

HAMS-GPS : HAZOP Study for : MyCo.

Project/Plant stage at HAZOP : Enter Project/Plant stage

Hazop study Number: Hazop-1a

Node: SKO from AVU-1 and AVU-2 to ATF-MEROX

P and I Dwg. No. : N.A.

Parameter : N.A.

Sop reference: N.A.

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Design intention (Operation): To remove S and Improve colour

Description of design intention:	To remove S and Improve colour				
Existing controls:					
Units:					
Control Range:					

HAZOP GUIDE WORD	LIKELY DEVIATION	LIKELY CAUSES	LIKELY CONSEQUENCES	PRESENT CONTROLS THEIR LIMITATIONS	RECOMMENDATION FOR BETTER HAZARD CONTROL
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(1) NO (NOT OR NONE)	No/Less Feed of SKO	Source Problem. No controls exist	Up to 80 m3/hr (Compressor Capacity) No Problem. If Less Unit Trips Auto. Below 80 m3/hr->Damage to compressor	L, LL Feed Alarms Exist.1. If Auto Trip fails-Air Stops fully2. To Manually open Air Control Valve to continue to run MEROX at rduced rate.Unit stopped below 70 m3/Hr.	None.
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RISK LEVEL: Risk level: NO DAMAGE and NO CHANCE Operability. **SIL/LOP:** **N.A.**
Action by:

(2) MORE OF	More Feed of SKO	More Production of SKO	No Problem. Required Air Set Auto.	Compr. Fails Standby Compr. Manually started	None.
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RISK LEVEL: Risk level: NO DAMAGE and NO CHANCE Operability. **SIL/LOP:** **N.A.**
Action by:

Observations

1. Before starting HAZOP, meeting was held with all senior officers and head of unit with briefing about HAZOP being undertaken.
2. Hard copies of P&ID's were available at the unit were referred to and fully made use of on HAZOP study.

Hazop study Number: Hazop-1

Node: N.A.

P and I Dwg. No. : N.A.

Parameter : N.A.

Sop reference: N.A.

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Design intention (Operation): N.A.

Description of design intention:	None				
Existing controls:					
Units:					
Control Range:					

HAZOP GUIDE WORD	LIKELY DEVIATION	LIKELY CAUSES	LIKELY CONSEQUENCES	PRESENT CONTROLS THEIR LIMITATIONS	RECOMMENDATION FOR BETTER HAZARD CONTROL
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(1) NO (NOT OR NONE)	No/ less feed	Feed pump trip, Fail Open CV-FC-105 Fails or Stuck Mid way.No or less Fuel gas	Interlock with Furnace to Trip.	AL, ALL at 52 m3 Hr.By pass operated till FC Replaced.FSSS Exists	Provide flow Transmitter and Indicator.
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RISK LEVEL:	Risk level: MEDIUM DAMAGE and LOW CHANCE	Operability.	SIL/LOP:	1
Action by:				

(2) MORE OF	More feed	FC fails	Pump Rpm Rises-> Pump trip-> Plant stops.	AH, AHH existBypass operated till FC replaced	None.
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RISK LEVEL:	Risk level: NO DAMAGE and NO CHANCE	Operability.	SIL/LOP:	N.A.
Action by:				

Observations

Purpose is to reduce S content in Diesel from 10,000 and above to <50 ppm. Diesel is taken through Surge Drum to Filters-> Heat exchangers to heat up from 70 to 345 then sent to Catalytic reactor-R1 and R2 with mixed hydrogen 35,000 M3->Cold separator V103 -> 2-parts 1. Gas (Hydrogen and H2S) and 2. Diesel and Dissolved H2S.->Gas to RGC (Recycle gas compressor) via Amine wash through C102 (Rich Amine Column), Liquid part to stripper for recovery of H2S.

HAZOP team: Name, Designation, Department

1. Dr. Ram S. Hamsagar, Chairperson, BES,2. Mr. Sunil Hamsagar, Computer Operation and Report Generation,3. Unit Panel Operators.

SIL	Generalized View
4	Potential for fatalities in the community
3	Potential for multiple fatalities
2	Potential for major serious injuries or one fatality
1	Potential for minor injuries

Node : N.A.

Design intention (Operation): N.A.

HAZOP GUIDE WORD	LIKELY DEVIATION	LIKELY CAUSES	LIKELY CONSEQUENCES	PRESENT CONTROLS THEIR LIMITATIONS	RECOMMENDATION FOR BETTER HAZARD CONTROL
(1) NO (NOT OR NONE)	No/ less feed	Feed pump trip, Fail Open CV-FC-105 Fails or Stuck Mid way.No or less Fuel gas	Interlock with Furnace to Trip.	AL, ALL at 52 m3 Hr.By pass operated till FC Replaced.FSSS Exists	Provide flow Transmitter and Indicator.

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Project/Plant stage at HAZOP : Enter Project/Plant stage

ACTION REPORT

Action By report only

Design intention (Operation): N.A.

Node: N.A.

Description of design intention:

None

Hazop study Number: Hazop-1

Parameter : N.A.

P and I Dwg. No. N.A.

Sop reference: N.A.

HAZOP GUIDE WORD	RECOMMENDATION FOR BETTER HAZARD CONTROL	Action by: Name , Designation, Department	Action Date
(1) NO (NOT OR NONE)	Provide flow Transmitter and Indicator.	Process and Mechanical	25/07/2016
SIL/LOP: 1			Action taken: <input type="checkbox"/>

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Summary of RBI-Matrix (conforming to European Process Safety Center's Standard) for selected Nodes:

Number of Risk (Damage-Consequence) level areas						
	<u>Num. Guide</u> <u>Words used</u>	<u>HIGH</u>	<u>MEDIUM</u> <u>HIGH</u>	<u>MEDIUM</u>	<u>LOW</u>	<u>SAFE</u>
Node:						
N.A.	2	0	0	0	1	1
SKO from AVU-1 and AVU-2 to ATF-MEROX	2	0	0	0	0	2
TOTAL		0	0	0	1	3
PERCENT		.00	.00	.00	25.00	75.00

Applications of RBI-Risk Matrix: Following are the applications of an RBI-Risk matrix

1. As an indicator of the risk level of the installation,
2. To establish risk mitigation measures and evaluate their effects,
3. To compare units and processes on the basis of risk,
4. To develop trends of risk development of a unit over time and during its life cycle.

SAFE :	3 x 100 / 4	=	75.
LOW :	1 x 100 / 4	=	25.
MEDIUM :	0 x 100 / 4	=	.
MEDIUM HIGH :	0 x 100 / 4	=	.
HIGH :	0 x 100 / 4	=	.

Summary of RISK BASED INVESTIGATION (RBI) MATRIX

Chance levels ----->

↑ Damage level ↓	0	0	0	0	0	0	0.0
	0	0	0	0	0	0	0.0
	0	1	0	0	0	1	25.0
	0	0	0	0	0	0	0.0
	3	0	0	0	0	3	75.0
TOTAL	3	1	0	0	0	4	
%	75.0	25.0	0.0	0.0	0.0		100.0

RISK LEVELS	TOTAL	%
HIGH	0	0.00
MEDIUM HIGH	0	0.00
MEDIUM	0	0.00
LOW	1	25.00
SAFE	3	75.00
	4	100.00

Applications of RBI-Risk Matrix: Following are the applications of an RBI-Risk matrix

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17 July 2016

Hazop study Number: Hazop-1**Node:** N.A.**Design intention (Operation):** N.A.**Observations**

Purpose is to reduce S content in Diesel from 10,000 and above to <50 ppm. Diesel is taken through Surge Drum to Filters-> Heat exchangers to heat up from 70 to 345 then sent to Catalytic reactor-R1 and R2 with mixed hydrogen 35,000 M3->Cold separator V103 -> 2-parts 1. Gas (Hydrogen and H2S) and 2. Diesel and Dissolved H2S.->Gas to RGC (Recycle gas compressor) via Amine wash through C102 (Rich Amine Column), Liquid part to stripper for recovery of H2S.

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2. Hard copies of P&ID's were available at the unit were referred to and fully made use of on HAZOP study.

HAZOP team: Name, Designation, Department

1. Dr. Ram S. Hamsagar, Chairperson,
2. Mr. Sunil Hamsagar, Computer Operation and Report Generation,
3. Unit Panel Operators.

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Over all Risk Levels

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Risk Levels for HAZOP	Count	Remarks	SIL/LOP Required
Risk level: MEDIUM DAMAGE and LOW CHANCE	1	Medium Low Critical	1
Risk level: NO DAMAGE and NO CHANCE	3	Safe	N.A.

SIL	Generalized View
4	Potential for fatalities in the community
3	Potential for multiple fatalities
2	Potential for major serious injuries or one fatality
1	Potential for minor injuries

Note: Design team to check and ensure the SIL requirements for safety instrumentation system and LOP for equipments safety as applicable are available. If not the SIL/LOP requirements to be provided.