HTIS
Hazardous Technical Information Services
BULLETIN
Vol. 20, No.5 September – October 2010

The HMIC Explained

By Philip Saunders, Chemical Engineer, HTIS

When looking at the logistics information for a National Inventory Identification Number (NIIN) in Segment A of the Total Item Record (TIR), people frequently misunderstand the intent and meaning of the Hazardous Materials Indicator Code (HMIC). The HMIC for a NIIN may be one of four single-character codes (Y, P, N or D), and is intended for use as a flag that indicates that a Material Safety Data Sheet (MSDS) might be required for that NIIN. However, many users of the Federal Catalog System, after reading the translation of the acronym, assume that the HMIC tells one if the asset having that NIIN is hazardous or not. This is a popular misconception about the HMIC, and this article will attempt to provide a better understanding of what the HMIC means, and how it should be used.

The primary function of the HMIC is to indicate to the user that information applicable to that NIIN is, or was at one time, available in a record in the DoD Hazardous Materials Information Resource System (HMIRS). If a NIIN has the HMIC 'Y', this indicates that HMIRS currently contains a record with that NIIN (or that HMIRS contained such a record in the past). Many people interpret this HMIC to mean that a material with this NIIN is hazardous, but this is not the case. It just means that there is (or was) information (such as a MSDS) available in HMIRS.

The second function of the HMIC is to indicate if materials are known to require, or are suspected of requiring, that a MSDS be entered into HMIRS. When there is no information in HMIRS, the HMIC for an asset will have one of three different values (P, N or D) depending on its Federal Stock Class (FSC), that is, the first four digits of that National Stock Number (NSN = FSC + NIIN), or the Federal Stock Group (FSG), that is, the

In This Issue:

News from DoD 2
News from DoT 3
Environmental News 3
Occupational Safety & Health News 6
Other News 11

first two digits of the FSC. All new stock numbers will start out with one of these three codes since it is unlikely that an HMIRS record has been created for an NSN prior to the actual creation of that NSN.

To understand how these codes are initially assigned, we must start with Federal Standard 313 (Fed-Std-313) that includes two tables that are of interest here. Table I of the standard includes a list of every FSC for which an MSDS is always required due to safety and health, transportation, environmental or other concerns that are associated with all items having that FSC. These FSCs include chemicals, compressed gases, lubricants, paints, adhesives, etc. If a stock number has an FSC listed in Table I, but no record with that NIIN exists in HMIRS, the HMIC for that NSN will be 'D'.

The other table of interest in Fed-Std-313 is Table II that includes a list of FSGs/FSCs for which an MSDS is **sometimes** required; but this depends on the hazards associated with the particular item. If the FSG/FSC of a stock number is found in Table II, and there is no record with that stock number in HMIRS, then the HMIC 'P' will be assigned to that NIIN/NSN.

The final HMIC is the code 'N'. Many people interpret this code to mean that materials with this HMIC are not hazardous. Again, this is not the case. When the FSG/FSC for a NSN is not found in Table I and the FSG/FSC is not found in Table II, then that NSN is not generally **suspected** of being a hazardous material; but, it does not define a material as being non-hazardous. When a NSN has the HMIC 'N', common sense, experience and knowledge of the specific product should be used to determine if an MSDS is required for the specific product in question.

You may now be wondering how the HMIC is assigned to an NSN. What happens is that the Defense Logistics Agency Logistics Information Services (DLIS) has an automated routine that periodically reviews the NIIN of every record in HMIRS, and compares that list to a list of each NIIN with an HMIC other than 'Y'. If there is a match, the HMIC for that NIIN/NSN automatically changes to 'Y'. Once that happens, the HMIC for that NIIN will always be 'Y', even if the record that caused the automated change to occur is deleted or if the NIIN in that record is changed. Unfortunately, this can cause a situation where a typo in the NIIN or an erroneous HMIRS entry could cause the HMIC for a non-hazardous article to inadvertently be changed to 'Y'. Also be advised that the HMIC does not change instantaneously after the creation of a new HMIRS record, or the modification of the NIIN of an existing record, so there may be a delay that depends on the frequency of DLIS's updates.

In summary, the Hazardous Material Indicator Code is not a code that indicates that a material is hazardous. Rather, it merely indicates that information is available for products with the code's NIIN/NSN, or that an MSDS may be required. Any other interpretation is invalid, and it should not be used to infer anything about the actual hazardous characteristics for any material.

News From DoD

Rare Earth Materials in the Defense Supply Chain

By Abdul H. Khalid, Chemical Engineer, HTIS

The National Defense Authorization Act for Fiscal Year 2010, Section 843, directed the Government Accountability Office (GAO) to report its findings on rare earth materials to the Department of Defense (DoD) by the end of September 2010.

Rare Earth Elements (REEs) constitute a group of 17 chemically similar metallic elements in the periodic table: namely, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium and yttrium. REEs are classified into two groups:

1. Heavy Rare Earth (HREE); and,
2. Light Rare Earth (LREE) due to their atomic weights and their location in the period table.

Some defense systems such as precision-guided munitions, lasers, satellites, and communication equipment use rare earth metals. "Green" technologies such as hybrid electric vehicles, wind turbines, compact fluorescent lights, cell phones and computer hard drives are also among many products that are dependent on rare earth metals.

On April 14, 2010, the GAO provided a report on rare earth materials to members of the Senate Armed Services Committee, and sent copies of this report to the Secretaries of Defense, Commerce, Energy, and the Interior.

According to the report, China mines and processes most of these metals, giving it a dominant position that could affect worldwide supply and prices. In addition, environmental concerns exist over issues such as the radioactive nature of metal ore products, although US environmental regulations addresses these issues.

For further information concerning this report, visit GAO's website at: http://www.gao.gov

Or contact:

Mr. Belva M. Martin
Acting Director, Acquisition and Source Management
PH: 202.512.4841
eMail: marinb@gao.gov

GAO's briefing titled, "Rare Earth Materials in the Defense Supply Chain", is available at:

http://www.gao.gov/new.items/d10617r.pdf

Reference:
Rare Earth Materials in the Defense Supply Chain: Briefing for Congressional Committees, April, 2010.

News From DoT

Overpack and Outer Packagings for Cylinders

By Muhammad Hanif, Chemist, HTIS

The exposure of cylinders containing compressed gases to heat and increased temperatures can cause the pressure inside the cylinder to increase. During shipping, the use of an outer packaging or overpack protects these cylinders from reaching temperatures that may trigger their pressure-relief mechanism. Due to the potential hazards, to include fire, asphyxiation, explosion, or projectile, associated with a cylinder, the U.S. Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) approved specifications for the construction, maintenance, and charging of pressurized containers that are not required for other classes of hazardous material. Subpart G "Gases, Preparation and Packaging of" in part 173, Title 49 Code of Federal Regulations (49 CFR 173), includes the rules for safely filling (charging) containers with compressed gases, as well as transporting of charged cylinders. Within subpart G, several provisions require pressure vessels to be packed in strong non-bulk outer packagings, including:

CFR	Provisions
49 CFR 173.304 (d) and (e)(1)	Refrigerant and Dispersant Gases and Engine Starting Fluids
49 CFR 173.304a (d)(3)(ii)	Note 1 Requirements for Liquefied Petroleum Gas
49 CFR 173.305(c)(1)	Specification 2P (49 CFR 178.33)
49 CFR 173.306(a)(3)	Limited quantity metal containers
49 CFR 173.306(b)	Exceptions for foodstuffs, soaps, biologicals, electronic tubes, and audible fire alarm systems
49 CFR 173.306(h)	Lighter Refills

The DOT, 49 CFR 171.8, defines an "overpack" as an "enclosure that is used by a single consignor to provide protection or convenience in handling of a package or to consolidate two or more packages."

The hazardous materials regulations (HMR) at 49 CFR 173.25 have special marking requirements for overpacks to include that they be "marked with the word "OVERPACK" when specification packagings are required, unless specification markings on the inside packages are visible. Alternatively, an overpack marked with a statement indicating that the "inside (inner) packages comply with prescribed specifications" was used to satisfy the provisions of this paragraph until October 1, 2007." [49 CFR 173.25(a)(4)]

On October 1, 2007, the transition period for the alternate use of the "Inner packages to comply with prescribed specifications" ended. However, many of the provisions in Part 173 Subpart G still require cylinders to be packed in an outer packaging, and require "an indication that the inner packagings conform to the prescribed specifications." On the surface, this requirement may appear to be in conflict with the overpack marking requirement of 49 CFR 173.25(a)(4).

Since the above referenced packaging standards specify the use of outer packagings, these outer containers would be part of the packaging specification, and not an overpack as defined at 49 CFR 171.8. This is further supported by PHMSA's discussion of the overpack marking that was revised in its 2005 HM-215G (70 FR 34381) rulemaking. The rule included many small amendments as part of the ongoing effort to harmonize DOT regulations with International standards. In the October 2005 preamble, PHMSA stated:

> "The "inner container comply with prescribed specifications" marking remains in effect for cylinders or containers packaged in a strong non-bulk outer packaging that are specifically required elsewhere in this part to be marked in this manner." [70 FR 34385, June 14, 2005].

So, when a shipper offers a cylinder filled with compressed gas for transportation that must be placed in an outer packaging, it must be marked as indicated by the packaging specification rules, and not the overpack requirements at 49 CFR 173.25.

References:

1. Federal Register Volume 72, Number 20, Wednesday, January 31, 2007, Pages 4442 - 94458 (72 FR 4442).

2. Federal Register Volume 70, Number 113, Tuesday, June 14, 2005, Pages 34381 - 34399 (70 FR 34381).

3. Title 49, Code of Federal regulations (CFR), Part 173, Subpart G - Gases; Preparation and Packaging.

Environmental News

Common Compliance Violations at Federal Agencies

By Abdul H. Khalid, Chemical Engineer, HTIS

As a result of environmental compliance inspections which it conducts at Federal facilities, the U.S. Environmental Protec-

tion Agency (EPA) has identified some common violations, at Federal agencies, which it has compiled after a review of the compliance data from several of its Regions. DOD facilities can avoid these common or typical violations by taking the necessary actions which the EPA's compliance inspectors recommend.

In an effort to improve environmental compliance within the Federal community, the EPA has generated the following list with the hope that all Facilities can benefit from the lessons learned.

Common Violations

1. Resource Conservation and Recovery Act (RCRA), Subtitle C (Hazardous Waste):

- Failure to properly sample and/or test hazardous waste or apply user knowledge of waste in order to comply with Subpart C: waste determinations.
- Failure to close hazardous waste containers not currently in use. Absence of hazardous waste labels on containers, or mislabeled containers.
- Existence of inadequate aisle space.
- Hazardous waste signs and emergency numbers not posted at hazardous waste storage areas.
- Drums in the storage areas longer than 90 days.
- Satellite accumulation areas with more than one 55-gallon drum.
- Incompatible waste materials /wastes stored next to each other as well as drums that lack secondary containment per state requirements.
- Lack or incomplete inspection of the weekly logs at the hazardous waste storage areas per state requirements.
- Lack of training plans by large quantity generators, or not having annual RCRA training, and/or maintaining poor training records.
- Incomplete Hazardous waste contingency plans and/or not sending them to local emergency entities.
- Land Ban notifications do not accurately reflect the waste.
- Although contractors may handle waste determinations and manifests, the facility staff signing the manifests is legally responsible for both waste determinations and the accurate reporting on the manifests.

2. RCRA ,Subtitle I Underground Storage Tanks (USTs):

- Failure to provide any release detection for underground piping.
- Failure to register USTs.
- Failure to conduct leak detection testing conducted on an UST.
- Failure to conduct release detection monitoring.
- Failure to perform required maintenance on, and calibration of electronic tank leak detection devices. A solution is to include operational programming and maintenance in the equipment installation contracts.
- Failure to maintain records of leak detection device maintenance.
- Failure to maintain UST release detection records (records of monthly testing for automatic systems).
- Failure to properly mark the fill ports and other ports of the UST systems at the facility (API standards for color coding, stage 1 vapor recovery orange, unleaded gasoline white with a black X).
- Failure to properly close UST systems.
- Failure to properly install UST systems (fiberglass risers on tank vent pipes).

3. Clean Water Act (CWA) and the Spill Prevention, Control, and Countermeasure Plan(SPCC):

- Lack of a facility plan. An SPCC plan is required when there are more than 660 gallons in a single oil tank, or there are more than 1,320 gallons in aggregate above ground, or there are more than 42,000 gallons of oil below ground.
- Key elements required by 40CFR112.7 are missing.
- Failure to review Plan every 3 years.
- Failure to have certified P.E. sign and date Plan.

4. Clean Water Act (CWA) - National Pollutant Discharge Elimination System (NPDES):

- Failure to obtain a NPDES permit for wastewater discharges.

5. Clean Air Act (CAA): Violations of the New Source Performance Standards, including:

- Failure to submit proper start-up notifications for boilers.
- Exceeding the particulate standard because the opacity monitor has been incorrectly calibrated.
- Failure to submit excess-emission reports.
- Operation of combustion equipment without valid permits.

- Failure to provide proper notification for asbestos demolition and renovation activities.

- Failure to record the location of asbestos-containing material on the facility deed.

6. CAA CFC Program —
Process refrigeration, MVACs, Disposal & Certification:

- CFC technicians do not have certification cards on their person.

- Refrigerant/recovery machines are not certified with the EPA.

- Purchase invoices for all the refrigerant/recovery machines are not available. These invoices are necessary for the confirmation of the usage start date for such equipment.

- Careful and proper disposal handling of CFC containing equipment.

7. Toxic Substances Control Act (TSCA): Lead Based Paint

- Failure to provide lead-based paint disclosures.

8. Safe Drinking Water Act (SDWA) —
Underground Injection Control (UIC):

- Unauthorized and unpermitted injection (e.g., operation of wells without a permit).

- Endangerment (e.g., injection of material into wells which may adversely affect human health).

9. Asbestos (NESHAPS)

- Owner/operator failed to inspect the facility for presence of asbestos prior to starting demolition/renovation per 40CFR61.145(a) .

- Failure to deposit all ACWM (asbestos containing waste material) as soon as practical at an approved/ properly operated site per 40CFR61.150(b).

- Failure to provide a copy of the waste shipment records to the disposal site owners/operators (O/O) at the same time the ACWM is delivered per 40CFCR. 61.150(d)(2).

- Failure to report in writing to the local, State or EPA Regional Office when a copy of the waste shipment record signed by the O/O of the designated waste disposal site is not received by the waste generator within 45 days of the date the waste was accepted by the initial transporter per 40CFR61.150(d)(4).

For further information, the point of contact (POC) is:

Mr. José Jimenez

PH: 215.814.2148, or
Toll Free: 800.438.2474 / 800.228.8711

eMail: jimenez.jose@epa.gov; or,

Reference: Mid-Atlantic Federal Facilities, Enforcement-Common Violations at: http://www.epa.gov/Region3/federal_facilities/common_violations.htm

EPA Expands the List of Acceptable Substitutes for Ozone Depleting Substances

By Abdul H. Khalid, Chemical Engineer, HTIS

On June 16, 2010, the U.S. Environmental Protection Agency (EPA) announced that it would expand the list of acceptable substitutes for ozone-depleting substances used in refrigeration and air conditioning, foam blowing, aerosols, and sterilants under the Significant New Alternatives Policy (SNAP) program.

The 1987 Montreal Protocol on Substances that deplete the ozone layer requires the phase-out of chlorofluorocarbons (CFCs) and other ozone-depleting substances, and at the same time allows exemptions for industries that do not have technologically and economically feasible alternatives.

According to the announcement, the EPA is adding the substitutes as alternatives to the ozone-depleting substance hydro chlorofluorocarbon (HCFC)-22, HCFC-142b, and blends containing one or both of those substances. The listing of additional refrigerant alternatives as acceptable will provide users in the refrigeration and air conditioning sector with more options for replacing HCFC-22 and HCFC-142b, which, pursuant to EPA's phase-out regulations, may generally be used only as a refrigerant to service equipment manufactured before Jan. 1, 2010.

The notice includes the listing of acceptable substitutes for:

- Household and light commercial air conditioning and heat pumps;
- Residential dehumidifiers;
- Reciprocating and screw chillers;
- Centrifugal chillers;
- Industrial process air conditioning;
- Industrial process refrigeration;
- Bus and passenger train air conditioning;
- Ice skating rinks;
- Cold storage warehouses;
- Refrigerated transport;
- retail food refrigeration;
- commercial ice machines;
- household refrigerators and freezers;

- vending machines;
- water coolers;
- very low temperature refrigeration; and,
- non-mechanical heat transfer systems.

The substitutions became acceptable on June 16, 2010.

The full text of this notice and the alternatives approved for substitution, and their acceptable uses are available online at:

http://edocket.access.gpo.gov/2010/2010-14510.htm.

For more information on the determination and other issues, DOD personnel can contact:

Ms. Melissa Fiffer

PH: 202.343.9464

FAX: 202.343.2338

eMail: fiffer.melissa@epa.gov

Reference: Federal Register, June 16, 2010, Vol. 75, N0. 115, pages, 34017-34040, web page at:

http://edocket.access.gpo.gov/2010/2010-14510.htm

Occupational Safety & Health News

The Effectiveness of Workplace Training

By Carol Merry Stephenson, PhD

Dr. Stephenson is Chief of the Training Research and Evaluation Branch in the National Institute for Occupational Safety and Health (NIOSH) Education and Information Division.

Training is an important part of efforts to reduce workplace injury, illness, and death. In the United States, the total cost of workplace training is over $100 billion per year. In light of the costs and time involved with safety and health training, businesses want to know whether training can meet the goals of decreasing workplace injuries and illness, and whether the cost of training programs can be justified.

To better understand if occupational health and safety training and education programs have a beneficial effect on workers and businesses, the National Institute for Occupational Safety and Health in collaboration with the Institute for Work and Health (IWH), Ontario, Canada, conducted a review of some of the recent research in this area. In January, NIOSH and IWH released *"A Systematic Review of the Effectiveness of Training & Education for the Protection of Workers"*.

This report shows that investment in training results in positive changes in worker knowledge and skills, attitudes, and behavior. These results are encouraging given that a primary purpose for workplace training is to impart new skills/behaviors that are transferred into the workplace. However, this research revealed that training as a lone intervention has not been demonstrated to have an impact on reducing injuries or symptoms. The fact that the study did not show an effect of training on health outcomes was, in part, an indication that training alone is not sufficient to result in reduced morbidity, mortality, or injury. For training to be effective in preventing occupational injuries and illness, it also requires management commitment and investment and worker involvement in a comprehensive hazard identification and risk management program. Additionally, the nature of the available research, (we studied only randomized, controlled trials) prohibited us from linking training to health outcomes. Randomized, controlled trials are considered by many, but certainly not all, to be the gold standard in research designs; but they are often expensive, difficult to conduct, and sometimes impractical for workplaces. As a result, many training studies are only quasi-experimental or completely correlational. This makes it quite a bit harder if not impossible to draw generalized conclusions about the effectiveness of the training studied.

The research also examined the impact of one characteristic of training programs — the degree to which they "engage" the learner in training activities. Low engagement is defined as training that uses oral, written, or multimedia presentations of information by an expert source, but requires little or no active participation by the learner other than attentiveness. High engagement involves hands-on practice in a realistic setting. While other authors present evidence supporting high engagement training2, our review of randomized, control trials published in the last ten years could not confirm that a single session of high engagement training has a greater effect on behavior than a single session of low/medium engagement training as the observed effects were too small.

In many cases, it was difficult or impossible to draw firm conclusions about the areas we examined due to the lack of quality research. There is a critical need for high quality, controlled studies of workplace health and safety training. That said, given that workplace education and training programs have a positive impact on health and safety behaviors, as we noted earlier in our discussion, and that training and education is a fundamental component of workplace safety and health protections, we recommend that workplaces continue to conduct education and training programs.

Researchers, training providers, labor, and management should continue to work together to advance the knowledge of effective practices in education and training. We encourage these parties to incorporate an evaluation component of training wherever possible and to utilize comparison or control groups. Additional research may reveal that improving training quality and effectiveness may require not only changes in the current parameters of the training programs, but also

changes such as additional resources and an expansion of the audience for training to include supervisors, foremen and owners. We would appreciate your input on occupational health and safety training, particularly the feasibility of adding additional rigor to research designs through use of randomized controlled trials or other methodologies utilizing comparison groups, novel methods for evaluating "transfer of training" into the workplace, and methods that facilitate the measurement of "return on investment" of training to organizations.

We offer the following suggestions as areas for future research:

- Studies investigating factors associated with optimal intervals for refresher training
- Studies exploring and better defining the concept of training "engagement"
- Studies broadening our understanding of the effects of pre-training factors on training success
- Studies that discriminate between various elements related to training methods, delivery, and media
- Additional investigations clarifying what is known about factors affecting transfer of training
- Further exploration of the role of national culture in training effectiveness, particularly as it relates to beliefs about acceptable risk3
- Broad efforts to validate comprehensive models such as that proposed by Alvarez et al.[4]

The document can be accessed at: http://www.cdc.gov/niosh/docs/2010-127/

References:

1. Rive ra RJ, Paradise A. State of the industry report. Alexandria (VA): American Society for Training and Development; 2006.

2. Burke, MJ, Sarpy, SA, Smith-Crowe, K, Chan-Serafin,S, et al. Relative Effectiveness of Worker Safety and Health Training Methods. American Journal of Public Health; 2006; 96, 2: 315-324.

3. Burke MJ, Chan-Serafin S, Salvador R, Smith A, Sarpy S. The role of national culture and organizational climate in safety training effectiveness. European Journal of Work and Organizational Psychology. 2008; 17:133-154.

4. Alvarez K, Salas E, Garofano CM. An integrated model of training evaluation and effectiveness. Human Resource Development Review. 2004; 3(4): 385-416.

OSHA Program Protects Federal Workers

By Beverly Howell, Industrial Hygienist, HTIS

Occupational Safety and Health Administration's (OSHA) Federal Agency Targeting Inspection Program (FEDTARG) is a fiscal year (FY)-based programmed inspection program designed to focus on specific federal agency worksites experiencing a high number of lost time cases. FEDTARG10 continues OSHA's nationwide inspection targeting program for hazardous federal worksites. The nationwide program emphasizes workplace safety and health for federal workers and contractors supervised by federal personnel.

FEDTARG10 focused on the most dangerous federal agency workplaces that experienced high numbers of lost time injuries during fiscal 2009. To implement this program, OSHA obtained establishment-specific as well as lost time claims data from the Office of Workers' Compensation Programs (OWCP).

Field inspectors conducted 59 inspections of high hazard federal worksites and found 336 violations of the OSHA safety and health standards. The top three standards cited were electrical, respiratory protection and hazard communications. The 336 violations cited were more than twice the number cited in 2008, indicating the necessity for the FEDTARG program.

"The right to safe and healthful working conditions is not limited to private industry workers," said Assistant Secretary of Labor for OSHA David Michaels. "Workplace safety also extends to those working for the federal government. Continuing the targeting of federal workplaces assures consistent workplace safety standards in federal and private sectors."

A **primary inspection list**, also known as the inspection cycle, will be developed by each of the OSHA Regions, using a random numbers table. Each OSHA Region's primary list will include 100% of the establishments within the Region's jurisdiction reporting 100 or more lost time cases (LTCs) during FY 2009, 50% of the establishments reporting 50 to 99 LTCs, and 10% of the establishments reporting 20 to 49 LTCs. All sites on the primary list must be inspected.

This program began in 2008 in response to a Government Accountability Office audit report that recommended the agency develop a targeted inspection program for federal worksites.

OSHA's Office of Federal Agency Programs (FAP) represents the federal sector regarding occupational safety and health issues. The FAP provides federal agencies with guidance for implementing effective occupational safety and health programs.

For more information review the OSHA NOTICE at:

http://www.osha.gov/OshDoc/Directive_pdf/FAP_01-00-006.pdf

The Notice implements FEDTARG for FY 2010 and outlines the procedures for carrying out programmed inspection activity at some of the most hazardous federal workplaces.

Reference:

OSHA NOTICE, US Department of Labor, Occupational Safety and Health Administration, Directive Number FAP 01-00-006, " Federal Agency Targeting Inspection Program (FEDTARG10)", March 22,2010.

Manganese, Iron, and Total Particulate Exposures to Welders

By Ariel Rosa, Environmental Protection Specialist, HTIS

Welding fumes are toxic metal fumes produced during welding operations. The fumes usually have different compositions, depending on the metals used for welding. Most fumes contain a small percentage of manganese. A recent study performed by The Center for Construction Research and Training (CCRT) (formerly the Center to Protect Worker's Rights (CPWR)) through a cooperative agreement with the National Institute of Occupational Safety and Health (NIOSH) found that welders are frequently exposed to manganese at or above the American Conference of Governmental Industrial Hygienists (ACGIH) recommended limit of 0.2 milligrams per cubic meter (mg/m3).

There is a concern among workers, employers, and health professionals that exposure to manganese in welding fumes is associated with neurological effects.

Manganese is an essential nutrient. A healthy person with normal liver and kidney function can excrete excess dietary manganese. But inhaled manganese is of greater concern because it bypasses the body's normal defense mechanisms, which can lead to manganese accumulation and adverse health effects including damage to the lungs, liver, kidney and central nervous system. Male workers exposed to manganese also have a higher risk of fertility problems. Prolonged exposure to high manganese concentrations (>1 mg/m3) in air may lead to a Parkinsonian syndrome known as "manganism.

According to estimates, more than 400,000 men and women employed in welding and related occupations in the U.S. may be exposed to welding fumes.

Dr. Michael Flynn, ScD, of the University of North Carolina's Department of Environmental Sciences and Engineering and Ms. Pam Susi, an industrial hygienist with MSPH at the CCRT analyzed several large data sets containing welding exposure information to characterize manganese, iron, and total particulate mass exposures. The data sets contained covariates for a variety of exposure modifiers, including the presence of ventilation (i.e. local, hood, general), the degree of confinement, and the location of the personal sampler (i.e., behind or in front of the welding helmet). The researcher findings were published in the February issue of the Journal of Occupational and Environmental Hygiene.

The analysis suggests that exposures to manganese are frequently at or above the current ACGIH threshold limit value (TLV) of 0.2 mg/m(3). The following findings were also highlighted in the report:

- Local exhaust ventilation (LEV), which is placed right next to the operation generating the welding fumes, reduced exposure to welding fumes and manganese.
- Higher exposures are associated with a greater degree of enclosure, particularly when LEV is absent.
- Area fans or "natural" ventilation, such as open windows, generally did not provide adequate exposure reduction.
- Samples obtained behind the helmet were, in general, lower than those measured outside of it.

By comparing different exposure data sets, the researchers found that there were strong correlations among manganese, iron, and total particulate mass exposures, suggesting simple equations to estimate one fume component from any of the others. These equations (published in the journal article), allow researcher to calculate manganese exposure when only iron or total particulate data are available.

The researchers recommend that the Occupational Safety and Health Administration (OSHA) reconsider its policy requiring compliance officers to place the sampler behind the welding helmet when evaluating welding fume exposures. The researchers found that this approach gives lower exposure readings than sampling outside the helmet, which suggests that the helmet itself helps reduce exposure. Thus, the method seems to deviate from OSHA's standard practice of measuring exposure without regard to the reduction provided by personal protective devices, such as respirators.

Dr. Flynn and Ms.Susi said, "OSHA permissible exposure limits (PEL) are based on breathing zone exposures irrespective of respirator use, and are used to determine the adequacy of the existing engineering controls. The researchers recommended that OSHA revise its sampling procedure for welding fumes. OSHA's approach complicates the ability to measure the effectiveness of these engineering controls by introducing the welding helmet as an exposure attenuating device," they added.

References:

1. Report Abstract – Manganese, iron, and total particulate exposures to welders. National Library of Medicine (NLM) web page: http://www.ncbi.nlm.nih.gov/pubmed/20013450?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=1

2. Welding and Manganese: Potential Neurologic Effects: http://www.cdc.gov/niosh/topics/welding/

OSHA's Update on Permissible Exposure Limits

By Abdul H. Khalid, Chemical Engineer, HTIS

The U.S. Occupational Safety and Health Administration (OSHA) sets enforceable permissible exposure limits (PELs) to protect workers against the health effects that are due to ex-

posure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air, and are based on an 8-hour time weighted average (TWA) exposure.

At the May 2010 American Industrial Hygiene Conference and Expo (AIHce), OSHA Administrator, Dr. David Michaels, disclosed that the agency would examine the possibility of updating PELs and to achieve this purpose, the agency has established an OSHA Task Force.

According to Dr. Michaels, most of the exposure limits were set for the nearly 500 chemicals in 1971 when the agency was created. The current OSHA PELs (1971) are old, and are based on research conducted primarily in the 1950's and early 1960's that may not protect workers now because of advances in areas of industrial hygiene, toxicology, and its related subjects on occupational health and safety. Various representatives of OSHA related organizations have shown interest and are trying to update the PELs.

At the same AIHce, Dr. John Howard, director of the National Institute for Occupational Safety and Health (NIOSH) stated that NIOSH would strongly support OSHA's efforts to update workplace PELs. He suggested that to assist in OSHA's efforts, the federal government could consider compiling a "clearing-house of risk assessments" that could be used as a starting point for developing new limits.

Dr Michaels suggested that the agency could look into enforcing manufacturers' developed occupational exposure limits (OELs) in situations where OSHA has not developed a limit. It makes the job easy for OSHA where the agency has no PELs and OSHA will hold them responsible to enforce their limits while protecting workforce from over exposure.

For further information on updating PELs, DOD interested personnel can contact:

OSHA Office nearest you, see map of offices on OSHA's website at: http://www.osha.gov/html/RAmap.html

Or, contact our Toll Free number: 1.800.321.OSHA (6742)

References:

1. OSHA Task Force to Look into Updating Permissible Exposure Limits, Michaels Says, Occupational Safety and Health Reporter at: http://ehscenter.bna.com/PIC2/ehs.nsf/id/BNAP-863E9H

2 Air Contaminants- Permissible Exposure Limits (Title 29 CFR Part 1910.1000), U.S. DOL, OSHA, 3112. 2. Federal Register, January 24, 1996, Vol. 61, No. 16, page 1947-1950.

3. OSHA Table Z-1-Limits for Air Contaminants, website at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9992

4. HTIS Bulletin, OSHA PELs Update, Sept-OCT 1996, web-page at: http://www.dscr.dla.mil/USERWEB/AviationEngineering/HTIS/bulletins/SEPOCT96.HTM

The Essentials of Good Housekeeping

By Ariel Rosa, Environmental Protection Specialist, HTIS

Housekeeping is a broad term that refers to the routine maintenance and upkeep of a workplace. Good housekeeping reduces injuries and accidents, improves morale, reduces fire potential, and can even make operations more efficient. Experience has shown that good housekeeping is an essential part of every agency's health, safety and fire program.

The Occupational Safety and Health Administration (OSHA) makes reference to housekeeping in several General Industry Standards:

- Bloodborne Pathogens (29 CFR 1910.1030);
- Fire Protection Plans (29 CFR 1910.39); and,
- Walking-Working Surfaces (29 CFR 1910.22).

Walking-Working Surfaces 29 CFR 1910.22

The general housekeeping requirements referenced in 29 CFR 1910.22 apply to all permanent places of employment, except where domestic, mining, or agricultural work only, is performed:

1. **29 CFR 1910.22(a)(1)**

   All places of employment, passageways, storerooms and service rooms must be kept clean and orderly and in a sanitary condition.

2. **29 CFR 1910.22(a)(2)**

   The floor of every workroom must be maintained in a clean and so far as possible, a dry condition. Where wet processes are used, drainage must be maintained, and false floors, platforms, mats or other dry standing places should be provided where practical.

3. **29 CFR 1910.22(a)(3)**

   Every floor, working place, and passageway must be kept free from protruding nails, splinters, holes, or loose boards, so as to facilitate cleaning.

4. **29 CFR 1910.22(b)(1)**

   Aisles and passageways must be kept clear and in good repair.

Why pay attention to housekeeping at work?

Some people might think too little about housekeeping, but effective housekeeping can eliminate some workplace hazards and help get a job done safely and properly. Poor housekeeping can frequently contribute to accidents by hiding hazards that cause injuries. A few minutes a day used in cleaning after oneself by picking up junk and litter, might prevent a slip, trip or fall, a fire, or a fatal explosion that could cause death or injuries that would keep someone off work for days, weeks or

even months. If the sight of paper, debris, clutter and spills is accepted as normal, then other more serious health and safety hazards may be taken for granted.

Housekeeping is not just cleanliness. It includes keeping work areas neat and orderly; maintaining halls and floors free of slip and trip hazards; and the removal of waste materials and other fire hazards from work areas. Housekeeping also requires paying attention to important details such as the layout of the whole workplace, aisle marking, the adequacy of storage facilities, and maintenance.

Effective housekeeping should be an ongoing effort by all employees, not a hit-and-miss cleanup done occasionally. Clean debris and trash as work progresses. If one is not using tools and equipment at the time, do not leave them lying around. Periodic "panic" cleanups are costly and ineffective in reducing accidents.

In office spaces, keeping one's workplace clean can help remove pollutants from air and hard surfaces. Indoor air pollution can arise from construction materials generated from adjacent projects, furnishings, fixtures and equipment. The accumulated air pollutants in one's office space can affect skin, eyes, nose, throat and lungs. And one need to ensure one's work area ventilation and air filtration systems are properly maintained.

Benefits of good workplace housekeeping

- Promotes safety and also indicates a level of professionalism in the work area (it reflects a well-run business). An orderly workplace will impress all who enter it, (employees, visitors, customers, etc);
- Eliminates clutter which is a common cause of accidents, such as slips, trips, and falls, fires and explosions;
- Helps an agency to keep its inventory to a minimum (makes it easier to keep an accurate count of inventories);
- Improves use of workspace;
- Prevents being hit by falling objects;
- Prevents slipping on greasy, wet, or dirty surfaces;
- Prevents striking against projecting, poorly stacked items or misplaced material;
- Prevents cutting, puncturing, or tearing the skin of hands or other parts of the body on projecting nails, wire or steel strapping;
- Reduces the chances of harmful materials entering the body such as dusts, vapors, etc);
- Imroves productivity (the right tools and materials for the job will be easy to find); and,
- Makes the workplace neat, comfortable and pleasant.

Effective housekeeping means, everyone is responsible for ensuring that the working environment remains tidy, clean and safe. High housekeeping standards help to achieve these important outcomes. These outcomes can be best achieved by promoting positive attitudes and pro active measures. Every employee should incorporate "everyday" housekeeping tasks into their work activities to ensure that ubiquitous workplace hazards are effectively controlled.

Irrespective of workplace, effective housekeeping requires one to:

- Follow safe work procedures and the requirements of the law;
- Organize your work area and equipment;
- Keep your work area clean and aisles clear;
- Keep walk ways, exits and entrances clear;
- Keep floors clean, dry and in good condition;
- Store and stack items safely and in their proper place
- Store all work materials (e.g. paper products, flammable liquids, etc.) in approved, clearly labeled containers in designated storage areas only;
- Clean up spills and leaks of any type quickly and properly;
- Fix or report broken or damaged tools, equipment, etc;
- Keep lighting sources clean and clear;
- Use proper waste/recycling containers;
- Keep clear floors and access-ways unobstructed;
- Regularly disposing rubbish in bins provided;
- Vacuum or wet sweep dusty areas frequently
- Keep sprinklers, fire alarms and fire extinguishers clear; and,
- Follow maintenance requirements.

Remember, good housekeeping means having no unnecessary items about and keeping all the necessary items in their proper places. Five minutes invested to save months out of work or a death is a wise investment, because who knows…. next time, it could be you who gets hurt.

OSHA Updates Screening and Surveillance

ByAriel Rosa, Environmental Protection Specialist, HTIS

OSHA has updated its "Screening and Surveillance: A Guide to OSHA Standards", OSHA3162-12R 2009. This pocket guide

is a quick reference to help occupational health professionals in locating and implementing the screening and surveillance requirements of the Federal OSHA standards published in Title 29 of the Code of Federal Regulations (29 CFR).

The guide provides an overview of OSHA requirements on medical screening and surveillance. It describes what physical examinations and tests, such as chest x-rays, lung function tests and blood tests, are required to measure worker exposure to chemicals such as hexavalent chromium, benzene, and other workplace hazards such as noise and bloodborne pathogens.

This quick reference also point to the appropriate standards for full details of specific compliance requirements.

Copies of this document can be ordered online from OSHA's publications Web page:

https://www.osha.gov/pls/publications/publication.html
The Occupational Safety and Health Act requires that employers comply with safety and health standards promulgated by OSHA or by a state with an OSHA-approved state plan.

Reference:
https://www.osha.gov/Publications/osha3162.pdf

Other News

Disposal of Fire/Smoke Detectors

By Ariel Rosa, Environmental Protection Specialist, HTIS

As an entity of the Department of Homeland Security's Federal Emergency Management Agency, the U.S. Fire Administration (USFA) provides national leadership to foster a solid foundation for the fire and emergency services stakeholders in prevention, preparedness, and response.

The December 2009 edition of the USFA Tech Talk addresses the disposal of fire/smoke detectors; and also describes the types of smoke detectors and how to distinguish among the various types. It also reports that "depending on where you live and what type of fire or smoke detector you need to dispose of, there may be regulations that apply to the disposal of scrap detectors".

References:
1. http://www.usfa.dhs.gov/downloads/pdf/techtalk/techtalk_v1n2_1209.pdf
2. http://www.usfa.dhs.gov/fireservice/research/techtalk/index.shtm

NIOSH Develops New Contact Dermatitis Screening Test

By Ariel Rosa, Environmental Protection Specialist, HTIS

NIOSH scientists and colleagues reported that they have created a fast, inexpensive test for chemicals that can cause contact dermatitis while not requiring the use of animals.

The need for alternatives to animal-based skin sensitization testing has directed scientist research toward the use of *in vitro*, *in silico*, and *in chemico* methods.

This newly developed test has the potential for use as a preliminary screening tool to determine whether chemicals used in consumer products such as soaps and shampoos, and at workplaces might cause skin sensitization, and contact dermatitis in people.

Existing chemical tests use Glutathione, as an agent to determine the reactivity of electrophilic allergens to nucleophiles, but these methods are inadequate to accurately measure rapid kinetics observed with many chemical sensitizers.

Dr. Itai Chipinda and a team of scientist at the National Institute for Occupational Safety and Health in Morgantown, W.Va evaluated a kinetic spectrophotometric assay involving the reactivity of electrophilic sensitizers to nitrobenzenethiol. When nitrobenzenethiol was used on chemicals known to cause skin irritation, the test produced positive results, while nonsensitizers chemicals such as benzaldehyde, sodium lauryl sulfate, and benzocaine did not produce a reaction with nitrobenzenethiol.

The findings from this simple and rapid absorbance model show that for the same mechanistic domain, skin sensitization is driven mainly by electrophilic reactivity.

"This simple, rapid and inexpensive absorbance-based method has great potential for use as a preliminary screening tool for skin allergens," the researchers said.

Reference: The Chemical Research in Toxicology journal:
http://pubs.acs.org/doi/abs/10.1021/tx100003w

This bulletin is printed on
RECYCLED PAPER

DEFENSE LOGISTICS AGENCY
Aviation
8000 Jefferson Davis Highway
Richmond, VA 23297–5609

The HTIS Bulletin is produced bimonthly. If you have questions or would like to communicate with us, mail us your requests, call, email, or visit us on the WEB using the contact information to the right.

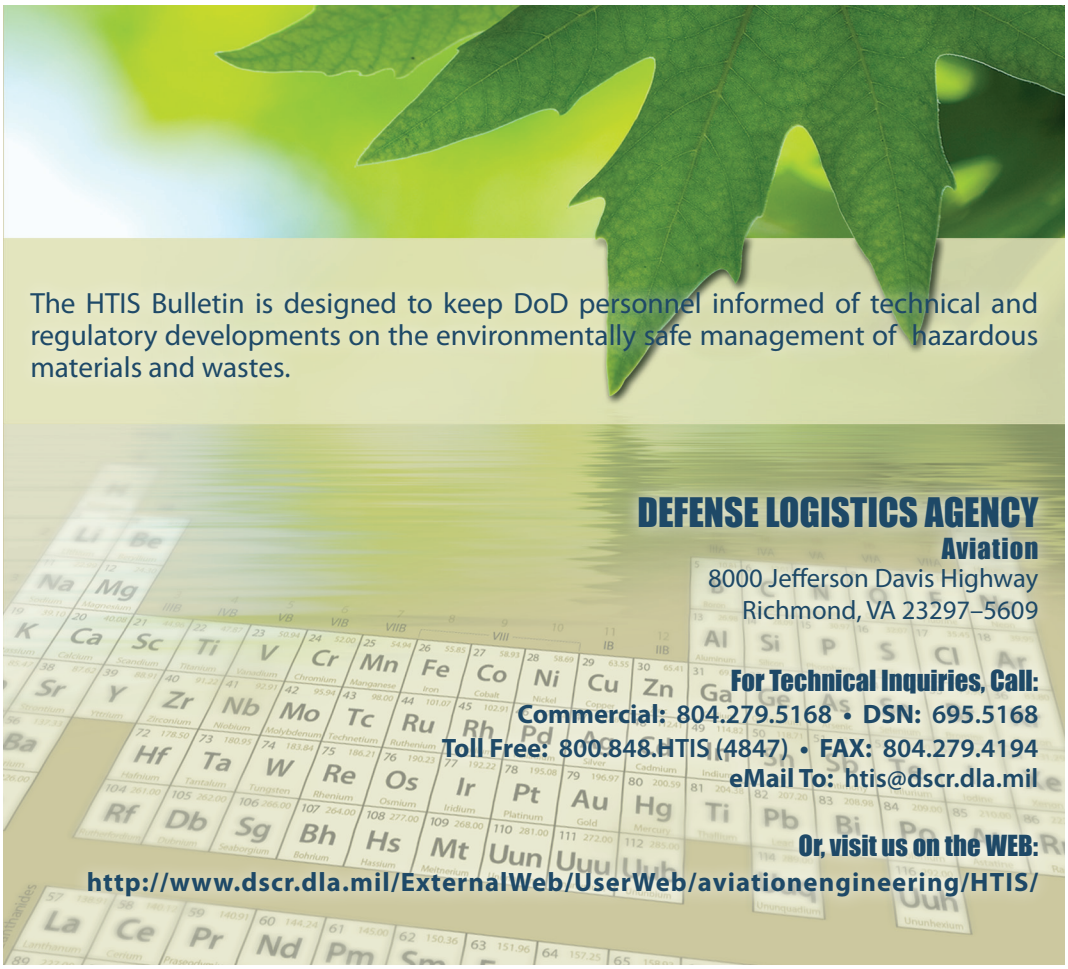
Commander,
DEFENSE LOGISTICS AGENCY Aviation
RADM Vincent Griffith, USN

Director,
Aviation Engineering
Karron Small

Chief,
Hazardous Information Programs Division
Edilia A. Correa

Chief,
Hazardous Technical Information Services Branch
Fred J. Tramontin, Ph.D.

Editor, HTIS Bulletin
Leonard S. Lambert

If you are presently on our mailing list and wish to make a change, please include your current mailing address along with your change of address in your notice to us.

No special permission is required to quote or reproduce articles written by the HTIS Staff. However, proper credit would be appreciated.