



Pipeline and Hazardous Materials Safety Administration (PHMSA)

Office of Pipeline Safety (OPS)

Accident Investigation Division (AID)

Western Region Gas Conference

August 23, 2022



Presentation Topics



- National accident trends
- AID Roles
- National Pipeline Incident Coordinator
- Deployments
- 30-day report review
- Case Study



National Incident Trends

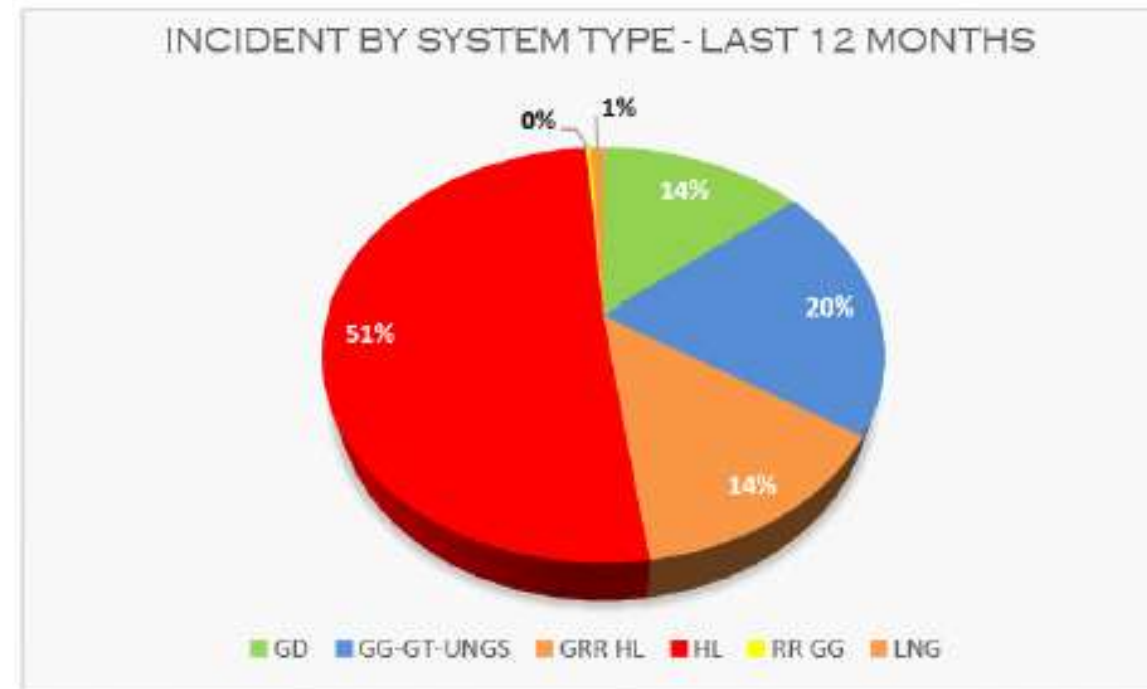


Chart based on 30-day report data for incidents that occurred 6/21 to 6/22

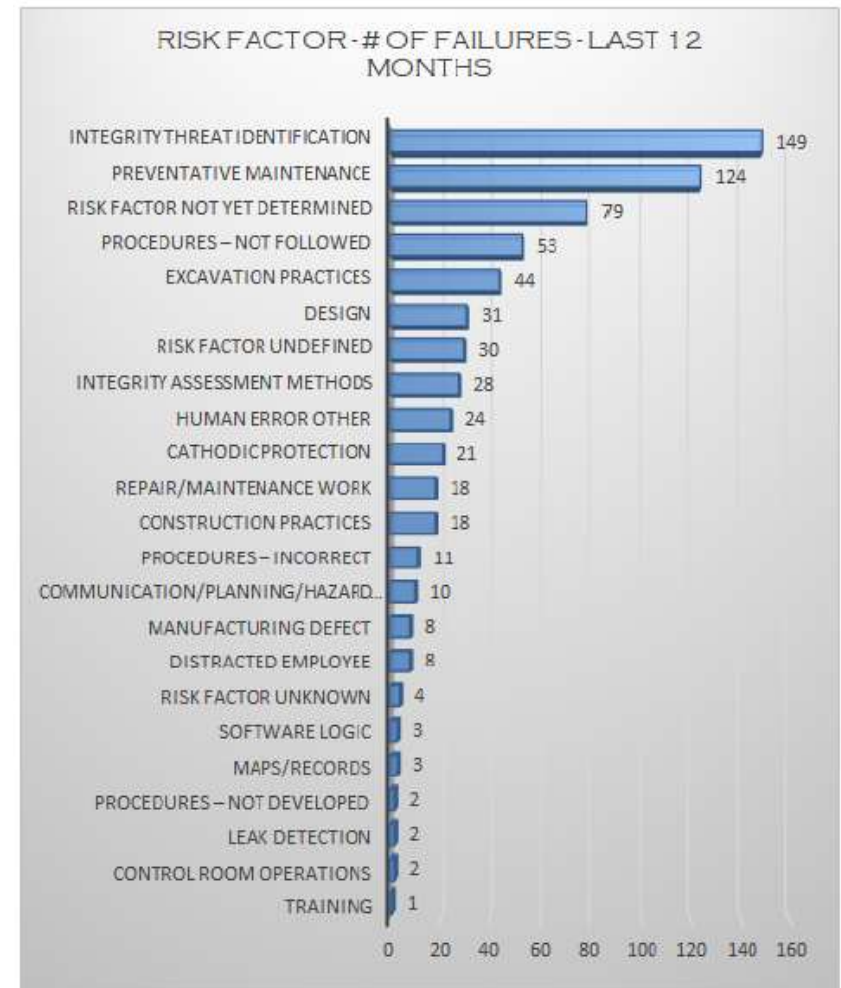
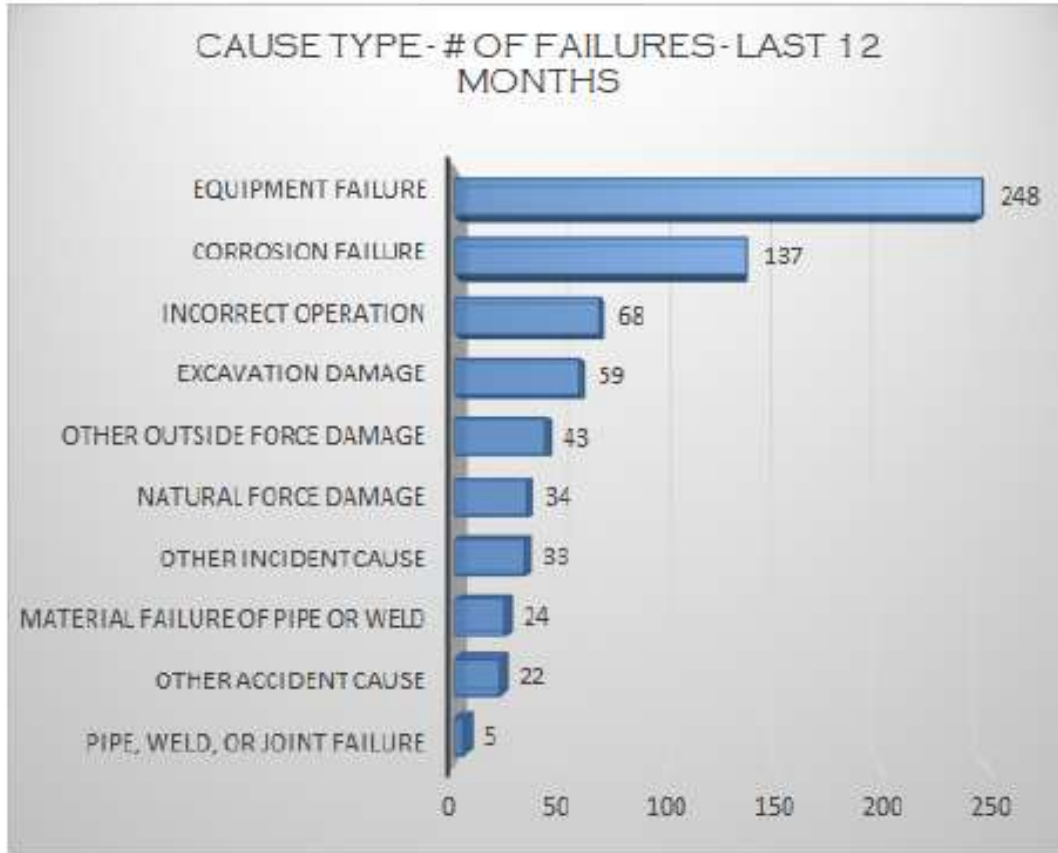


Investigate - Analyze - Prevent

PHMSA: Your Safety is Our Mission



National Incident Trends

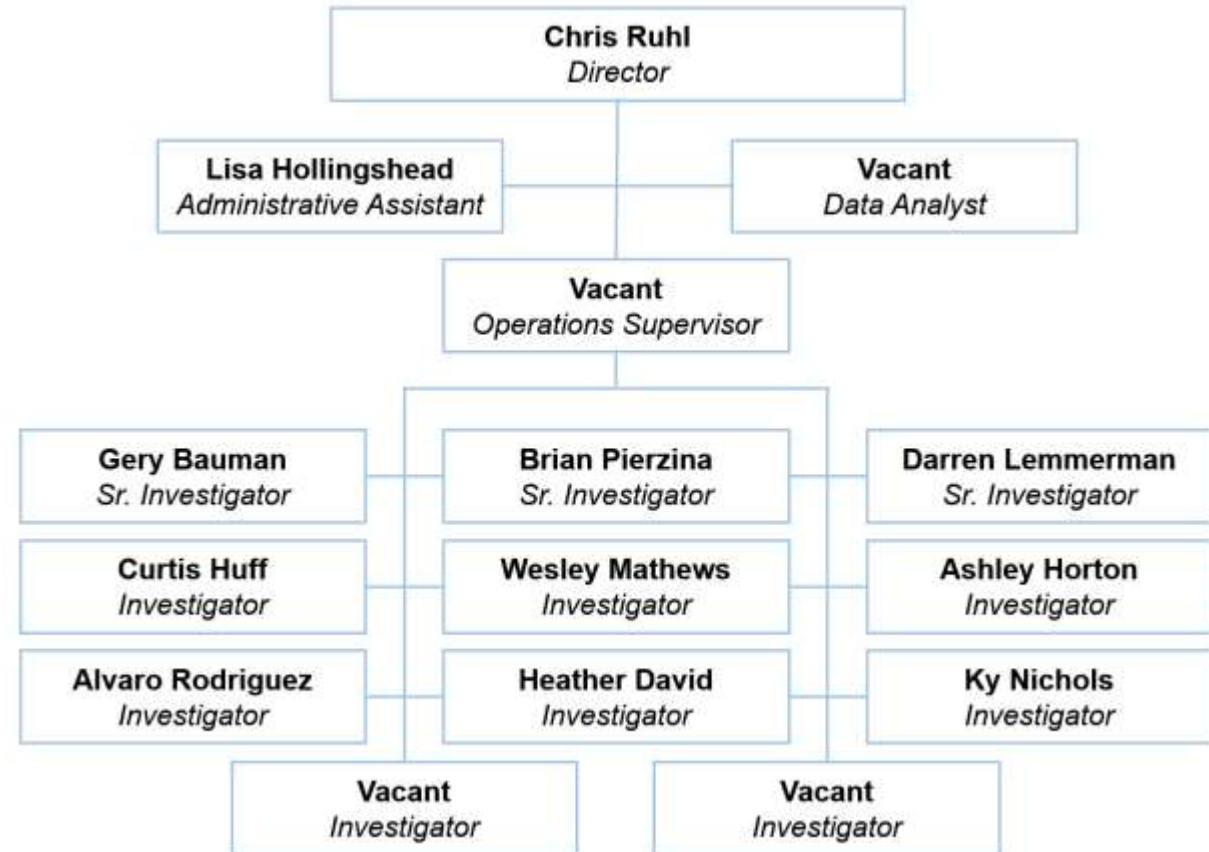
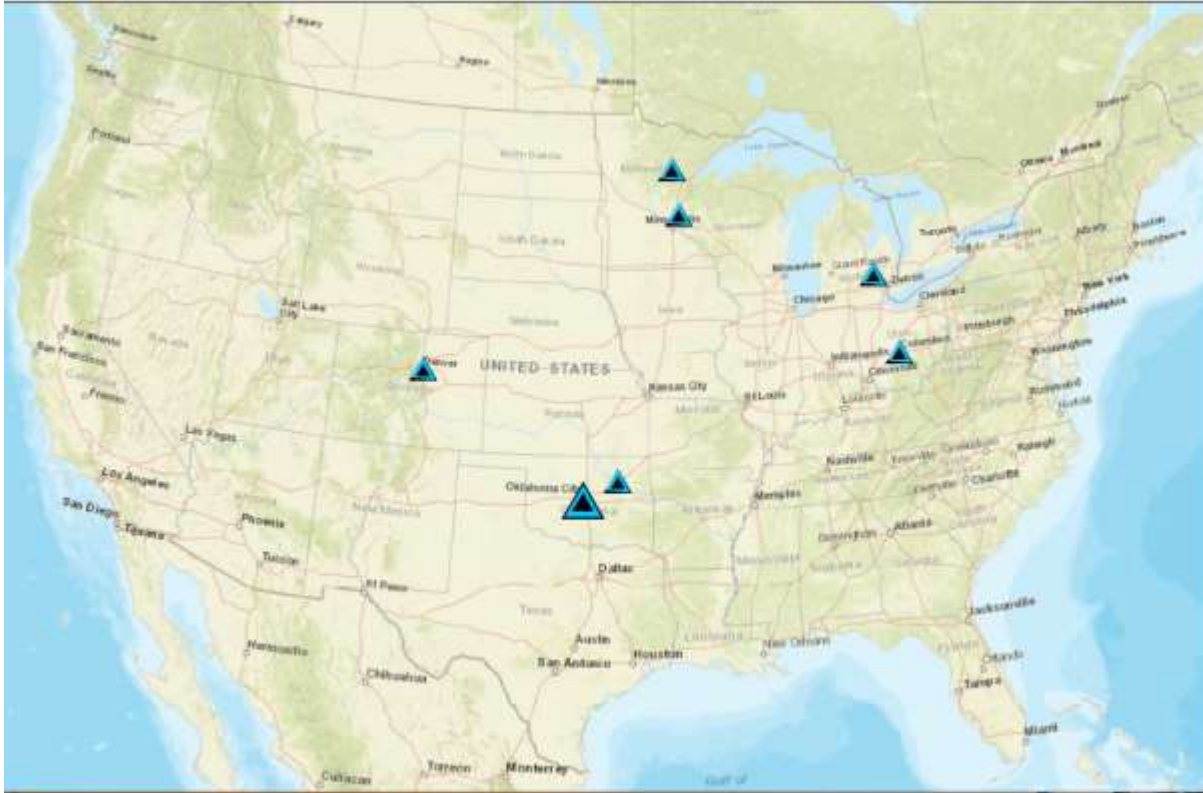


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Accident Investigation Division



What We Do



- Review, Evaluate, and Disseminate NRC Notifications
- Manage Investigations from Initial Notification through Cause Determination
- Conduct Onsite Accident Investigations: Support State Investigations
- Oversee Operator 30-Day Reports
- Disseminate accident trending data to improve pipeline safety
- Analyze Data to Identify Emerging Trends
- Capture and Share Lessons Learned



National Pipeline Incident Coordinator (NPIC)



- Monitors/Evaluates/Coordinates all ongoing incidents 24/7/365
- Single Point for Operators, State Partners and Agencies

NPIC Hotline (888) 719-9033

PHMSAAID@dot.gov



When Do We Deploy?



- A release of product and one or more of the following:
 - Death
 - Injury
 - Hazardous liquid spill > 500 barrels or spill reaches water
 - Major transportation impact - highway, airport, rail
 - Major supply impact
 - Pipeline system/operator of interest
 - Toxic release – ammonia, CO₂
 - NTSB deploys
 - Politically sensitive/high media interest
 - State request



Deployment considerations

- Location
- Availability
- Expertise
- Complexity
- Severity
- Possible duration
- Outages
- History with pipeline



Metallurgical Examination Protocol

- Guidance metallurgical laboratory failure examination protocol
- Includes background information, evidence collection & preservation, chain of custody, material testing
- Revised March 2019 – Available on PHMSA AID’s website
- www.phmsa.dot.gov/incident-reporting/accident-investigation-division/metallurgical-laboratory-failure-examination-protocol-pdf



NTSB-Led Investigations



Roles and Responsibilities with the NTSB

- PHMSA Party Coordinator (OPS Lead Investigator)
 - Deliver investigation information within PHMSA and provide updates to NTSB
- PHMSA Representative for NTSB Teams
 - Provide pipeline subject matter expertise to NTSB Team
 - Operations, Emergency Response, Integrity Management, Human Factors
- PHMSA Region
 - Issue enforcements for potential violations
- NTSB can perform metallurgical laboratory examination
- NTSB performs root cause failure analysis

***Background:** The Independent Safety Board Act created the NTSB and authorized it to investigate transportation accidents. An **amendment gave NTSB investigations priority over other Federal agencies.** OPS or States (with certification) - can conduct their own investigations and obtain information directly from parties. MOU signed between agencies.*

Ongoing Investigations



AID August Investigation Update



- 20 ongoing investigations
- 5 ongoing NTSB investigations

Natural Gas Pipeline of America (NGPL), Natural Gas Rupture, Artesia, NM

▪ On September 24, 2020, Natural Gas Pipeline of America's (NGPL – a Kinder Morgan asset) 20-inch Indian Basin natural gas transmission line ruptured near Artesia, NM. There were no injuries or evacuations.

Beta Offshore, Crude Oil Spill, Long Beach, CA

▪ On October 1, 2021, Amplify Energy's Beta Offshore 16-inch diameter crude oil pipeline ruptured offshore resulting in an estimated release of 588 barrels of crude oil into the Pacific Ocean. The spill impacted miles of beaches and coastline.

El Paso Natural Gas (EPNG), Natural Pipeline Rupture and Fire, Coolidge, AZ

▪ On August 15, 2021, Kinder Morgan's El Paso Natural Gas 30-inch natural gas transmission line ruptured near Coolidge, AZ. The escaping gas ignited and impacted a home approximately 400-ft away from the failure. The incident resulted in two fatalities and one injury to occupants of the house.



30-Day Reports Review



- AID's information collection begins upon notification of an incident
 - Lead is normally the NPIC that was on duty when originally reported
- For State Regulated incidents, AID relies on state partners
- When initial 30-day report is received it is included in the following months SMARS/MARS reports
 - State Program managers will have a chance to review SMARS entries prior to SMARS distribution



30-Day Report Changes



- **F7100.1 - Gas Distribution**
 - Updated 05/2021
 - Minimal Report Form modifications – primarily added Mechanical Joint Failure information to G-5, eliminating the requirement for PHMSA Form 7100.1-2
- **F7100.2 - Gas Transmission**
 - Updated 03/2022
 - Added Section D-13 to reflect Moderate Consequence Area (MCA) information
 - Added Under Section E-9 a selection option for Type C Gathering
- **Form 7100.2.2 - Regulated Reporting (RR)-Gas Gathering**
 - New Form
 - Implementation Date in the Portal was 5/16/2022



Investigation of failures - 192.617, 195.402(c) Significant changes effective 10/5/22

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.

Before

Investigation of failures and incidents.

(A) **Post-failure and incident procedures.** Each operator must establish and follow procedures for investigating and analyzing failures and incidents as defined in § 191.3, including sending the failed pipe, component, or equipment for laboratory testing or examination, where appropriate, for the purpose of determining the causes and contributing factor(s) of the failure or incident and minimizing the possibility of a recurrence.

(B) **Post-failure and incident lessons learned.** Each operator must develop, implement, and incorporate lessons learned from a post-failure or incident review into its written procedures, including personnel training and qualification programs, and design, construction, testing, maintenance, operations, and emergency procedure manuals and specifications.

(C) **Analysis of rupture and valve closures.** If an incident on an onshore gas transmission pipeline or a Type A gathering pipeline involves the closure of a rupture-arrestion valve (RAV), as defined in § 192.3, or the closure of alternative equivalent technology, the operator of the pipeline must also conduct a post-incident analysis of all of the factors that may have impacted the release volume and the consequences of the incident and identify and implement operations and maintenance measures to prevent or minimize the consequences of a future incident. The requirements of this paragraph (c) are not applicable to distribution pipelines or Types B and C gas gathering pipelines. The analysis must include all relevant factors impacting the release volume and consequences, including, but not limited to, the following:

(1) Detection, identification, operational response, system shut-off, and emergency response communications, based on the type and volume of the incident.

(2) Appropriateness and effectiveness of procedures and pipeline systems, including supervisory control and data acquisition (SCADA), communications, valve shut-off, and operator personnel.

(3) Actual response time from identifying a rupture following a notification of potential rupture, as defined in § 192.3, to initiation of mitigative actions and isolation of the pipeline segment, and the appropriateness and effectiveness of the mitigative actions taken.

(4) Location and timeliness of activation of RAVs or alternative equivalent technology; and

(5) All other factors the operator deems appropriate.

(D) **Rupture post-failure and incident summary.** If a failure or incident on an onshore gas transmission pipeline or a Type A gathering pipeline involves the identification of a rupture following a notification of potential rupture, or the closure of an RAV (as those terms are defined in § 192.3), or the closure of an alternative equivalent technology, the operator of the pipeline must complete a summary of the post-failure or incident review required by paragraph (c) of this section within 90 days of the incident, and while the investigation is pending, conduct quarterly status reviews until the investigation is complete and a final post-incident summary is prepared. The final post-failure or incident summary, and all other reviews and analyses produced under the requirements of this section, must be reviewed, dated, and signed by the operator's appropriate senior executive officer. The final post-failure or incident summary, all investigation and analysis documents used to prepare it, and records of lessons learned must be kept for the useful life of the pipeline. The requirements of this paragraph (d) are not applicable to distribution pipelines or Types B and C gas gathering pipelines.

After



Closer look at 192.617

- Post-failure and incident procedures
 - Must establish and follow procedures for investigating failures and incidents
 - Includes sending failed specimen to lab to determine cause and contributing factors
- Post-failure and incident lesson learned
 - Must develop, implement and incorporate lessons learned
- Analysis of rupture and valve shutoffs
 - When incidents cause the closure of RMV, operator must conduct a post incident analysis
- Rupture post-failure and incident summary
 - Required within 90 days of incident with quarterly status reviews until complete



Case Study – Stuck ILI Tool Incident



- Rupture caused by ILI tool ejecting from the pipe through an elbow bend
- Two employees injured, one hospitalized
- 76 MCF natural gas released
- Cost Approximately 800K
- Over 1000 customers impacted



Case Study – Events Leading up to the Failure



- Operator was running the MFL-C ILI tool when it got lodged in an elbow
- They started cycling pressure to dislodge the ILI tool
- Pressure built up behind the tool and propelled it through the pipe at an elbow combination of 90°-45° fittings

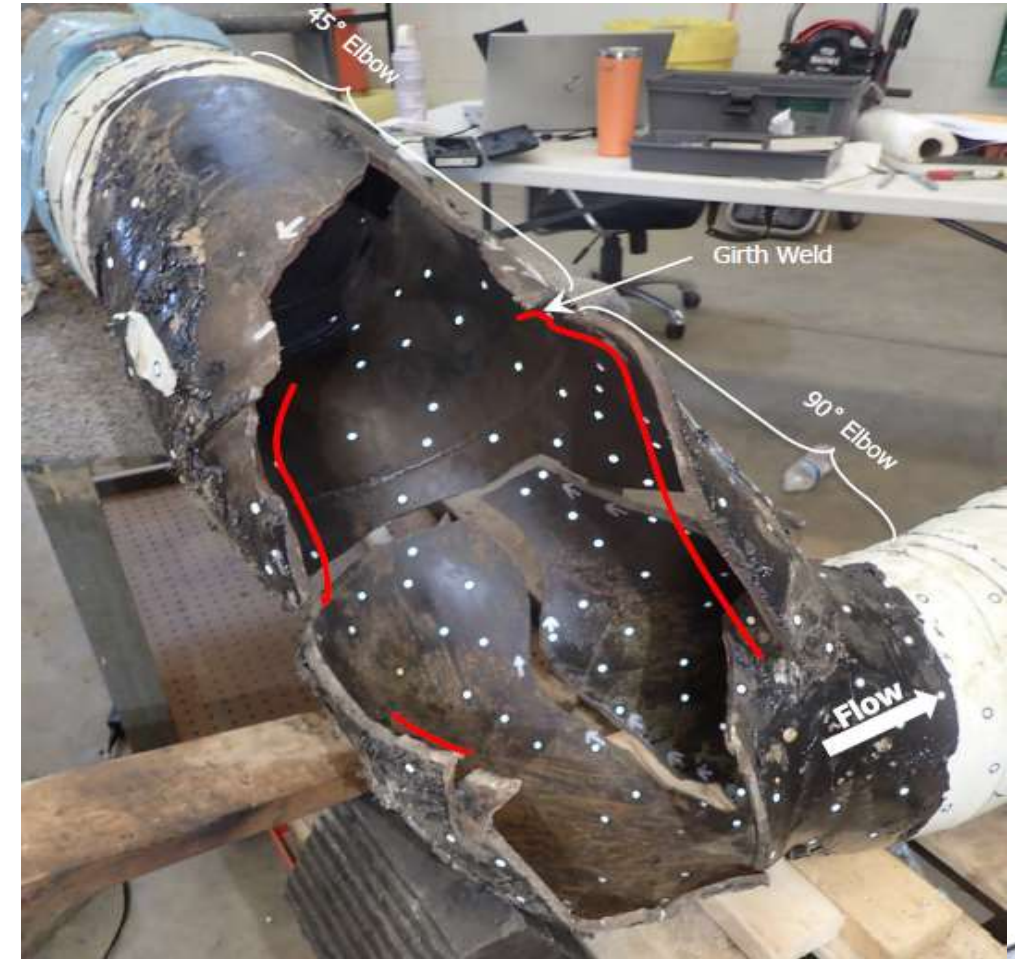


Case Study – Findings and Contributing Factors



Root cause of the failure was **incorrect operation**

- Operating parameters were not within tool specifications
- A modified tool launch sequence was implemented without required review and approval
- Attempts to dislodge the tool were not in accordance with written procedures





Procedural/Documentation Issues:

- ILI procedure did not specify how to dislodge a stuck tool
- OQ-AOC stated to follow a procedure that operator had not developed
- Operator had missing as-built drawings and were unaware of the specific elbow configuration, including the 90°-45° fittings





In-Line Inspection Issues:

- Operator has issues with previous tool runs were not communicated to the vendor
- The replacement tool had a different configuration than the original tool specified for this system
- Operator did not launch the tools at velocities reported on the vendor questionnaire



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