Risk Communications: Web-sites for Barrier Diagrams and Process Safety

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Abstract

Many companies globally are now using barrier diagrams as a key tool for risk management during operations – and this has been approved by regulators. Traditional risk assessments focus on design issues – separation distances, blast and fire hazards, emergency isolation system specification, risk tolerance, etc. The barrier approach focuses instead on critical activities necessary to prevent or mitigate threats from becoming major accidents. It does this based on the Swiss Cheese model – where each slice is a barrier and the holes represent its effectiveness. Barriers can be hardware, people or systems. These diagrams have threats on the left and document all the prevention controls, a central hazardous event – usually a loss of containment, and all the mitigation and recovery controls on the right side. They are often called bow-tie diagrams as the figure has that classic shape.

Communications of barriers and their ownership is essential to ensure that critical barriers are operational, meet their effectiveness requirements, and that everyone from operators, contractors to site management knows these. Bow tie software can generate very useful large scale diagrams, showing all the threats, the barriers, their effectiveness, and color coded for ownership. However these can get complicated and large scale drawings and paper reports are poor tools for ongoing communication and regular updating.

The paper describes the development of a web-based solution, using Sharepoint 2007, Microsoft’s standard knowledge management tool, that takes the bow tie database and converts this into a format accessible to everyone. On a basic level this provides on everyone’s desk a full hazard and risk register, the full list of controls for user selectable facilities, and documentation of outstanding actions to enhance barriers. At a more sophisticated level this tool has been further developed to customize the presentation to show the barriers relevant to the person sign-on, their outstanding actions, and their HSE KPI achievements. A case study is presented for a gas facility in the Middle East.