
HOTWORK
OPERATIONS
7.13

Enabling Objectives

- **DESCRIBE**: The Gas Free Engineering requirements for welding in or on containers, compartments and tanks under normal and emergency conditions
- **DESCRIBE:** The safety precautions for preparing a shipboard compartment or structure for hot work on or within the boundaries

Enabling Objectives (cont.)

- **DESCRIBE**: The procedures to be followed in preparation for and during hot work on the following.

a) Structural Voids.

b) Oil Tanks.

c) Miscellaneous Hazard Spaces.

d) Ammunition and explosive spaces.

Enabling Objectives (cont.)

- **DESCRIBE:** The required administrative procedures (both inport and underway) before conducting hot work.

REFERENCES FOR HOT WORK

- NSTM 074-VOL 1 SECTION 10
- NSTM 074-VOL 3 SECTION 22 & Appendix C
- OPNAV 510019.D
  *OPNAVINST 8023.21
- NAVSEA OP 4

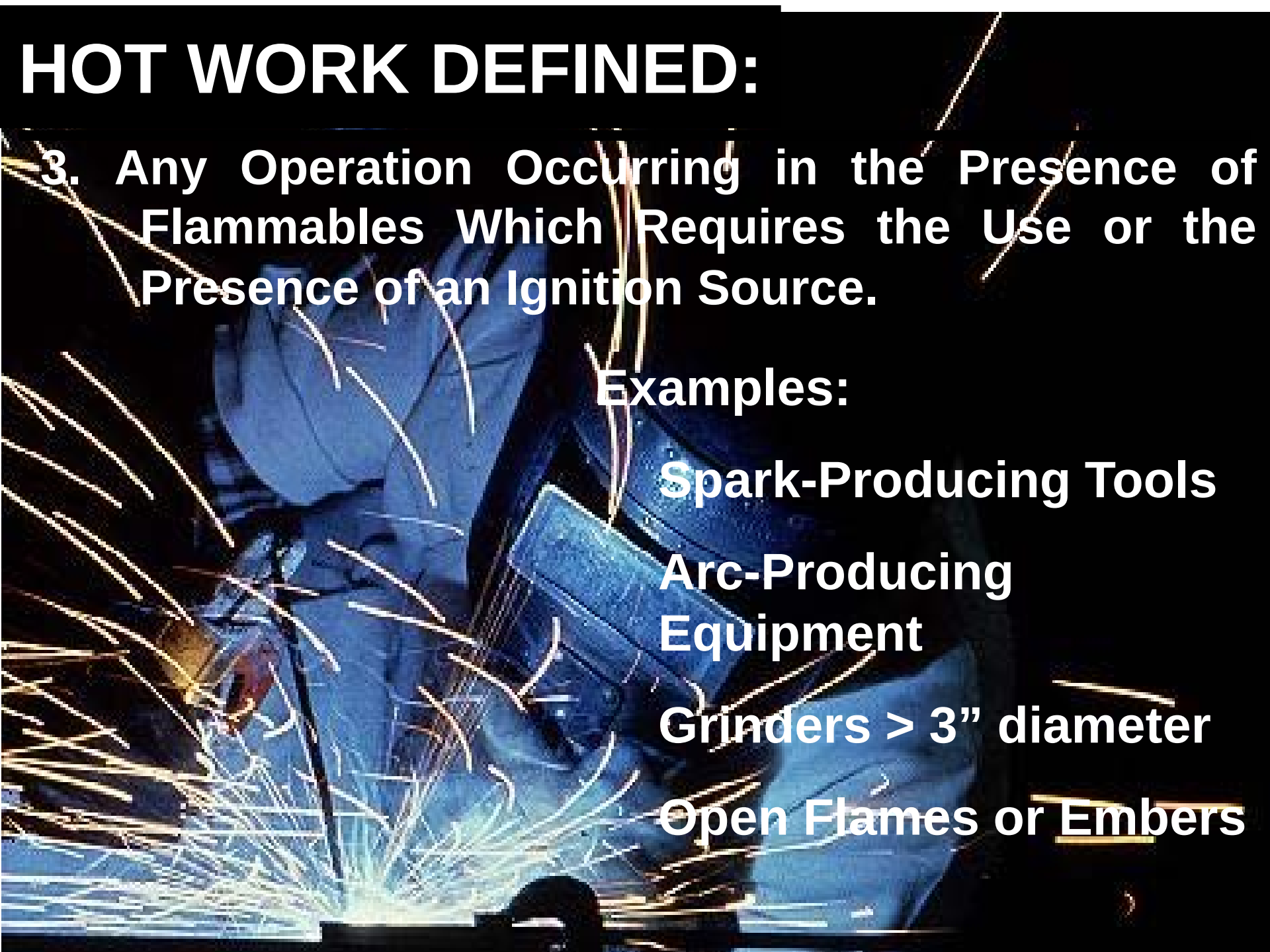
HOT WORK DEFINED:

1. Flame Heating, Welding, Torch Cutting, Brazing or Carbon Arc Gouging.

2. Any Operation Producing Temperatures of 204^0C \ 400^0F.

HOT WORK DEFINED:

3. Any Operation Occurring in the Presence of Flammables Which Requires the Use or the Presence of an Ignition Source.



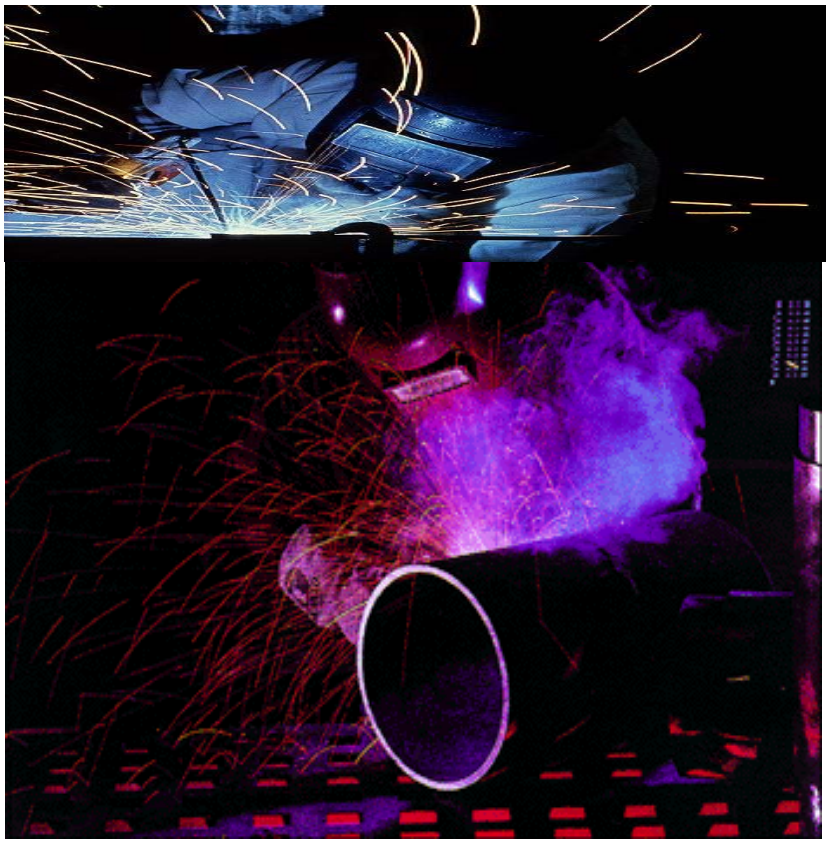
Examples:

- Spark-Producing Tools
- Arc-Producing Equipment
- Grinders > 3” diameter
- Open Flames or Embers

Where only Class Alpha Materials are Exposed, Hot Work is Divided into Two Classes:

CLASS I

High Energy, Scattered Sparks



CLASS II

Minimal Energy, Localized Sparks

* CLASS I : High Energy, Scattered Sparks

Processes that produce high energy sparks or slag that can be thrown or dropped at the work site or produce heat that can be transferred through the deck, overhead, bulkhead, or structure to a location not visible to the hot work operator. --NSTM 074 VOL 1 sec 10.8.1.2

Flame Cutting
Welding
Plasma Cutting
Electric Arc Welding

- Arcing and Gouging
- Thermal Spraying
- Other Hot Sparks/Flames

***Requires Fire Watch---ALWAYS**

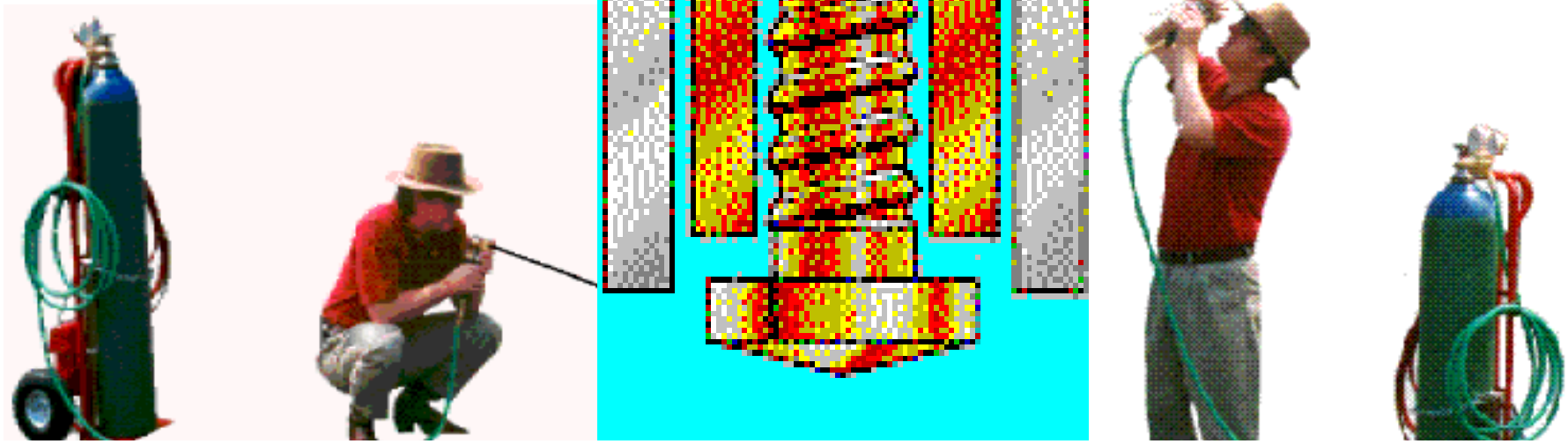
Fire Watch Requirements

Basic DC PQS Qualified	All affected Sides Watched	Watch & Welder Comms
PPE: Visor, Flash Gear, Gloves	Portable Extinguisher or Fire Hose	30 minutes after Work Complete

CLASS II: Minimal Energy, Localized Sparks

Processes that produce flames or minimal energy sparks or slag which are generally localized to the immediate work area.

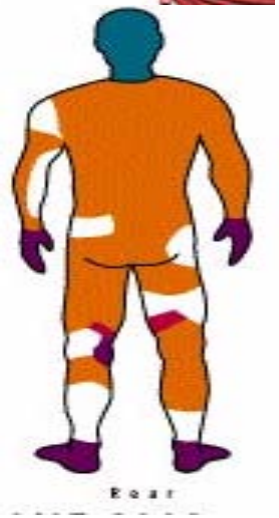
- **Stud Welding with an Electric Stud Gun**
- **Gas-Tungsten-Arc (GTA) welding**
- **Torch Brazing**
- **Ferrous Metal Grinding with Abrasive Disks**

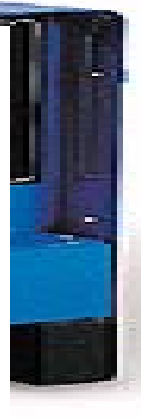


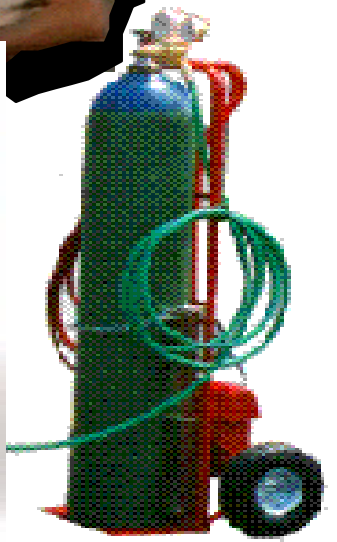
DCA or Fire Marshal determines the need for a Fire Watch --

If no Fire Watch, Worker stays for 30 min Cool Down

HOTWORKER SAFETY







- Ground All Electrical Welding Equipment !
- Use Only Non-Shatter Cylinders
- De-Energize Equip Before Walking Away
- Keep Welding Material Clean & Dry
- Wear Protective Gear
- Remove cigarette lighters

CREW SAFETY

- Minor skin burns and eye irritation are common injuries for people not involved in hot work.
- When class one hot work is conducted in open areas, flash screens should be used.
- Control spread of smoke and fumes by using local exhaust.

SERIAL # _____ NAVY GAS FREE CERTIFICATION AND TEST LOG

INITIAL CERTIFICATION	TEST RESULTS			
SHIP/UNIT/ACTIVITY: _____	TESTS CONDUCTED AS REQUIRED	INITIAL TEST	1ST RETEST	2ND RETEST
ITEM/COMPARTMENT/SPACE:				
_____	EXISTING CONDITIONS	INITIAL TEST	1ST RETEST	2ND RETEST
	NOT SAFE FOR PERSONNEL/			
_____	SAFE FOR HOT WORK			

Prior to Issuing a Hot Work Chit, the GFE or Fire Marshall Must Assess Space for Hazards

Any flammables in the space must be re-located a minimum of 35 feet from the work site when possible.

No Hot Work within 40 feet of Painting or Chemical Cleaning (IAW p. C-16)

TIME SECURED _____

*FINAL CHECKUP: WORK AREA AND ALL ADJACENT AREAS TO WHICH SPARKS AND HEAT MIGHT SPREAD WERE INSPECTED 30 MINUTES AFTER THE WORK WAS COMPLETED AND WERE FOUND TO BE FIRE SAFE. THE EQUIPMENT AND STRUCTURES WORKED ON WERE COOL TO THE TOUCH.

I CERTIFY THAT I AM FAMILIAR WITH AND WILL COMPLY WITH ALL SAFETY PRECAUTIONS PERTINENT TO THIS TYPE OF WORK.

HOT WORK OPERATOR SIGNATURE _____

HOT WORK SUPERVISOR _____

FIRE MARSHAL _____

RECERTIFICATION

1ST RETEST/UPDATE

TIME: _____ DATE: _____ EXPIRES: _____

GFE PERSONNEL SIGNATURE _____

2ND RETEST/UPDATE

TIME: _____ DATE: _____ EXPIRES: _____

GFE PERSONNEL SIGNATURE _____

OPNAV 5100/16 (5-91) S/N 0107-LF-011-7400

PIPES, TUBES, COILS:

Must be certified safe prior to any hot work.

Valves to pipes, tubes, coils must be closed and pipes blanked off.

CLOSED CONTAINERS OR STRUCTURES:

- Hollow Structures, Bilge Keels, Support Stanchions, Bits, Bollards
- Must be Flushed, Purged, Inerted, Filled with Water, or otherwise Made Safe
- VENTILATE AS REQUIRED

FLAMMABLE / TOXIC COATING:

- Determine the Flammability of Coating (NSTM-631 or MSDS)
- Never use Flame or Uncontrolled Heat for Stripping Flammable Coating
- Shield Flammable Coating from Slag and Sparks in the Area of Hot Work (Wet Down if Required)
- Strip Coated Area 4 inches Beyond Area to be Heated
- Use Required PPE (Pressure Demand SCBA)
- Ventilate (One Air Change Every 3 Minutes)
- Keep a 1 1/2 " Fire Hose in the Immediate Vicinity

DAMAGED SURFACES:

- Tank wall coatings

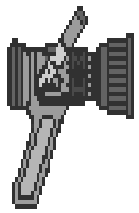
May Contain Toxicants

- Clean Away Blisters, Scales and Similar Formations
- Ascertain Previous Tank Contents
  - Clean / Wet Down Minimum 4 “ on All Sides of Work Area
    - Assess Possibility of a Surface Flash Which Would Involve the Whole Space


PRESSURIZED SYSTEMS:
• Depressurize System
TAG OUT !!
• Protect Piping, Fittings, & Valves From Hot Slag
•Clean Space and Remove Contaminants Before Hot Work

INSULATION

- Remove Insulation 12 inches from the hot work Area
- Wet Down Non-Removable Insulation and Cover with Fire Retardant Cloth
- Station Fire Watch with a Charged 1 1/2” Hose



AMMUNITION AND EXPLOSIVES:

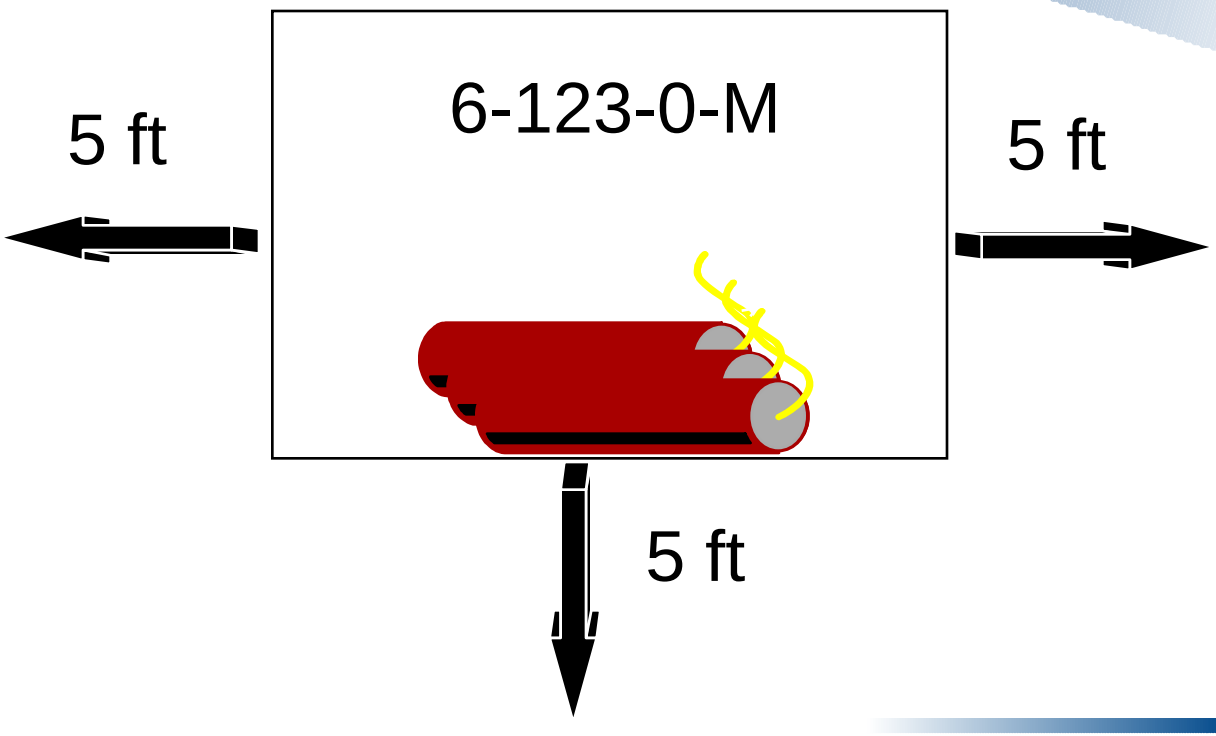
- Remove Ammunition Prior to Availability or Overhaul
- No Hot Work in Any Space Containing Ammunition
- CO Must Approve in Writing any Hot Work in Adjacent Spaces
- Apply 5 ft. Rule for Adjacent Spaces

5 FT RULE

NO HOT WORK IS ALLOWED IN SPACES <u>ABOVE</u> , OR

<u>WITHIN 5 FT</u> OF A

LOADED MAGAZINE



NAVSEA OP 4 SIXTH REVISION

2-22.5. HOT WORK. The following hot work precautions shall be observed aboard ship:

a. a. Within the ship, no hot work of any type will be performed in any space containing ammunition and explosives. Further, no hot work shall be performed in or on any space adjacent to, directly above, or directly below a space containing ammunition and explosives.

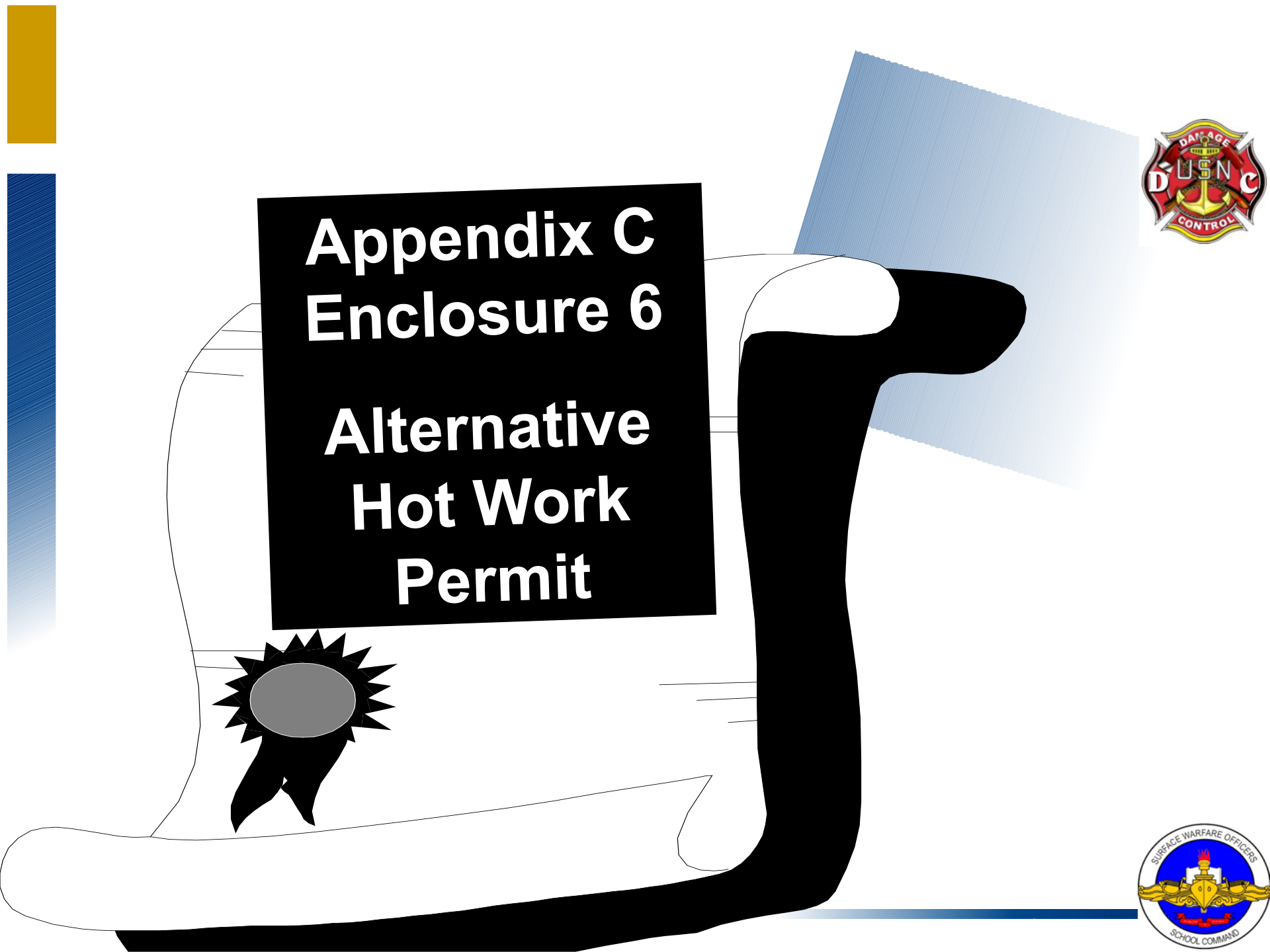
MISCELLANEOUS HAZARD SPACES:

- Battery Lockers
- Flammable Liquid Storerooms
- Paint Mix and Issue Rooms
- Flammable Gas Cylinder Storerooms

HAZARDOUS EVOLUTIONS:

- **Hot Work Shall Not be Performed During Fueling or Ammunition Transfer**

A/S TYPE SHIPS ARE EXEMPT


Appendix C
Enclosure 6
Alternative
Hot Work
Permit

SPACES EXEMPT FROM HOT WORK PERMIT REQUIREMENTS

(Due to Design, Work Stands, Curtains & Vent Hoods)

Upper & Lower Nuclear Weld Shop

Shipfitter Shop

Machine Shop

Aviation Engine Shop

Aviation Structure Shop

R-Div Pipe Shop

A-Div Steam Heat Shop

Arresting Gear Terminal Socket Pouring Room

GAS FREE RELATED HOT WORK

PQS QUALIFIED FIRE WATCHES ASSIGNED

LOCATIONS	PRINT NAME/RATE	SIGNATURE* (UPON COMPLETION)
01-224-3-L	HT2 ALLEN	
1-224-0-C	FN NGUYEN	

TIME SECURED 1530

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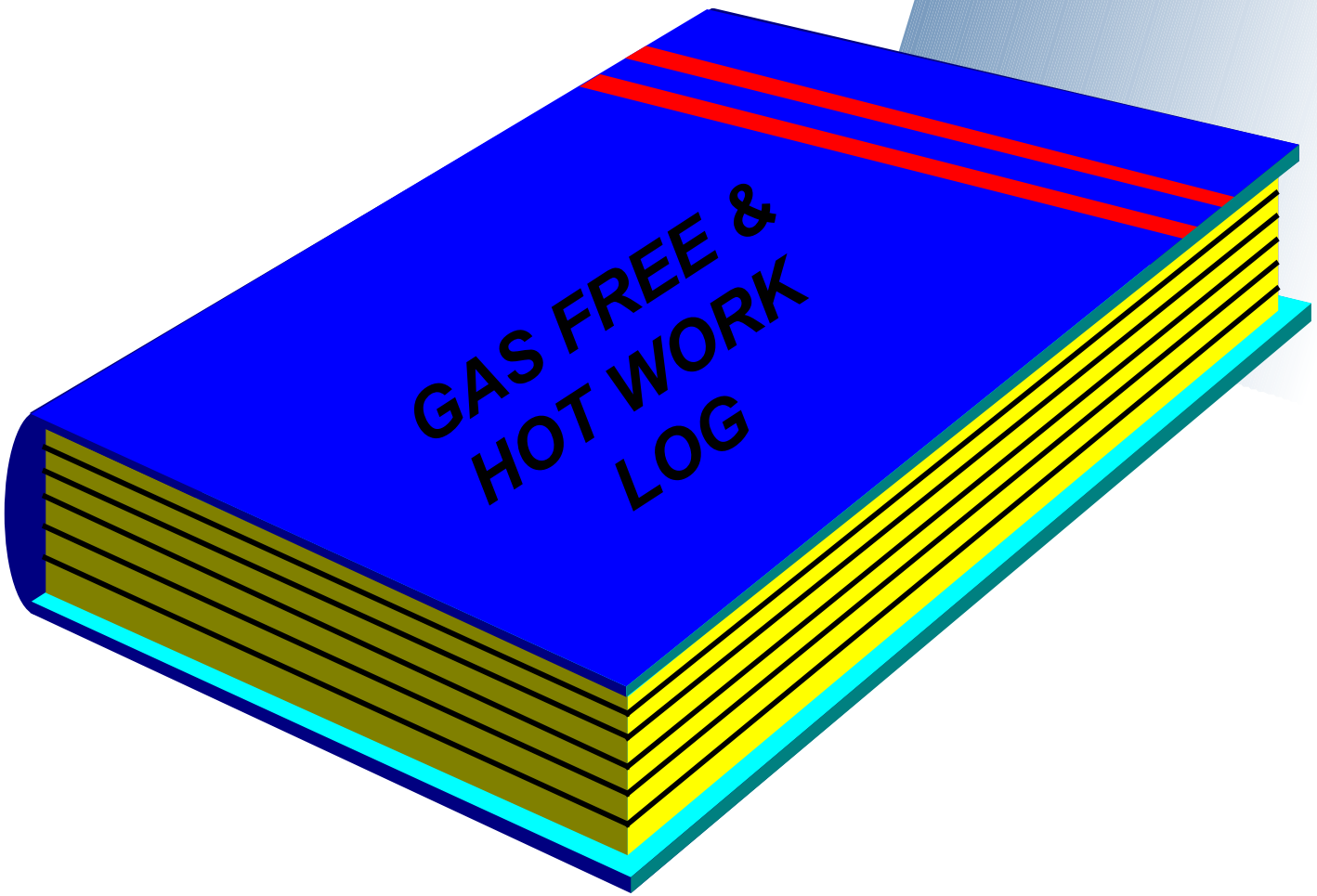
HOT WORK OPERATOR SIGNATURE HT1 (SW) Bowen

HOT WORK SUPERVISOR DCC(SW) Lacount

FIRE MARSHAL DC1(SW) Bruderer

FILE IN YOUR HOT WORK LOG



HOT WORK MISHAPS

- USS J.F.Kennedy- 1445 18 Jul 2003
- NAVSTA MAYPORT, FL
- Contractor removes pump foundation in #5 pump room.
- Heat from cutting ignites class “B” fuel fire in bilge (JP-5 leak in manifold). Fire watch uses 2 - 25 LB water extinguisher, fire spreads, Halon activated, fire extinguished.
- Main cause – Hot worker failed to inspect space for flammables, wrong extinguishers used for fuel.

SUMMARY / REVIEW:

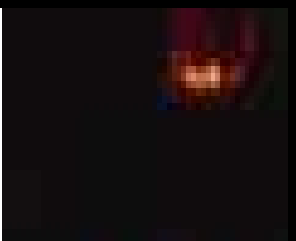
Which Class of Hot Work ALWAYS requires a Fire Watch?

Class I : High Energy Sparks

Flammables Must be Moved How Far From Work Site? 35 Ft

Surface Coatings Should be Cleared Away How Many Inches? 4 Inches

What is the 5 Ft Rule About?



Maintain 5 Ft Boundary Away from Magazine Bulkheads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