

COMPUTERIZED DATA ACCELERATES INDUSTRIAL HYGIENE CHEMICAL EXPOSURE RISK ASSESSMENTS AT NS ROTA

Industrial hygiene is a scientific discipline that is dedicated to the prevention of occupational diseases and injuries. The job of the industrial hygienist is to anticipate, recognize, and evaluate chemical and physical hazards in the workplace and to develop ways to eliminate or control those hazards.

The U. S. Navy employs industrial hygienists to help evaluate the types and amounts of hazardous materials used in Navy workplaces and potential exposures to Navy personnel who use these materials on the job. A *hazardous material* is any compound or mixture of compounds or chemicals that has physical or chemical properties that are considered hazardous, i.e. very acidic or basic, flammable, unusually toxic, etc. These determinations are made by several government agencies, including OSHA and EPA.



Industrial Hygienists analyze potentially hazardous materials used in Navy workplaces



Manufacturing companies must supply Material Safety Data Sheets on the chemical composition of their products and how to safely use them

Navy industrial hygienists review Material Safety Data Sheets (MSDSs), product labels, and manufacturing data to ascertain the composition of the hazardous materials used at each Naval activity. The principal source of this information is the MSDS, which each manufacturing company is required to develop for the hazardous materials they produce. MSDSs contain information on the chemical composition of the product along with first aid, fire-fighting, storage and toxicological information. Navy industrial hygienists are charged with reviewing this information to see if a

particular chemical compound or mixture contains suspected or known carcinogens (cancer-causing) and/or reproductive hazards.

Reviewing all this material presents a daunting task for Navy industrial hygienists, with the seemingly endless range of hazardous materials that may be

stored and used on large Naval installations, some of which are akin to small cities. A major milestone for the Navy was the creation of the Hazardous Material Control & Management (HMC&M) Program, which requires consolidating purchasing operations for hazardous materials and, whenever possible, centralized storage of all hazardous material at Hazardous Material Minimization (HazMin) Centers. The Navy Supply Command's Consolidated Hazardous Material Reutilization Management Program (CHRIMP) is used to manage the inventory at these HazMin Centers, including the one established at Naval Station (NS) Rota, Spain by Mr. Nelson Gonzalez.



Workshops may store only a one- to two-week supply of hazardous material

With the advent of the HMC&M Program, all hazardous materials were inventoried, consolidated and dispensed in a centralized HazMin Center for the first time in NS Rota's history. Now, instead of storing large quantities of hazardous materials, individual workshops are allowed to store only the amount of hazardous materials they will need for the next one- to two-week period. A representative from each workshop must apply to the NS Rota HazMin Center for approval to use and store any hazardous materials at that work location. Once approved, the material is added to the work center's authorized use list, or AUL, which limits use of that product to only that work center.

After all the hazardous material previously dispersed throughout NS Rota was consolidated in the HazMin Center, Mr. Gonzalez computerized the entire hazardous material inventory. The data was entered into the Hazardous Material Information Control System (HICS) computer program, which organized the information by work center. The HICS was supplemented by another database developed by the Navy - the Hazardous Material Information System (HMIS), which is an extensive database of over 4,000 MSDSs containing the chemical composition and National Stock Number of the chemicals used on Navy facilities.

The availability of the HICS and HMIS marked an important turning point for NS Rota's industrial hygienists. Because of the HazMin Center's combined supply, distribution, and authorization functions they now had all the data on hazardous material in one location in easily searchable formats. Mr. Kevin Dyr Dahl,

Certified Industrial Hygienist with Naval Hospital Rota's Industrial Hygiene Department, quickly recognized the power of cross-referencing these databases and cross-referencing MSDS information – specifically, Chemical Abstract Service (CAS) numbers (numbers that define and register particular chemicals) with National Stock Numbers (NSN) and specific Navy work center AULs. He recommended that NS Rota industrial hygienists request specific data fields be

searched, cross-referenced, and then exported from the HICS system into a spreadsheet program.



Hazardous Material database information is used to raise awareness on finding less hazardous substitutes

Once this critical AUL and NSN data was exported from the HICS program, the information was cross-referenced with the CAS numbers of the chemical(s) that posed risks. In all, over 70 different hazardous materials were researched for potentially harmful chemical components such as lead, toluene, chrome and benzene. This newly summarized information allows

industrial hygienists to complete their risk assessments of hazardous materials much more rapidly, while reducing the potential for omissions and oversights. This summary information is also provided to NS Rota work centers to facilitate Hazard Communication training on hazardous materials and raise awareness about finding less hazardous substitutes.

Now each industrial hygienist can quickly review and assess which materials may present a risk of hazardous overexposure to workers. The computerized hazardous material cross-referencing system has truly transformed the process of hazardous material risk assessment at NS Rota. The system represents a tremendous improvement from the days when industrial hygienists had to search through chemical storage cabinets and shelves, write down all of the chemical components and the National Stock Numbers (NSNs) for each stored item, then search for each product on a microfiche system or contact the product suppliers to obtain MSDS sheets to help determine the health and safety



NS Rota industrial hygienists can use cross-referenced hazardous material databases for hazardous material risk assessments

hazards associated with each inventoried material.

There are numerous benefits associated with automation of hazardous material inventories and risk assessments. Among the most important to NS Rota are:

- 1) The cross-referenced summary listing drastically reduces industrial hygiene staff time spent determining the potentially hazardous chemical components at every NS Rota workshop. This makes NS Rota industrial hygienists available to provide other services like time intensive indoor air quality investigations, more in-depth ergonomic evaluations of NS Rota work places, and various occupational health training.



NS Rota has reduced the number of potential workplace carcinogens by 85%

- 2) Having hazardous material data quickly available allows rapid response to *chemical alerts* issued by the Centers for Disease Control (CDC) and other regulatory and advisory agencies. NS Rota's industrial hygiene staff can promptly search its database to determine whether the chemical of concern is used on base, identify the locations and quantities of that chemical, and take action to prevent harm to NS Rota's workforce.



Industrial hygienists at NS Rota have more time to train workers on occupational safety and health matters

- 3) The added information allowed the HazMin Center to identify and tag products that contain potential carcinogens and/or reproductive hazards. These items were removed from the supply stream and “quarantined,” i.e., placed in a separate storage area, and restricted from issue. The only way that a work center could access these quarantined materials was to provide a reference that stated that that specific material was required, by Military or Manufacturer’s specification. By identifying and “quarantining” unwanted chemicals and using a review/approval process prior to purchasing new chemicals, the number of line items on NS Rota’s inventory that

contain potential carcinogens has been reduced from over 200 to just 32 items, nearly an 85% reduction. Most of the remaining items are specialty

paints or items that contain very small percentages of hazardous chemicals.

- 4) Increased awareness by work center personnel of the potential carcinogens and/or reproductive hazards in their workplaces has prompted them to look for less hazardous substances, which can be approved for substitution on their work centers' AULs. This heightened awareness has helped to reduce the number of potential reproductive hazards at NS Rota from 1,250 to just over 400, nearly a 65% reduction.

As a result of Mr. Dyrdaahl's vision to cross-reference the MSDS and AUL databases, NS Rota industrial hygienists are now armed with summary data on the kind, amount, and specific location of hazardous materials for every work site on the base. The resultant control over hazardous materials used at NS Rota has significantly reduced the types and amounts of potential carcinogens and reproductive hazards used by NS Rota personnel as well as increasing general awareness of less hazardous substances that can be used in NS Rota workplaces.



The number of potential reproductive hazards used at NS Rota have been reduced by nearly 65%

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