CLIENT CASE STUDY

"WELLHEAD GATHERING SYSTEM OVERPRESSURE QRA"

- **Facility Type:** Wellhead Gathering System
- **Services Provided:** Quantitative Risk Assessment

The Opportunity:

- A review of the "overpressure protection plan" for a wellhead gathering pipeline found that the potential for "multiple simultaneous well shutdown system failures" had been overlooked. The flowing pressure on the inlet to the well choke valve exceeded the allowable pressure in the gathering system. If multiple well safety systems failed, there would be an unacceptable potential for large-scale loss of containment. A Quantitative Risk Assessment of the entire system was needed to determine if the existing overpressure protection system, as a whole, met corporate and regulatory requirements. Initially, the protection plan suggested additional shutdown hardware and increased testing frequency. Smith & Burgess was hired to review this system.

Our Solution:

- Smith & Burgess provided engineering expertise to model the wellhead safety systems and gathering system as a whole. The detailed model needed to specifically address common-cause failures for the different wellheads and the potential for multiple independent coincidental failures. The final QRA fed data from the manufacturers into a detailed model, accounting for all identified parameters. The final risk assessment was presented to site management and regulatory oversight boards and approved.

The Results:

- The Smith & Burgess QRA determined that the original project specifications adequately met the overall system performance requirements, even after accounting for common-cause and coincidental failures. Originally, the regulatory oversight board wanted to add shutdown hardware and increase the functional testing of the safety systems. However, based on the results of our QRA, the site management was able to demonstrate that the existing hardware and testing frequency met the requirements. The regulators agreed to our recommendations, saving the facility over 20 new shutdown systems and eliminating the lost production time from biannual full-function tests.

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