Roles of Contractors in Process Safety

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ABSTRACT

Process safety starts at the conceptual phase and continues throughout the entire life cycle of an asset. From process selection to de-commissioning, various process safety elements govern the safety and reliability of the total system. Contractors play a crucial role in project execution including detailed design, technology selection, plant layout, commissioning, start-up, and further expansion, modification and maintenance activities. The interface/interaction of the contractor with the operator/owner often defines the importance of process safety throughout this life cycle. Undoubtedly, these are the most critical phases of a plant life cycle which could trigger an unexpected or uncontrolled situation leading to a catastrophic incident. This paper discusses the impact of the contractors’ role during major process safety events including the Phillips explosion in Pasadena (1989), Sonat vessel failure (1998), Texas City Refinery explosion (2005), T2 Laboratories explosion (2007) and a few others. Lessons from past incidents are highlighted and an in-depth analysis is conducted to identify essential process safety components for different groups of contractors and for the different phases of projects. Different aspects of process safety functional elements are presented and discussed for both greenfield and brownfield projects. A Comprehensive understanding of process safety and risk management is required by all levels of contractors to ensure risk-based decision making and hazard mitigation. Besides the process safety expertise needed by the contractors, the necessity of having a consistent and harmonized interaction between the operators/owners and the contractors is also emphasized.

Keywords: Contractor Management, Process Safety Competency, Project Management, Project Life Cycle, Design Safety

1. INTRODUCTION

Contractors are an integral part of the modern industrial era due to their role in plant/platform design, construction, commissioning and maintenance. They play a very crucial role in managing risk throughout the plant life cycle and the engineering and design phases are undoubtedly the most crucial stages for incorporating process safety concepts. The choices made during the design phase impact everything in the future from operations to modifications and finally decommissioning. A single flaw during the design phase, could be carried throughout the plant life cycle and with some unfavorable conditions, may eventually cause a catastrophic incident.

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