CLIENT CASE STUDY

"FLARE MAINTENANCE OPERATIONS - FLARE DESIGN STATISTICALLY (QRA)"

- **Facility Type:** Refinery
- **Services Provided:** Flare QRA

The Opportunity:

- After a routine preventative maintenance inspection, a refinery found that a major flare header was in need of replacement. This header connected two large sections of the refinery, and the management feared that a majority of the facility would need to be shut down to safely replace the header. The site hired Smith & Burgess to perform a Flare Header QRA to determine the minimum amount of necessary shutdowns in order to safely perform the line replacement. The Flare Quantitative Risk Assessment used load probabilities to determine the likelihood of various events, should a power failure occur.

Our Solution:

- The Smith & Burgess engineering team used the refinery's existing flare system model to develop a statistical model that represented the potential loads in the event of a site-wide utility failure (power, steam, cooling water, etc.). The existing model was updated to reflect the temporary configuration required to safely make the needed header replacement. Smith & Burgess Engineers then reviewed the largest relief load in order to account for the effects and likelihood of potential equipment line ups (e.g., A or B pump running) and to determine if instrumentation would mitigate the expected flare load. This information was then used to generate a Flare System Quantitative Risk Assessment to determine the probabilistic demands of the flare system and the likelihood of exceeding corporate risk criteria.

The Results:

- Outside of the units that needed to be shut down directly due to the required repairs, the Smith & Burgess engineers identified only a single system that exceeded the corporate risk criteria. The team then updated site management and provided several short-term risk mitigation options. Site management used the information provided to determine the appropriate short-term risk. The provided engineering analysis allowed for the refinery to maintain significantly higher feed rates than originally thought possible, and provided a detailed engineering analysis that fed into the risk assessment. The repairs were completed without incident.

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