

CAUSE AND EFFECT CHART

rev 4.2 7/21/06

- Questionable
- Modified
- Local Control

Process Component		Device ID					PLC	Function Performed
ID	Service	ID	#	SAC#	In	PLC	Out	
MAJ	102	Sand Filter						
MAJ	103	Sand Filter						
MAJ	104	Secondary Scrubber Filter	PSH	104		X127	5	X X
			PSL	104		X130	5	X X
			LSH	104/A		X131	5	X X
			LAH	104/A		X132	5	
			LAL	104/A		X133	5	
			LSL	104/A		X134	5	X X
MAJ	105	Amine Sock Filter	PSH	105			loc	
			PSL	105			loc	
MAJ	106	Amine Sock Filter	PSH	106			loc	
			PSL	106			loc	
MAJ	107	Amine Carbon Filter	PSH	107			loc	
			PSL	107			loc	
MAK	207	Amine Plant Inlet Gas Scrubber Filter Separator	PSH	207			loc	
			PSL	207			loc	
			LSH	207			loc	
			LAH	207			loc	
			LAL	207			loc	
			LSL	207			loc	
MAK	208	Acid Gas K.O. Drum Filter Separator	PSH	208B			loc	
			PSL	208B			loc	
			LSH	208	X6		3	X X
			LAH	208	X15		3	
			LS	Start			loc	
			LS	Stop			loc	
			LAL	208			loc	
			LSL	208A			loc	
MBA	504	Seal Drum	LSH	504A		X135	5	X X
			LAH	504		X136	5	
			LAL	504		X137	5	

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		ID	#	SAC#	In	PLC		
MBD	205	Gross Separator	PSH	205		X160	5	
			PSL	205		X161	5	
			LSH	205		X162	5	
			LAH	205		X163	5	
			LAL	205		X164	5	
			LSL	205		X165	5	
MBD	206	Gross Separator	PSH	206		X166	5	
			PSL	206		X167	5	
			LSH	206		X170	5	
			LAH	206		X171	5	
			LAL	206		X172	5	
			LSL	206		X173	5	
MBD	500	Glycol Skimmer (H2S Scavenger Service)	PSH	500		X174	5	
			PSL	500		X175	5	
			LSH	500		X176	5	
			LSL	500		X177	5	
MDB	502	Refrigerant Cooler	PSH	502			loc	
			PAH	502A			loc	
			PAL	502A			loc	
			PSL	502			loc	
MBD	503	Refrigerant Surge Tank	PSH	503			loc	
			PSL	503			loc	
MBD	509	Low Temperature Separator	PSH	509			loc	
			PSL	509			loc	
			LSH	509			loc	
			LSL	509			loc	
MBF	501	Chiller Inlet Scrubber	PSH	501			loc	
			PSL	501			loc	
			LSH	501			loc	
			LSL	501			loc	

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ID	Service	ID	#	SAC#	In	PLC	Out			
PBE	427	HTM Pump	PSH	427		X123	3	5	CBA-414 - Vapor Comp - S/D	
			PSL	427		X124	3	5	CBA-416 - GC2 S/D	
PBE	428	Sour Water Pump	PSH	428			loc	5	CBA-420 - Chiller Comp #1 S/D	
			PSL	428			loc	5	CBA-421 - Chiller Comp #2 S/D	
PBE	430	Fire Pump	PAHL	430		X274	5	2	CBA-434 - Vapor Recovery Comp S/D	
			UL/OL	430		X275	5	3	CBA-435/436 - Start Lead Air Comp	
PBE	431	Waste Oil Pump	PSH	431		X277	5	3	CBA-435/436 - Start Lag Air Comp	
			PSL	431		X300	5	3	CBA-435/436 - Stop Air Comp	
PBE	432	Waste Water Pump	PSH	432		X302	5	5	CBA-439 - GC3 S/D	
			PSL	432		X303	5	3	CBA-449 - Acid Gas Comp S/D	
PBE	437	Potable Water Pump	Aux	437		X320	5	3	CBA-449 - Acid Gas Pump/Fan Motor S/D?	
PBE	442	Lean Amine Pump	PSH	442			loc	7	CMB-406 - Vacuum Pump S/D	
			PSL	442			loc	5	HAL-301/302 - Gas Fin Fan S/D	
PBE	443	Regenerator Reflux Pump	PSH	443			loc	5	HAL-303 - Chiller Fin Fan S/D	
			PSL	443			loc	5	HAL-304 - GC2 Fin Fan S/D	
PBE	444	HTM Pump	PSH	444		X125	3	5	HAL-305 - GC3 Fin Fan S/D	
			PSL	444		X126	3	3	HAL-309 - Amine Fin Fan S/D	
PBE	445	Fire Pump	PAHL	445		X274	5	loc	HAL-320 - Acid Gas Exchanger S/D	
			UL/OL	445		X275	5	5	loc	HAL-320 - Acid Gas Exchanger S/D
PBE	446	Potable Water Pump	Aux	446		X321	5	5	PAX-423 - Ship Pump #1 S/D	
PBE	452	Water Injection Charge Pump	FSH	452		v3004	7		5	PAX-440 - Ship Pump #2 S/D
			FSL	452		v3004	7		5	PAX-441 - Ship Pump #3 S/D
			PAH	452		v3003	7		7	PBE-412 - Seawater Lift Pump S/D
			PAL	452		v3003	7		7	PBE-413 - Stop Backwash
			FAH	452		v3004	7		5	PBE-415 - Well Clean Pump S/D
			FAL	452		v3004	7		5	PBE-415 - Start Well Clean Pump in Auto
			Aux	452		X26	7		5	PBE-415 - Stop Well Clean Pump in Auto
								5	PBE-422 - Glycol Pump S/D	
								3	PBE-423 - Glycol Pump S/D	
								5	PBE-424 - Relief Scrub Pump S/D	
								5	PBE-424 - Start Relief Scrub Pump in Auto	
								5	PBE-424 - Stop Relief Scrub Pump in Auto	
								3	PBE-427 - HTM Pump S/D	
								5	PBE-431 - Waste Oil Pump S/D - PLC5	
								5	PBE-431 - Start Waste Oil Pump in Auto	
								5	PBE-432 - Waste Water Pump S/D	
								3	PBE-444 - HTM Pump S/D	
								5	PBE-447 - SO2 Pump S/D	
								7	PBE-452 - Water Inj Charge Pump S/D	
								7	PBE-453 - Water Injection Pump S/D	
								7	LCV-801 - Close Vacuum Degasser Dump	
								7	ZZZ-901 - Air Scour Blower S/D	
								4A	LCV-602 - Open Main Scrubber Dump	
								4A	LCV-602 - Close Main Scrubber Dump	
								2	LCV-611 - VR Comp Suct Scrub Dump	
								7	LCV-802 - Close Backwash Tank Inlet	
								1	Shutdown VSDs	

Date	Rev	Edited By	Changes Made
5/20/06	1.0	Rick Hurdle	Added final sheet for revisions. Moved all C&E sheets onto the first sheet.
5/21/06		xxx	Removed "Close SSV/SSSV Affected Wells" from Function performed.
5/29/06	2.0	Rick Hurdle	Added missing process components and functions.
6/7/06	2.1	Rick Hurdle	Merge old SAFE chart with PLC5 I/O list to fill in gaps. Submitted to xxx for revisions.
6/23/06	2.2	Rick Hurdle	Update output coil addresses based on programming changes.
7/1/06	3.0	xxx, rmh	Update based on feedback from operations on xxx.
7/5/06	3.1	Rick Hurdle	Changes made by Rick Hurdle. These need to be reviewed and approved by xxx during next API RP 14C audit.
7/11/06	4.0	xxx	Changes made by Rick Hurdle as suggested by xxx.
7/21/06	4.1	Rick Hurdle	Changes made by Rick Hurdle as instructed xxx. Mostly alarms from the old Ronan panel that are being brought over into WW.