



**uniongas**

A Duke Energy Company

# Re-Writing Standard Operating Policy Using Risk-Based Methodologies

Leigh Ann Shoji-Lee, P. Eng.  
Vice-President, Operations  
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# Standard Operating Practices at Union Gas

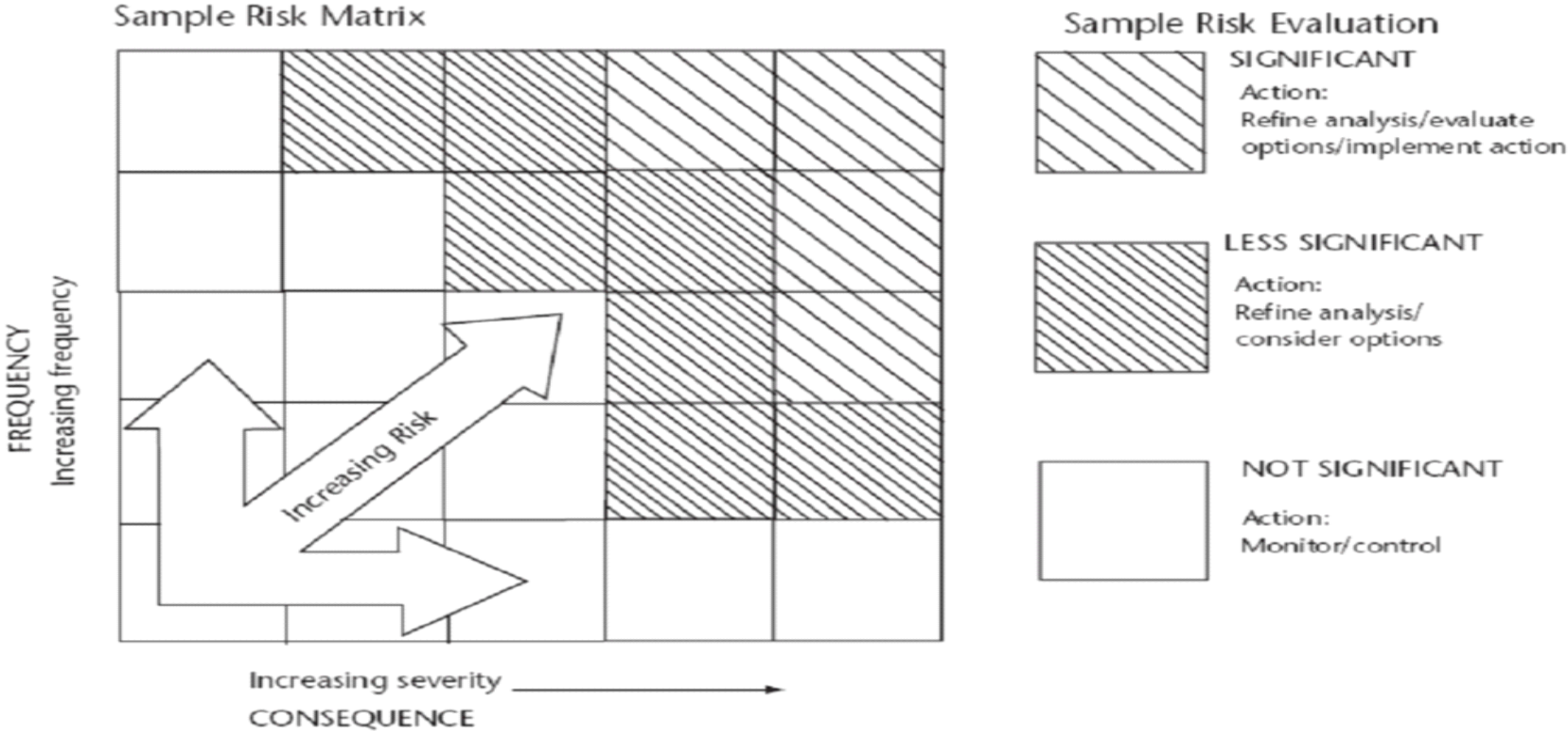
- SOPs are the Company's policies for the inspection and maintenance of distribution and transmissions systems.
- The policies were historically developed using intuition, experience and engineering judgment.
- Union Gas developed and applied risk based methodologies to policy development.



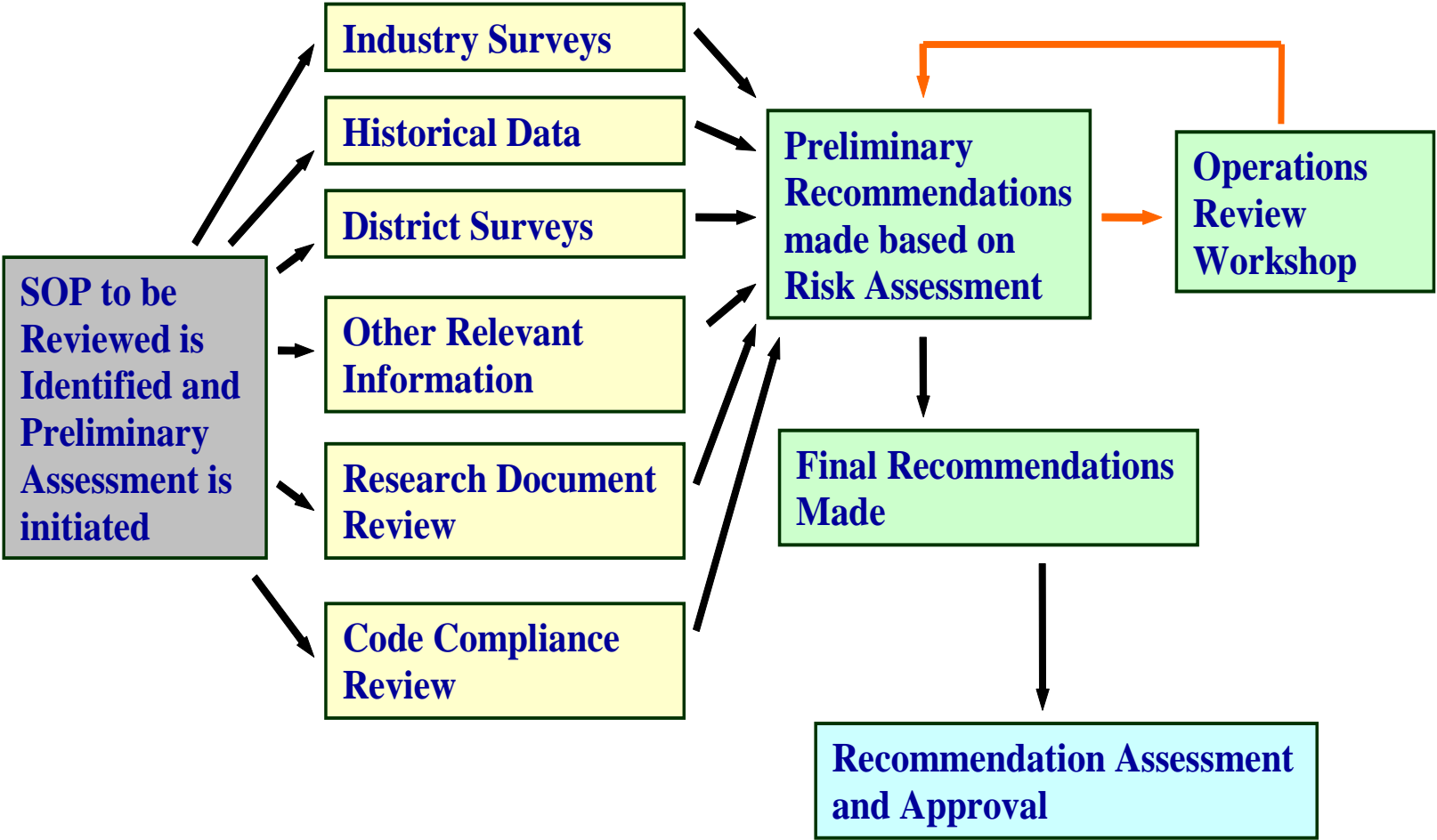
# Risk Assessment

- The basis of risk based analysis is to analyze the consequence and probability of a certain event occurring in order to predict the ultimate risk associated with that event.
- The results can be expressed as a risk matrix.
- The risk matrix concept is well developed in industry and is presented in the Canadian Oil and Gas Pipeline Systems Code, CSA Z662.

# Risk Assessment – The Risk Matrix



# Union Gas Methodology



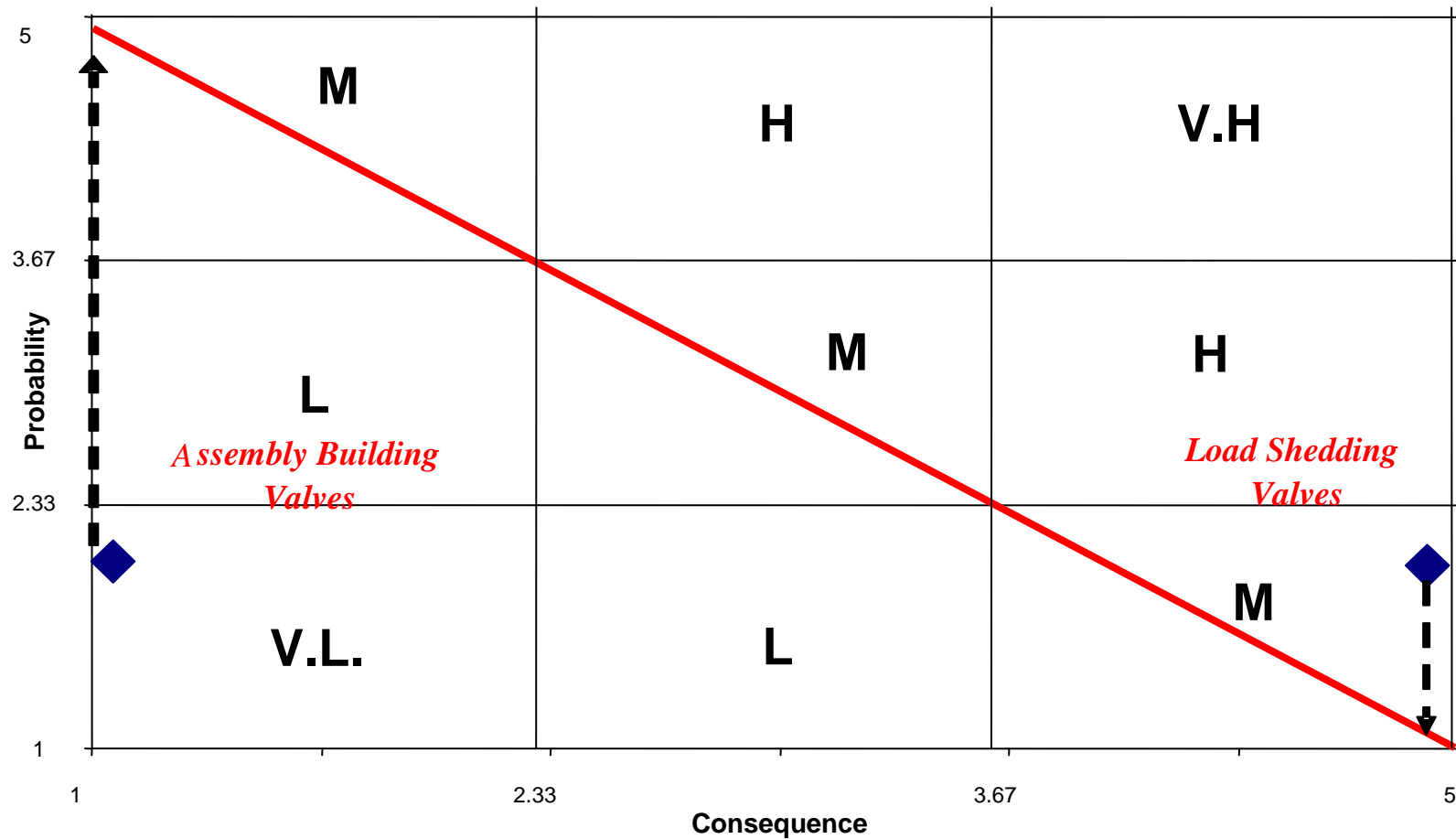


## Case Study – Valve Inspection and Maintenance

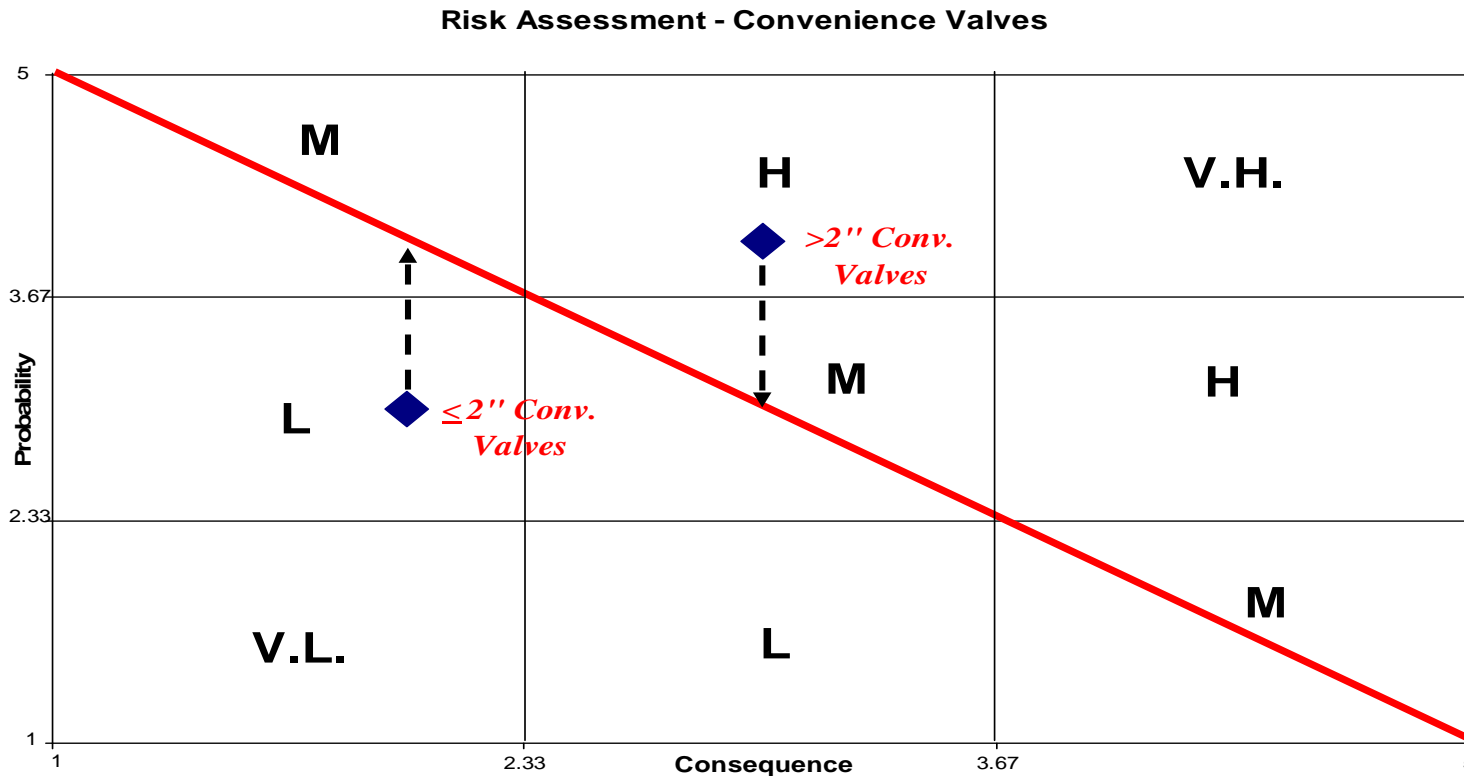
- The goal of the analysis was to bring the risk for each category covered by the SOP as close to the Company's risk threshold as is practicable.
- The consequence of a failure was derived from a qualitative analysis. The analysis included surveys of internal SMEs, surveys of other companies and the review of research documents.
- The probability of failure was derived from a quantitative analysis, which consisted primarily of consultation of historical data.

# Case Study Results – Emergency Valves

Risk Assessment - Emergency Valves



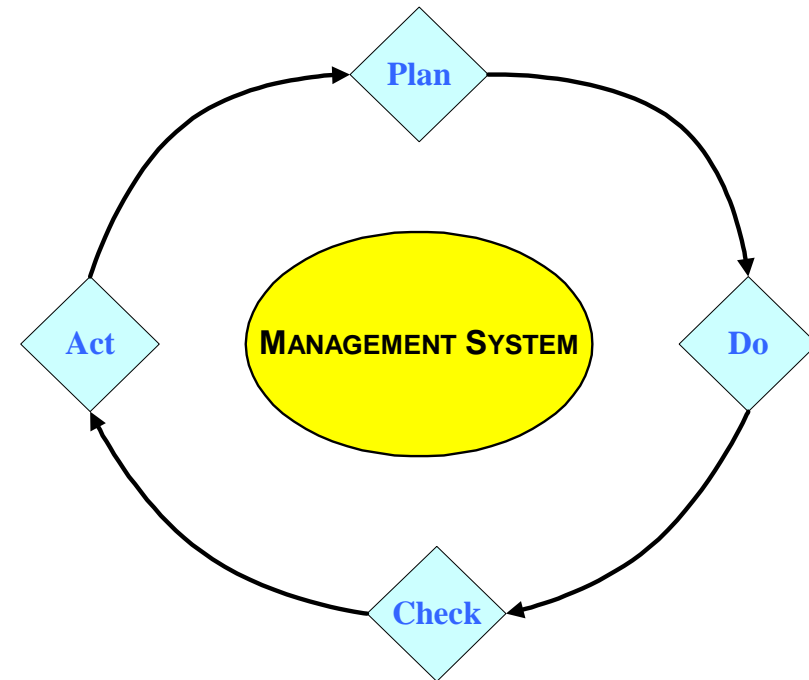
# Case Study Results – Convenience Valves





# Subsidiary Benefits

- Increase awareness and understanding through roll-out.
- Development of a management system
- Improved data collection and IT systems.





Questions?