



Analyzing barriers at the Dutch State Supervision of Mines

The State Supervision of Mines (SSM) in the Netherlands has recently started the development of BowTies around the distribution of gas, working closely together with the industry. The insights from the BowTies actively help SSM in their supervisory role.

Barrier failure or weakening is often a causal factor in accidents and incidents. State Supervision of Mines uses BowTies to identify the weak barriers by analyzing different incidents. Unique is that a Governmental body works together with the industry to close the loop between proactive risk assessments and incident analysis.

“SSM tries to help the gas network industry to get a better understanding on how to manage the major hazards relating to the distribution of gas,” says Ingeborg Kemper-van Gent, Inspector at the State Supervision of Mines. “The insights from the BowTies are helpful in assisting the gas network operators with their safety programs.”

The organization oversees the compliance with statutory regulations applicable to mineral exploration, extraction, storage and transport of minerals.

Supervisory role

The BowTies are also actively used for the supervisory role of SSM. “Looking at the risks shown in the BowTies, we have developed inspection projects for the next five years,” Ingeborg Kemper-van Gent explains. “We looked at how often a certain barrier occurred in the BowTies we developed. For example ‘Renovating’ shows up 10 times, so we created a separate inspection project to supervise this barrier.”

Odourisation of gas is another example of a reoccurring barrier, which we will inspect closely during the coming years.”

The BowTies are helpful in analyzing incidents whenever there is an incident within the industry. “We had one recently. The benefit of using the BowTies is that we have thought about the barriers in advance. When an incident happens, we can compare the elements of the incident investigation with the barriers in our BowTie. In this case the incident was a gas explosion, which injured two people. The incident investigation carried out by the organization was very extensive, however it lacked certain barriers relating to the organization. Without the use of BowTie, we would not have noticed this. Putting all the elements of the investigation in the BowTie, we could easily count that the barriers relating to the organization failed more often than the other barriers.”

Statistical analysis of failing barriers

SSM uses BowTieXP to develop the BowTies. “The BowTie methodology has been part of our strategy for years, but until recently we didn’t have the software to easily develop them,” Ingeborg Kemper explains. “Having implemented the BowTieXP software makes it easy to visualize things in such a way that everyone understands the methodology.”

She sees a second advantage of using the BowTieXP software. “As a supervisory organization we have to be transparent about why we make certain choices. Within BowTieXP we can perform statistical analysis showing how often certain barriers occur and which barriers are failing.”

Level of detail

Avoiding too much detail in developing the BowTie is important, Ingeborg Kemper-van Gent says. “Keep it simple. Many people want to include too many details in the BowTie, losing sight of the important barriers. Choosing the right level of abstraction is essential to avoid confusion. If you develop a very detailed BowTie, it is complex to understand the difference between the top event, the threat and the barriers.” Also, as a supervisory organization, it is not effective to inspect on too many items at the same time. “If I develop 30 BowTies, it is hard to decide which barriers should be inspected.”

To keep the right level of abstraction, SSM focused on two main BowTies for the gas industry: ‘Uncontrolled release of gas’ and ‘release of carbon monoxide’. “In focusing on two main top events, we avoid losing ourselves in details. If need be, you can always make a ‘mini-BowTie’ during a specific inspection,” Ingeborg Kemper-van Gent explains.



Spreading the BowTies

After creating the Bow Ties, the next step for SSM is to spread the BowTie methodology and the developed BowTies, both internally and externally. "Some gas network operators are already using BowTies, while for other operators the BowTies we developed give an insight in what's happening in the gas network industry," Ingeborg Kemper-van Gent says.

"Also, we want to develop KPIs relating to the large issues. Currently we are looking at which KPIs we want to use, what are the main concerns and which level of detail is useful. BowTieXP is also very useful in helping us answer these questions. Ideally, we want to integrate BowTieXP in our management information system."

Industry Award nomination 2012

State Supervision of Mines has been nominated for an Industry Award in the category 'Best Initiative for compliance & working safely'.

State Supervision of Mines (SSM) oversees the compliance with statutory regulations applicable to mineral exploration, extraction, storage and transport of minerals, focusing on the aspects of health, safety, the environment, effective extraction and soil movements.

The department falls under the ministerial responsibility of the Ministry of Economic Affairs, Agriculture and Innovation. SSM is led by the Inspector General of Mines and was established in 1810.

BowTieXP is a next generation risk assessment tool that uses the BowTie Method to assess risks. BowTieXP is unique in its ability to visualize complex risks in a way that is understandable, yet also allows for detailed risk based improvement plans. Many global companies have chosen BowTieXP.