Assessing Risk in the Supply Chain Using the Bowtie Method

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After a number of recent incidents involving the transportation and storage of hazardous materials, many industry end-users wish to understand their level of risk exposure during the supply chain. This exposure can either be via actual ownership or when the product can be associated with the concerned party. Ultimately, this may mean that an end-user’s procurement group will want to see that their suppliers of products and services are performing as needed in the control of these risks.

A qualitative risk assessment is a technique by which these risks can be identified, understood, and evaluated. This paper will describe the application of one such method, where the bowtie barrier analysis is central to the means by which this assessment is completed. The barriers identified are those necessary to prevent and mitigate undesired events that could result in a fatality or a catastrophic incident to the environment, public, or a company’s reputation.

The overall method employed in this process includes the following steps:

1. Hazard identification
2. Bowtie diagram development and barrier identification
3. Barrier screening to identify safety critical elements - those that provide a credible reduction in the risk of fatalities or other catastrophe
4. Performance standard development for the safety critical elements

The performance standards are then enforced appropriately throughout the supply chain. This will ensure that the transportation and handling of hazardous materials meet the purchasing concerned company’s expectations with regards to proper risk management.

A quantitative risk assessment can also be completed to provide additional risk knowledge to aid in prioritization and decision-making.

**Keywords:** Supply Chain, Hazards, Risk Assessment, Risk Management, Bowtie, Performance Standards