Human Factors Engineering is Contributing to the Safe Operation and Maintenance of an LNG plant

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Abstract

Maintenance accessibility and material handling studies provide important information related to Process Safety and overall facility design. Designing for maintenance ensures that handling of critical equipment and materials are given priority and that safe lifting and handling practices are actively implemented throughout the facility life cycle. One of the primary goals of material handling studies is to ensure that all maintainable equipment can be safely and efficiently accessed, isolated, maintained, removed, and re-installed as required during periods of planned/preventive maintenance, as well as shutdown conditions. In the current study, major equipment items were studied for maintenance accessibility, handling and transport from their installed positions to and from maintenance or warehouse facilities. This study investigated the lift, laydown, transfer, and offload of equipment items and materials, and identified lifting devices required to safely perform these actions. A database was compiled with the objective of providing the operating company with a comprehensive lift and removal plan for all maintainable equipment items in the facility. This database was populated via thorough, multidisciplinary review of the detailed design three-dimensional computer model of the facility, as well as vendor models and drawings. Input from numerous disciplines was incorporated to ensure that the proper equipment, tools, and strategies are selected and available to safely execute any lift of equipment and handling of material that will be associated with routine maintenance activities.

Contributions of this effort include: 1) the assurance that layout and design considers safe and efficient maintenance of equipment over the life of the facility, and 2) a database which provides a valuable tool for planning lifts during routine maintenance activities, thus minimizing shutdown time and cost while ensuring that all maintainable items are studied for safe accessibility, handling, and transport.

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