FMEA																FMEA REVIEW				
Project Name/Description: FMEA of #SYNGAS COMPRESSOR#ASSET RANK#1													Date: 22nd Nov 2014			Review No:				
Prepared by: FMEA Team HP/LP Compressor																Review Date:				
Team:Nagasundaram (SMH) and customer team																Draft - Work in Progress				
Equipment System	Assembly	Sub-assembly	Component	Function	Functional Failure	Failure Mode	Failure Effect	Sev (S)	Cause of Failure	Occ (O)	Current controls	Det (D)	RPN = S*O*D	Recommended Action	Resp	Target Date	Action Taken	S	O	D	RPN
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	No lubrication	Damaged to bearing and journal,increased vibration	8	Pump failure	8	AC & DC LOPS	1	64	To ensure uninteruppted electrical power supply.	Electical	Implemented	DG set already in place additional backup taken from battery bank.	8	2	1	16
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Lube oil pressure not adequate	Damaged to bearing and journal,increased vibration	8	LO pump not delivering at desired discharge pressure	8	Pressure transmitter trips the LP compressor	1	64	Providing of Overhead tank.	Mech	To be discussed					
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Lube oil pressure not adequate	Damaged to bearing and journal,increased vibration	8	LO Pump delivering but leakage in the Lube oil line	8	Pressure transmitter trips the LP compressor	5	320	Ultrasonic leak detection	CMC	May-15	Implemented	8	8	1	64
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Improper lubrication due to poor oil quality	Bearing lubrication film properties disturbed.Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Inadequate centrifuging	3	Plant Local Lab carrying out lube oil moisture analysis	5	120	Routine centrifuging Checking lube oil analysis as PPM measurement through third party lab	CMC	Dec-14	Implemented	8	2	1	16
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Improper lubrication due to poor oil quality	Bearing lubrication film properties disturbed.Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Cooler puncture.Lube oil temperature after cooler is more than 45 deg C Improper cooling in Lube oil cooler	2	Pressure transmitter trips the LP compressor	5	80	Proper maintenance and testing as per OEM and Ultrasonic leak detection/IRIS	Mech/CMC	May-15	Ultrasonic leak detection implemented	8	2	1	16
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Improper lubrication due to poor oil quality	Bearing lubrication film properties disturbed.Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Excessive Moisture in the lube oil tank	1	Plant Local Lab carrying out lube oil moisture analysis	6	48	Checking lube oil analysis as PPM measurement through third party lab	CMC	Dec-14	Implemented. Moisture content found to be 990 ppm as against permissible level of < 100 ppm	8	1	2	16
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Improper lubrication due to poor oil quality	Bearing lubrication film properties disturbed.Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Excessive Moisture in the lube oil tank	1	Centrifuging	6	48	Checking lube oil analysis as PPM measurement through third party lab. If it exceeds more than 100 ppm carry out oil filtration	Mech/CMC	Feb-15	Moisture content found to be 990 PPM. Oil filtration carried out and Oil top up done	8	1	2	16
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Electric pitting due to residual electromagnetism	Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Excessive static charge buld up discharging through shortest path/Residual magnetism	4	Brush provided in steam tubine and on LP Compressor Front end bearing	9	288	Provide brushes in HP and LP compressor bearings and monitor quantum of electric charge developed by measuring shaft voltages	Mech/Elec	Apr-15	Brushes provided in LP and HP compressor	8	2	5	80
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Electric pitting due to residual electromagnetism	Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Moisture in Syngas stream	4	Knock out drum provided	9	288	Check the knock out drum drain level settings	Operations/Mech	Dec-14	The drain setting is set at 55% of level indicator.At 55% the gas discharge line from KOD is partially submerged in condensate. The setting was changed to 45%	8	3	4	96
SYNGAS COMPRESSOR	HP COMPRESSOR		Bearing	To support the rotor.	Bearing losses its load carrying capacity.	Electric pitting due to residual electromagnetism	Bearing temperature increases. Damaged to radial and thrust bearing and journal,increased vibration	8	Inadequate knockout drum capacity after LP Compressor stage, resulting in moisture in Syngas stream	4	-	9	288	Re evaluate KOD capacity	Projects	Apr-15	The project was undertaken by Flours Daneil and the KOD has been redesigned	8	2	4	This is to be carried out during next ATR in Mar 2016. The RPN is expected to be 64
SYNGAS COMPRESSOR	LP COMPRESSOR/TURBINE		Brush	To Ground electric charge build up	Partial or No grounding of static charge	Ineffective grounding	Electrc pitting leading to bearing failure	8	Worn out brush	4	inspection during shutdown	9	288	Regular replacement and monitor quantum of electric charge developed by measuring shaft voltages	Mech/Elec	Continuos	Ongoing	8	2	5	80
SYNGAS COMPRESSOR	LP COMPRESSOR/TURBINE		Brush	To Ground electric charge build up	Partial or No grounding of static charge	Ineffective grounding	Electrc pitting leading to bearing failure	8	Inadequate capacity	4	-	9	288	monitor quantum of electric charge developed by measuring shaft voltages.If the charge developed is more than brush capacity replace with suitable brush	Elec	Continuous	Ongoing	8	2	5	80