

Underground Natural Gas Storage Program Risk Management

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Regulatory Language

- Risk Management 192.12(d)

(d).....***must consist, at a minimum, of a framework developed under API RP 1171 (incorporated by reference, see § 192.7), section 8 (“Risk Management for Gas Storage Operations”), and that also describes how relevant decisions will be made and by whom.*** An operator must make continual improvements to the program and its execution.



Risk Management

Risk Management Program Components

Data
Collection
and
Integration

Threat
Analysis and
Risk
Assessment

Preventive
and
Mitigative
Measures

Record
keeping

Periodic
Review



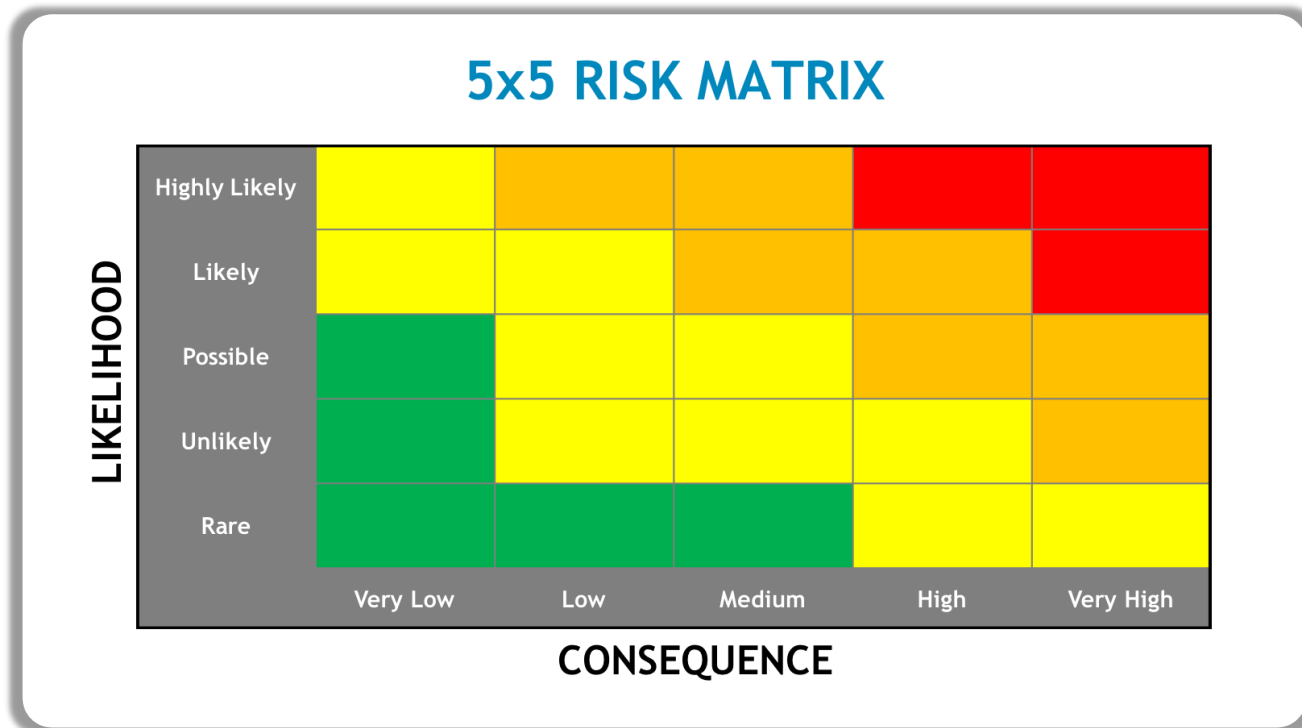
Risk Management

Overview of the Risk Assessment Process



Risk Management

Risk Assessment Methods



Regulatory Language

- API 1171 Section 8.2
- The operator **shall** develop, implement, and document a program to manage risk that includes:
 - Data collection
 - Identification of potential threats and hazards to the storage operation
 - Risk analysis including estimation of the likelihood of occurrence of events related to each threat
 - Likelihood of occurrence and potential severity of the consequences of such events
 - Preventive, mitigative, and monitoring processes to reduce the likelihood of occurrence



Risk Management

- API 1171 Section 8.3.2
- The operator **shall** use available information such as performance data collected through the field history, operations and maintenance (O&M) activities, geotechnical data such as well logs, engineering data, and completion reports to determine **susceptibility to threat and hazard-related events** and to **assess threat and hazard interaction**.



Risk Management

- API 1171 Section 8.4.2
- The operator **shall** evaluate the potential threats and hazards impacting storage wells and reservoirs. The operator should refer to the list of common threats and hazards in Table 1 and may supplement the list in Table 1 with other hazards or threats identified by site-specific assessments.



Risk Management

- API 1171 Section 8.5.2
- The operator **shall** assess risk related to the storage operation using a consistent process.



Risk Management

- API 1171 Section 8.6.2
- The operator **shall** develop P&M measures to manage risks.



Best Practices

- Risk Management
 - ***Regardless of the plan the Operator must ensure that their plan meets regulatory requirements***
 - Operator internally created plans
 - Purchased plans - There are a few vendors that sell plans that may meet the required regulations.



Common Findings

Risk Model does not include:

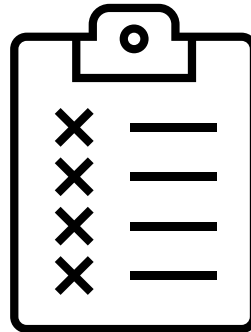
- Third party wells
 - Documenting data requests, evaluation of 3rd Party data
- Plugged and Abandoned Wells
- Preventive & Mitigative measures were not identified
- No Blow-Out Contingency Plan
- Addressing all threats & hazards
- Interactive, Exclusions and, Threat Evaluation



Common Findings

Risk Model does not include:

- Well Integrity Evaluations
- Risk Assessments and using the results
- Periodic review & improvement cycle, effectiveness, applying results
- Wellhead Safety Zone Criteria for Underground Gas Storage Facilities





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