

PROCESS DESIGN

EMISSION RECOVERY SYSTEM REVISION NO. 3

T-702 SEAL WATER LEVEL CONTROL REVISIONS

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EMISSION RECOVERY SYSTEM REVISION NO. 3T-702 SEAL WATER LEVEL CONTROL REVISIONSI. PURPOSE OF DESIGN

The purpose of this design is to revise the seal water level control system in the Emission Recovery System to assure more efficient operation and to minimize operator attention.

The level in the vacuum pump seal water separator, T-702, in the Emission Recovery System often drops to the point that the seal water pump loses suction pressure. The vacuum pump and compressor continue running, but efficient operation is not possible without seal water. Restoration of the level requires that the HPSW make-up valve be opened manually by the field operator.

The loss of level in T-702 can be caused from leaks and losses of seal water in the seal water system. One major seal water loss occurs when T-702 periodically drains to either T-701, the inlet knockout drum, or the old blowdown tank via CV-716. CV-716 is actuated by the middle level switch on the level well for T-702. The position of the switch allows very little tolerance for water addition to the system before opening CV-716. CV-716 is opened regularly because excess water periodically enters T-702 via CV-703 while CV-703 is closing. CV-703 allows water to periodically drain from T-703, the compressor seal water separator, to T-702, and closes very slowly. During the time it closes, approximately 30-40 gallons of excess water drains into T-702, causing the level switch to open CV-716.

This design will provide for make-up water to be automatically added to T-702 when the water level falls below the bottom level switch. Water losses will be minimized by raising the switch that activates CV-716. Water losses will also be minimized by replacing the solenoid valve on CV-703 with another solenoid valve having a larger orifice size, so that CV-703 will close faster.

EMISSION RECOVERY SYSTEM REVISION NO. 3T-702 SEAL WATER LEVEL CONTROL REVISIONSII. PROCESS DESCRIPTION

Liquid, which is essentially water, flows into the existing vacuum pump seal water separator, T-702, from the existing vacuum pump, P-704. T-702 is equipped with a level well which will sense the liquid level at three locations.

The existing high level switch, LS-702C, will sense a high liquid level and will open CV-716, the existing T-702 drain valve. CV-716, will allow liquid to be pumped to T-701, the existing inlet knockout drum for the Emission Recovery System. The existing timer on the valve actuator is set to close the control valve 25 seconds after opening if the liquid level is below LS-702C. If the level is still above LS-702C, the valve will remain open until the level drops.

The existing low level switch, LS-702A, will sense a low liquid level in T-702 and open CV-702, the HPSW make-up valve. The HPSW make-up valve is an existing manual ball valve that is to be equipped with an actuator. A new ball valve will be installed in the HPSW make-up line ahead of CV-702 to be used if needed to shut off make-up water to the tank. CV-702 will close when LS-702B, the existing middle level switch, is activated.

In the event LS-702C malfunctions and T-702 fills with liquid, LS-702A, a new capacitance probe to be installed from the top of T-702, will be activated. LA-702A will shutdown the vacuum pump and compressors and will also activate the control room shutdown alarm. A level alarm located on the local panel will also be energized.

EMISSION RECOVERY SYSTEM RECOVERY NO. 3T-702 SEAL WATER LEVEL CONTROL REVISIONSIII. INSTRUMENT SPECIFICATIONSINSTRUMENT LIST

<u>Item</u>	<u>Description</u>	<u>Location</u>
LA-702A	Level Alarm	T-702
CV-702	Control Valve	Line 1-WP-765



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SPECIFICATION SHEET

LIQUID LEVEL INSTRUMENTS

A F E NO _____

DATE 2-8-79

W O NO _____

MADE BY MPB

INO NO. _____

APP'D BY _____

REQ NO. _____

B M NO _____

P O NO _____

PLANT ABERDEEN PVCPROJECT EMISSION RECOVERY SYSTEM REVISION No. 3T-702 SEAL WATER LEVEL CONTROL REVISIONS

1	TAG NO	<u>LA-702A (1)</u>	
2	SERVICE	<u>HIGH LEVEL T-702</u>	
3		<u>(2)</u>	
4	INSTRUMENT TYPE	<u>HIGH LEVEL ALARM</u>	
5	LOCATION	<u>PANEL</u>	
6	ELEMENT TYPE	<u>CAPACITANCE PROBE</u>	
7	LOCATION	<u>T-702</u>	
8	RANGE, INCHES		
9	INTERFACE		
10	UPPER DENSITY, LB./CU. FT.		
11	LOWER DENSITY, LB./CU. FT.		
12	TEMPERATURE °F		
13	PRESSURE PSIG		
14	VALVE TYPE		
15			
16	LOCATION		
17	MATERIAL		
18	BODY SIZE	PORT SIZE	
19	PLUG FORM		
20	ΔP	MIN.	NOR.
21	CALC. Cv	VALVE Cv	
22	AIR TO OPEN OR CLOSE		
23	MAXIMUM SHUTOFF ΔP		
24	FLUID	<u>WATER</u>	
25	TEMPERATURE °F	<u>130</u>	
26	PRESSURE PSIG	<u>0</u>	
27	IN (MW)	<u>(18)</u>	
28	SP. GR. AT STD. COND.	<u>1.0</u>	
29	SP. GR. AT P. & T.	<u>0.986</u>	
30	WEIGHT % VAPOR IN-OUT		
31	VISCOSITY AT P. & T., cP	<u>0.51</u>	
32	RATE, NORMAL		
33	RATE		
34	MAX	MIN.	
35	NOTES		

- (1) LA-702A TO REPLACE EXISTING LA-702 AS T-702 HIGH LEVEL ALARM.
 (2) LA-702A TO SHUT DOWN SYSTEM UPON HIGH LEVEL IN T-702



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SPECIFICATION SHEET
CONTROL VALVESPLANT ABERDEEN PVCPROJECT EMISSION RECOVERY SYSTEM REVISION No. 3DATE 2/22/79 S. M. NO. _____

A. F. E. NO. _____

W. O. NO. _____ I. N. O. NO. _____

REQ. NO. _____ P. O. NO. _____

MADE BY MPB APP'D BY _____T-702 SEAL WATER LEVEL CONTROL REVISION

1		GENERAL		ITEM NO. & TAG		CV-702 ⁽¹⁾					
2		SERVICE		MAKE-UP H ₂ O		TO T-702					
3		LINE SIZE		1"							
4		MANUFACTURER		JAMESBURY							
5		MODEL NO.									
6		TYPE		ON / OFF							
7		SERVICE CONDITIONS		WATER							
8		TEMP. °F		NORMAL		MAX.		70		—	
9		PRESS., INLET,		NORMAL		MAX.		200		—	
10		Δ P		MIN.		NORMAL		MAX.		—	
11		MOLECULAR WEIGHT		A.P.I.		18		—			
12		SP. GR. @ 60°F.		@ F.T.		1.0		—			
13		WEIGHT % VAPOR IN.		OUT		—		—			
14		VISCOSITY @ F.T. & P.		0.982							
15		RATE, NOR. LB./HR. (SCFH) GPM		36							
16		RATE, MAX. LB./HR. (SCFH) GPM		40							
17		NORMAL FLOW CV									
18											
19		BODY		BODY SIZE		PORT SIZE					
20		TYPE (ANGLE OR GLOBE)									
21		MATERIAL									
22		END CONNECTIONS									
23		BONNET									
24		CV									
25		LUBRICATOR		ISO. VAL.							
26		PACKING									
27		TRAVEL INDICATOR									
28											
29		TRIM		TYPE INNER VAL.		NO. OF PORTS					
30		PLUG & SEAT MATERIAL									
31											
32		ACTUATOR		TYPE		PNEUMATIC					
33		FAILURE POSITION		CLOSED							
34		MANUFACTURER		BETTS							
35		POSITIONER		INPUT SIGNAL		OUTPUT SIGNAL					
36		BYPASS		GAUGES							
37		MANUFACTURER									
38		MODEL NO.									
39		ACCESSORIES		SOLENOID VALVE		VERSA ⁽²⁾					

NOTES:

(1) VALVE IS EXISTING 1" BALL VALVE IN FIELD. ACTUATOR, MOUNTING BRACKET, AND SOLENOID VALVE TO BE NEW EQUIPMENT.

(2) SOLENOID VALVE TO BE 110V AC.

() INDICATES ITEM CHANGED ON LATEST REVISION.

(X) INDICATES MANUFACTURER TO GIVE REQUESTED INFORMATION IN HIS QUOTATION.

SHEET _____ OF _____ REV. _____

EMISSION RECOVERY SYSTEM REVISION NO. 3T-702 SEAL WATER LEVEL CONTROL REVISIONSIV. WORK LIST

1. Install actuator on existing 1" HPSW make-up valve in 1-WP-765-S-A2-3. Connect solenoid valve to electrical signals from existing LS-702A and existing LS-702B.
2. Move existing PG-702 to same nozzle as existing PS-702/PA-702 and install new LA-702A on vacant nozzle.

Note: Nozzle that existing PG-702 is now on should be inspected to make sure LS-702A will go into the nozzle. If not, another nozzle may have to be welded onto T-702.

3. Install new ball valve in existing 1-WP-765-S-A2-3 upstream of new CV-702.

EMISSION RECOVERY SYSTEM REVISION NO. 3

T-702 SEAL WATER LEVEL CONTROL REVISIONS

V. DRAWINGS

For P & I diagram, refer to Drawing No. MS-9226-42-1D,
Revision No. 9.