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From: Commander, Naval Facilities Engineering Command (Code 15C)
To: Distribution

Subj: INTERIM TECHNICAL GUIDANCE - HAZARDOUS MATERIAL MINIMIZATION (HAZMIN) CENTERS

Ref: (a) OPNAVINST 4110.2, "Hazardous Material Control and Management Program", 20 Jun 89
(b) OPNAVINST 5090.1B, “Environmental and Natural Resources Program Manual”
(c) CONSOLIDATED HAZARDOUS MATERIAL REUTILIZATION AND INVENTORY MANAGEMENT PROGRAM (CHRIMP) MANUAL, Jan 94
(d) CNO WASHINGTON DC R0118102 MAY 95

Encl: (1) HAZMIN Centers - Interim Design Guidance

1. Purpose: To provide interim technical guidance for the planning, design, and construction of HAZMIN Centers. The guidance should be retained until it is incorporated in the criteria noted in paragraph 4.

2. Background: With the increased attention being focused on environmental issues, much consideration has gone into identifying the best way for the Department of the Navy to carry out its mission to protect our personnel and preserve the environment. Controlling and reducing the amounts of hazardous materials (HM) used and the amounts of hazardous waste (HW) generated are essential parts of this effort.

Reference (a) was established as a result of increasing environmental regulations, significant HW disposal fees, and the increasing potential for liability. It defines uniform policy, guidance, and requirements for the life-cycle control and management of HM acquired and used by the Navy, and directs that controls be established to reduce the amount of HM used and the amount of HW generated.

Further, reference (b) specifically identifies reference (c) as a means to achieve this goal. This program, was initiated by Naval Air Weapons Station, Point Mugu, California, and has proven to be a successful method to achieve life-cycle control and management of HM and HW at the command and activity levels. CHRIMP implementation has reduced the amount of HM procured, stocked, and distributed to work centers, and eventually disposed of as HW.

Reference (d) mandates the use of CHRIMP procedures to control, track, and reduce the variety and quantities of HM in use at the activities. Reference (b) offers practical guidelines for the Navy to meet its immediate needs for controlling and reducing the amount of HM used to support naval operations and the ensuing HW generated.

In addition, Executive Order 12856 of 3 August 1993 mandated Federal compliance with the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, and conformance with the Pollution Prevention Act (PPA) of 1990 guidelines. This legislation requires a 50% reduction in the use of toxic substances and chemicals, and the subsequent generation of pollutants and waste by 31 December 1999, determined by a baseline established no later than the 1994 reporting year.

To facilitate this effort, the Pollution Prevention Directorate (SUP 424) of Naval Supply Systems Command (COMNAVSUPSYSCOM) has been designated the Executive Agent for Navy Hazardous Material Control and Management Ashore and the Program Manager for Hazardous Material Afloat. The key to the implementation of CHRIMP, within a given Navy activity or region, is the establishment of a HAZMIN Center. A HAZMIN Center is a new facility type that has requirements that are similar to, but are different than those of a Hazardous Material Storage Facility.

3. Technical Guidance:

a. General. Facility planning and design, in new construction or facility modernization, shall accommodate operational requirements, safely and effectively, while giving due consideration to the protection of the environment as well as conformity with applicable federal, state, and local regulatory requirements. There is an inherent need to demonstrate diligence in HAZMIN Center planning and design, such that DOD and installation commanders do not incur undue risk of financial penalty due to regulatory non-compliance, personal injury, facility and material damage, etc. While it is widely recognized that all potential hazards associated with HAZMIN Center design and operation cannot be eliminated, the prudent application of preventive engineering measures is expected.

b. Existing Facilities. The utilization of existing facilities may provide the most expeditious and cost effective means of accommodating operational requirements. In such cases, some degree of facility improvements will typically be required. However, using an existing facility will often entail a change in occupancy classification of the building and new code requirements. The technical requirements delineated in enclosure (1) apply to all facilities selected for conversion and subsequent use as a HAZMIN Center. A concerted

effort should be made to evaluate candidate facilities, identify known deficiencies, and establish a means of alleviating these deficiencies in a timely manner. The role of technical specialists (e.g. safety, environmental, fire protection, etc.) is considered especially important throughout this process. A structured hazard analysis/vulnerability assessment can assist planners in prioritizing expenditures that mitigate potential hazards. Plans for accommodating HAZMIN Centers operations should reflect a clear improvement in contrast to the status quo. Facility initiatives should provide for an enhanced level of life safety, environmental protection, and other regulatory compliance.

c. Application of Technical Guidance. Enclosure (1) shall be used for the planning, design, and construction of all HAZMIN Centers worldwide involving new construction, additions, and alterations. Enclosure (1) outlines the fundamental goals (e.g. life safety, environmental protection, and facility protection) to be applied in the planning, design, and construction process. It provides technical principles to be followed in support of these goals. It also has a list of technical references applicable to HAZMIN Center planning, design, and construction. If a conflict exists between guidance from different sources, then the guidance that is the most stringent shall apply. Consult with the Fitting Out and Supply Support Assistance Center (FOSSAC), Code 08 or the NAVFAC Criteria Office prior to deviating from this guidance.

d. Specialized Technical Support. Unique factors involving individual activities make active involvement of the facility engineering, occupational health, safety, environmental, fire protection, and operational specialists especially important. NAVFAC Engineering Field Divisions (EFDs) and NAVFAC Engineering Field Activities (EFAs) will provide technical assistance to activities as required. Interpretation and application of fire protection criteria (e.g. NFPA 30), in particular, is expected to routinely require EFD involvement.

4. Action:

a. NAVFAC Headquarters, Engineering Field Divisions (EFDs), Engineering Field Activities (EFAs), Officers in Charge of Construction (OICCs), Public Works Centers (PWCs), and Public Works Departments (PWDs) shall plan, design, and construct HAZMIN Centers in compliance with stated guidance taking into consideration cost, schedule, and design constraints.

b. The NAVFAC Criteria Office will coordinate revisions of the following criteria to incorporate the interim technical guidance stated in enclosure (1).

- MIL-HDBK-1005/13, "Hazardous Waste Storage Facilities", 30 April 1987
- MIL-HDBK-1032/2, "Covered Storage", 1 June 1982
- MIL-HDBK-1008B, "Fire Protection for Facilities Engineering, Design, and Construction", 15 January 1994
- NAVFAC P-80, "Facility Planning Criteria for Navy and Marine Corps Shore Installations"

c. The NAVFAC Criteria Office will develop a new Military Handbook, “Hazardous Materials Facilities”, that will coordinate, incorporate, and develop MIL-HDBK-1005/13, the applicable sections from MIL-HDBK-1032/2, and the interim technical guidance stated in enclosure (1).

d. The NAVFAC Criteria Office will develop a draft Guide Specification, NFGS-13XXX, “Hazardous Material Storage Lockers”, for release by the NAVFAC Guide Specifications Division to incorporate the interim technical guidance stated in enclosure (1).

5. Coordination: This interim technical guidance has been coordinated with FOSSAC.

6. Points of Contact: For clarification or additional information related to this subject, please contact the Fitting Out and Supply Support Assistance Center (FOSSAC), Code 08 or the NAVFAC Criteria Office. The FOSSAC point of contact is Mr. Brian Brown, DSN 565-1675/804-445-1675, fax 804-445-2482. The NAVFAC Criteria Office point of contact is Mr. Dennis Talton, R.A., DSN 262-4211/804-322-4211, fax 804-322-4416.

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HAZMIN CENTERS - INTERIM DESIGN GUIDANCE

1. FUNDAMENTAL GOALS

a. **LIFE SAFETY** - Protect our People and the Public

(1) Design facilities that eliminate or reduce hazardous materials (HM)

CHRIMP eliminates and reduces the amounts and locations of potential exposure

(2) Engineered controls to eliminate/reduce potential exposure to HM

Proper site planning reduces the exposure of adjacent occupancies to HM

System Safety Working Group participation during facility planning will reduce the HM risks

Ventilation systems eliminate or reduce exposure to HM mists, sprays, dusts, etc.

Containment systems reduce the exposure and extent of HM spills

Proper Egress provisions of Exits, Emergency Lights, Signs reduce exposure to spills of HM by enabling prompt evacuation of personnel

Emergency showers and eye-washes provide first aid facilities

Alarm systems provide prompt notification of personnel and responders to an event

(3) Personal Protective Equipment

Aprons, gloves, boots, face shields, respirators should be available to provide secondary protection

b. **ENVIRONMENTAL PROTECTION** - Protect the environment

(1) Planning - Goals are to avoid siting the facility at a location: that is contaminated from previous activities; that will result in significant environmental damage from an accidental release; and that will pose problems in meeting regulatory compliance requirements.

National Environmental Policy Act (NEPA) analysis and Baseline analysis are required prior to project construction. National Pollutant Discharge Elimination

System (NPDES) permit may need to be revised to account for precipitation, washdown, and sprinkler test discharge.

Include the HM facility in the station Spill Prevention Control and Countermeasures (SPCC) plan, the Spill Containment Plan (SCP), and other required emergency or contingency plans.

(2) Cleanup - Goals are to provide rapid response to spills of hazardous materials and to test effluents prior to discharge. Reporting is required for releases to the environment over specified threshold levels.

Design facilities to facilitate:

- *Stockpile of cleanup supplies and test kits*
- *Testing of contained spills and fire flows*
- *Release of uncontaminated precipitation and fire water flows*

(3) Hazardous Waste (HW) - Goal is to minimize Resource Conservation and Recovery Act (RCRA) requirements related to generation, containerization, labeling, handling, storage, disposal, and recordkeeping for hazardous wastes.

Control the quantity and staging time of HW to minimize special design features required to comply with the Resource Conservation and Recovery Act (RCRA).

c. **FACILITY PROTECTION** - Protect our buildings and equipment

(1) Segregation

Separate materials for storage by hazard categories and incompatibilities

Separate containment of spills, precipitation, and fire flows by hazard categories and incompatibilities

(2) Containment

Impervious surfaces

Dikes and Curbs

Drainage and Temporary Storage

Spill notification alarm system

(3) Fire Planning

Proximity of adjacent occupancies, required separation, and building construction

Proximity and response time of fire, rescue, and hazmat response resources

Identify hazardous materials and/or waste which pose a special hazard to firefighting personnel

(4) Fire Protection

Fixed Fire protection systems (sprinklers)

Fire Alarm systems

Explosion relief systems

Smoke Ventilation

Fire Hydrants

Fire Extinguishers

d. **MATERIAL PROTECTION** - Protect the stored material

(1) Freeze protection
(2) Overtemperature protection
(3) Water-reactive material protection
(4) Weather protection
(5) Physical Security

e. **FUNCTIONAL REQUIREMENTS** - Protect our ability to serve our customers

(1) Continuance of Customer service operations
(2) Continuance of HM facility operations

2. **TECHNICAL PRINCIPLES:** The guidance provided below addresses general, as well as, specific technical issues that are relevant in the facility planning process. Adherence to the general technical guidance is expected. Local/site specific considerations may be a primary determinant in the application of the specific technical guidance provided.

a. **LIFE SAFETY** - Protect our People and the Public

(1) REDUCE THE HAZARD (RH) - Design facilities that eliminate or reduce the hazardous materials on station.

RH1. The planning and design shall be coordinated with the Authorized Use List (based on inventory and reorder history) and process requirements.

CHRIMP program eliminates and reduces the amounts and locations of potential exposure.

(2) ENGINEERED CONTROLS (EC) - Keep the HM away from our personnel.

EC1. Provide proper site planning and system safety analysis to reduce the exposure of adjacent occupancies to HM.

Site HM facilities with due regard to prevailing wind directions, surface and subsurface drainage directions, occupancy of adjacent public and environmentally sensitive areas, and adequate setback from property lines.

EC2. Provide the appropriate engineered controls for ventilation, access, and personnel protection to reduce the exposure to HM.

Provide adequate natural or mechanical ventilation systems to maintain personnel airborne exposure limits below OSHA Permissible Exposure Levels (PELs) and to prevent accumulation of significant quantities of vapor-air mixtures in concentration over one-fourth of the lower flammable limit, as defined by NFPA 30. Provide and mark adequate means of egress, as defined by NFPA 101. Provide Emergency Showers and Eyewash stations; Fire and Spill Alarms.

(3) PERSONAL PROTECTIVE EQUIPMENT (PE) - Provide wearable protection for our personnel.

PE1. Provide personal protective equipment to all facility personnel.

Design facilities such that aprons, gloves, boots, face shields, and respirators for secondary protection are readily available to personnel.

b. **ENVIRONMENTAL PROTECTION** - Protect the environment

(1) PLANNING (PL) - Select a site which minimizes environmental impact

PL1. Perform a National Environmental Policy Act (NEPA) analysis of the potential environmental impact for the proposed site.

A NEPA analysis is required for all actions that have the potential for significant impact. The analysis will confirm there are no significant environmental compliance problems with the site and help identify facility design features which will reduce potential impacts. The analysis will include a Clean Air Act (CAA) General Conformity Rule Evaluation which ensures the proposed action does not violate State or Federal CAA requirements. It is expected that most sites will require a minimal level of analysis consisting of a Categorical Exclusion or an Environmental Assessment (EA).

PL2. Perform a Baseline Site Assessment of the proposed site.

A Baseline Site Assessment is considered to be a Best Management Practice to confirm the site is not significantly contaminated from previous activities. Contamination may be present in existing facilities, site soils, adjacent surface waters or site groundwater. Cleanup of a contaminated site could disrupt HAZMIN operations and be costly to the Chrimp program. It is expected that a review of facility records and a site walk will be adequate for most locations. Some sites may require laboratory testing of surface soils and water or the testing of subsurface soils and groundwater from monitoring wells or push rod sampling.

PL3. Check the Activities National Pollutant Discharge Elimination System (NPDES) Permit requirements.

PL4. Add the HAZMIN Facility to Activity pollution prevention, contingency and response plans as appropriate.

Some environmental compliance requirements affect operations while others may directly or indirectly affect the facility siting and design. Examples of compliance requirements are:

Facility Pollution Prevention (P2) Plan
(Details Activity efforts to reduce the release of toxic chemicals)

Emergency Planning and Community Right-to-Know (EPCRA)
(Details hazardous material tracking and reporting requirements)

Oil and Hazardous Substance Spill Prevention, Control and Countermeasures (SPCC) Plan
(Details plans for physical containment of a spill)

Spill Contingency Plan (SCP)
(Details response actions in the event SPCC controls fail)

Oil and Hazardous Substance Facility Response Plans (OHSFRP)
(Details responsible individuals, training exercises and documentation requirements)

(2) CLEANUP (CU) - Design facilities that will avoid spilling HM, but will facilitate cleanup should a spill occur.

CU1. Provide spaces for cleanup supplies, including overpack drums and pails, containment booms and socks, absorbent materials, test kits, personal protective equipment, instructions, and material safety data sheets.

Rapid response reduces the potential for human exposures and degradation of the environment, facilities and material stored.

CU2. Design facilities that will enable testing for contamination (and proper disposal) of contained precipitation, washdown flows, sprinkler drain and inspection test flows, emergency shower and eye wash stations (ES/EWS) flows, and fire flows prior to discharging to the authorized drainage system such as the sanitary or storm sewers.

Testing and releasing uncontaminated waters will reduce the cost of operations and preserve the environment. Consider piping sprinkler drains and test flow drain lines to a receptor outside the secondary containment areas, in order to avoid requirements for testing the effluent. Consider piping ES/EWS flows to sanitary drains per new Draft Interim Technical Guidance for ES/EWS, to avoid requirements for testing effluents. Use above slab piping, with elevated ES/EWS platform to avoid piping beneath slab.

(3) HAZARDOUS WASTE (HW) - Packing, handling and storage of hazardous wastes are regulated by the Resource Conservation and Recovery Act (RCRA).

HW1. Consult the Activity or EFD / EFA environmental specialist regarding RCRA requirements.

RCRA hazardous waste requirements are complicated with many waste definitions, categories of operations and exemptions. Specific RCRA requirements may vary between different State hazardous waste programs. A hazardous waste environmental specialist should evaluate the facility design and operations to determine RCRA implications.

HW2. Design the facility in coordination with the Activity hazardous waste storage facilities.

Use of the Activity permitted hazardous waste storage facilities can help limit storage time in the HAZMIN facility and minimize RCRA requirements.

c. **FACILITY PROTECTION**

(1) SEGREGATION (SG) - Keep all materials that chemically react to produce hazardous conditions physically separated.

SG1. Provide separate storage areas for materials having incompatible hazardous characteristics.

Hazardous materials are commonly divided into ten (10) primary segregation codes. As the HAZMIN Center will not be handling compressed gases, radioactives, or explosives, the subject facility should provide for accommodation the remaining seven segregation codes. These seven categories applicable to the HAZMIN Center are Corrosive, Oxidizer, Flammable, Low Hazard, Organic Peroxide, Reactive, and Poison. Refer to the joint services publication titled STORAGE AND HANDLING

OF HAZARDOUS MATERIAL (NAVY NAVSUP PUB 573), Chapter 4 (Storage of Hazardous Materials) and Appendix C (Storage Segregation Matrix) for details on HM storage and segregation. Prior to the design and construction of separate storage areas for all seven categories, investigate the need for material storage for each category. (i.e. Do not design a special area for organic peroxides if none are currently used or forecast for the operation.)

SG2. Provide segregation, handling, and yard spill containment areas.

See CONTAINMENT below. The yard is the uncovered, exterior portion of the site subject to HM storage, transport, spillage, or runoff from those areas.

(2) CONTAINMENT (CN) - Design facilities to contain and cleanup a spill.

(a) Spill Containment in Storage: Provide separate segregation spill containment areas for each class of incompatible materials stored.

See SG1, CN1, CN3, CN4, CN6, and CN9.

Provide spill containment area capacity for 10% of the gross volume of material stored or the volume of the largest container, whichever is greater. This may be achieved through the use of curbed storage areas, containment pallets, and conforming HAZMAT storage lockers.

See CN7.

(b) Spill Containment in Handling: Consider the full potential for failure of containers (Cans, drums, bottles, etc.) during handling incidents, in the planning and design process.

Provide for the containment and cleanup of spills throughout the handling cycle in all areas. Handling areas include, but are not necessarily limited to, receiving areas, loading docks, and dock aprons. Provide handling spill containment areas.

Handle materials on impervious surfaces. If impervious surfaces are not currently available, use portable spill containment equipment (e.g. containment pallets with load stabilization, or impervious membranes on grade or on the floor) as a temporary means of containing spills. Provide permanent impervious surfaces and spill containment curbs immediately.

See CN1, CN3, CN6, CN7, and CN9.

(c) Containment of Contaminated Precipitation: Should the potential exist (through normal operations such as material handling) for HM to be spilled onto a surface which is not covered and thereby exposed to precipitation, a means of containing the precipitation in the subject area must be provided. Provisions shall be made to hold accumulated water for pre-

release testing. Containment design should accommodate a volume equal to 1 hour of precipitation during the 100 year storm event.

See CU2, CN1, CN2, CN7, and CN8. Check the volume requirement, but the 6 inch curb will usually be sufficient for the rain event.

(d) Containment of Effluent from Fire Suppression:

General. Effluent from automatic fire sprinkler systems, fire hose stream, and other liquid fire suppression systems should be considered as potentially contaminated and not releasable to the environment without prior testing. Given the potential for overflowing flammable and combustible liquids to contribute to the spread of fire, provisions must be made to fully contain the volume of liquid reasonably expected to be used during a fire incident.

See CU2.

Sprinkler Water Containment. In estimating the volume of water to be released from automatic wet pipe sprinkler systems, assume that no less than all the sprinkler heads over the largest individual containment area would be involved for a 30 minute period at the design density (typically 0.35 to 0.6 GPM/SQ. FT.) during the fire incident. Local conditions, especially the expected fire department response time (as may be dictated by travel distance) may result in longer periods of sprinkler system discharge.

See CN9.

Containment of Fire Hose Stream Water. In estimating the volume of fire hose water to be accumulated, assume no less than a 20 minute discharge at a rate consistent with the established fire response plan. AFFF fire suppression, for example, may reduce the required design holding capacity of the containment area, but may create a new problem of HM contaminated foam blowing off of the site.

See CN9.

Containment. of Excess Flow. If design calculations indicate the potential to exceed the capacity of sumps and interior containment areas, the facility design should provide for diverting overflowing liquids to auxiliary containment areas. Location and design of the auxiliary containment areas should not inhibit fire suppression efforts, expose adjacent areas to spread of fire, or unduly risk the release of contaminated fluids to the environment. Consider the use of oil/water separators on overflows to prevent the spread of floating flammables into the auxiliary containment areas.

In absence of existing containment sumps, provide a minimum curb height of 6 inches. Provide not less than a one inch of free board in excess of the total estimated accumulation depth (e.g. 7” accumulation requires minimum 8" curb height).

See CN2.

CN1. Provide an impervious containment surface beneath the storage area for HM materials. The surface shall be accessible, inspectable, and repairable.

Without this, any HM spill will contaminate the environment and may endanger people, facilities, and materiel. Hazardous Materials Storage Lockers (HMSL) provide this by means of a sump beneath their floor grating. Area pavements, building floors, containment curbs should normally be of portland cement concrete construction. Surface shall be free of cracks or gaps and sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed (40CFR264.175).

CN2. Provide a dike or curb completely around the perimeter of the HM site, to form a yard spill containment area. Minimum height shall be 6 inches for all curbs or dikes. Grade site to divert spills away from buildings , other exposures, and fire department access areas. A pond or other containment may be provided for supplemental storage.

Without this, any large HM spill or precipitation in the yard area, or fire flow that overflows a segregation or handling spill containment area will contaminate the environment and may endanger people, facilities, and material.

CN3. Provide a dike or curb completely around the interior perimeter of each HM storage building and shed, to form a building perimeter spill containment area.

Without this, any large HM spill or fire flow in the building or shed, that overflows a segregation or handling spill containment area will contaminate the entire HM facility and may endanger people, facilities, and material. This is provided by the sump for HMSL's.

CN4. Provide a dike or curb completely around each individual segregation category of HM to form a segregated spill containment area. This curb may be part of the building perimeter spill containment area curb system.

Without this segregation spill containment area , any spill will contaminate the adjacent storage areas and may cause chemical reactions which will endanger people, facilities, and material. This is met by the sump of a HMSL dedicated to the single category. Spill containment pallets may also meet this requirement.

CN5. Provide a dike or curb completely around the exterior of each (existing or new) HM building or shed whose foundation pierces the impervious surface required by CN1.

Without a dike or curb on each side of the foundation to area pavement construction joint, the facility must rely on the integrity of the construction joint to prevent release into the environment. The dike or curb is long lasting, inspectable,

and repairable for the life of the facility. The joint is not. This is to prevent yard flows from penetrating the impervious surface at the building foundation.

CN6. Provide segregation spill containment area curb crests 1 inch higher than the handling spill containment area curb crests, which shall in turn be 1 inch higher than yard spill containment area curb crest. Provide a crest weir from each individual segregation and handling spill containment area into the yard spill containment area. See Figure 1, page 14.

This ensures that flooding of the yard spill containment area will not back- flood or contaminate any handling spill containment area, and that flooding of a handling spill containment area will not back-flood or contaminate any segregation spill containment area. The purpose is to prevent cross-contamination of spills into incompatible segregation areas and to prevent incompatible spills into a common handling spill containment area. Ensure incompatible segregation areas do not crest flow into a common indoor area. Ensure that crest flows from each interior spill containment area into the yard spill containment area occurs out of doors, to reduce the hazard of emissions from inadvertent chemical reaction to personnel.

CN7. Provide a spill containment area storage volume of not less than ten percent of the total volume of all containers within, or not less than the volume of the largest container within, whichever is larger. Provide this spill containment area volume for each segregation, handling, and yard spill containment area.

This provides storage for the largest creditable spill event, to allow cleanup.

CN8. The yard spill containment area storage volume for outdoor areas shall also be sized to hold 24 hours of precipitation during the twenty five year storm event. Curb height shall be not less than 6 inches. Use NOAA weather data, to obtain the rain fall data.

Minimize the additional storage by leading roof drains from buildings and sheds within the curbed area, to spill outside the curbed area. Run roof drain leaders above ground to allow inspection and to prevent penetration of the impervious surface of CN1.

CN9. Provide a total spill containment area storage volume for sprinkler protected indoor or shed storage areas, sized to hold not less than 30 minutes of sprinkler flow and 20 minutes of hose stream flow. The yard spill containment area storage volume may be included with the respective indoor or shed spill containment area storage volume in the total.

This provides time for the Fire Department to respond and evaluate the situation before the fire flows overtop the curbs and spill into the environment.

CN10. Provide an manual alarm system to warn personnel of a HM spill. Where mechanical ventilation systems are provided, provide an alarm system to automatically sound an alarm upon failure to maintain the proper air flow. Provide a suppression alarm system to sound locally and to transmit an alarm signal to the fire station.

This manual alarm allows the first person to detect the spill to warn others and summon help. The ventilation alarm warns personnel of potentially unsafe conditions prior to entering an area, and warns them to exit immediately. The suppression alarm warns of potential spill and summons help, whether the facility is manned or not.

(3) FIRE PLANNING - Design facilities to coordinate with the Documented Fire Prevention Program, the Documented Fire Emergency Plan, and the Fire Hazard Analysis.

(4) FIRE PROTECTION

(a) Refer to Military Handbook 1008B, Fire Protection for Facilities Engineering, Design, and Construction for design criteria and specifications.

(b) When an evaluation of an existing facility identifies a deficiency in sprinkler systems, the feasibility of accepting a total loss of the facility and material should first be considered. Of course, this under no circumstance would alleviate requirements to provide for adequate life safety. If a loss is considered a potentially acceptable risk, then this loss should be compared with the cost of the subject sprinkler system and this analysis used to justify the resulting decision. Included in this analysis will be the hazard presented to adjacent facilities by the subject building or site. Such a case would commonly exist where a potential HAZMIN Center has inadequate or no sprinkler protection and is sufficiently separated from adjacent facilities.

(c) Design suppression system with careful consideration given to the material characteristics in the protected area.

(d) Design a fire alarm system with features that provide for evacuation of personnel and initiation of fire emergency plan.

d. **MATERIAL PROTECTION**

(1) HAZARD ANALYSIS - Systematic method of threat identification.

HA1. Use system safety engineering and management to ensure the highest possible degree of safety and occupational health is incorporated into the CHRIMP facility.

Hazard identification, vulnerability analysis, and risk assessment, shall be based upon the severity of the projected danger, to determine the potential for loss and/or damage. Emphasis should be placed on the evaluation and elimination or control of possible hazards.

(2) PHYSICAL SECURITY - Protect the facility and surrounding perimeter.

PS1. Provide a secure perimeter around the facility to protect the personnel, structure, and material. Furnish a security alarm panel for local and base interconnections.

Physical security requirements, within a military compound or installation, will vary based on base mission, function, geographic location, site constraints and local procedures. Activity security personnel and the Naval Criminal and Investigative Service shall evaluate threat conditions and determine the appropriate means and methods for level of security required. Refer to Military Handbook 1013/1, DESIGN GUIDELINES FOR PHYSICAL SECURITY OF FIXED LAND-BASED FACILITIES, for additional information.

The remaining issues are typical as for any other storage facility, needing ordinary care and methods.

e. **FUNCTIONAL REQUIREMENTS**

(1) DISPATCH OFFICE - Space designated for administrative purposes.

DO1. Provide an area that conforms to general office standards within a warehouse. It shall be heated and cooled, and physically isolated from the rest of the areas.

This is mandatory since this facility will be manned, and proper levels of protection are necessary for personnel assigned to this work center. Restroom and locker facilities are recommended in the proximity of the office.

DO2. Provide an electrical power distribution and lighting system with a primary source and an alternate Emergency Power System (EPS). Provide a general illumination system, and emergency and exit lights. Provide an Uninterruptable Power Supply (UPS) for the Personal Computer (PC), with capacity to operate the PC for 2 hours. Provide a connection to the EPS for operating the PC and simultaneously recharging the UPS throughout the normal power outage.

System shall support a personal computer suite, to include a PC, and peripheral equipment such as a printer, barcoder, and scanner. The UPS and EPS power will allow continued operation during long power interruptions, due to conditions such as wind and ice storms, and hurricanes. The material may be required for recovery, but the inventory integrity would be damaged without PC operation.

DO3. Provide a complete telecommunications wiring system from the office to the local exchange carrier interconnection. Provide data connections for telephone, fax, and MODEM connections.

A minimum of two telephone lines is required for normal ADP operations.

(2) STAGING AREA - Space designated for receiving and delivery functions.

SA1. Provide an indoor portion of the facility allocated for the purpose of staging in-coming and out-going orders.

"A" condition and reuse materials shall be processed indoors in a well-lit, ventilated, unencumbered area free of obstacles.

(3) MATERIALS STORAGE - Space designated for the storage of hazardous materials.

MS1. Provide an area for the proper storage of hazardous materials. Area shall conform to the requirements outlined in all applicable references.

Refer to Facility Protection segment.

(4) WASTE ACCUMULATION - Space designated for the accumulation of hazardous waste.

WA1. In situations where the temporary staging of HW will be at a HAZMIN Center, provide a space designated for the accumulation of HW.

See "hazardous waste" section (HW1 through HW2) under Environmental Protection

(5) EQUIPMENT - Devices used to streamline HAZMIN functional requirements.

EQ1. Solutions to accommodating HAZMIN functional requirements will frequently involve the application of commercially available apparatus. They will increase the safety and efficiency of the facilities.

EQ2. Equipment provided shall conform with all applicable local, state, and federal codes and regulations, and certified as such, if applicable.

Examples of equipment include, but are not limited to, storage lockers, Material Handling Equipment (MHE), containment pallets, storage aides, scales, Automated Data Processing (ADP), dispensers, crates, etc. Most of these are available under current DLA and GSA contracts.

The remaining issues are typical as for any other storage facility, needing ordinary care and methods.

3. TECHNICAL REFERENCES

1. 29 CFR 1910, OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR GENERAL INDUSTRY, Subpart H - Hazardous Materials, Part 106, Flammable and Combustible Liquids {a}

2. 29 CFR 1926, OCCUPATIONAL SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION {a}

3. 40 CFR PARTS 260-266, RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) {a}

4. American Conference of Government Industrial Hygienists (ACGIH), Industrial Ventilation, A Manual of Recommended Practices {b}

5. CONSOLIDATED HAZARDOUS MATERIAL REUTILIZATION AND INVENTORY MANAGEMENT PROGRAM (CHRIMP) MANUAL, January 1994 {c}

6. Design Manual 3.03, HEATING, VENTILATION, AND AIR CONDITIONING, dated January 1987, (becoming Military Handbook 1003/3) {a}

7. Emergency Planning and Community Right-to Know Act (EPCRA), 1986 {d}

8. Executive Order 12856, Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements, 3 August 1993 {d}

9. International Plumbing Code (IPC), by BOCA/ICBO/SBCCI, 1995 {e}

10. Military Handbook 1005/13, HAZARDOUS WASTE STORAGE FACILITIES, 30 April 1987 {a}

11. Military Handbook 1008B, FIRE PROTECTION FOR FACILITIES, ENGINEERING, DESIGN, AND CONSTRUCTION, 15 January 1994 {a}

12. Military Handbook 1013/1, DESIGN GUIDELINES FOR PHYSICAL SECURITY OF FIXED LAND-BASED FACILITIES, October 1987 {a}

13. Military Handbook 1032/2, COVERED STORAGE, 30 September 1987 {a}

14. NAVFAC Instruction 5100.11H, NAVFACENGCOM SAFETY AND HEALTH PROGRAM {d}

15. National Fire Protection Association NFPA 12A, Halon 1301 Fire Extinguishing Systems, 1992 edition {f}

16. National Fire Protection Association NFPA 13, Installation of Sprinkler Systems, 1994 edition {f}

17. National Fire Protection Association NFPA 15, Water Spray Fixed Systems, 1990 edition {f}

18. National Fire Protection Association NFPA 16A, Installation of Closed-Head Foam-Water Sprinkler Systems, 1994 edition {f}

19. National Fire Protection Association NFPA 17, Dry Chemical Extinguishing Systems, 1994 edition {f}

20. National Fire Protection Association NFPA 30, Flammable and Combustible Liquids Code, 1993 edition {f}

21. National Fire Protection Association NFPA 70, National Electric Code, 1993 edition {f}

22. National Fire Protection Association NFPA 101, Life Safety Code, 1994 edition {f}

23. National Fire Protection Association NFPA 231C, Rack Storage of Material, 1986 edition {f}

24. NAVSUP PUB 573, STORAGE AND HANDLING OF HAZARDOUS MATERIALS, Navy Reprint January 1993, Cog I Stock Number 0530-LP-189-1200 {c}

25. OPNAV INSTRUCTION 4110.2, HAZARDOUS MATERIAL CONTROL AND MANAGEMENT (HMC&M), 20 June 1989 {g}

26. OPNAVINST 5090.1B, ENVIRONMENTAL AND NATURAL RESOURCES PROGRAM MANUAL, 1 November 1994 {g}

27. OPNAVINST 5100.23D, NAVY OCCUPATIONAL SAFETY AND HEALTH PROGRAM MANUAL, 11 October 1994 {g}

28. Pollution Prevention Act (PPA), 1990 {d}

SOURCES:

a. Construction Criteria Base CD-Rom, available from EFD/EFA/PWC/PWD Design
b. Published Book, available from EFD/EFA/PWC/PWD Mech Engn Branch or Industrial Hygienist
c. NAVSUP Pub, available from NAVSUP 424
d. Available from EFD/EFA Base Legal or Environmental Office
e. Published Book, available from EFD/EFA/PWC/PWD Mech Engn Branch
f. Published Standard, available from EFD/EFA Fire Protection

g. OPNAV Pub, available from EFD/Base File Room
h. DOD Index of Specifications and Standards (DODISS) available from EFD/EFA