590-LAW-U0D-W16T-00001, Rev 2
Low Relative Humidity (%RH)	10	2	hours	24590-LAW-U0D-W16T-00001, Rev 2
High Pressure (in.-w.g)	4	2	hours	24590-LAW-U0D-W16T-00001, Rev 2
Low Pressure (in.-w.g)	-2.4	2	hours	24590-LAW-U0D-W16T-00001, Rev 2
Radiation Dose Rate (mR/hr)	0.5	Note 1e	hours	24590-LAW-P1N-P01T-00050, Rev N/A
Submergence	☒ Yes ☐ No Note 4	2	hours	24590-LAW-U0C-20-00001, Rev F
Chemical/Spray Exposure	☐ Yes ☒ No	N/A	hours	24590-LAW-U0D-W16T-00001, Rev 2
Additional DBE Information	Deleted text			

DBE Chemical Exposure Details	
DBE Chemical Types / Concentrations	None

Electrical Interfaces Supporting the Safety Function	
Power Supply Voltage (VAC, VDC)	460 VAC
Power Supply Frequency (Hz)	60
Power Connection Method	By Seller
I/O Signals to/from Equipment	By Seller
I/O Connection Method	By Seller

Mechanical Interfaces	
Mounting Configuration (orientation)	Horizontal mounted
Mounting Method (bolts, welds, etc.)	Base to be welded to existing embeds or anchored into the concrete depending on the Seller's anchorage configuration. Reference drawings 24590-BOF-DD-S13T-00001, 24590-LAW-DB-S13T-00135 & 00136
Auxiliary Devices	Inlet and outlet hoses, LVP-HOSE-00003 to 00008

Equipment Seismic Qualification (ESQ)

Parameter	Title	Reference/Document Number	Version / Revision	Remarks
WTP Seismic Design Specification	Engineering Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks	24590-WTP-3PS-FB01-T0001	4	
Specified Seismic Load Parameters	Engineering Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks	24590-WTP-3PS-FB01-T0001	4	Active mech & elect testing per section 4.3.4 & Section 7.0

Equipment Qualification Notes and Additional Information

1.0 General notes:

a) For thermal aging, the high normal temperature shall be assumed to subsist for 40 years less the duration of the high abnormal temperature. For any lesser qualified life, the normal and abnormal condition durations shall be assigned proportionally. The abnormal temperature is stated to subsist for a certain number of hours per year. It shall be taken to subsist for this number of hours for each year of the qualified life.

b) The ability to provide the safety function at the low normal temperature, the low abnormal temperature or the low DBE temperature (whichever be the lowest) shall be established by test, analysis, or operating experience. The thermal aging at these respective low temperatures will be conservatively covered by the thermal aging per item a) above. Therefore, no duration is assigned for the low temperatures.

c) The ability to provide the safety function at the extremes of the normal and abnormal humidity conditions, taking into consideration the high and the low normal and high and low abnormal, shall be established by test, analysis, or operating experience. No duration is assigned for the normal and abnormal humidity conditions.

d) If the performance of the safety function of the equipment is affected by ambient pressure, the ability to provide the safety function at the extremes of the normal and abnormal pressure conditions, taking into consideration the high and the low normal and the high and low abnormal pressures, shall be established by test, analysis, or operating experience. No duration is assigned to the normal and abnormal pressure conditions.

e) (1) If the abnormal radiation dose rate is the same as the normal radiation dose rate, the normal radiation dose rate shall be assumed to subsist for 40 years, or any lesser qualified life, and the duration of the abnormal radiation dose rate is "0."

(2) If the abnormal radiation dose rate is higher than the normal radiation dose rate, the abnormal radiation dose rate shall be assumed to subsist for 40 years, or any lesser qualified life, and the duration of the normal radiation dose rate is "0."

f) The DBE conditions shall be taken to subsist for the stated number of hours following the qualified life of the equipment.

g) Spray due to fire sprinkler actuation shall be taken to occur once over the entire qualified life duration for a period of 2 hours, even if the qualified life is a period less than 40 years. If spray qualification is provided for DBE conditions (whether for water or chemical spray), then separate qualification for the fire sprinkler spray need not be provided.

h) The values stated in this EQD are the ambients and do not include the thermodynamic and radiation conditions imposed by the process fluids, self-heating, etc. The data pertaining to process fluid and service induced parameters are to be taken into account where significant, such as in thermal aging analyses. These data can be obtained from the equipment data sheets or the Equipment Specification.

i) Equipment that is to be installed in inaccessible locations must be qualified to a 40-year life without the need for maintenance or replacement.

2.0 The Normal, Abnormal, and DBE Low Temperature (F) is listed as **59 F** in 24590-LAW-U0D-W16T-000001, **Rev 2.** 50 F is per Basis of Design (BOD) Table

Equipment Qualification Notes and Additional Information

12-1 (Plant Rooms), **24590-WTP-DB-ENG-01-001, Rev 1P. Rev 7**

3.0 The Abnormal and DBE High Room Temperature (F) is listed as 95 F in 24590-LAW-U0N-W16T-00001, Rev 2. 113 F is specified for the equipment qualification goal.4.0 Seller shall be responsible to locate any sensitive part of the exhauster, junction box or control panel above the flood height of 0.67 Feet.