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Bow Tie Analysis – Enhancing Safety Communication and Asset Management in Power and Waste Sectors

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ABSTRACT

Bow tie analysis has been used as a visual risk management tool since the late 1970s with ICI and Shell being early adopters. Incidents such as Piper Alpha (1988) and Longford (1998) embeded the technique into the oil and gas and chemical industries covered by major harzard regulations and the safety case regime in the UK and Australia. In Australia there has been a slower adoption and application through sectors not covered by the Major Hazard Facility regulations. The analysis method is often recommended as a process safety improvement strategy post an incident as it helps organisations understand and manage their risks by visualising the causal relationships between threats, hazards, controls and consequences in a way that can be communicated clearly through all levels of the organisation.

This paper uses two recent project case studies to demonstrate the the application of the bow tie technique in two alternative sectors - power generation and waste management. The case studies demonstrate how the method helps different organisations understand and manage their risk, improve the safety management culture and communication through all levels of the organisation from exectutive management through engineering, operations and maintenance, and how linking of the technique to and prioritisation of safety critical elements can be used to improve asset management. The studies demonstrate lessons in learning from incidents, competency building and the concious decision making needed to take an organisation from a reactive to preventative maintenance regime which improves safety, reliability and overall business performance.

KEY WORDS

Risk Assessment, Process Safety Leadership, Bow Ties, Asset Integrity, Asset Management, Safety Critical Elements

BIOGRAPHY

Andrea Hosey is a chartered engineer and Fellow of IChemE with nearly 40 years of experience in the energy and chemical industry. She is currently Managing Consultant for Worley Consulting's Chemical and Fuels where she applies technology and system thinking to support robust business case planning across the hydrogen, green chemicals, and sustainable fuel. She has held a number of General and Operational Management roles and was previously the Operations Manager for a Risk and Safety Company. She is an experienced risk facilitator and has supported companies with safety management audits, tactical emergency response and process safety improvement projects.

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