Mitigate Risk
Enhance Culture
Improve Performance

Public Service Commission of Wisconsin
2022 Pipeline Safety Seminar
Incident Investigation/Root Cause Analysis
February 10, 2022
Who We Are?

• Training and consulting services provider
• 30+ years experience partnering with clients in the Energy sector
• Expertise in performance improvement, safety culture, and risk mitigation

• Clients include:
  ➢ PHMSA
  ➢ State Utility Commissions
  ➢ Pipeline Operators
  ➢ Utilities
What We Offer?

Training and Consulting Services Related to:

- Incident Investigation/Root Cause Analysis
- Human Performance Improvement
- Corrective Action Program Development and Implementation
- Pipeline Safety Management Systems
- Safety Culture
- Regulatory Counsel
- Audits & Evaluations
Management Oversight and Risk Tree (MORT)

• Conger & Elsea’s proprietary analytical technique for root cause analysis
• Comprehensive – Provides the content to assess and analyze organizational, programmatic and cultural drivers of events
• Objective – Not subject to analyst bias
• MORT can be used proactively to identify latent vulnerabilities and prevent events

A proven methodology used on high profile incidents
- Northeast blackout of 2003
- Oil spill in Gulf of Mexico
- Space shuttle rocket booster failures
- 2019 gas pipeline rupture in Ohio
What happened? How did we get here?

- Crack in a weld between a 36-inch diameter, 0.625-inch-thick pipe and an insulated joint fitting (fitting) which is a pre-fabricated, non-separable joint that electrically isolates different sections of a pipeline to prevent corrosion caused by stray electrical currents.
Applying Lessons Learned to Risk Management

Incident: Compressor Station

Description
- 46 welds not subject to a post-installation pressure test
- Leak discovered as the line was placed into service
- NDT/NDE failed to recognize 10 additional weld defects before in-service period

Findings
- Contractors (welders, inspectors & technicians) failed to perform quality work
- Project Manager failed to hold contractors accountable to construction contracts

DTE Response
- Pipeline Safety Management System
- Quality Management System (Quality Oversight)
- Improved Incident Investigation Standard 617 & Associated Employee Training

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The initial internal investigation performed was incomplete. While it identified some contributing factors, the true root cause was not determined.

- The public service commission conducted an RCA\(^1\) and identified 10 contributing factors, along with identifying the root causes
  - Weld quality & inspection
  - Material chemistry impact with welding
  - # of tie-in welds
  - Project oversight & contingency plans

DTE performed benchmarking with some best-in-class peers in both natural gas and nuclear industry. In addition, the methodology I am going to share with you today was recommended by our public service commission.

\(^1\) RCA: Root Cause Analysis
The Incident Investigation element of PSMS is a focus of our DTE Gas program.

- As part of the development and implementation of PSMS, DTE Gas has provided focus on the element of Incident Investigation.
- DTE Gas participated in the AGA PSMS Peer to Peer Assessment Program on Incident Investigation in 2020-2021:
  - Assessment of the DTE Gas program in January – February 2021.
The DTE Gas PSMS Maturity Assessment for Incident Investigation and a review of recent incident investigations and standard process revealed enhancement opportunities within the DTE Gas program.

**PSMS Maturity Assessment**

- Evaluation of the 12 shall statements within API 1173 for incident investigation
- Initial maturity assessment in 2021
- Action plan initiated to increase maturity in the incident investigation element

**Review of Recent Incident Investigations and Standard Process**

- Evaluation of After-Action Review and Root Cause Analysis Reports
- Evaluation of the DTE Gas Incident Investigation Standard, including event classification, process, investigation team qualifications, timelines, actions, and approval/presentation
DTE Gas has made enhancements to its Incident Investigation process to align with the requirements of API RP 1173 (PSMS)

- The event classification matrix is clearly defined
- Events are classified into four levels
  - Health and Safety
  - Pipeline and Facility Damage
  - Unintended Gas Release
  - Customer Outage
  - Financial Impact
- Enhanced Incident Investigation Process
  - Executive & Leadership Support
  - Detailed Process based on Investigation Level
  - Incorporation of Conger & Elsea Tools
  - Trained Staff on RCA Methodology
  - PSMS Involvement & Review
  - Action Item Tracking
  - Lessons Learned Sharing
  - Pipeline Safety Culture Integration

### 2021 PSMS Incident Investigation Action Items

- Revisions of Incident Investigation Process / Event Matrix
- Development of a Near Miss/Non-Regulatory Event Investigation Procedure
- Creation of an Event Management Database for Reference / Historical Data
- Training of staff in the Conger & Elsea RCA methodology and use of tools

### Investigation Level

- **Level 0** After Action Review
- **Level 1** Apparent Cause Analysis
- **Level 2** Root Cause Analysis
- **Level 3** Independent Root Cause Analysis

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