

Knovel®  
CHEMICAL MANUFACTURING

## Solution Story: Global Diversified Chemicals Company

The right information prevents unnecessary expenses when  
performing safety regulation-driven automation upgrades



### SUMMARY

A global diversified chemicals company that manufactures nitrogen fertilizer was faced with a costly upgrade of automation systems based on an initial assessment of their plant compliance with safety regulations. However, on further assessment using the comprehensive resources in Knovel, they discovered that their systems already met the mandated specifications.



## Rather than needing several sources, the engineer found all the required technical data and documentation in Knovel.



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#### CHALLENGE

Incredible capital investment is involved in upgrading a manufacturing plant, whether due to changes in safety regulations, chemical process changes or the desire to meet industry best practices. One manufacturing corporation was looking at upgrading multiple plants as part of a modernization effort, with costs mounting as plans were made for the various systems of each plant.

One subsidiary of the company runs multiple nitrogen fertilizer plants that came under scrutiny during the modernization project. The upgrade assessment included an initial process hazard analysis (PHA) that investigated the compliance of the automation system to federal regulations. Investment costs for their upgrade were estimated at \$1.5 million per plant, with 75 new I/O sensors deemed necessary.

The engineer tasked with leading the upgrade process believed that some of the existing automation systems already met requirements. Testing this hypothesis would require access to the newest information about the application of current codes and standards.

#### SOLUTION

The engineer turned to Knovel to get the information, knowing that Elsevier's engineering decision-support solution has a comprehensive database of technical and safety information from recommended sources. The aim was to assess risk and adherence to safety regulations by applying layer of protection analysis (LOPA) to the existing automation systems in the nitrogen fertilizer plants.

In this case, the resources included codes and code application documents, engineering cases and safety conference proceedings from American Association of Chemical Engineers and Center for Chemical Process Safety publications. Rather than needing several sources, the engineer found everything in Elsevier's aggregated resource for technical engineering data and documentation. Standard LOPA approaches A and B were also available, including application examples and a walkthrough (Figure 1).

With quick access to this valuable information, the engineer was able to save his company considerable investment costs: the research revealed that the automation systems of the plants were closer to current code and best practices than originally thought based on the initial PHA.

**BUSINESS IMPACT:**

By applying LOPA approach B to the automation systems, the engineer determined that they already met the mandated safety criteria for the country of operations. The successful implementation of LOPA approach B is attributed to the clear and comprehensive information available in Knovel.

The savings to the company were considerable. The research proved that there would be no need to purchase and install the new I/O sensors. In addition, the company had no operational downtime for the automation systems.

The engineer has also stated that using Knovel saved several weeks in research because the application examples and walkthroughs were all available together with source publications. Knovel helped build a defensible and justifiable position on the business case while keeping the plant running and avoiding considerable unnecessary expenditure.

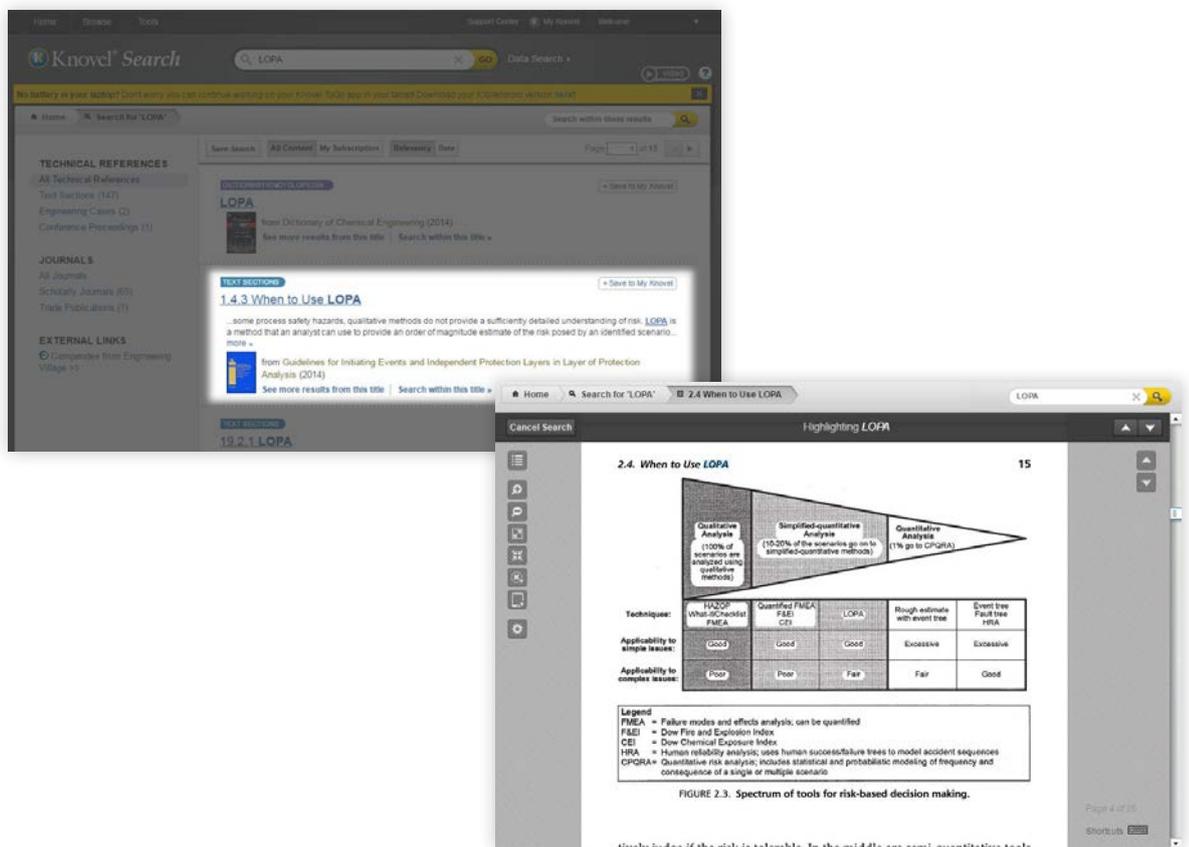
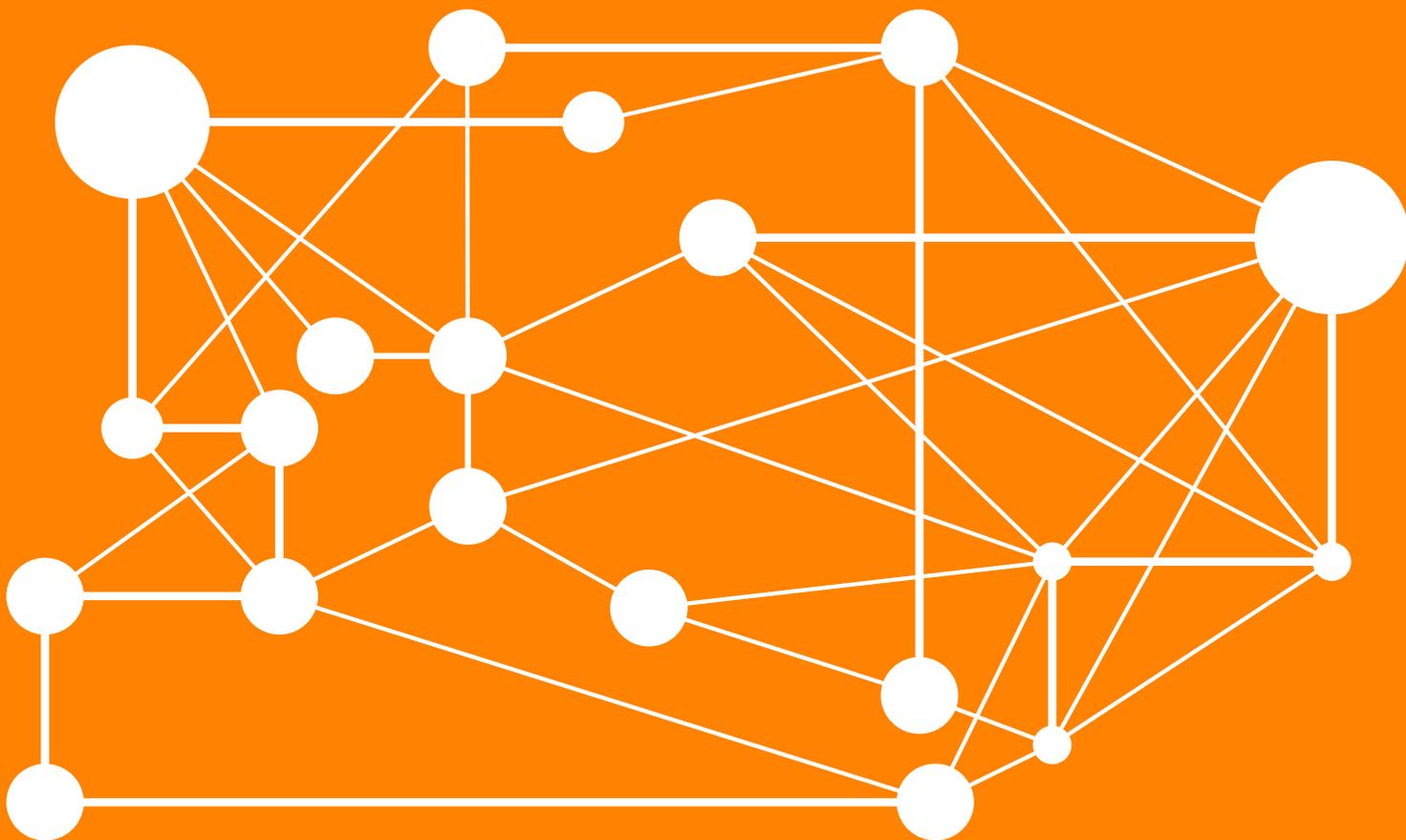


Figure 1 Knovel includes information on LOPA approaches, including detailed explanations on how to apply them.



# Knovel

Knovel helps chemical companies reduce plant and manufacturing costs and mitigate EHS risks with plant designs and systems by providing manufacturing and engineering staff access to design change examples, materials property data, operational best practice insights and more.

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