



	Gachsaran Polymer Industries Company HDPE Plant			
	Hazop Close Out Report For Refrigerator Package		 	
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Hazop Close Out Report For Refrigerator Package

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 Consultant: Arya Imen Tadbir

Recommendations / H.S.E Reply	References	Responsibility	Disciplines						Item (Open/Close)	Deadlines	Signature
			Process	Instrument	Piping	Machinery	Mechanic	General Engineering			
Check for considering pressure differential gauge for C-6101A, and C-6101B suction strainers.	REF#01	H.S.E.	Suction strainer cannot get clogged as this an "80micron" filter, overall referred to as "bolt catcher". If we considers that strainer can get dirty over time, Then 3 cases need to occur. a) From where this amount of dirt can accumulate with this amount of dirt size? here is medium or material that can create this kind of clogging within the closed loop system. Design of Package is that this item is consider as strainer and not filter. Only reason for installation of this type of strainer is as common engineering practice to have a mechanical protection in front of a rotating equipment. b) Maintenance schedule is not respected as Suction filter needs to be checked on regular basis. c) If this amount of dirt is present within the closed loop system and of this considerable size that it can clog the suction strainer, Then it would mean that the oil system with consideration of the oil filters would also get clogged up and in this case even sooner than the suction strainer due to it fine size mesh. In this case the compressor would already get tripped by low oil pressure. If we consider dirt originating from Evaporator. Then what material except metal can clog strainer? Anyhow a PG at upstream of suction strainer and another PG at downstream of suction strainer is considered.								
Consider emergency depressurizing system with ESD system (I.e. blow down valve) for the refrigeration system. Check study/ for considering a shut down with depressurizing, and a shut down without depressurizing.	REF#02	H.S.E./EIED	As per API-521, section 4.6.4, emergency depressuring is required for large process equipment operating at a gauge pressure of 1700 kPa (-250 psi) or higher. For this package, equalize pressure after compressor shutdown is about 1140 kPag which is less than the required pressure in API-521. So emergency depressuring is not applicable for this package.								
Consider Thermal Relief Valve (TRV) for cooling water line of E-6104. Or, remove isolating block valves on cooling water lines of E-6104 (due to presence of PSV-61101-R in PID-611B).	REF#03	H.S.E.	Isolating block valve on cooling water line will be removed. RO will be considered.								
Consider independent pressure transmitters with low low alarm with ESD system for suction C-6101A, and C-6101B. Or, perform SIL study for the refrigeration package.	REF#04	H.S.E.	Recycle valve is used only during start up and very low flow. Additionally, for project minimum capacity (10% capacity) this recycle valve does not require to operate as per MAYEKAWA design. Compressor manufacturer allows to go to -0,8 Barg without any jeopardy to functionality or safe guard of compressor. In this case suction temp Low alarm 61111 will be activated. As these are 2 separate transmitters double jeopardy cannot be considered. At the same time when "No" suction pressure, Limit (low suction pressure) will be activated reducing the slide valve position to min. position until suction pressure is recovered. In case of failure PT 61111 than still TT 61111 suction temperature L alarm will be activated as low refrigerant pressure means low refrigerant temperature. Considering above reasons, no need to have an independent pressure transmitter for recycle valve. Pressure Transmitters for suction of C-6101A, and C-6101B of will be supplied with SIL2 certificate which is over requirements for this small package based on vendor a lot of experiences.	Recycle valve is used only during start up and very low flow. Additionally, for project minimum capacity (10% capacity) this recycle valve does not require to operate as per MAYEKAWA design. Compressor manufacturer allows to go to -0,8 Barg without any jeopardy to functionality or safe guard of compressor. In this case suction temp Low alarm 61111 will be activated. As these are 2 separate transmitters double jeopardy cannot be considered. At the same time when "No" suction pressure, Limit (low suction pressure) will be activated reducing the slide valve position to min. position until suction pressure is recovered. In case of failure PT 61111 than still TT 61111 suction temperature L alarm will be activated as low refrigerant pressure means low refrigerant temperature. Considering above reasons, no need to have an independent pressure transmitter for recycle valve. Pressure Transmitters for suction of C-6101A, and C-6101B of will be supplied with SIL2 certificate which is over requirements for this small package based on vendor a lot of experiences.							
Consider temperature and pressure gauges for (as a minimum), transmitters which initiate compressors shut down (including compressor suction and discharge pressure, and oil separator temperature).	REF#05	H.S.E.		There is no consequences for this recommendation. To meet this preference, PG for pressure transmitters which initiate compressor shut down and TG for temperature transmitters which initiate compressor shut down is provided by vendor.							
Consider Thermal Relief Valve (TRV) for cooling water line of E-6102. Or, remove isolating block valves on cooling water lines of E-6102 (due to presence of PSV-61101-R in PID-611B).	REF#06	H.S.E.	Isolating block valve on cooling water line will be removed. RO will be considered.								

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Recommendations / H.S.E Reply	References	Responsibility	Diciplines								Item (Open/Close)	Deadlines	Signature
			Process	Instrument	Piping	Machinery	Mechanic	General Engineering	HSE				
Consider temperature and pressure gauges for (as a minimum), transmitters which initiate compressors shut down (including lube oil temperature downstream of the oil filter, lube oil pressure).	REF#07	H.S.E.											

There is no consequences for this recommendation. To meet this preference, PG for pressure transmitters which initiate compressor shut down and TG for temperature transmitters which initiate compressor shut down is provided by vendor.