

However, OPP1537 stated on page 2, (b)(4)

[REDACTED] result in an explosive condition or high temperatures at the very least in the Spent Standpipe and Reactor."

Furthermore, the 2013 Compliance Audit indicated on pages 4-5, (b)(4)

Operating procedure OPP1537 does not address what to do if reversal happens during shutdown, only during operation. As OPP0563 and OPP1537 both stated, (b)(4)

However, interviews determined when a shutdown is being performed several High/High and Low/Low alarms are going off all at the same time as the unit is being shutdown, therefore, a critical alarm may missed. See employee interview comments below.

#### **Incident on 4/26/18-**

The operating procedure (OPP0563) utilized during the shutdown incident on 4/26/18 did not provide clear information on consequences of deviation and the steps required to correct deviations, particularly in addressing reversal, differential pressure along the spent slide valve, and loss of catalyst which may have contributed to the incident.

It was indicated based on documentation and interviews that factors leading up to the incident that occurred on 4/26/18, in which the primary and sponge absorber blew up, was correlated with a reversal situation due to loss of the catalyst barrier above the spent slide valve. Documentation showed the spent catalyst slide valve had severe erosion which could have contributed to the loss of catalyst barrier above the spent catalyst slide valve in the reactor stripper, and/or the catalyst was dumped prematurely due to confusion in the new operating procedures (OPP0563) (see citation 1-8b). With no catalyst above the spent catalyst slide valve a reversal situation in which air was able to get into the reactor from the regenerator (differential pressure was not maintained, with higher pressure in the regenerator and lower pressure in the reactor) occurred; moreover, the main auxiliary air blower and one compressor were running at the time of the incident. This allowed air to travel from the regenerator into the reactor into the main column (as the blind had not yet been put in) eventually ending up in the primary and sponge absorber finding an ignition source along the way.

Operating procedures have several important steps in addition to closing the slide valve to prevent reverse flow; holding a catalyst level in the reactor stripper so that you can visually see what is happening and balancing the pressure between the reactor and the regenerator as needed to keep the catalyst level. It appears they were losing level, and the level did not make adequate adjustments to prevent the reversal.

OPP0563 does not address loss of catalyst level/barrier when performing shut down operations.

(SUPERIOR010053) noted the following in the 2018 Spring Turnaround Safety Bulletin, (b)(4)

#### **Deficiencies in OPP1512 FCCU Control Room Pressurization Procedure-**

Another example of a deficient operating procedure included OPP1512 FCCU Control Room Pressurization- Subtitle: HVAC Operation, Troubleshooting, and Air Monitoring. This OPP does not provide clear instructions and information in the operating procedure for employee response to critical events. Page 4 notes, (b)(4)

This Emergency Response Plan references critical steps that should be included in OPP1512 in the event of a chemical release not just in the event the control rooms are used as safe havens. There could be a chemical release in which employees need to don respirators right away before fleeing the control room to safety, etc.