



OSFM Pipeline Safety Inspection of Kinder Morgan's Integrity Management Program

December 4, 2014 – Martinez, CA

Contra Costa County Board of Supervisors

Transportation, Water, and Infrastructure Committee Meeting

OSFM Pipeline Safety – Overview



- Staffing and Office Locations
- OSFM Regulated Pipelines and Facilities
- OSFM Inspection Responsibilities
- SFM Authority and Federal Partner
- Integrity Management Program – what is it?
 - Program Elements
- Kinder Morgan Intrastate Integrity Management Program Inspection
- Concluding Remarks

OSFM Pipeline Safety – Staffing



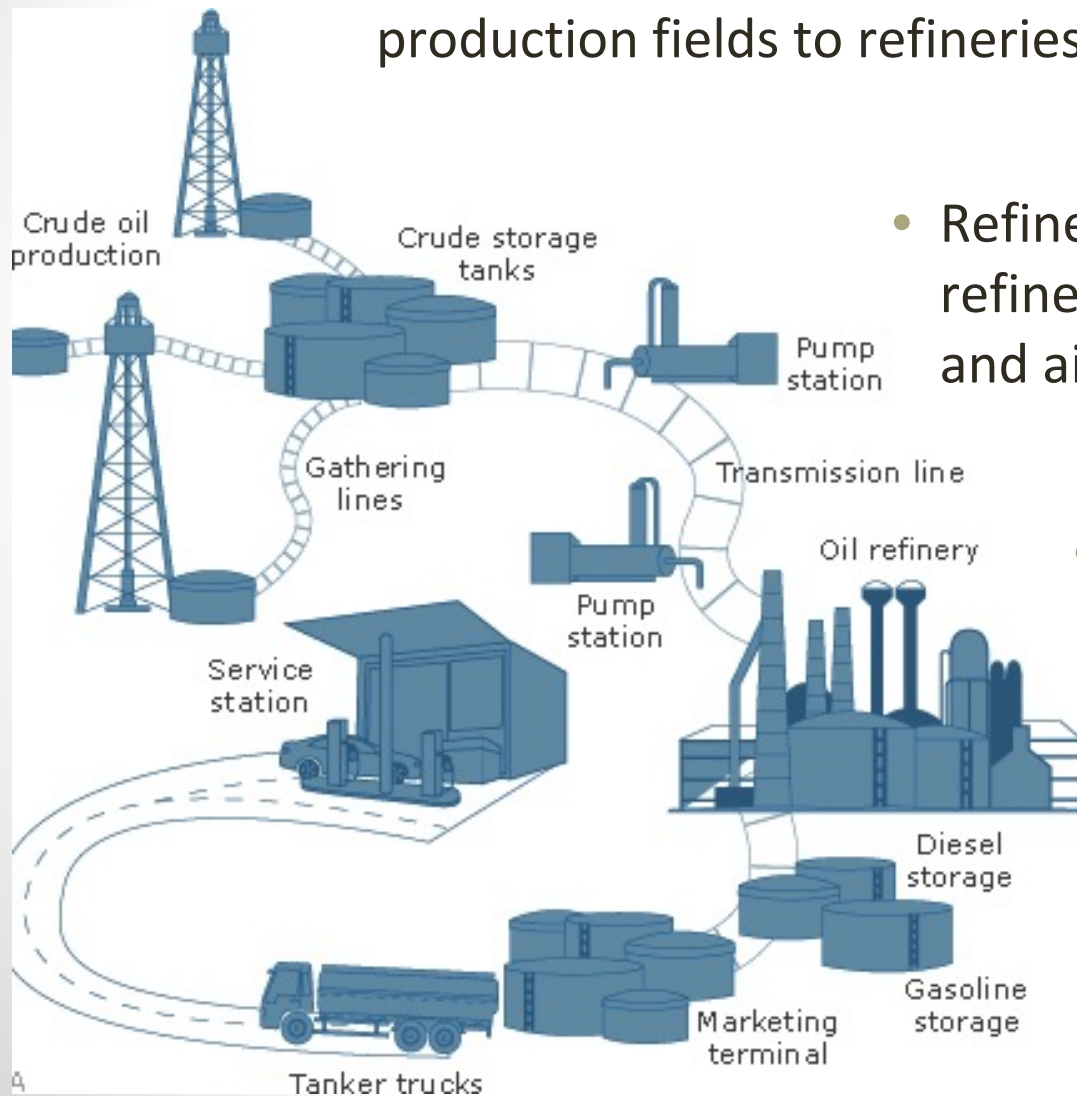
- **Inspection Staffing:**
 - Division Chief
 - 1 Supervising Pipeline Safety Engineer (1 vacancy)
 - 4 Pipeline Safety Engineers (6 vacancies)
 - 2 Retired Annuitants (1/2 time)

- **Office Locations:**
 - Sacramento
 - Bakersfield
 - Lakewood (LA area)

OSFM Pipeline Safety – Jurisdictional Pipelines/Facilities



- Crude oil pipelines from onshore and offshore production fields to refineries



- Refined product pipelines from refineries to marketing terminals and airports

- Highly Volatile Liquid Pipelines

- Breakout Tanks

OSFM Pipeline Safety – Federal/State Partnership



- The State Fire Marshal is certified by DOT/PHMSA to conduct inspection and enforcement of federal pipeline safety regulations on intrastate pipelines in California.
- Effective January 1, 2013, the inspection of the interstate pipelines in California was turned back to the federal Pipeline and Hazardous Materials Safety Administration (PHMSA).
- The decision to end California's interstate agent agreement was necessitated by the shortage of inspectors and the need to focus resources on the remaining 4,500 miles of intrastate pipelines.

OSFM Pipeline Safety – Jurisdictional Pipelines in Statewide

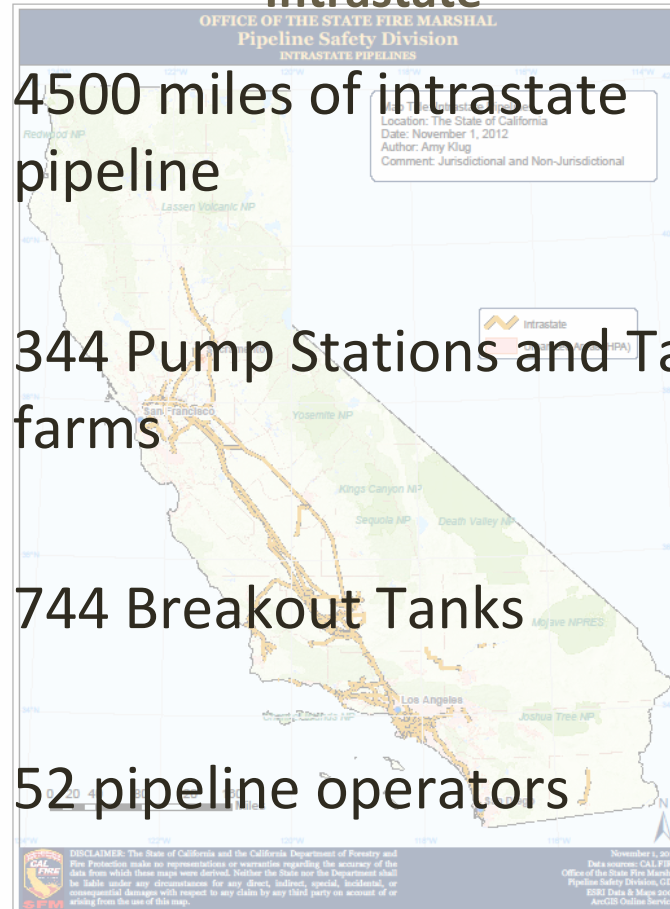


Intrastate and Interstate



Intrastate

- 4500 miles of intrastate pipeline
- 344 Pump Stations and Tank farms
- 744 Breakout Tanks
- 52 pipeline operators



OSFM Pipeline Safety – Pipelines in Contra Costa County

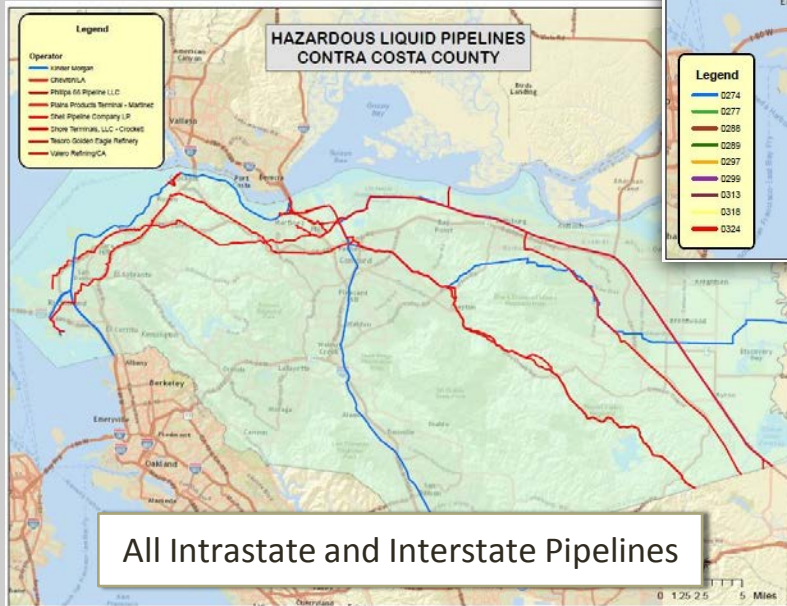
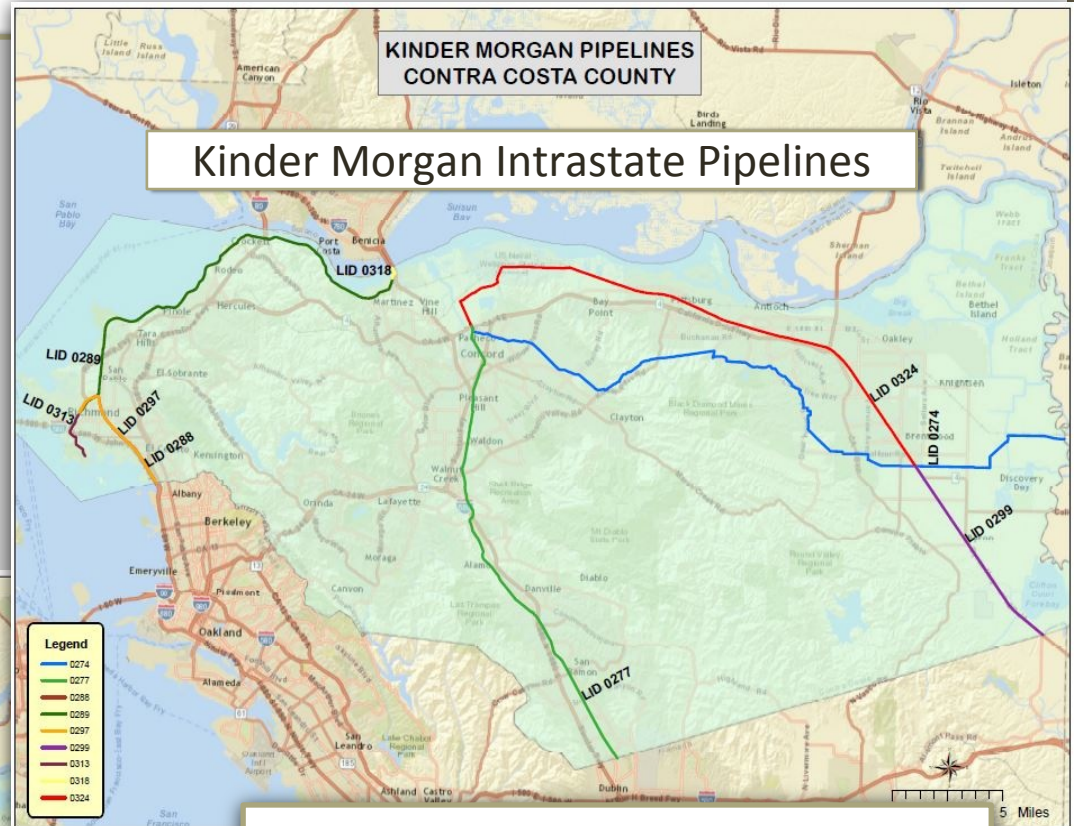


Intrastate Hazardous Liquid Pipeline Operators – (Contra Costa County Only)

- Total operators: 9

Intrastate Pipeline Mileage – (Contra Costa County Only)

- Total Miles: 993
- Kinder Morgan Miles: 419

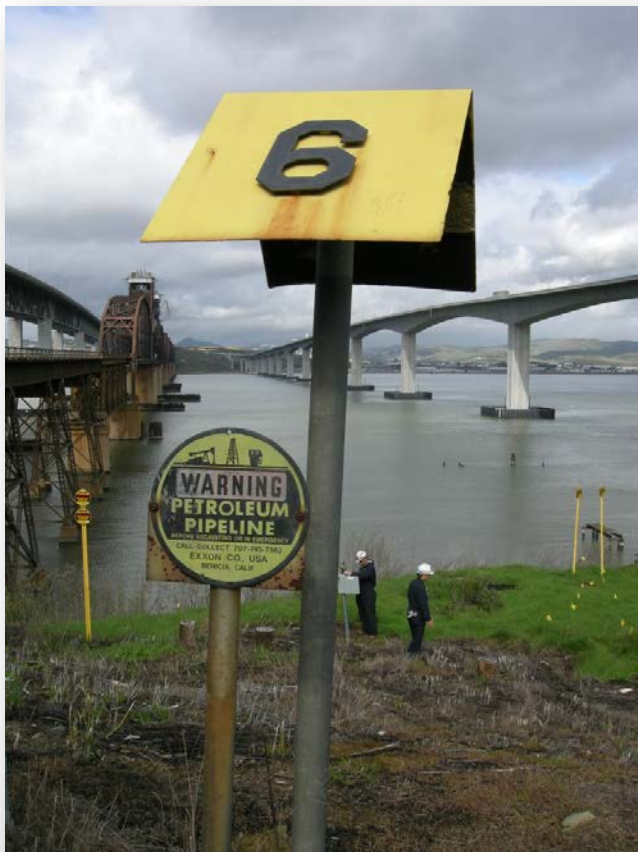


There are 9 Kinder Morgan Intrastate pipelines in Contra Costa County. Each of these lines were included in this IMP inspection plus two additional pipelines that travel from Oakland to Brisbane.

OSFM Pipeline Safety – Types of Inspections



OSFM utilizes a risk-based inspection approach based on available resources.



- Standard (Comprehensive)
- Construction
- Accident Investigations (Leaks)
- Integrity Management
 - Program (Procedures)
 - Field (Hydrostatic tests, ILI)
- Operator Qualification
 - Program, Field
- Breakout Tank
- Drug and Alcohol
- Public Awareness
- Control Room Management

OSFM Pipeline Safety – Additional Requirements



- Train Derailments
- Encroachment Issues
- Safety Related Conditions
- Local Assistance
- Training
- Spill Drills
- Public Requests
- Media Request

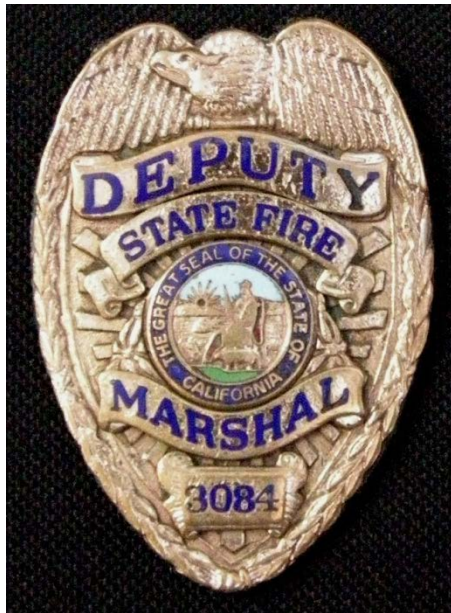


OSFM Pipeline Integrity Program – Hydrostatic Pressure Tests/ILI

Ca. Govt. Code 51010-51019



Beginning in 1984, the California State Fire Marshal has required all intrastate pipelines over 10 year of age to be periodically hydrotested or internally inspected at intervals not to exceed 5 years.



- Program started with the passage of the Elder Pipeline Safety Act
- Requires Operators to pressure test each Hazardous Liquid Pipeline every 5 years
- Independent Testing Companies/Witnesses
- Test must be documented and sent to OSFM
- Many Operators utilize high tech In-Line Inspection (ILI) tools
- Testing and Repairs may be monitored by OSFM

DOT/PHMSA Integrity Management Program – Elements (Protocols)

195.452 (f)



Beginning in 2001, DOT/PHMSA required all pipeline operators to comply with the Liquid IM Rule. The Liquid IM Rule specifies how pipeline operators must identify, prioritize, assess, evaluate, repair and validate the integrity of hazardous liquid pipelines that could, in the event of a leak or failure, affect High Consequence Areas (HCAs) within the United States. HCAs include: population areas; areas containing drinking water and ecological resources that are unusually sensitive to environmental damage; and commercially navigable waterways.



GOALS: Improve pipeline safety through:

- accelerating the integrity assessment of pipelines in High Consequence Areas,
- improving integrity management systems within companies,
- improving the government's role in reviewing the adequacy of integrity programs and plans, and
- providing increased public assurance in pipeline safety.

Kinder Morgan Integrity Management Program Inspection – Overview



- A DOT-PHMSA Team Inspection of Kinder Morgan's Integrity Management Program was completed in June 2010.
- OSFM completed an Inspection of Kinder Morgan's Integrity Management Program in July 2014.

- Inspection Forms
- Protocols Reviewed
- Inspection Findings



Kinder Morgan Integrity Management Program Inspection – DOT/PHMSA IMP Elements (Protocols)

195.452 (f)



1. Identifying Segments that Could Impact HCAs

- High Population Areas and Other Populated Areas
- Commercially Navigable Waterways
- Unusually Sensitive Areas of Environment
 - Drinking Water USA
 - Ecological USA (see 195.6)

2. Baseline Assessment Plan

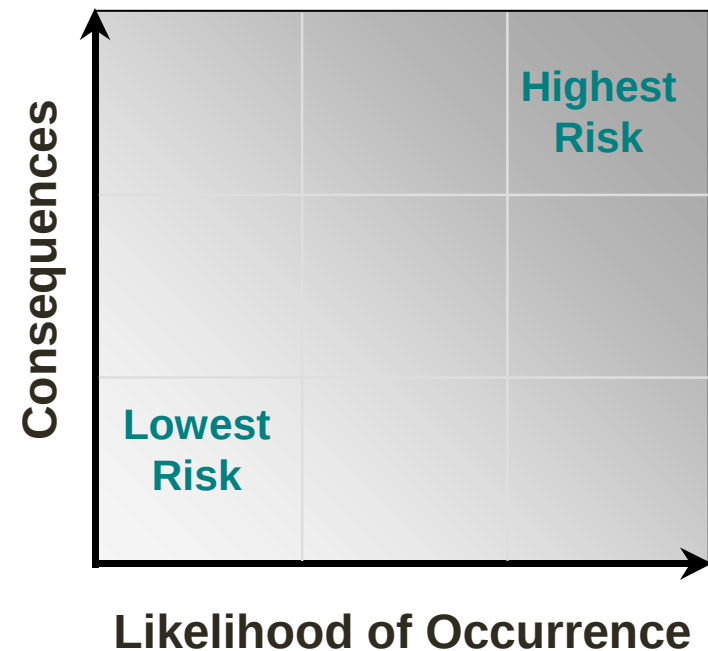
Completion Date

- February 18, 2003
- 1 Year after the pipeline begins operation

DOT PHMSA reviewed Kinder Morgan's Baseline Assessment Plan during the 2010 Integrity Management Program Inspection. There were no potential issues identified in Protocol 2 (Baseline Assessment Plan) during the PHMSA 2010 inspection. Kinder Morgan has not constructed any new INTRAsate pipelines in Contra Costa County or identified any new High Consequence Areas since the 2010 DOT PHMSA Integrity Management Inspection that would require a Baseline Assessment.

3. Integrity Assessment Results Review

4. Remedial Action - Making Mitigation and Repair Decision

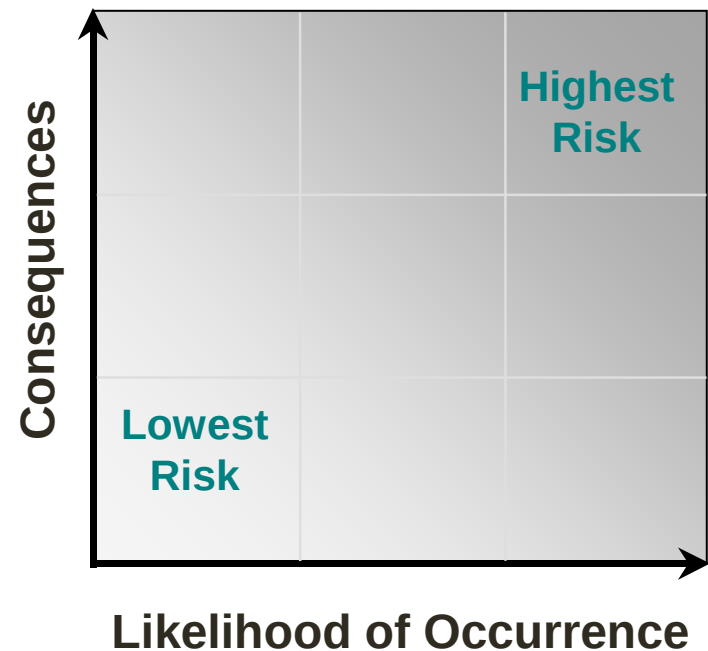


Kinder Morgan Integrity Management Program Inspection – DOT/PHMSA IMP Elements (Protocols)

195.452 (f)



5. Risk Analysis - Integrating and Analyzing Risk Information
6. Identifying Additional Preventive and Mitigative Measures
7. Continual evaluation and assessment of pipe integrity
8. Operator Measures Program Performance



Kinder Morgan Integrity Management Program Inspection – Identify Segments that Could Impact an HCA



1. Direct Analysis
2. Indirect Analysis
3. Terrain Analysis
4. Direct Watershed Analysis
5. Indirect Watershed Analysis
6. Pool Fire Analysis

Kinder Morgan uses the PHMSA National Pipeline Mapping System (NPMS) High Consequence Area (HCA) dataset as a baseline for their HCA model. Their HCA dataset is updated annually using input from field Subject Matter Experts that document new HCA's, changes in existing HCA's, or changes to the system that may not have been captured during the Management of Change (MOC) process. Their contractor, American Innovations (AI), receives an updated NPMS HCA layer from Kinder Morgan prior to performing the HCA Impact identification. AI performs the six types of analysis for Kinder Morgan using a combination of its risk analysis software, Risk Intelligence Platform (RIPL™), and its HCA analysis software, Risk Consequence Analysis Tool (RiskCAT)

Kinder Morgan Integrity Management Program Inspection – Integrity Assessment Results Review



The Kinder Morgan Analysis Profile specifies In-Line Inspection Tool requirements (i.e. tool type, reporting specifications, ILI vendor personnel qualifications, etc.). Kinder Morgan is notified by the ILI vendor of all Immediate Repair Conditions by phone, email, and written. Kinder Morgan then determines for each Immediate Repair Condition if the maximum operating pressure of the line must be lowered, the line needs to be shut down, or a safety related condition exists.

According to regulations, once an operator discovers a condition the operator is required to determine if the condition meets any of the rule's special requirements for scheduling remediation. The assessment records reviewed during this IMP Inspection show that all repair conditions ("immediate repair," 60-day, 180-day, and "other" conditions) had been discovered within 180 days of running the ILI tool.



Kinder Morgan procedures require that only qualified individuals review and analyze information generated from integrity assessments. ILI vendor personnel evaluating integrity assessment results will be level II qualified per API 1163 and ASNT ILI-PQ-2005. Kinder Morgan personnel involved in the review and evaluation of integrity assessment results possess at least, or work with someone who has Bachelor of Science Degree in an engineering discipline or equivalent experience.

Kinder Morgan Integrity Management Program Inspection – Remedial Actions (Repairs)



If KM is unable to meet the schedule for any conditions which meet the definitions of Part 195.452 (h), then KM will provide notification to PHMSA justifying the reason the schedule cannot be met and that the change will not jeopardize public safety or environmental protection.



The ILI Action Plans reviewed during this IMP inspection show that each repair condition was repaired or remediated within the required time.

Immediate Repair Conditions are provided to Kinder Morgan by the ILI vendor in a verbal, written, or preliminary report. Kinder Morgan will review the report and complete any actions required within five working days of receiving the report (i.e. reduce pressure to safe limits or shut down the pipeline) or the condition will be considered a safety related condition that requires reporting to PHMSA. If more than one anomaly site has been identified as an immediate repair condition, Kinder Morgan will prioritize the repair work based on the severity of the anomaly and the proximity of HCA locations

Immediate Repair Conditions

- Immediate reduction of pressure or shutdown (within 5 business days of discovery) until appropriate repairs are completed

60-Day Repair Conditions

- Scheduled for evaluation and remediation within 60 days of discovery

180-Day Repair Condition

- Scheduled for evaluation and remediation within 180 days of discovery.

Kinder Morgan Integrity Management Program Inspection – Risk Analysis



Kinder Morgan uses the Risk Intelligence Platform (RIPL™) to spatially align the risk data (i.e. pipe data, coatings, crossings, one-call records, geographic data, assessment results, CIS data, CP readings, PIRR, Foreign Line Crossing Reports, Subject Matter Expert input, and more) into the KM PODS database.

Kinder Morgan calculates the Risk of Failure by multiplying the weighted threat (Likelihood of Failure) and consequence (Consequence of Failure) scores. Kinder Morgan's Likelihood of Failure categories include; External Corrosion Threat, Internal Corrosion Threat, Stress Corrosion Cracking, Manufacturing Threat, Construction Threat, Equipment Threat, Third Party Damage, Incorrect Operations, and Weather Related Outside Force. Kinder Morgan's Consequence of Failure categories are Consequence to the Public and Consequence to the Environment.



Kinder Morgan employs a Risk Management Team to run the risk database audit and perform quality control analysis. The Kinder Morgan Risk Management Team includes the Risk Manager, GIS PODS Database Team (consisting of GIS Manager and 4 Pacific Region Gatekeepers), and the KM Contactor American Innovations (consisting of three Risk Engineers and two GIS Database Specialists).

Kinder Morgan Integrity Management Program Inspection – Additional Preventative and Mitigative Actions

Kinder Morgan completes a Pipeline System P&MM Analysis Sheet for each pipeline system except those pipeline segments that are found to have sufficient P&MM's and require no additional P&MM's. The justifications are submitted to the KM Risk Manager for review and approval. A Pipeline System P&MM Analysis Sheet was completed for all but one INTRAstate pipeline in Contra Costa County.

Kinder Morgan did not complete a Pipeline System P&MM Analysis Sheet on their LS74 (CSFM 0313) pipeline. An In-Line Inspection was completed on this line in 2012 with no integrity management conditions identified and there were no newly identified “could affect” high consequence area. Kinder Morgan stated that they would perform the P&MM Analysis in 2017 after the next ILI assessment is complete.



The action items identified for the pipelines in Contra Costa County include sending all Right-of-way (ROW) inspectors to the 1-week Kinder Morgan ROW college, monitor wash outs and unstable slopes, input cathodic protection data using Allegro units, drill with local Emergency Responders, continue to update alignment sheets, and increased aerial patrols (weekly). Each of these action items are on-going.

Kinder Morgan Integrity Management Program Inspection – Continual Evaluation of Pipeline Integrity

Kinder Morgan bases the periodic evaluation and assessment intervals of their pipelines on in-service failures, past and present integrity assessment results, analysis of information from other surveys and inspection, repairs and P&MM implemented, risk factors, and risk analysis. This is discussed by the risk team at the end of the ILI Assessment. As a minimum standard, KM reassesses each pipeline segment that could affect an HCA at intervals not to exceed 5 years from the previous assessment. Variance from the 5-year assessment interval are permitted only in circumstances where an engineering basis for a variance is established or the technology required is unavailable.



Kinder Morgan Integrity Management Program Inspection – Measure Program Performance



KM continually evaluates and revises their Integrity Management Program Manual to reflect new operating and industry experience, include the conclusions drawn from integrity management process results, and incorporate the evolution of tools and techniques as they become available.

KM utilizes lessons learned from audits and accident investigations to make improvements to their program. Findings from integrity activities and risk reduction activities (ex. install flow meter on other end to have a mass balance, P&MM, relocation) are also considered.

KM measures performance against other operators in the industry (information is obtained from regulatory agencies and industry organizations)

Performance Measures and Goals:

- Reduce total volume of unintended releases
- Reduce total number of unintended release
- Document the percentage of integrity management activities completed during the year
- Track & evaluate the effectiveness of KM's outreach activities
- Internal audits of pipeline systems
- External audits of pipeline systems
- Operations events that have the potential to adversely affect pipeline integrity.
- Demonstrate that the integrity management program supports continuous risk reduction activities with a focus on high risk items. As assessments, repairs, and procedural or process changes are made, operating risk for individual segments and pipelines should be reduced.
- Demonstrate that the integrity management program for pipeline stations and terminals supports continuous risk reduction activities with a focus on high risk items
- Narrate descriptions of pipeline system integrity, including performance improvements
- Provide increasingly useful decision-making assistance and information by suggesting effective preventative and mitigative strategies

Kinder Morgan Integrity Management Program Inspection – Take Away



Kinder Morgan IMP Inspection – Conclusions

1. KM is dedicated to having qualified and experienced personnel developing, managing, and implementing their IMP program. KM commits a considerable volume of resources to maintain the integrity of their pipelines.
2. Significant leaks have dramatically dropped in the past 10 years. One reportable release on a KM pipeline in CCC within the last 10 years (38 barrels from block valve). Part of this success can be attributed to KM finding and repairing anomalies in their lines before they develop into a release and a concerted effort to reduce 3rd Party Damage.
3. KM incorporates information from each of their Business Units and field Subject Matter Experts in the evaluation of their IM Program
4. KM continues to improve their IM Program. Including developing new technologies and analysis for detecting anomalies, hiring additional ROW personnel and developing new processes to limit 3rd party damage, developing and mandating a line rider college, and providing public awareness presentations to emergency responders and schools.

