

Automatic Shut-off and Remote-Controlled Valve Installation on Existing Pipelines

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Topic Areas Addressed by API

- Industry Standards for Valves
- Regulatory Requirements and Industry Best Practices
- Risk Reduction
- Integrity and Safety Considerations
- Security Challenges for Valve Conversions

Industry Standards for Valves

API Specification 6D

- Long standing specification for manufacturing of valves
- Current version is 25th edition (December 2021); initial version was published in 1936
- Defines the requirements for the design, manufacturing, materials, welding, quality control, assembly, testing, marking, documentation, and process controls
- Applies to ball, block, check, gate, and plug valves for petroleum and natural gas pipelines
- Part of the API Monogram Program
- Requirements for valve inspection and maintenance in 49 CFR §195

Specification for Valves

API SPECIFICATION 6D
TWENTY-FIFTH EDITION, NOVEMBER 2021

API MONOGRAM PROGRAM EFFECTIVE DATE: NOVEMBER 2022



Regulatory Requirements and Industry Practices

- HCA analysis as the basis for IMP
 - Worst-case discharge – assumes rupture
 - Integrated with Emergency Response and Leak Detection
 - HCAs can change over time – sustainability issues
- 49 CFR §195.452(i)(4) – EFRD evaluation; based on risk analysis criteria in §195.452(i)(2)
 - Impact to environment, valve effectiveness to reduce volume-out, and accessibility for maintenance
- Annual review of IMP Manual and O&M Procedures
 - Information analysis and verification of risk factors as the basis for re-assessment of potential benefits of installing EFRD

Regulatory Requirements and Industry Practices (cont.)

- PHMSA recognized that there may be locations where it is not economically, technically, or operationally feasible to install RCVs, ASVs in final rulemaking
- Check valves, other equipment function as EFRDs
- PHMSA Integrated Inspections - PDCA
 - EFRD process included in PHMSA integrated inspections; limited enforcement actions initiated related to EFRD evaluation and analysis

Risk Reduction Related to New/Converted Valves

- IMP for liquids operators – mature program
- Many years of EFRD evaluations
 - Each system, pipeline segment evaluated based on operational and product specific data – consideration in pipeline risk models
 - Significant effort to install new valves or retrofit existing valves
 - EFRDs are already placed in the locations where they provide significant risk reduction – spill volume reductions
 - Diminishing returns on risk reduction for adding more valves
 - Leak vs rupture – drain down volume, limited impact on consequence after an incident has occurred; focus on prevention

Risk Reduction Related to New/Converted Valves

- Environmental impacts, feasibility, and added complications in urban locations
- Land acquisition and available space on pipeline ROW
- Accessibility for maintenance
- Potential negative consequences of ASVs/RCVs
 - Use of upstream and downstream assets to minimize drain down volume release
- PHMSA incident data show that ASVs/RCVs do not provide an improvement with regard to spill volumes

Integrity and Safety Considerations

- Focus on inspection and prevention
- Excavation should only be conducted when necessary to improve pipeline safety – risk management
 - Replacing valves is a significant construction process – design, installation, integration, maintenance procedures
 - Personnel safety – increased risk
 - Geotechnical considerations
 - Adding new valves can also result in product supply interruptions and increased emissions (natural gas focus)
- Controlled shut down of liquids pipeline leaks
- Weather events and unplanned valve closures
- Reliability – hundreds of valves presents practical challenges
- Supply chain issues and meeting demand for new valves

Security Challenges for Valve Installations/Conversions

- Valve actuators don't fit in a vault or pit
 - Need to bring the pipe above grade to install
 - Adds additional risk for physical security of an above grade pipe
 - Public acceptance
- Cybersecurity of automated valves in the system
 - Integration with Control Room and SCADA
 - Power supplies and remote communications on systems

Questions

Contact Information

Mark Piazza, Senior Policy Advisor

API

piazzam@api.org

202-682-8546