

Worksheet

HAZOP-PC 1.00

Company: DOW CHEMICAL CO.

Node: 11

Process: HDPE - POLY B

Page: 1

Node: 11 First Stage Dryer (DR-2007) / Process Parameter: Flow Intention: 33,000 lb/hr					
GUIDEWORD	DEVIATION	POSSIBLE CAUSES	CONSEQUENCES	RECOMMENDATIONS	BY
No	No Flow	Rotary feeder trip. Dryer rotor trip. Broken blades. Broken coupling. Motor shutdown. Fused polymer in the discharge. Excessive buildup	Shutdown train. Fused polymer. Powder overhead. Plug exchangers. High pressure.	Motor amps are monitored. Speed alarm. Powder recycle to prevent buildup. Evaluate % solids analyzer on hydroclone overhead. Set rotor blades.	* * * BS *
More	More Flow	See Node#1/More flow. Excessive seal flush.	Overload dryer. Solvent wet powder Refer Node#1/More flow.	High seal flush switch. See Node #1.	*
AsWellAs	AsWellAs Flow	Jacket crack. Backup from second stage dryer. Mechanical seal. Left from shutdown	Water in the system. Stop reaction. Generate HCl in dryer. Nitrogen in dryer.	Evaluate how to get water out of D-2302. Equipment drying procedure. Operation train.	RF GH GH

DO A 120964
CONFIDENTIAL

Worksheet

HAZOP-PC 1.00

Company: DOW CHEMICAL CO.
Process: HDPE - POLY B

Node: 11
Pag : 2

Node: 11 First Stage Dryer (DR-2007) / Process Parameter: Temperature Intention: 30-90 Deg. C					
GUIDEWORD	DEVIATION	POSSIBLE CAUSES	CONSEQUENCES	RECOMMENDATIONS	BY
More	Higher Temp	Loss of heating water control.	Fused polymer. Plug outlet. Shutdown train.	HAZOP temp.control.	BB
Less	Lower Temp	Loss of steam to E-2017.	Wet product.	Low temperature shutdown.	*
		Loss of water flow to the dryer High solvent feed. Loss of heat transfer due to buildup.	Emissions problem in extrusion area. Plugging. Reach explosive range in the check hopper.	Hot water control scheme.	*

Worksheet

HAZOP-PC 1.00

Company: DOW CHEMICAL CO.
 Process: HDPE - POLY B

Node: 11
 Page: 3

Node: 11 First Stage Dryer (DR-2007) / Process Parameter: Pressure Intention: 1. psig.					
GUIDEWORD	DEVIATION	POSSIBLE CAUSES	CONSEQUENCES	RECOMMENDATIONS	BY
More	Higher Pressure	Vapor outlet plugged or blocked. Nitrogen on the end plate open. Loss of MRU or chilled water.	PSV Discharge. Powder in the flare header. Isopentane in DR-2008.	Operations training. System pressure alarms. Block feed on high pressure.	RF * *
Less	Lower Pressure	Pressure control valve failure.	Get water from DR-2008. Get oxygen into the dryer.	Low pressure alarm. Evaluate adding nitrogen to D-2302 for low pressure or high oxygen.	* GH

Worksheet

HAZOP-PC 1.00

Company: DOW CHEMICAL CO.
Process: HDPE - POLY B

Node: 11
Page: 4

Node: 11 First Stage Dryer (DR-2007) / Process Parameter: Vessel Entry Intention: Safe Operating Procedure					
GUIDEWORD	DEVIATION	POSSIBLE CAUSES	CONSEQUENCES	RECOMMENDATIONS	BY
Inadequat	Inadequat Vessel Entry	Pyrophoric concentrations. Nitrogen atmos. Inadequate entry preparation.	Fire. Asphixiation. Hydrocarbon release.	Evaluate CO2 or steam purge or nitrogen purge saturated with water. Write vessel opening procedure for DR-2007.	RF RF

DO A 120967
CONFIDENTIAL