

ammonia safety



Trainees wearing Level A protective suits with self-contained breathing apparatus approach the site of a mock ammonia spill in an emergency response class conducted in Glen Ellyn IL by Industrial Consultants. The company trains 3,000 to 3,500 people a year.

Industrial Consultants Trains Cold Storage Operators

By Foss Farrar

SAFETY in the workplace concerns everyone, especially those who work around hazardous substances like ammonia — an inexpensive and effective, but poisonous and explosive, refrigerant used in many warehouses and food processing plants.

Industrial Consultants in Owasso, Oklahoma, conducts safety programs for food and warehouse companies to help them meet specific Occupational Safety and Health Administration and Environmental Protection Agency training requirements.

"We train 3,000 to 3,500 people a year throughout the US and Canada," said Kent Harmon of Industrial Consultants. "Safety is our primary emphasis."

The government requires emergency response training for workers in facilities with more than 10,000 pounds of ammonia in the refrigeration systems. Industrial Consultants provides this training, including mock ammonia spill scenarios.

Founded 12 years ago by Harmon's father Robert Harmon, Industrial Consultants updates its classes for compliance with the latest government regulations. For instance, they help companies develop risk management programs. Plants with more than 10,000 pounds of ammonia have been required to have such plans in place since June 21, 1999.

Recent Illinois Training

About 250 trainees recently attended classes in emergency response and basic ammonia refrigeration in Glen Ellyn, Illinois. "My class is ammonia leak prevention and Kent's is leak stoppage and repair," said his brother Chris Harmon, who helped teach the basic ammonia refrigeration class.

The three-day emergency class is designed for emergency response teams. "Prevention is the best plan, and ammonia releases are rare, but OSHA says you have to plan for worst-case scenarios," Kent Harmon said. "Ammonia can reach out and kill you, and we want people to respect that."

During the mock ammonia response drill held in a hotel conference area, students wearing air-tight Level A protective suits with self-contained breathing apparatus roped a path past the decontamination area into the "warehouse" to find the leak. The first team failed, but another team found the problem, and had to close a refrigeration valve to stop the leak.

Participants who earned certification included some who don't actually work in processing or warehousing. For instance, Leo Harper is a controller at the Bestfoods plant in Englewood Cliffs, New Jersey. It has 350 employees.

"We take ammonia spills seriously," Harper said. "Even though I'm an accountant and not as involved with ammonia as others, I need to know how to respond in an emergency. The plant has a lot of trained personnel to ensure that we have people on the premises who are ready for emergencies. We need to know our role in working with the fire department and the community."

Harper was one of four sent to the class by Bestfoods. "Our plant is very safety-conscious," he said. "We have operated more than 500 days without a lost-work-time incident. We spend a lot of money on safety."

Basic Ammonia Refrigeration

Cold storage plants depend on engineers and technicians to keep the ammonia system running safely. But plant safety is really everyone's problem, Rick Dumais said.

"We try to get our students to use all the tools they can to learn about refrigeration systems," he said. "Learning refrigeration theory helps operators improve troubleshooting skills so they can make repairs."

Many operators aren't paid enough and don't have the technical knowledge they need, he added. "We teach basic and advanced ammonia refrigeration in a way that the information is easy to absorb. We don't use engineering language, but practical language understandable to non-engineers."

Workers also tend to overlook the dangers of ammonia because of advanced equipment with automatic shut-off valves and protected piping on plant roofs, he said. Ammonia is relatively safe and non-polluting, but it is toxic and flammable. It is an irritant to body tissues at low concentrations and can cause burns, permanent injury, or death at higher concentrations. Exposure to 5,000 to 10,000 parts per million for one-half hour can be lethal or at least produce serious injury.

These properties of ammonia were covered in the recent class in Glen Ellyn. In addition, Chris Harmon and Dumais taught the history of refrigeration, the basic refrigeration cycle and fundamentals for evaporators, compressors, condensers, and other refrigeration components.

Students also toured the 200,000-sq-ft Krack evaporator assembly plant in Addison, Illinois. The course required them to make simple calculations, such as figuring the amount of energy needed to cool substances to certain temperatures. They worked with pressure/temperature charts and computed heat rejection rates to determine condenser size. The course ended with a 100-point test.

"Our students earn high grades, averaging 86," Dumais said. "We want them to use this knowledge to work more safely and efficiently. We want them to leave work each day the way they came in." □



[top] Students show instructor Kent Harmon a simulated valve that caused the mock ammonia leak. Though ammonia releases are rare, OSHA requires emergency response plans.

[middle] Students in the basic ammonia refrigeration class tour the 200,000-sq-ft Krack evaporator assembly plant in Addison IL.

[bottom] Tom Lemar, national sales manager for Krack, shows an evaporator control panel.