

DTE Energy®



Preventing Combustible Dust Incidents, One Utility's Approach

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DTE Energy's Actions

- Developed a written Combustible Dust Control Program
 - Combustible Dust Hazard Mitigation Plan
 - Electrical Classification
 - Dust Control/Housekeeping
 - Ignition Control
 - Training
 - Contractors
- Developed a Combustible Dust Awareness training program
 - 60 minute instructor led session for all power plant employees



DTE Energy's Actions

- Combustible Dust Explosion Hazard Assessments
 - Chilworth Technology
- Combustible Dust NEP and Hazards Presentation to Fossil Generation Safety Committee
 - Fossil Fuel Power Plant Management and Union Safety Representatives
- OSHA Dust Explosion Inspection Preparatory Training Seminar
 - Union Safety Representatives, Plant Managers, Fuel Supply Managers and Corporate Safety
 - Background, NEP, OSHA Regulations and Consensus Standards, Elements of an Inspection and Inspection Preparation



DTE Energy's Actions

- Fossil Generation Combustible Dust Committee
 - Engineering, Fuel Supply, Corporate Safety
- Combustible Dust Awareness Presentation at Fossil Generation 2009 Safety Summit
 - Plant Employees, Plant Safety Committee Members, Plant Management and Union Representatives
 - Combustible Dust Overview and Review of Our Efforts to Date

Experience to Draw on...

TS Power Plant Silo Explosion



- Located 50 miles West of Elko, Nevada
- PRB coal-fired, 203 MW Net Output
- Plant began Commercial Operation in May 2008
- Unplanned outage began August 6, 2008 due to unstable main flame detection
- Maintenance and problems with “A” coal feeder delayed start-up attempt until August 16th





TS Power Plant Silo Explosion

- Explosion and Fire Timeline of Events
 - August 14th, 0400 Coal in Silo A caught on fire
 - CO Monitors detected rising levels of Carbon Monoxide
 - August 16th, 0800 Silo “A” Fire discovered by Operations
 - Heat Discoloration of Silo Cone
 - Some Coal Dumped – Fire thought to be extinguished
 - August 17th, 0700 Fire Continued
 - CO Levels rising / Exterior of Silo 300 F / Burning Paint
 - Emergency Response organized
 - 1045 2000 gallons water / 3% F-500 applied to silo top
 - Silo cooled off – CO levels decreased
 - 1430 CO levels rising
 - 1600 Fire growing
 - 1745 Explosion Occurs



TS Power Plant Silo Explosion

- Explosion and Fire Damage
 - Roof of Silo “A” torn open
 - Overpressure damage to Silos “B” and “C”
 - Overpressure damage to Dust Collector
 - Explosion/Flash Fire in Dust Collector
 - Overpressure damage to Tripper Room, doors, fans and fire system
 - Fire damage to electrical wiring





TS Power Plant Silo Explosion

- Explosion and Fire Initiating Event
 - Most likely – collapse of large void within burning coal mass
 - Created a puff of coal dust, which then ignited and created a blast wave and flame front





TS Power Plant Silo Explosion

- Corrective Actions/Lessons Learned
 - Define PRB Coal holding times
 - Monitoring of PRB Coal in silos (CO & Thermal Imaging)
 - Communication
 - Internal fire suppression in silos / silo wash-down system
 - Develop “Best Practice” fire suppression system / fire fighting methods
 - Additional fire training / fire suppression
 - Silo isolation
 - Explosion diversion
 - Improve methods of emptying PRB Coal from silos
 - Fire Resistant (FR) clothing



Summary

- Identify
- Educate / Communicate
- Assess
- Plan
- Execute
 - Immediate
 - Short Term
 - Long Term