

Technical Safety Engineering



**Experienced in Assuring
Safe Project Delivery**

Regardless of the type of project undertaken – onshore or offshore – an operating company is charged with providing a safe facility in compliance with standards of governmental and regulatory bodies. Mustang is consistently recognized by our industry for attention to personnel safety on its projects and has received numerous client safety awards for incident free.

Performance, while working significant manhours. In addition to its effective Health, Safety and Environmental (HSE) solutions to provide occupational protection for Mustangers, clients and vendors, a significant focus is on the development of safety in design. These functions are the Technical Safety Engineering Department's area of expertise.

This group's responsibility is to mitigate risk to an acceptable level. This effort consists of protecting workers from any possible injury or death, minimizing damage to the environment, and preserving the physical asset from harm or catastrophe. With Mustang as part of a project, the Technical Safety Engineering team assumes the responsibility of making sure that the end result meets the client's safety and risk criteria, helping them decide the proper level of protection.

The team addresses three principal areas – fire protection, environmental and process safety. Each segment is tended to by professionals with specific expertise in each of these fields. On major projects, the group's efforts are focused through a Technical Safety Lead. The group's involvement transcends all segments of Mustang's business, from upstream through downstream and pipeline.



Fire Protection – Mustang's fire protection experts are among the industry's elite in their chosen field. They have the background and practical expertise to understand how fires

originate and spread, and how they can be controlled.

Their concentration is on developing concrete strategies in harmony with the client's overall safety philosophy and hazard prevention standards. Knowledge of the behavior of materials in fire situations and the consequences of fire and blasts allows them to provide a proactive fire protection design basis, which is validated by thorough risk analysis. Early in the FEED process, the team calculates required fire suppression demands in order to dimension the fire water/foam systems, as well as other fixed extinguishing systems for the facility. They develop location plans for fire fighting and safety equipment, which also identifies access and egress routes for the facility, and determine the fire and gas detection requirements. As the project moves into the detailed design phase, the group designs the complete fire protection system supported by hydraulic calculations and systems studies. They continue to monitor and update the system's progress and make necessary changes as the project continues through construction, commissioning, operations handoff and throughout the facility's lifecycle.

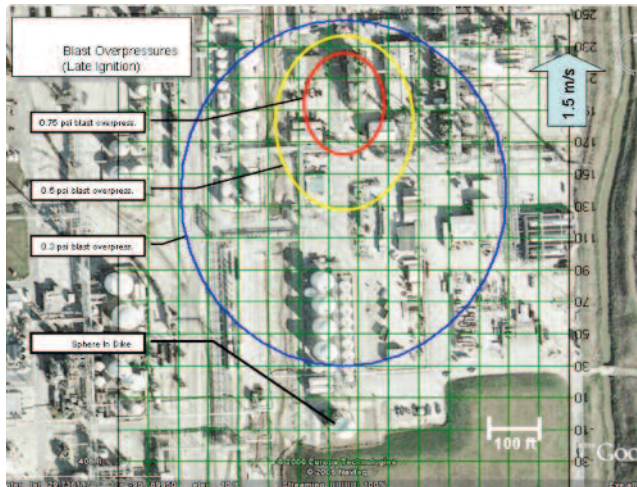
Environmental – Mustang's environmental engineers are experienced specialists with years of designing equipment and processes for protecting the environment. They understand the causes and ramifications of emissions and effluents, and are experts in their prevention and treatment. Team members are intimately familiar with global regulatory standards and understand how to productively interface with the public and clients to help guide them through environmentally sensitive projects.

At the beginning of a project, the environmental engineers help develop a roadmap in conjunction with the client's philosophy and the regulatory climate. Utilizing the results of comprehensive studies and analyses, an environment impact assessment is developed which is ultimately used to minimize and manage waste, prevent pollution, and eliminate exposure and consequences from emission releases into air and water. The Mustang team provides a comprehensive design basis and establishes thoughtful guidelines that lead to the completion of an environmentally safe project.

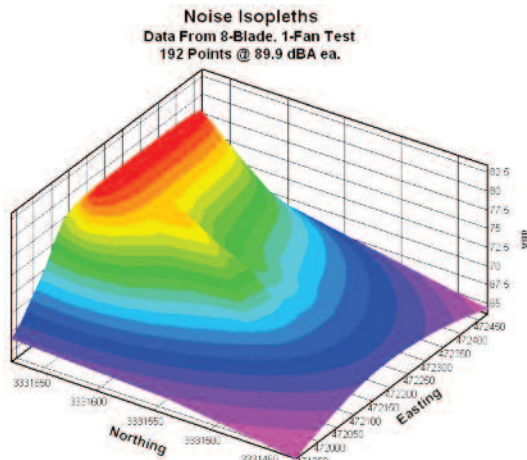


Mustang's Technical Safety Engineering Group assists clients in making sure their projects meet safety and risk criteria.

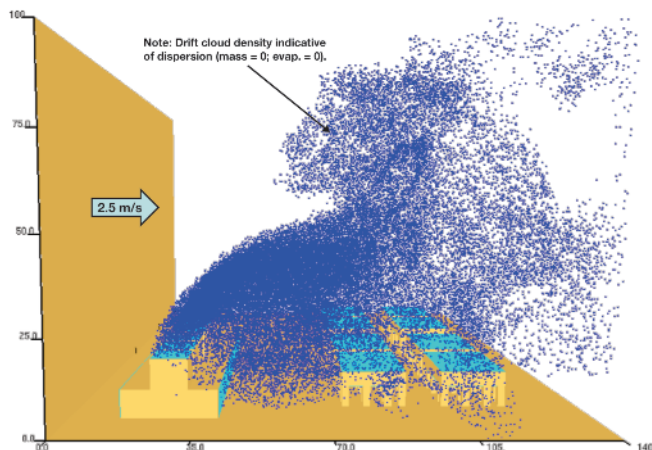
Studies and Assessments



Fire and Explosion Risk Assessment



Noise studies show decibel levels from an equipment test.



Specialized vapor dispersion studies help identify personnel risks.

Process Safety – Many of Mustang’s safety engineers come from chemical engineering backgrounds and have extensive experience in conducting process hazards analysis (PHA) within all industry segments. They are skilled at conducting Hazard Identification Assessments (HAZID) and Hazard and Operability Studies (HAZOP) using any number of industry recognized or client specific methodologies. They perform Safety Integrity Level (SIL) Assessments, utilizing such techniques as a Layers of Protection Analysis (LOPA). For risk or performance based designs, Formal Safety Assessments are conducted to evaluate potential consequences and the likelihood of Major Accident Hazards. Some examples of these assessments are Quantitative Risk Assessment (QRA), Fire and Explosion Assessment (FERA), and Escape, Evacuation, and Rescue Analysis (EERA). The Technical Safety group works with the client to frame, subcontract, or conduct in-house the tasks required to support the Hazard Management Program that is appropriate for the project. Mustang’s professionals are bolstered by a broad array of sophisticated software tools to execute this work.



In order to add the most value, Technical Safety should be addressed at the earliest possible stage of any project with the primary focus on inherently safer design. Ideally, the effort begins as early as the conceptual phase, but most certainly starts in earnest during the pre-FEED and FEED stages. The group, in cooperation with the client, sets the safety direction for the project. If safety considerations are not incorporated into the project’s design prior to the detailed design phase, potential costly changes and schedule delays may occur. Mustang’s designers understand the concept of fit for purpose and make certain that all safety features are incorporated early, with proper justification.

Mustang has experienced Technical Safety Leads who become the point persons on projects. With their expertise and communication skills, they are able to interface with discipline leads, clients, and regulators. They provide the execution assurance for the project. Their proactive role essentially ‘manages a safety project within a project’ as the design progresses.

Mustang's Technical Safety Engineering professionals have experience on both new build and brownfield projects, either as integral members of the project team or as independent consultants. They have working knowledge of the OSHA Process Safety Management (PSM) requirements for onshore projects as well as the Minerals Management Service (MMS) requirements for Safety and Environmental Management. The Technical Safety group has provided regulatory compliance guidance to multiple operators across sectors. Due to its global experience, the Technical Safety group is knowledgeable when it comes to the varying regulatory regimes and their requirements. The group has successfully served

projects in the North Sea (UK and Norway), Western Australia, the Middle East, India, as well as the United States.

Despite variances in approach, the underlying goals are always to assure a safe facility for the operators, have favorable impact on the environment and protect the assets being employed. Mustang's Technical Safety Engineering team has the understanding, experience and commitment to ensure the proper level of due diligence has been performed to the stakeholders' satisfaction.

*For more information, Contact Chris Fiedler at
chris.fiedler@mustangeng.com*



Members of Mustang's Technical Safety Engineering group in Houston.