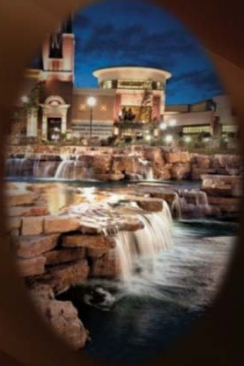




Iowa
2022
Seminar

INVESTIGATION OF
FAILURES
49 CFR §192.617




Hilton Garden Inn West Des Moines
West Des Moines, IA




Who is AID

- Established in April 2017 to establish consistent repeatable process agency-wide
- Headquartered in Oklahoma City
- 7 Investigators – 3 field offices (2 additional field positions actively being filled)



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National Pipeline Incident Coordinator

- AID On-call investigator is referred to as the “National Pipeline Incident Coordinator or NPIC”
- Duty rotated among AID Accident Investigators
- On-duty rotation extends one week
- Single Point for Operators, State Partners and Agencies

NPIC number is (888) 719-9033

PHMSAAccidentInvestigationDivision@dot.gov



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AID/NTSB - OPS’s Roles and Responsibilities

- Coordinate shared information within OPS.
- Represent PHMSA at NTSB meetings.
- OPS investigates under different statutory authority to address safety and compliance issues.
- PHMSA attempts to have a representative on each team (Operations, Emergency Response, Integrity Management, etc.) and keep same team on-scene through end of investigation.
- PHMSA or the State will determine if violations exist and issue enforcement.
- Party Coordinators provide updates to NTSB.



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National Response Center Notification

- Per 191 and 195, operators are required to make telephonic notifications to NRC.
- NRC receives a telephonic notification from operators, public, emergency responders, agencies regarding releases of hazardous product.
- 48-Hour Update - Revise or confirm the initial telephonic notice
 - Amount released
 - Impact - Number of fatalities and/or injuries
 - Significant facts relevant to cause of the incident
 - Extent of the damages



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NRC Reporting – Confirmed Discovery

Release of gas and one or more of the following consequences:

- Death or injury necessitating in-patient hospitalization
- Estimated costs exceeding \$122,000
- Estimated gas loss exceeding 3 MMCF

Confirmed Discovery means when it can be reasonably determined, based on information available to the operator at the time a reportable event has occurred, even if only based on a preliminary evaluation.



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30-Day Report Review

- Submitted by operators through ODES
- Integrated into PHMSA's Work Management System (WMS)
- Lead Investigator receives a 30-Day Report Review Task
- State-Regulated reports are sent to state partner for further review and processing
- WMS has added fields for Risk Factors – intended to promote lessons learned, identify improved barriers, improve analysis capabilities



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§192.617 Investigation of failures



Each operator shall establish procedures for analyzing accidents and failures, including the selection of samples of the failed facility or equipment for laboratory examination, where appropriate, for the purpose of determining the causes of the failure and minimizing the possibility of a recurrence.



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What is a Failure?


- Failures can be catastrophic events
- A reportable incident or accident
- Small
- Near Miss








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What is a Failure?

- **Breakdown of something:** a breakdown or decline in the performance of something, or an occasion when something stops working or stops working adequately
- **Something less than required:** something that falls short of what is required or expected
- **Does not need to meet a reportable criteria**
- **Does not need a release of product**



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What is a Failure?

- Whenever product comes out of the carrier pipe **incorrectly**
- Leak
- Third party damage
- Purging gone wrong



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So, What is a Failure?

- Abnormal Operation or near miss
- Regulator failure which causes an over pressurization
- Systemic problem with equipment
- Other
- As determined by company or state regulators



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Leaks

- Leak reports are failures but are they 192.617 compliant
- §192.459 and §192.475 require metallic pipe inspection when exposed or cut
- Both annual reports and 30-day accident reports require the cause of leak to be determined
- Integrity Management requires failure identification of leaks



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So why investigate?

- **§192.617** – Investigation of failuresprocedures for analyzing accidents and failures
- **§192.605 (e)**
The procedures required by and §192.617 must be included in the manual required by paragraph (a) of this section



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Investigate

To observe or study by close examination and systematic inquiry

- Examination:
 - to inspect closely,
 - to test the condition of,
 - to inquire carefully



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What to Investigate

- Do all failures, accidents, leaks or other events need to be investigated?
- Operator should specify in written procedures when investigations are needed as well as how detailed the investigation needs to be.



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How to Investigate

- Do all failures, accidents, leaks or other events need to be investigated?
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Observation

- Weather – before, during and after
- Markings
- Disturbances
- What's out of place
- People
- Big picture
- Photograph



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Excavation

- Slowly
- From the side
- Archeological Precision



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Evidence Preservation

- Material Near Pipe
- Soil Samples
- Coating
- Pipe
- CP
- Chain of Custody



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Interviews

- People on scene
- Public Responders
- Company Responders
- Other Responsible Company Staff



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Why do all this?

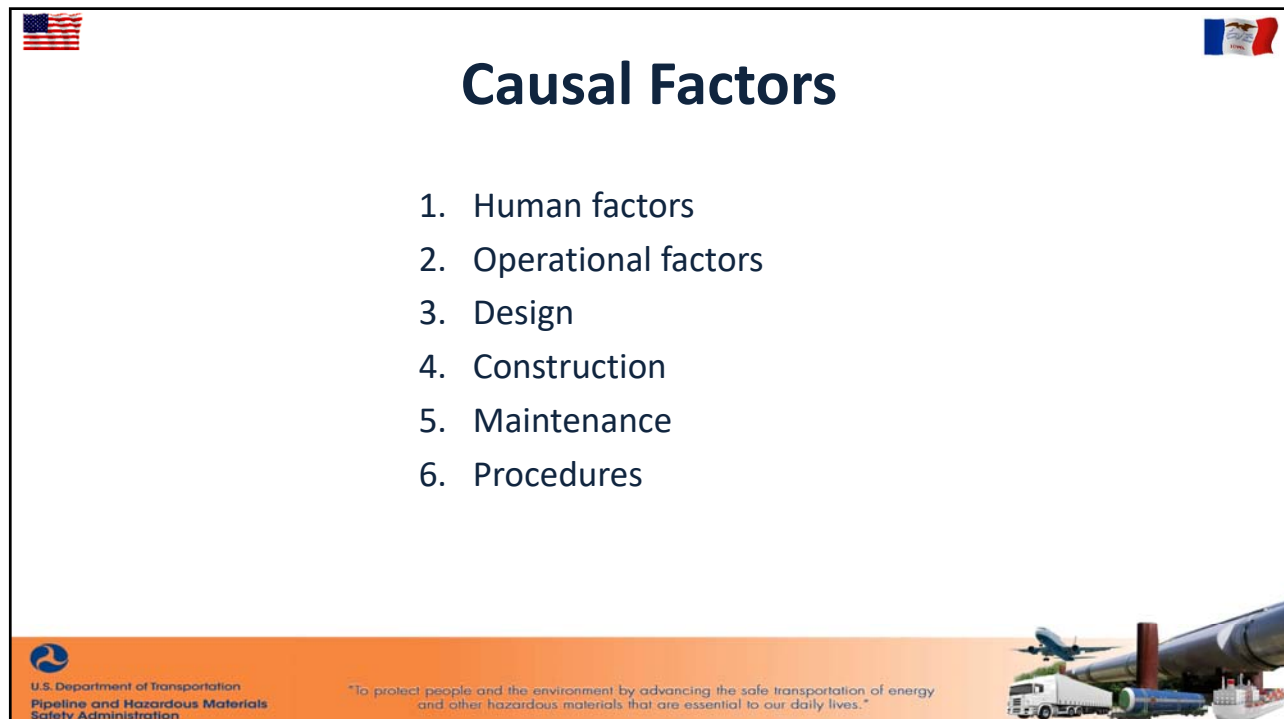
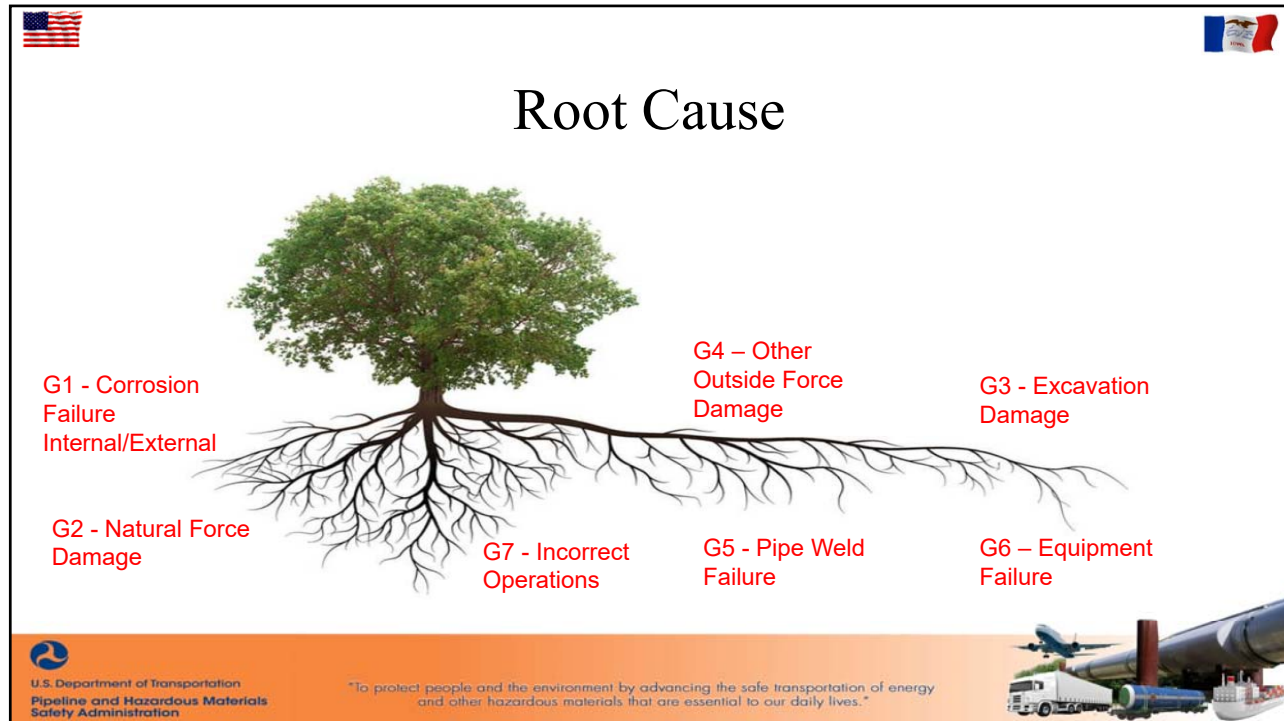
- Root cause
- Causal factors
- Prevent Recurrence



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Human Factors

- Fatigue
- Complacency
- Training
- Experience
- Safety Culture
- Priorities



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Operational Factors

- Pressure Cycles
- New pressure
- Maintenance
- Safety Barriers
- Safety Sensors
- Management of Change



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Design

- Material choice
- Robustness
- In-Kind Replacements
- Recalls
- Engineered Barriers



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Construction

- Construction Records
- Construction Procedures
- Non-conformance Reports
- Weather
- Deadlines
- Rough Handling
- Contractor History



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Maintenance

- Manufacture Specifications
- Procedures
- Training
- Consistency
- Preventative
- Routine



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Procedure Review

- Emergency response procedures
- O&M Procedures
- Operator Qualification
- Integrity Management
- Construction
- Purchasing



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Prevent Recurrence

§192.617 – Investigation of failures
.....procedures for analyzing accidents
and failures..... to minimize the possibility
of a recurrence



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How to Prevent Recurrence

- Safety Management Systems (SMS – API 1173)
- Information circulated to all personnel
- Procedure modifications
- Data storage for future reference
- Barriers
- Training improvements
- Management of change
- Design
- Share at industry events



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Preventing Accidents

- Threat Assessment
- Consequence Assessment
- Risk Assessment
- Learn From Other Industry Events

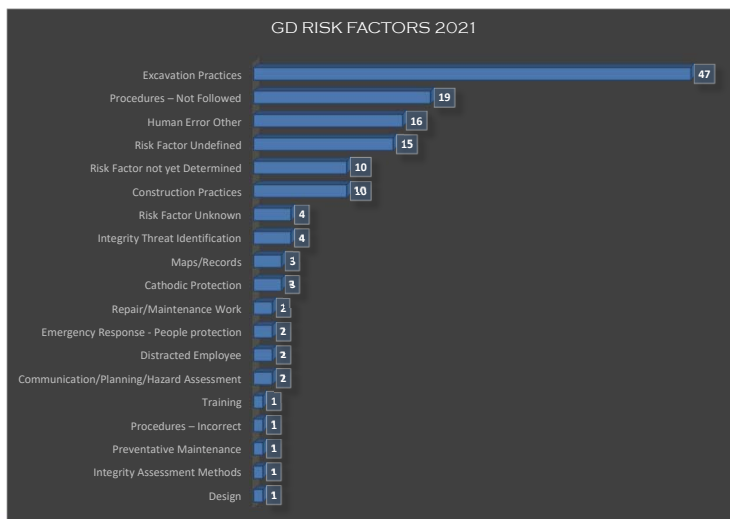


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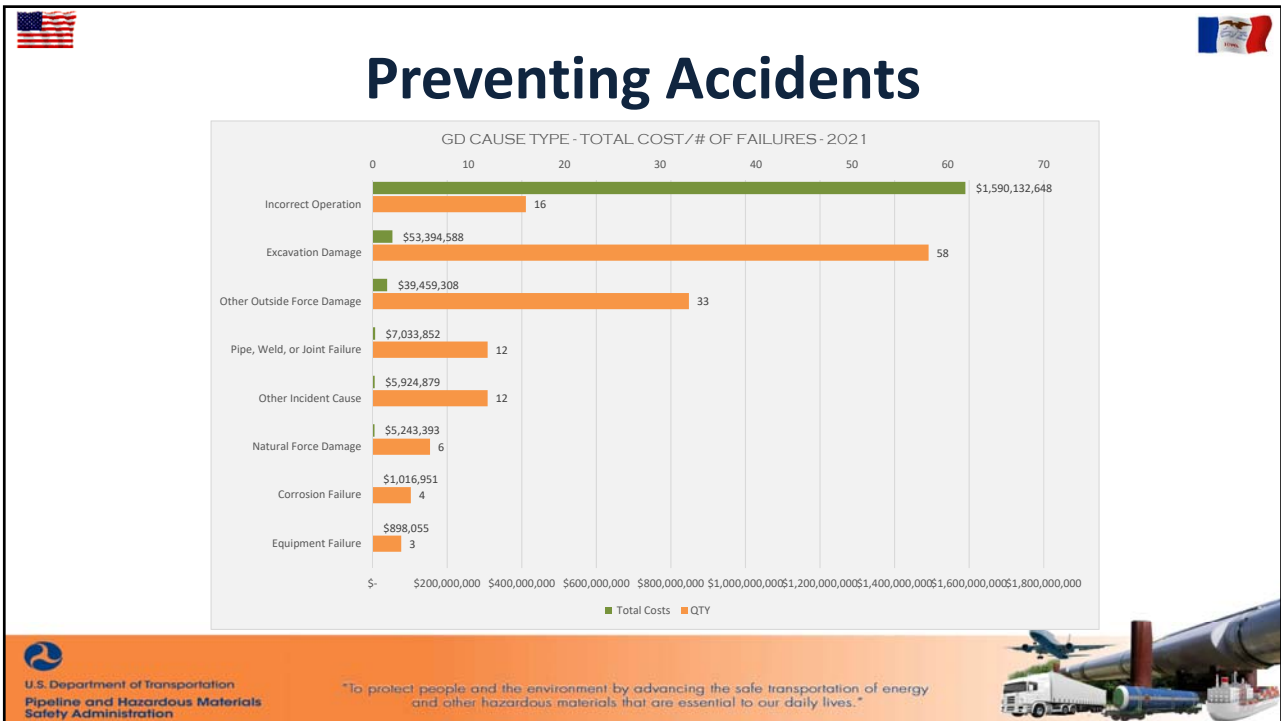
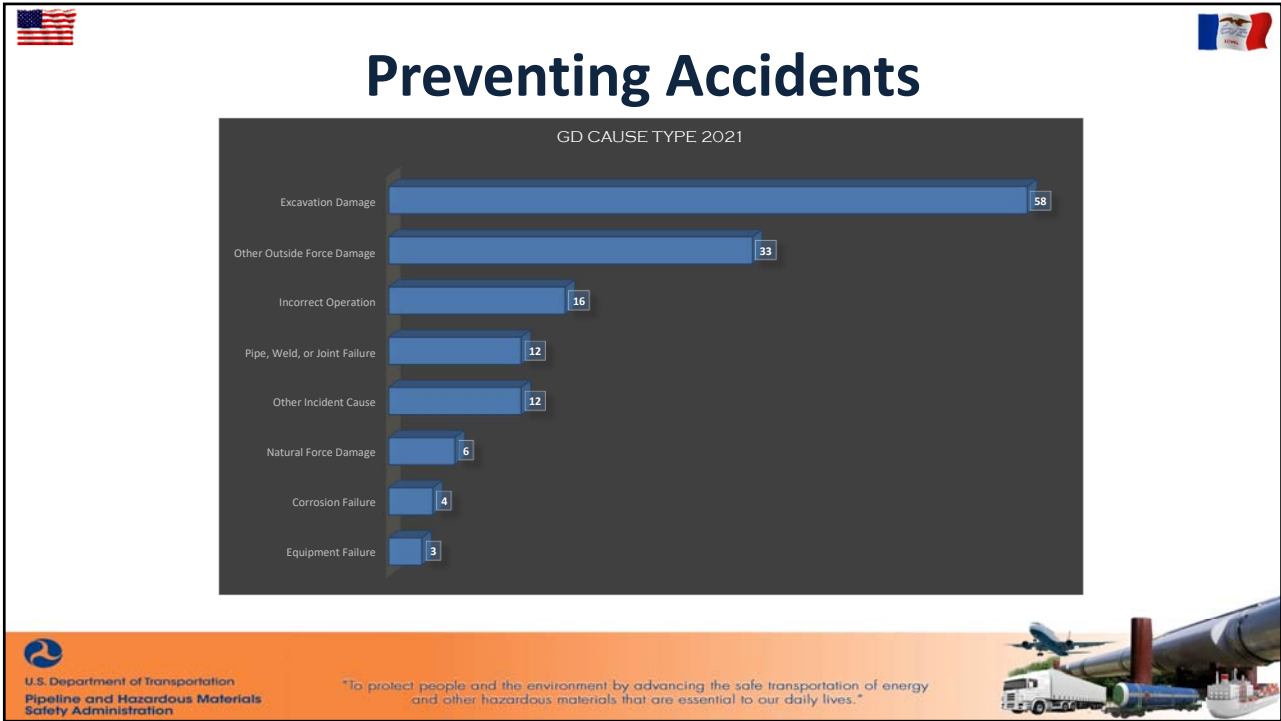
Preventing Accidents

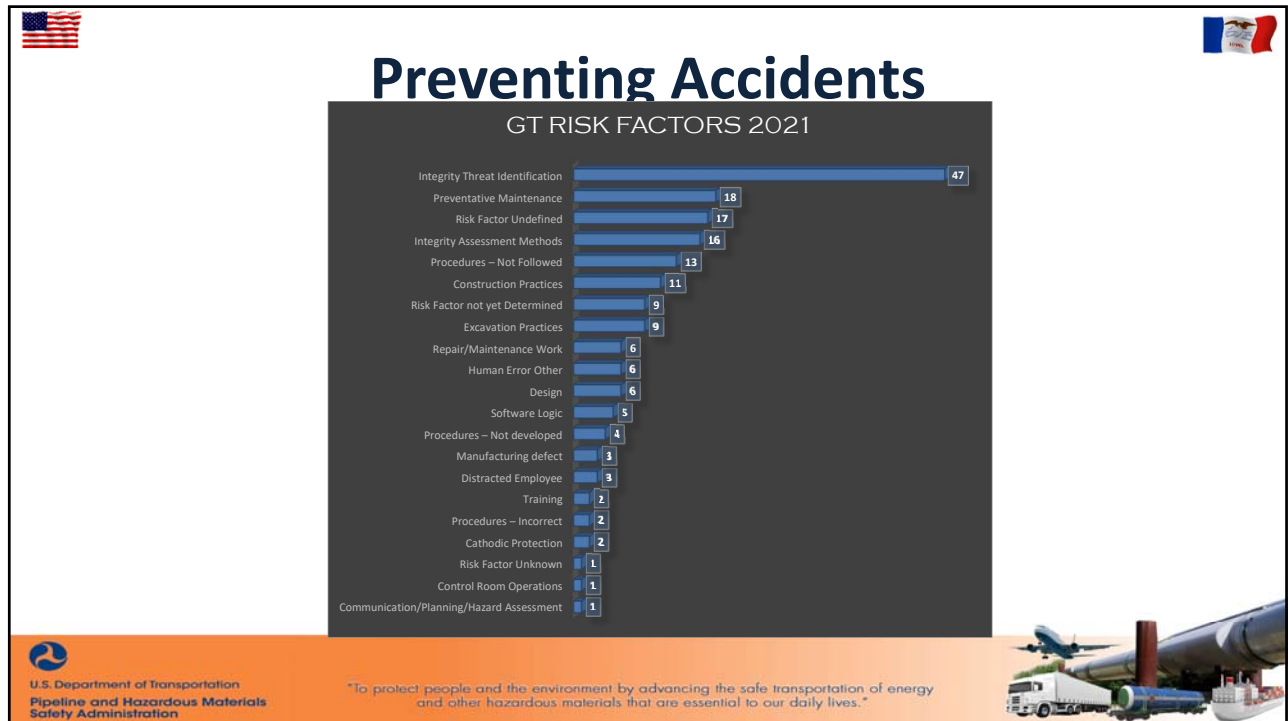
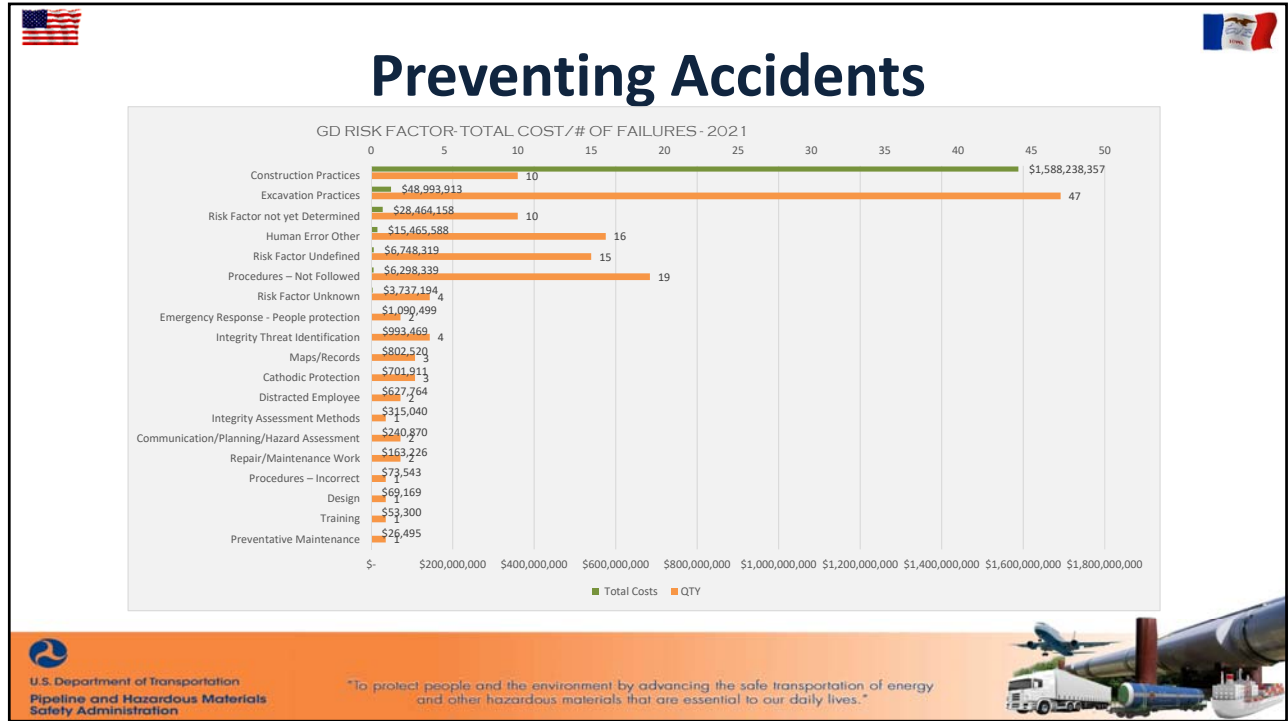


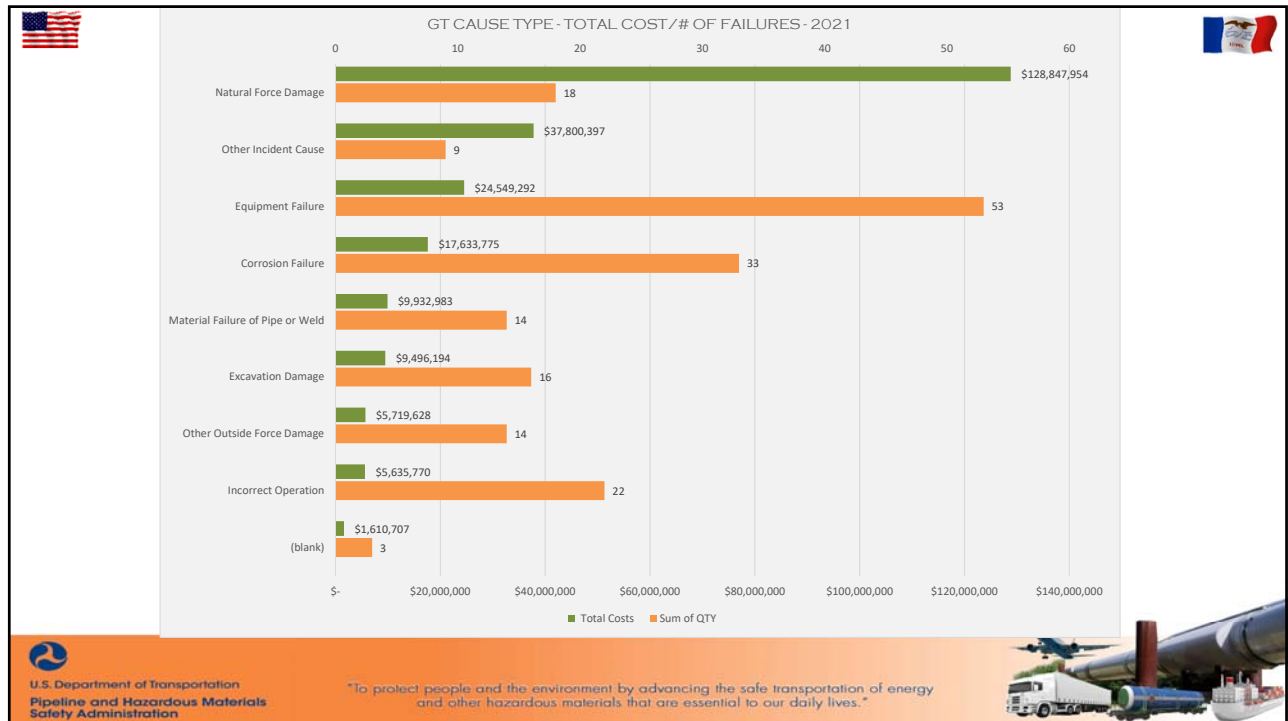
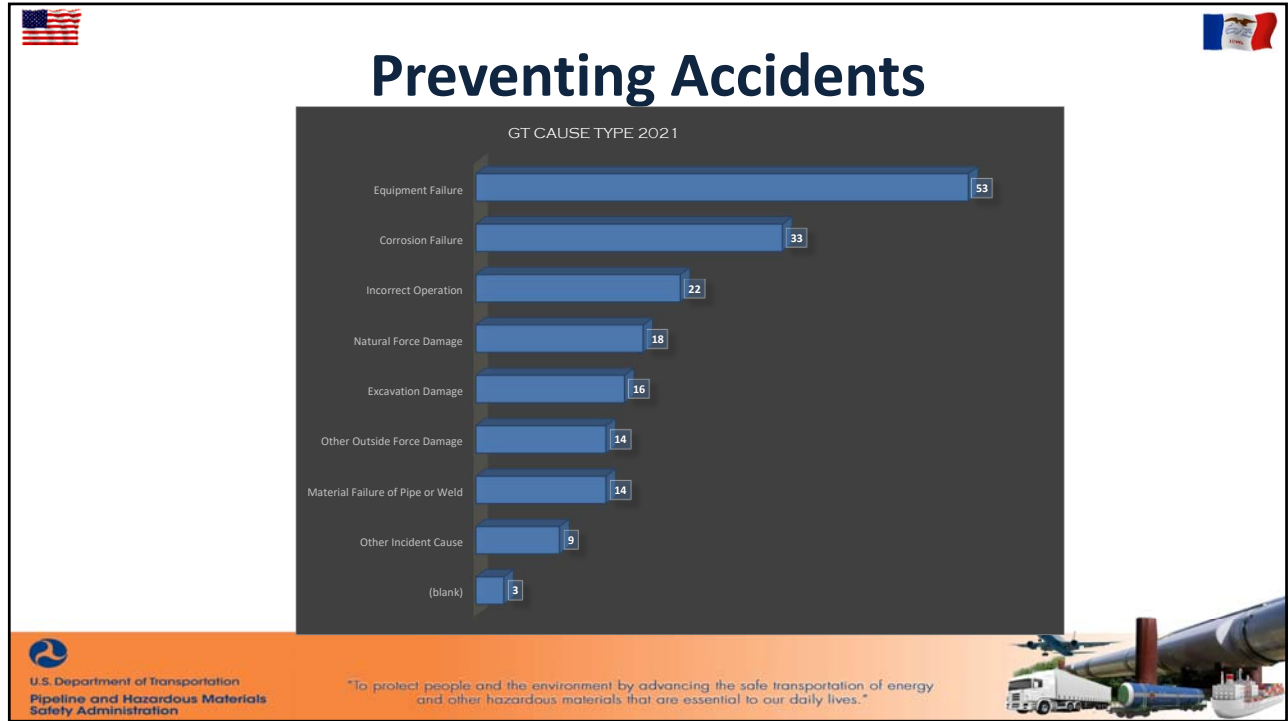
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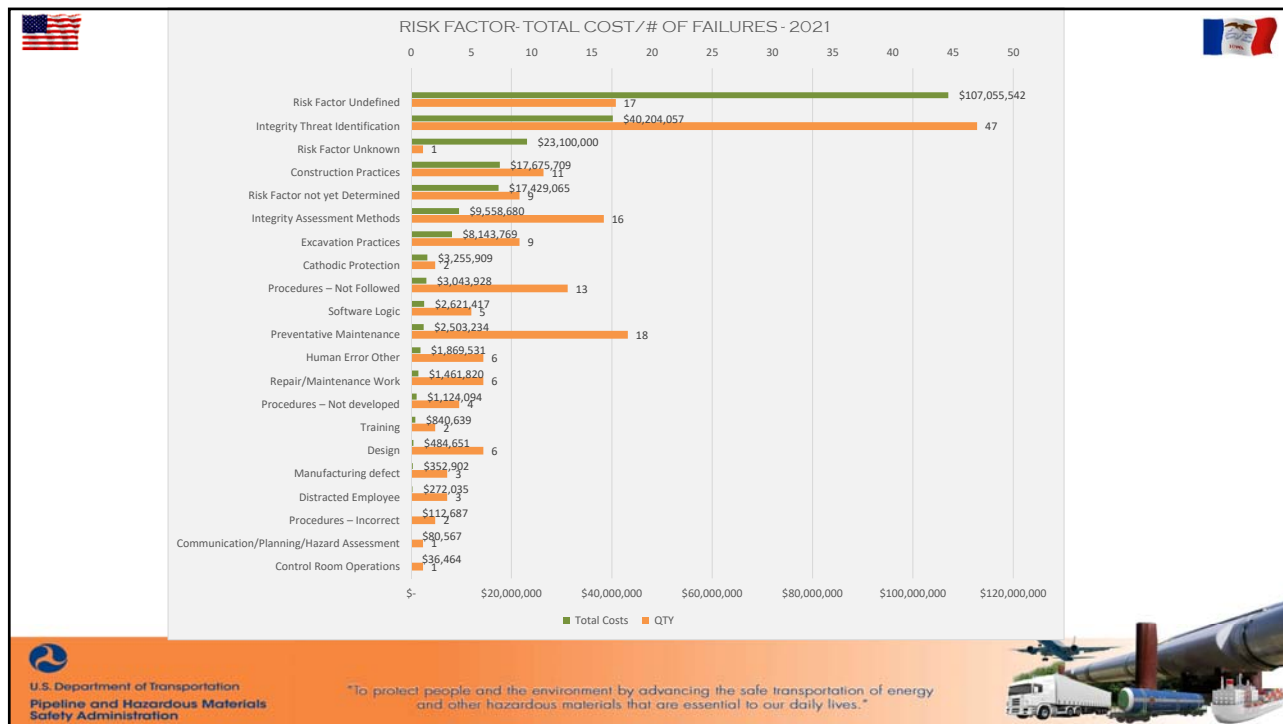
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Accident Summaries

- Texas pipeline fails external corrosion
- ILI tool findings were down graded
- Burst pressure calcs did not include tool tolerance
- Restarted line several times

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Accident Summaries

- Pennsylvania Tank overflow
- Conflicting procedures
- Complacency many procedures not followed
- Recent MOC
- Delay in addressing near miss 2 weeks earlier



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Accident Summaries

- Pipeline fails from external corrosion
- Leak detection in SCADA
- Previous issues with control valve
- Restart line
- Heavy Corrosion deposits under coating/ILI
- General corrosion/ILI
- Alternate ILI tools MFL and UT



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Accident Summaries

- House explosion
- Distribution company did not check neighboring homes
- Lacked response training



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Accident Summaries

- Farmer hits shallow line in field
- 8-inches deep
- Exceptionally heavy rains 6 months prior
- Newly identified washout near field
- Recent depth of cover survey
- No discussion with landowner or farmer



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Accident Summaries

- Pipeline fails from SCC
- Just upstream of compressor station
- No known history of SCC
- After failure now the line is in an SCC prevention program
- PHMSA sees multiple similar event annually



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Accident Summaries

- Pipeline fails from external corrosion
- Resulting fire impacts line another line at crossing
- Flame impinged line failures and hour later
- Multiple injures and fatality



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Accident Summaries

- Pipeline fails from latent 3rd party damage
- Sewer line drainage gradient intersected with main
- Sewer installation hit and pushed down gas line for clearance
- Sewer work padded with washed sand in clay soil
- Decades later failed
- Injuries and death



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Accident Summaries

- Pipeline fails on threaded pipe
- Small diameter piping
- Downstream side of compressor
- Near control valve
- Schedule 80
- No support
- Heavy mass on pipe



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Accident Summaries

- Pipeline fails from soil slippage
- Known topography for soil slippage
- LIDAR imagery identified area
- Area was being studied for stability
- Tree growth should signs of soil movement
- 12 months prior to failure averaged 100% more precipitation than average
- Geo Mapping tool was run showing movement



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Learn from other's Mistakes Questions?

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