

Knovel®

CHEMICAL MANUFACTURING

Solution story: Improving employee safety at a chemical manufacturing plant

Knovel helps an engineer discover hazards and recommend improved safety measures



Summary

A large chemical company assigns an engineer to assess the safety of a manufacturing facility where hazardous chemicals are handled in confined spaces. The engineer uses Knovel to surface insights on potential chemical and fire hazards, which she uses to recommend safety improvements that the company has implemented in many of its facilities.



To obtain quantitative analyses of each process used, she turned to Knovel because it enables faster search, relevant search targeting and easy navigation.

Challenge

A multinational chemical company sought to assess and improve the safety level of confined workspaces. The company operates a number of large production facilities with refinery capacities, producing chemicals such as polyolefin, olefins and catalysts for polyethylene, polypropylene and polybutylene. Many of these manufacturing processes involve hazardous and toxic chemicals, and they require employees to work in confined spaces that could pose significant health risks.

The company assigned a process and management engineer to improve the overall safety of manufacturing areas in one of its facilities, a 300-person complex that produces polymer resins. The engineer was tasked with performing a safety review of the facility's confined spaces, scoring the hazard level of each area and developing standard procedures for addressing potential safety issues.



This successful assessment led to similar analyses and improvements in other company facilities.

Solution

The engineer, Emaline Sung*, began by researching the chemical processes used in the facility. To obtain quantitative analyses of each process used, she turned to Knovel because it enables faster search, relevant search targeting and easy navigation, as well as providing trusted answers and insights. She quickly located Lees' Loss Prevention in the Process Industries, an indispensable industry-standard manual on hazard identification, assessment and control.

With these practical insights in hand, the engineer then used Knovel to obtain breakdowns of each process, as well as CAS registry numbers and safety data sheets for solvents and other hazardous chemicals used at the facility. Using Knovel Critical Tables, she performed searches on each chemical's heat capacity, thermal conductivity and reaction thermodynamics—as well as other physical, solvent and thermodynamic properties of each chemical. Critical Tables precisely plotted the chemicals' temperature correlation relationships, providing safe operating parameters for each piece of equipment in the facility.

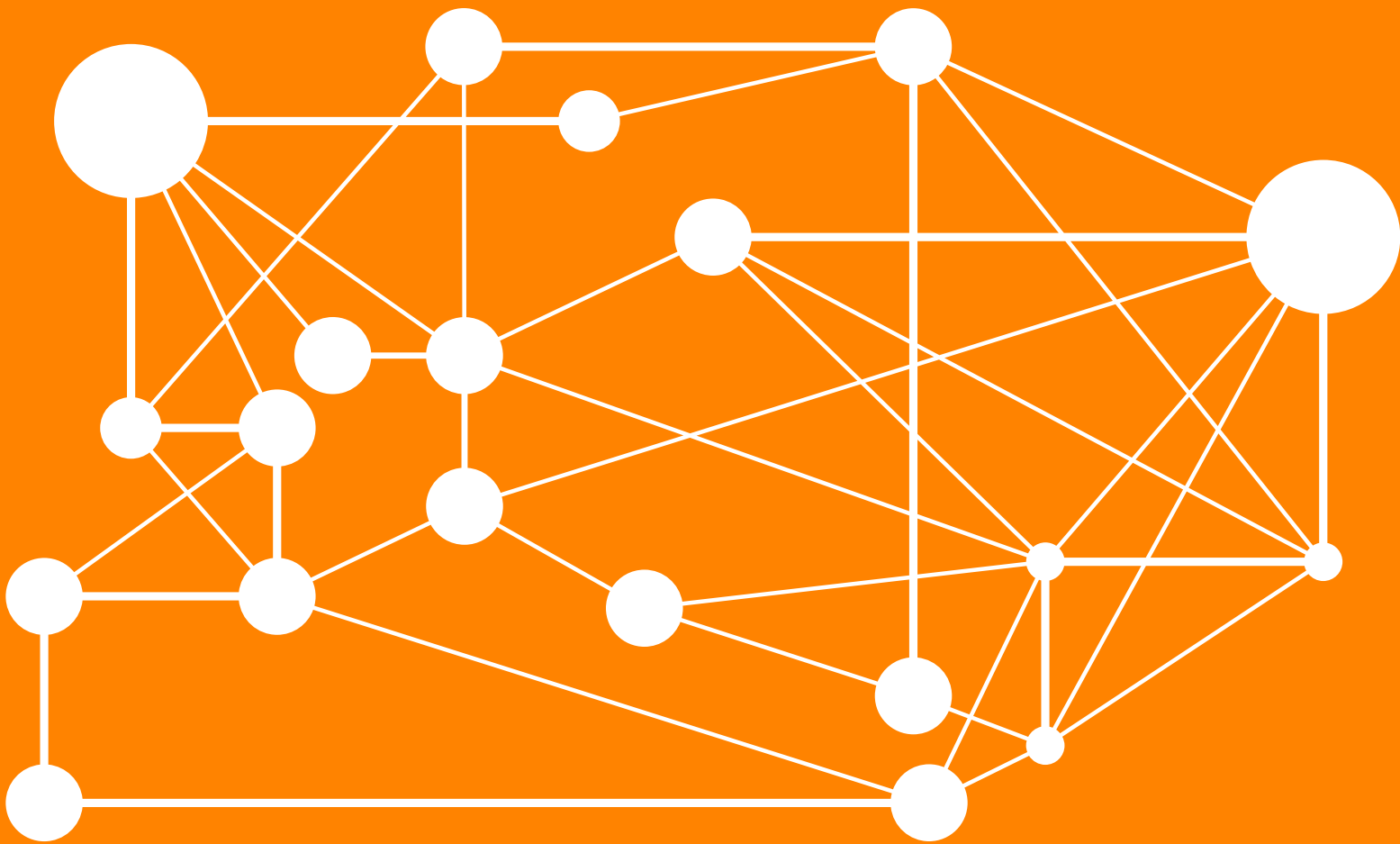
To reduce fire-related danger, Sung used Knovel to obtain relevant fire safety handbooks, including AIChE/CCPS codes. Knovel also provided resources for the creation of safer room layouts and equipment selections and even the design of pressure relief systems for the manufacturing facility. She incorporated all this information into a detailed assessment of the facility's risks and improvement opportunities. Knovel's combination of chemical data sheets, room concepts, equipment designs and safety handbooks equipped her to see the big picture, and notice problems that might otherwise be missed. It allowed her to assess potential hazards and effective means of addressing them to improve plant safety.

Impact

As a result of her research using Knovel, Sung successfully created a detailed matrix of risk evaluations associated with specific areas in the plant. This matrix enabled her to target opportunities for improvement within the CCPS and AIChE guidelines and to provide a platform for future expansion of the model.

This successful assessment led to similar analyses and improvements in other company facilities. In one instance, the company invested several thousand dollars to improve the safety of an electrical cabinet, significantly raising the safety rating of that plant.

* Names have been changed to protect rights to innovation



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