



RCA Name Metal Dust Flash Fires and Hydrogen Explosion
 Report Number CSB: No. 2011-4-I-TN
 Report Date 1/10/2012
 RCA Owner Chemical Safety Board/Hoeganaes Corporation

Root Cause Analysis Report

Problem Statement

Focal Point 2 Fatalities

When

Start Date 1/31/2011
 Start Time 5:00am
 Unique Timing After requesting that a motor be restarted

Where

Facility Hoeganaes Corporation: Gallatin, TN
 Component Bucket elevator # 12 and motor
 Other... Iron dust - 45 to 150 microns

Actual Impact

	Cost
Safety 2 Fatalities	
Revenue Unknown, but likely substantial	
Cost Unknown, but likely substantial	
Other... Publicity: Severe negative impact	
Other... Employee Confidence: Severe negative impact	
Actual Impact Total:	\$0.00

Frequency Notes Multiple flash fires occurred in the history of the plant, but none were fatal until 1/31/2011

Solutions

1	ID	Label	Description		
		Solution	Identify and seal leaks in dust handling system.		
		Cause	Dust handling system not completely sealed		
		Note	Inspect the plant for contributors to airborne dust through seal leaks. Rank them, and work on eliminating the largest contributors.		
		Assigned	Hoeganaes Corporation	Criteria	Pass
		Due		Status	Selected
		Term	Medium	Cost	\$0.00
2	Solution	Replace with closed conveyers, or modify existing so they are enclosed			
	Cause	Open conveyers			
	Note	No notes			
	Assigned	Hoeganaes Corporation	Criteria	Pass	
	Due		Status	Selected	
	Term	Medium	Cost	\$0.00	
	3	Solution	Implement housekeeping practices and standards		
Cause		Accumulated iron dust not cleaned up			
Note		Housekeeping should become much easier once the sources of dust are identified and eliminated.			
Assigned		Hoeganaes Corporation	Criteria	Pass	
Due			Status	Selected	
Term		Short	Cost	\$0.00	
4		Solution	Conduct dyanamic analysis into dust collection system outages		
	Cause	Dust collection system frequently down			
	Note	The dust collection system has reliability problems. Complete a reliabilty assessment of the dust collection system and develop a plan to reduce the number and severity of outages.			
	Assigned	Hoeganaes Corporation	Criteria	Pass	
	Due		Status	Selected	
	Term	Short	Cost	\$0.00	

5	Solution	Develop a plan to improve the dust accumulation properties of the plant design		
	Cause	Facility design susceptible to dust accumulation		
	Note	Utilize best practices for making a facility resilient to dust accumulation.		
	Assigned	Hoeganaes Corporation	Criteria	Pass
	Due		Status	Selected
	Term	Medium	Cost	\$0.00

7	Solution	Don't wait for regulatory agencies. Develop and apply standards internally.		
	Cause	Regulatory gaps (OSHA, NFPA, IFC)		
	Note	Proactively anticipate regulation and get in front of it. Conduct plant audits as if the regulations were in place.		
	Assigned	Hoeganaes Corporation	Criteria	Pass
	Due		Status	Selected
	Term	Short	Cost	\$0.00

8	Solution	Completely clean the facility from top to bottom.		
	Cause	Tons of iron dust throughout facility		
	Note	The facility needs a complete cleaning. This needs to happen in conjunction with a more effective housekeeping effort. This will likely be a one-time effort because as sources for dust are found and eliminated, less dust will accumulate.		
	Assigned	Hoeganaes Corporation	Criteria	Pass
	Due		Status	Selected
	Term	Short	Cost	\$0.00

9	Solution	Clean up area before beginning work		
	Cause	Iron dust on motor/elevator		
	Note	Work areas need to be clean and free from debris. Proximity to flammable iron dust was a major contributor to these two fatalities. Had the dust been removed before work began, the incident may not have occurred.		
	Assigned	Hoeganaes Corporation	Criteria	Pass
	Due		Status	Selected
	Term	Short	Cost	\$0.00

10	Solution	Inspect the site for wiring hazards and fix.		
	Cause	Exposed wiring		

Note Open J-boxes, exposed wiring, etc are not acceptable. All instances need to be identified and fixed as soon as possible.

Assigned	Hoeganaes Corporation	Criteria	Pass
Due		Status	Selected
Term	Short	Cost	\$0.00

11 **Solution** Complete an audit of the facility to identify improper grounding. Ensure everything is properly grounded.

Cause Motor not properly grounded

Note The facility and it's components need to be properly grounded.

Assigned	Hoeganaes Corporation	Criteria	Pass
Due		Status	Selected
Term	Short	Cost	\$0.00

12 **Solution** Conduct PJHAs to identify risks. Wear appropriate PPE per risks identified.

Cause Employees not protected

Note All employees need to conduct PJHAs prior to beginning a job. Make sure to identify and mitigate risks associated with any job.

Assigned	Hoeganaes Corporation	Criteria	Pass
Due		Status	Selected
Term	Short	Cost	\$0.00

Team

ID	Label	Description	Label	Description
1	First Name	Brian	Last Name	Hughes
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2	First Name	Hoeganaes Corporation	Last Name	
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3	First Name	Sheryl	Last Name	Jesse
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	Role		Group	
	Email			

Chart Type Legend

- ▶ Transitory
- Non-transitory
- ⌚ Omission - Transitory
- Omission - Non-transitory
- ★ Focal Point
- ⊙ Solution Implemented

