NASAfacts

ChemSecure

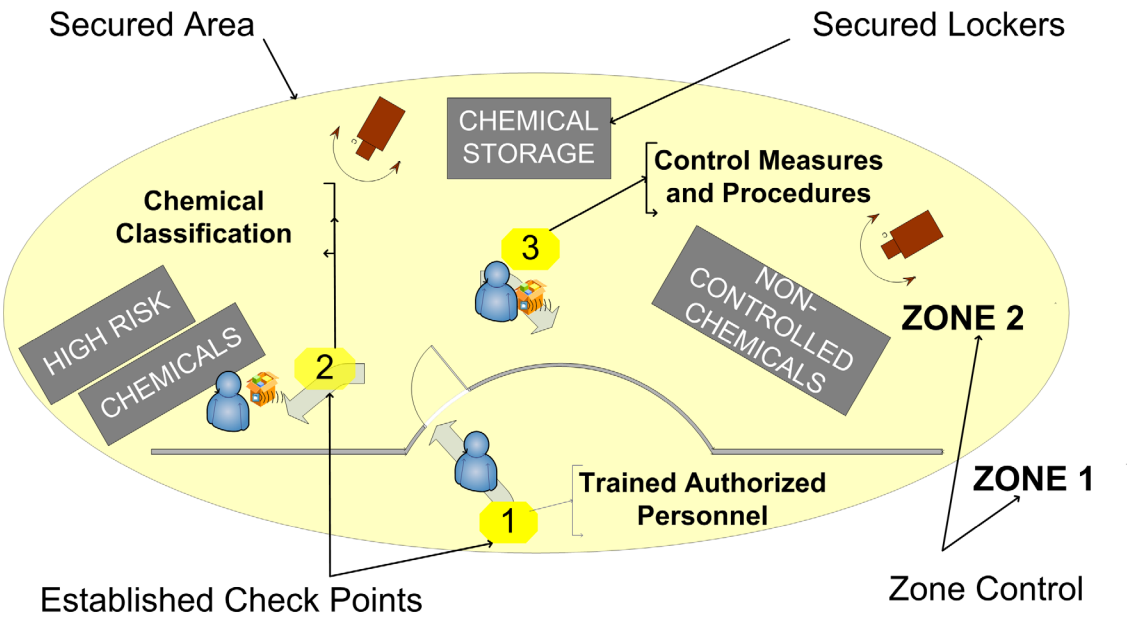
A hazardous materials management system for the 21st century

NASA's Dryden Flight Research Center has developed ChemSecure, a wireless, sensor-based hazardous materials management system aimed at improving management of chemicals and other hazardous materials to enhance security and safety while significantly reducing ongoing supply chain costs.

The ChemSecure pilot program integrated Radio Frequency Identification (RFID) and sensor-based technology with the Department of Defense's existing Web-based Hazardous Materials Management System (HMMS) database to automate the real-time management of hazardous materials including usage, shipment, tracking and storage.

As the first project of its kind, NASA Dryden, located at Edwards, Calif., spearheaded development of ChemSecure in close partnership with the Department of Defense and leading private sector companies, including Oracle Corp., Redwood Shores, Calif.; Intermec Technologies Corporation, Everett, Wash.; and EnvironMax, Inc., Salt Lake City, Utah.

ChemSecure uses RFID tags placed on hazardous material containers and Oracle Sensor-Based Services to capture, manage, analyze and assess environmental conditions, such as temperature fluctuations, that could render the chemicals unusable. Dryden enters the real-time information in the HMMS database to make



informed decisions about the transportion and storage of hazardous materials, and provides automatic alerts — text messaging, voice alerts and e-mails — to security, safety, health and environmental personnel to warn them of any changes with the chemicals.

ChemSecure utilizes data captured by Intermec 750 mobile computers, IP3 RFID mobile readers and fixed RFID readers, temperature sensors, and visual response devices to ensure that managers always have access to critical chemical information. For example, security personnel are notified if unauthorized access attempts are made to obtain highly hazardous materials, and environmental professionals are alerted when the storage limit of a hazardous chemical locker is close to exceeding capacity.

In addition to helping organizations significantly reduce hazardous materials management costs and errors, the ChemSecure program includes many additional capabilities that enhance safety and security measures such as:

• Supplying critical data to first responders and decision makers so they are equipped to make timely decisions for the safety, security and protection of people as well as the physical assets in the environment during an emergency evacuation involving a chemical spill;

• Monitoring personnel when they handle hazardous containers and providing accountability by crosschecking employee information with container information to reduce theft, error and fraud;

• Providing end-to-end visibility of the hazardous materials transportation and storage life cycle for improved decision making and auditing;

• Ensuring chemicals are placed in appropriate and safe locations to avoid adverse reactions with other chemicals;

• Ensuring personnel are properly authorized and trained to work with the chemicals to reduce human error.

ChemSecure's long-term goal is to protect the general population from the potential effects of accidental spills of hazardous materials. The system is not limited to protection of federal facilities, but can also help protect communities through which hazardous materials travel.

In late 2006, NASA Dryden submitted a patent application to the U.S. Patent and Trademark Office for the ChemSecure system.

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