

The Navy and Marine Corps Magazine for Afloat and Shore Safety

# SEA & SHORE

WINTER 2007-08

In this issue:

***Focus on***

**Safety in availabilities**

... plus features on

- ▶ **Gas-free engineering**
- ▶ **Consequences of rushing**
- ▶ **ORM**
- ▶ **Sleep deprivation**

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Mishaps waste our time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission, and that any losses are due to enemy action, not to our own errors, shortcuts or failure to manage risk. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is dangerous and demanding enough; the time to learn to do a job right is before combat starts.

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At an emergency room.



After the injury had started healing.

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The guided missile cruiser USS *Cowpens* (CG-63) nears completion of its ship's-repair force drydock period in Yokosuka, Japan.

Photo by PH1 Alan Warner

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# Availabilities: A Great Time To Use ORM

By LCdr. Jennifer Gelker,  
Naval Safety Center

Over the years, the names of maintenance and repair periods have changed, but the hazards have remained constant. Repairs used to be done primarily in separate, distinct periods (regular overhaul). Today, though, some upkeep and maintenance almost always is occurring when a ship is pierside (continuous maintenance availability). This issue focuses on these hazards and risks with a series of articles on safety during availabilities, upkeeps, overhauls, and shipyard periods.

Our series highlights some lessons learned and best practices from several ships over the last few years. If you look at these articles and compare them to the statistics described in the article entitled “Casualties in Availabilities,” you’ll see direct correlations. We don’t kill many people during actual overhaul work, but we certainly injure a lot and create a large burden on our shipmates.

Think of it this way: With 2,472 injuries in 10 years, even if only one day was lost per event, that amounts to 2,472 lost workdays (or about 250 lost days per year over a 10-year period). In other words, we’re losing one individual for the entire year, every year.

Some of the key safety-related items to consider in availabilities also show up negatively in our statistics. Availabilities always generate unsafe

walking conditions and housekeeping problems in the form of tripping hazards, missing ladders, slippery or uneven deck surfaces, and excessive staged material. Electrical maintenance and tag-out procedures become even more critical as equipment is taken off-line, repaired, replaced, and brought back up. Proper gas-free engineering practices are critical when spaces are opened. Contractors and their personnel disrupt our normal routines and affect things like fire watches, tag outs, and work-control packages.

Availabilities, upkeeps, overhauls, repair periods, or whatever you call them, create a dynamic environment where the hazards are constantly changing and ever-present. We have to keep a close eye on our shipmates and the conditions they work in to ensure everyone’s safety and well-being. It’s a great time to use risk management: Identify the hazards, assess the hazards, make risk decisions, implement controls, supervise (and watch constantly for changes). ■

*If your command has some additional best practices or ideas about staying safe during an availability or upkeep, send them to [safe-afloat@navy.mil](mailto:safe-afloat@navy.mil). We will add submitted items to our best-practices website or consider them for future Sea&Shore articles. Please be sure to include contact information, so we can reach you if we have questions.*

The bow of USS *Winston S. Churchill* (DDG-81) looms over the dry dock at Bath Iron Works in Bath, Maine.

Navy photo by IS1 Holly Hogan

## Staying Safe *in the* Shipyard

The shipyard industrial environment produces continuous hazards. Here's a look at what some ships have done to mitigate these hazards.

### USS Princeton (CG-59)

During a summertime, three-month restricted availability period, *Princeton's* biggest safety problem didn't come in the form of motorcycle or off-duty recreational vehicle [e.g., dirt bikes, ATVs, etc.] incidents as expected. It came in the form of alcohol-related incidents (ARIs). The ship saw a sharp rise in the number of alcohol-related incidents as the availability continued.

*Princeton's* safety team immediately embarked on two campaigns to reduce the number of ARIs. The first was an incentive program designed to reward the crew for consecutive days without an ARI. Based on the hull number, *Princeton* chose to reward the crew with a three-day weekend if all hands went 59 consecutive days without an ARI. Any such incident during the 59 days reset the counter, and the reason for the reset, minus names, was placed in the plan of the day to alert the crew.

The second campaign focused on providing more safe options to Sailors who found themselves under the influence of alcohol. After interviewing many crew members, *Princeton* developed the "Arrive Alive" program. The ship contracted with a local cab company to provide rides for Sailors who found themselves too drunk to drive. All hands were issued serialized cards with the cab company's name and phone number to keep and use in the event they were unable to drive. The cabs would take the Sailors back to the ship or

to their homes. There were no negative repercussions from using the card; however, the member had to repay the cab fare to the ship and then was issued another serialized card.

This campaign decreased the number of ARIs from six during the first six months of the year—before the campaign started—to two during the last six months.

### USS Fort McHenry (LSD-43)

Before starting a 10-week selected restricted availability (SRA), *Fort McHenry's* safety committee and safety council met to discuss ideas for maintaining a safe work environment. The ship implemented the following inspection and control measures:

- A different division was inspected weekly by senior members of the command, including the CO. This inspection focused on general safety, as well as electrical safety and damage control. Because of the extensive amount of preservation work taking place, the storage of hazmat also was scrutinized. These inspections and this focus on safety are a continuous process included in the ship's weekly division in the spotlight (DITS) program.
- The ship was divided into three zones, and each day, a member of the ship repair facility's (SRF's) safety department and *Fort McHenry's* safety officer or command duty officer (CDO) inspected a different zone. During the course of the week, all three zones were fully inspected twice. The discrepancies were recorded and corrected on the spot if possible. The list then was submitted to the quarterdeck, where the CDO mustered the duty department heads, and

A shipyard rigger assists in mounting a propeller to the No. 3 shaft aboard the *Nimitz*-class aircraft carrier *USS George Washington* (CVN-73) during the ship's planned incremental availability.

the remaining discrepancies were corrected. All these discrepancies were compiled and analyzed to aid in future prevention.

- As the SRA came to a close and contractors turned over spaces, the safety-committee members were given two specific items to inspect in their spaces daily. These areas included but were not limited to ladderbacks, scuttles/hatches and stanchions, non-skid strips, luminous tape, and eyewash stations. Discrepancies were noted and corrected.

- *Fort McHenry* formed a typhoon-response team. During the ship's SRA, five typhoons took aim on the ship's homeport of Sasebo, Japan. Because of various work packages involving the ship's main engine, generator, rudder seal, anchor chain, ballast tank, and topside areas, *Fort McHenry* was particularly vulnerable to high wind and seas. As each storm passed, the ship's leadership and subject-matter experts applied systematic ORM to their ever-changing material status and took preventive measures to safeguard the ship, assigned berthing barge, and crew. As a result, there were no personnel injuries, and cumulative damage from the five typhoons was limited to cosmetic damage from flying debris.



Navy photo by PH2 Glen M. Dennis

*Fort McHenry* subsequently completed the 10-week SRA with a mishap-free record.

### **USS Carl Vinson (CVN-70)**

In 2006, *Carl Vinson* entered Northrop Grumman Newport News shipyard for a refueling complex overhaul (RCOH), which tested every tenet of comprehensive safety practices and demanded the creation of new policies to solve emerging issues.

Several steps were taken to prevent traffic crashes and to ensure the safety of the crew. Two all-hands,

high-impact, safety stand-downs were conducted that focused on DUI and suicide prevention, motor-vehicle safety, and home and recreational safety.

*Carl Vinson* implemented an aggressive motor-vehicle mishap-prevention program that was designed to educate the crew on the dangers of poor driving choices, including drinking and driving, speeding, and not wearing seat belts. “Fatal Vision” goggles were used to provide departmental and command-wide demonstrations that simulated the effects of alcohol on coordination and reaction time. A seat-belt “convincer” was brought on board that encouraged seat-belt use by demonstrating the force of a 10-mph accident. The safety department also undertook a “Click It or Ticket” campaign to increase seat-belt use during the high-travel summer months and the holiday season.

The ship sponsored a safety-culture workshop for approximately 100 junior Sailors to assess the effectiveness of the ship’s safety initiatives and the overall safety climate. Inputs from this workshop were instrumental in developing a “free ride” program that enables crew members to get anonymous, free rides home from a local cab company if they are intoxicated or stranded because of alcohol consumption.

To reduce the risk of off-duty incidents, the ship also required all hands to complete operational and off-duty risk management (ORM) liberty checklists before taking leave, traveling, or starting extended holiday periods.

Compared to two previous RCOHs involving USS *Nimitz* and USS *Dwight D. Eisenhower*, Sailors aboard *Carl Vinson* had a substantially lower number of driving-while-intoxicated/under-the-influence events. Their totals were fewer than five (vice 20 to 40) per month. The ship had no fatalities attributed to motor-vehicle/motorcycle mishaps, and there were no permanently disabling injuries as the result of off-duty incidents.

### USS Ford (FFG-54)

Once before entering the shipyard environment and twice after starting a 20-week extended drydock selected restricted availability (EDSRA), *Ford* held safety stand-downs.

The initial stand-down elevated crew awareness of shipyard risks and operational and off-duty risk management (ORM) strategies. All maintenance personnel were trained on the use and upkeep of PPE. Respiratory-protection-equipment fittings were verified for all maintenance personnel, and all hands

received safety helmets and eye and hearing protection.

The second stand-down, held about halfway through the availability, focused on maintaining crew awareness and provided training on holiday and driving safety before a long liberty weekend. The third event, conducted after the EDSRA had been completed, centered on operations the crew hadn’t done in five months [e.g., *underway watches and special evolutions*], as well as driving safety.

While in the shipyard, *Ford* personnel conducted daily safety walkthroughs with the shipyard safety manager. Reports of hazards and concerns uncovered during these events were included in the daily 12 o’clock reports submitted to the CO. The shipyard safety manager also briefed the ship’s supervisory personnel during each morning’s production meeting, which occurred before the workday started. This brief included discussion of any unusual or changes in required precautions and significantly increased the safety awareness of both the crew and civilian workers.

*Ford* conducted complete audits of all tagout and work-authorization forms (WAFs) twice weekly and reported results to the CO. This action ensured that safety tags were not compromised during complex maintenance procedures or damaged during equipment removals. System experts from each department were assigned to a maintenance-information center for additional oversight of the tagouts and WAFs. As a result, supervisors were able to ensure proper personnel and safety measures were complete before the start of work. This strategy also ensured seamless coordination from one duty section to another, without loss of situational awareness. Because of these efforts, *Ford* had no tagout discrepancies during the EDSRA. ■

#### Resource:

- Safety in an Availability Shipyard Links (SIMAs/Repair Facilities, Government Offices, Shipyards), <http://www.safetycenter.navy.mil/afloat/surface/shipyardlinks.htm>



Find this symbol at the bottom of our main web page (<http://www.safetycenter.navy.mil>), and you’re only a click away from seeing a categorical listing of all the best practices currently posted. Maybe you have a time-saver, a good idea, a brainstorm, or a proven program of your own you would like to share with shipmates. If so, just click on the submission form (also at the bottom of our main web page).

# The **Casualties** of **Availabilities**

**H**ere is a look at how Sailors killed and injured themselves while their ships were undergoing an availability in the last 10 years:

A forward-deployed Navy transport dock sits tied to a pier as shipyard workers continue the ship's six-week selected restricted availability.

## Deaths

Activity	No.
Independent Unassigned	1
Handling, Lines	1
Watchstanding, Operations	1
Boarding/Departing Ship/Vehicle	1
Socializing	1
Swimming, Intentional	1
Bicycling	1
Maintenance, Vehicle/Accessories	1
Scuba Diving	1
<b>Total</b>	<b>9</b>

## Injuries

Activity	No.
Walking/Stepping	371
Maintenance, Electrical	306
Housekeeping	222
Handling, Material/Stores	187
Blank (e.g., activity wasn't entered by the coder/submitter.)	171
Maintenance, Mechanical	151
Installation/Removal (Equipment/Material)	97
Painting	66
Unknown/Not Reported	53
Independent Unassigned	42
Maintenance, Electronic	42
Recreation, N.E.C. (not elsewhere classified)	42
Aviation, Maintenance	41
Welding/Burning	41
Office/Administrative/Computer Duties	39
Inspecting	37
Damage Control Activities/Duties	36
Training, N.E.C.	34
Food Preparation/Services	29
Watchstanding, Deck	28
Basketball	27
Horseplay	25
Boat Crew	19
Climbing Fence, Wall, Tree	19
Handling, Lines	18
Maintenance, Building/Structure	17
Physical Fitness Programs	16
Security (Guard/Sentry/Rover)	15
Watchstanding, Operations	15
Deck Seamanship	13
Football	11
Motor Vehicle Operations	11
Watchstanding, Engineering (Includes Sounding & Security)	11
Jogging/Running	10
Boarding/Departing Ship/Vehicle	9
Handling, Fuel	9

Manufacturing, Assembling, Fabricating—Metal	9
Ordnance Maintenance—Non-Aviation	9
Socializing	9
Sports, N.E.C.	9
Aviation, Related Tasks (Working Spaces, A/C Securing)	8
Rigging Activities	8
Sleeping	8
Swimming, Intentional	8
Sanitation Duties (Trash/Garbage, Collection/Disposal)	7
Bicycling	6
Environmental Operations	6
Laundry/Drycleaning Operation	6
Testing/Research	6
Electrical Operations (Transmission and Distribution)	5
Handling, Ammunition	5
Supervision	5
Volleyball	5
WHE Operator	5
Maintenance, Utilities	4
Passenger	4
Showering, Bathing	4
Aviation, GSE Maintenance/Serviceing	3
Baseball	3
Construction/Renovation	3
Heavy Equipment Operator/Crew	3
Maintenance, Hull, Painting	3
Skateboarding	3
Weight Lifting	3
Dancing	2
Fire Watch	2
Glass/Knife Handling	2
Maintenance, Hull, Working Over Side	2
Manufacturing, Assembling, Fabricating—Wood	2
Patient Care	2
Soccer	2
Sports, Winter	2
Tank/Vent/Uptake Cleaning	2
Watchstanding, Ship Control	2
Winter Sports, Other	2
Aviation, Ordnance Maintenance, Load/Unload	1
Boating/Waterskiing/Fishing From Boat	1
Diving (Elevated Over Water)	1
Emergency Spill Response	1
Groundskeeping	1
Gun Handling	1
Horseback Riding	1
Maintenance, Vehicle/Accessories	1
Other N.E.C.	1
Pipefitting	1
Racquetball	1
Softball	1
Watchstanding, Shore Facility	1
<b>Total</b>	<b>2,472</b>

# Safety Officer's PMA

By Capt. C. A. Hase,  
OpNav

After only two months on the job as safety officer, I was faced with a phased maintenance availability (PMA), or mini-overhaul, as some call it. The biggest advantage of a PMA is that the Navy can fix a ship's major ailments in less time and with fewer dollars than a regular overhaul entails.

As I learned, though, a shortened yard period in no way lightened my responsibilities. The same hazards that exist during regular overhauls also apply to PMAs.

Before our PMA started, I visited the Naval Safety Center and got a copy of the "Guide to Safety in an Availability" [*now available online at <http://safetycenter.navy.mil/afloat/surface/downloads/availabilityguide.doc>*].

Navy photo by MC2 Stefanie Broughton



A submarine tender undergoes a four-month phased maintenance availability.

# A Survival Kit

## Preparation

Start PMA preparations six to eight weeks before entering the shipyard. Your task is to educate ship's personnel about a completely different environment, which may mean establishing new habits—something that isn't easy to do.

Hold a series of safety stand-downs during this time. Tagout, hot-work, and gas-free programs, along

with trip and hanging hazards, are good topics to review. Ensure that shipyard policy in these areas is in line with the Navy's policy. You also should cover ladder and trunk safety, as well as traffic and recreational safety.

We made a videotape for the crew, giving directions to the shipyard and showing where to park, how to get to the pier, and precautions to observe on the way to work. Evaluate the time change in working hours and how it will relate to traffic mishaps. These kinds of tips are helpful since the shipyard may be located in a different city than the ship's home port.

Walking through an industrial area to get to work is a new experience for some. You may have to wear hard hats and safety goggles and follow a traffic lane to get to and from work. You'll probably have to order extra supplies of hard hats, goggles, and hearing protection.

You'll also need more fire-watch equipment, starting with different goggles for gas and arc welding, welding respirators, and extra CO<sub>2</sub> bottles. There's always a temptation to use existing mounted CO<sub>2</sub> bottles, but it's a bad idea to give in to this temptation. First, it's too convenient to put a partly discharged bottle back on the bulkhead. Second, if a fire breaks out aboard the ship and someone needs a CO<sub>2</sub> bottle, they may find it empty or missing. Finally, it's comforting to know that if an extra fire bottle is needed, a backup is available on the bulkhead.

Shipboard fires are the biggest threat during a PMA. How well you combat that threat depends on organization, training and motivation. Many PMA contracts are written so the ship provides fire watches for all welding jobs. If your work package contains a lot of welding, ship's company outside the HT rating may have to supplement the contractor's fire watches. You might find it useful to form a fire-watch division.

About four weeks before the ship arrives at the shipyard, the safety officer should meet the shipyard's and SupShip's safety representatives. You must establish the ground rules and a good working relationship with these people. Find out about shipyard safety regulations and what you can do to help enforce them. This also is a good time to discuss hazmat, especially flammable liquids. Some shipyards require you to offload and store most hazmat elsewhere. This is a good idea because it allows you to control what material is brought back aboard. Identify how often hazmat will be picked up; don't let it accumulate.

## Organization

Orchestrate all the planning. The safety officer must be aware of maintenance in progress every day. You can use the management-by-walking-around leadership style to accomplish this requirement. The environment changes daily.

One day, it may be safe to weld in a space; the next day, it may not (e.g., someone may have temporarily stored flammable material in the space). It's a good idea to have a ship's safety representative visit all welding sites every day, checking for flammables and fire-watch procedures. The fire marshal also can help



inspect areas. You never can have enough eyes.

Daily walk-arounds are important throughout a PMA. These walk-arounds may be started by the shipyard's safety representative, but a ship's representative should go along each time to answer questions and show an interest in the program.

Good housekeeping and overall cleanliness of the ship is vital in keeping a ship fire-free. Don't let industrial and shipboard trash build up; remove it daily.

A weekly ship's information, training and entertainment TV update (if yard conditions permit) for the crew may be worthwhile. You can discuss what has happened aboard the ship the past week, as well as what is expected next week. You also might toss in a weekend weather forecast and safe-driving pitch.

## Supervision

A SupShip representative may be helpful during the first few weeks of a PMA to resolve issues of responsibility for correcting hazards. He usually is more familiar with the contract and requirements that the contractor must meet, while looking out for the Navy's interest.

During our PMA, the shipyard prepared a daily report, which listed discrepancies and who was responsible for correcting them. A copy of this report went to shipyard managers and the ship's CO, XO and me. Progress toward correcting these problems was tracked daily.

There are some advantages to keeping a copy of these reports for several years. For example, they could provide valuable documentation of hazards in case of a lawsuit. Pay particular attention to all these items:

- Ladders that are removed to help people move large items from one deck to another. Temporary barriers sometimes are put up wrong, and handrails aren't always installed.
- Fire-hose hookups to pierside firemain that run throughout the ship. Bends greater than 90 degrees will restrict water flow.
- Welding cables that chafe on sharp edges or that might get cut when doors and hatches are closed.
- Cables and tubing that are required to have quick-disconnects within 15 feet of any fire boundary through which they pass.
- Access trunks and hatches that usually are closed but may remain open during a PMA. Safety nets and chains must go up and stay up, except in machinery spaces. Yard workers often take down the

nets and chains several times a day to move equipment and frequently don't put them back. Navy standards call for the safety nets to be installed in access trunks at a minimum vertical distance of every 17 feet.

- Cables and hoses on the deck that crew members might trip over. This equipment should be tied to the overhead. Don't let it become a hanging hazard, either. Don't place ventilation hoses so they obstruct passageways or ladders.

- Fire lanes that vehicles can use for emergency access to the ship from the pier. If your ship has a

## Good housekeeping and overall cleanliness of the ship is vital in keeping a ship fire-free.

large internal space, such as a hangar bay, keep a fire lane open there, too.

- Compartments that are going to be painted. Before painting, use fire-retardant paper, set up blowers (approved for possible flammable environments) for exhausting fumes, make sure PPE is available, and notify the gas-free engineer. Also make sure people are trained in and wear the correct level of airline respirator.

- Void and tank entries that should be monitored.
- Hot-work sites that must be located and controlled.

Sailors seem to forget most of what they knew about going to sea after just a few months in a PMA. This problem is increased by the fact that large turn-overs in personnel usually occur during extended in-port periods. One of the best ways (and a requirement by some type commanders) to get ready for sea is to have a fast cruise and safety stand-up. Concentrate on equipment operation, fire and flooding drills, and missile hazards. It's amazing how many things have to be secured for sea. ■

*At the time the then-LCdr. Hase wrote this article, he was serving aboard USS Iwo Jima (LPH-4).*

### Resource:

- Safety in an Availability Shipyard Links (SIMAs/Repair Facilities, Government Offices, Shipyards), <http://www.safetycenter.navy.mil/afloat/surface/shipyardlinks.htm>

# GSO Available on Web

In March 2006, the General Specifications for Overhaul of Surface Ships (NavSea S9AA0-AB-GOS-010), or GSO, as it's more commonly known, went on the World Wide Web. It's available at [https://fleetreadiness.jdsr.navy.mil/domino/GSO/GSO/gso\\_main.asp](https://fleetreadiness.jdsr.navy.mil/domino/GSO/GSO/gso_main.asp).

As noted by Paul Horacek, the GSO program manager at Naval Sea Systems Command (NavSea), "Putting GSO on the Web has made Sailors' jobs a little easier when it comes to surface-ship overhaul, maintenance or repair." They can download the most current version of the section they are interested in and know they have the most up-to-date version. They also can track a record of change for each section, receive real-time updates of individual sections, and have access to a combined, searchable document.

The basic GSO and Aegis supplement no longer are published and forwarded via CD-ROM. However, the nuclear supplement remains and is forwarded as hard copy CD-ROM because of security requirements. Requests for copies of this supplement must be made to Norfolk Naval Shipyard, Code 223. Call Annette Huber at 757-396-2272, or send an e-mail to: [annette.huber@navy.mil](mailto:annette.huber@navy.mil).

New users of the GSO module first must acquire an account through the SEA04RM/05N website at <https://fleetreadiness.jdsr.navy.mil/maintenance/Sea04M/04m2Home.asp> and associate it with their valid PKI certificate before they can access the module. Uniformed and civilian Navy personnel can obtain more information on obtaining a PKI certificate at <https://infosec.navy.mil/pki> or by contacting the Navy PKI help desk at 1-800-304-4636, DSN 588-4286, e-mail: [itac@infosec.navy.mil](mailto:itac@infosec.navy.mil).

NavSea contractors can find PKI information on Verisign's website at [www.verisign.com/products-services/security-services/pki/index.html](http://www.verisign.com/products-services/security-services/pki/index.html). Otherwise, contractors should contact their local PKI resource for support.

Help in navigating the online GSO is available on the Web page through the help-guide link. ➡

*Adapted from a story on the Navy Newsstand.*



A Norfolk Naval Shipyard crane removes the main mast from the island structure of USS *George Washington* (CVN-73) during a shipyard availability.

# Staying Fire-Free

By Cdr. B.F. Hom, Staff, ComSecondFlt  
and JO3 Ken Greene

**H**ot-work problems don't have to plague a ship's availability if you follow the example set by the crew of USS *Carl Vinson* (CVN-70) during one of their complex overhauls. Those Sailors logged more than a million work-hours without a single hot-work fire.

According to the ship's fire marshal and fire-watch division officer at the time, "We had pieces of tape, rags, gloves, and stuff like that smolder, but we never had one fire caused by a welder. We didn't even have a fire watch suffer a skin burn," he boasted.

"It wasn't easy keeping up with the 350 watches running from one space to another," he explained. "We solved this problem by using dispatchers. These people maintained a big board that showed each hot-work location and the fire watch assigned there.

"When we sent Sailors on fire watch, we knew they were prepared for the task. Everyone in our division had gone through fire-watch training and was qualified in damage control. We also made sure they had goggles, gloves and CO<sub>2</sub> bottles before going on watch. Besides these precautions, we sent QA people to double-check the watch-standing procedures. If they found anything wrong, welding stopped until a CPO could investigate.

"Our QA people made sure the fire watches were equipped and that there were enough watches to monitor all potentially hot areas. The QA people also monitored shipyard workers. If we had a problem with one of them," said the fire marshal, "we turned to our shipyard liaison. This person provided a buffer between the Navy and civilian personnel and helped us a lot. We respected him, and in return, we could count on him to tell us when we did something wrong."

The fire marshal likened a smooth-running fire-watch division to poetry in motion. "A welder came to fill out his hot-work chit before 1400 and turned it in. We put it in one of two stacks—definite or contingent. This system cut down the workload of the fire marshals; it prioritized the spaces they had to check. They picked up the chits and checked all spaces for



A USS *Carl Vinson* Sailor stands fire watch as a shipyard worker welds one of the ship's bulkheads.

Navy photo by PHAN Lawrence J. Davis

# in Overhaul



flammables by 2300, which started a new hot-work day.”

The fire-watch supervisor attributed part of USS *Carl Vinson's* success in preventing fires during overhaul to the way they processed hot-work requests. “We handled them differently than other ships. Our chits were good for 24 hours, instead of 72 like theirs,” he explained. “All our watchstanders were alert to make sure no one did any hot-work on the ship without our knowledge.”

There also was another reason for USS *Carl Vinson* staying free from hot-work fires. “We didn’t let the welders have overall hot-work responsibility,” said the fire marshal. “In other words, we didn’t give up the ship, a mistake other crews sometimes make.”

When overhaul nearly was done, someone asked the fire marshal if he planned to relax the rules for fire watches. “Absolutely not,” he responded. “Doing things by the book gave us our clean track record, so we’ll keep using this method. We’ve reduced the number of fire-watch personnel, but those on watch and the welders continue working as safely as possible.”

If you want to increase the success of your fire-watch program, follow this formula:

**Draft a fire-watch instruction.** If you need a place to start, use the Naval Safety Center’s “Guide to Safety in an Availability,” available online at <http://safetycenter.navy.mil/afloat/surface/downloads/availabilityguide.doc>. Your instruction also can include manning, structure

of the fire-watch division, qualifications, and training requirements.

**Talk to the crews of ships that recently completed availabilities, and review your own ship’s historical data for lessons learned.** This information is an excellent source of fire-prevention data that can be used for training and setting up your own fire-watch program.

**Use personnel qualification standards to produce a knowledgeable fire-watch division.** Document all training and qualifications obtained for each person.

**Equip all fire-watch personnel with everything they need to do their job.** Make sure all PPE is the right type and is in good condition. Have eye, ear, hand, and respiratory protection available. The correct fire extinguishers also must be available.

**Monitor the hot-work areas with daily QA checks and re-checks by the DCA, fire marshal, or safety-division or fire-watch personnel.**

**Maintain ownership of the ship.** Establish policies that personnel from the ship and shipyard agree on, and enforce these policies. A point of contact between the ship and shipyard concerning fire-watch issues is a must.

**Don’t let industrial waste build up aboard the ship.** Insist on cleanliness. ■

*Refer to section 22 of the NSTM, Chapter 074, Vol. 4, Gas-Free Engineering, and the Safety and Occupational Health Program Manual for Forces Afloat (OpNavInst 5100.19E) for more fire-watch information. [OpNavInst 5100.19E, signed May 30, 2007, is available online at <http://www.safetycenter.navy.mil/instructions/OSH/5100-19E/default.htm>.] You also should review shipyard instructions and check out the “Safety in Availability Links” at <http://www.safetycenter.navy.mil/afloat/surface/shipyardlinks.htm>.*

*Adapted and updated from a combined story that appeared in the January-March 1998 issue of Fathom magazine, when the authors were assigned, respectively, to USS Leyte Gulf (CG-55) and USS Carl Vinson (CVN-70). The current whereabouts of JO3 Greene are unknown.*

# Keeping a Crew Safe in an **INDUSTRIAL SETTING**

By Lt. Haden U. Patrick,  
Staff, ComDesRon 14

**H**ere's my rule of thumb: If it looks industrial (lots of extra equipment around), sounds industrial (loud hazards to hearing everywhere), and smells industrial (noxious odors present), then it's industrial. And you can bet whether we're talking about a selected restricted availability (SRA) or a continuous maintenance availability (CMAV), I treat it as industrial and make sure the crew is prepared.

When I reported as the operations/safety officer on board USS *Samuel B. Roberts* (FFG-58), I had to catch up on the latest acronyms, starting with the two preceding ones. I quickly learned that an SRA is a CNO-designated time period, approximately two to three months long, for a very large maintenance and repair package. A CMAV, on the other hand, is a two-to-three-week period between operational commitments, in which maintenance items needed to meet those commitments are completed. The ship and immediate superior in command schedule a CMAV.

An SRA entails a large range of preparations. A good safety officer plans events, such as a safety stand-down, and invites shipyard personnel to talk to the ship's leadership. He or she participates in daily safety walk-throughs with shipyard project engineers. These walk-throughs ensure PPE (personal protective equipment) is used daily, hot-work is documented, fire watches are posted, and quick disconnects are used on hoses penetrating fire boundaries.

Any command should recognize that a crew's comfortable existence is about to change dramatically when faced with an SRA. Crew members regularly need the safety officer to remind them about the warnings available for quick download from the Naval Safety Center's website.

Now let's compare this process with how you prepare for a CMAV. A good safety officer plans an in-brief for the maintenance team to get together and

discuss the work to be accomplished over the next two to three weeks. He or she also drafts POD notes on PPE and various advisories on what to watch out for during this small-scale maintenance period. There are no hard requirements to prepare the crew for safety during a CMAV; instead, it's up to the imagination of the command. A CMAV isn't considered an industrial environment, but is it?

In February 2006, a NavSea preservation team arrived on board *Samuel B. Roberts* to commence stripping the bilge area of auxiliary room No. 2. The work was to be done in view of the No. 2 fire pump—under it, to be exact. Contractors didn't identify any tagout requirements as a precursor for their operation. The No. 2 fire pump, at this time, was secured.

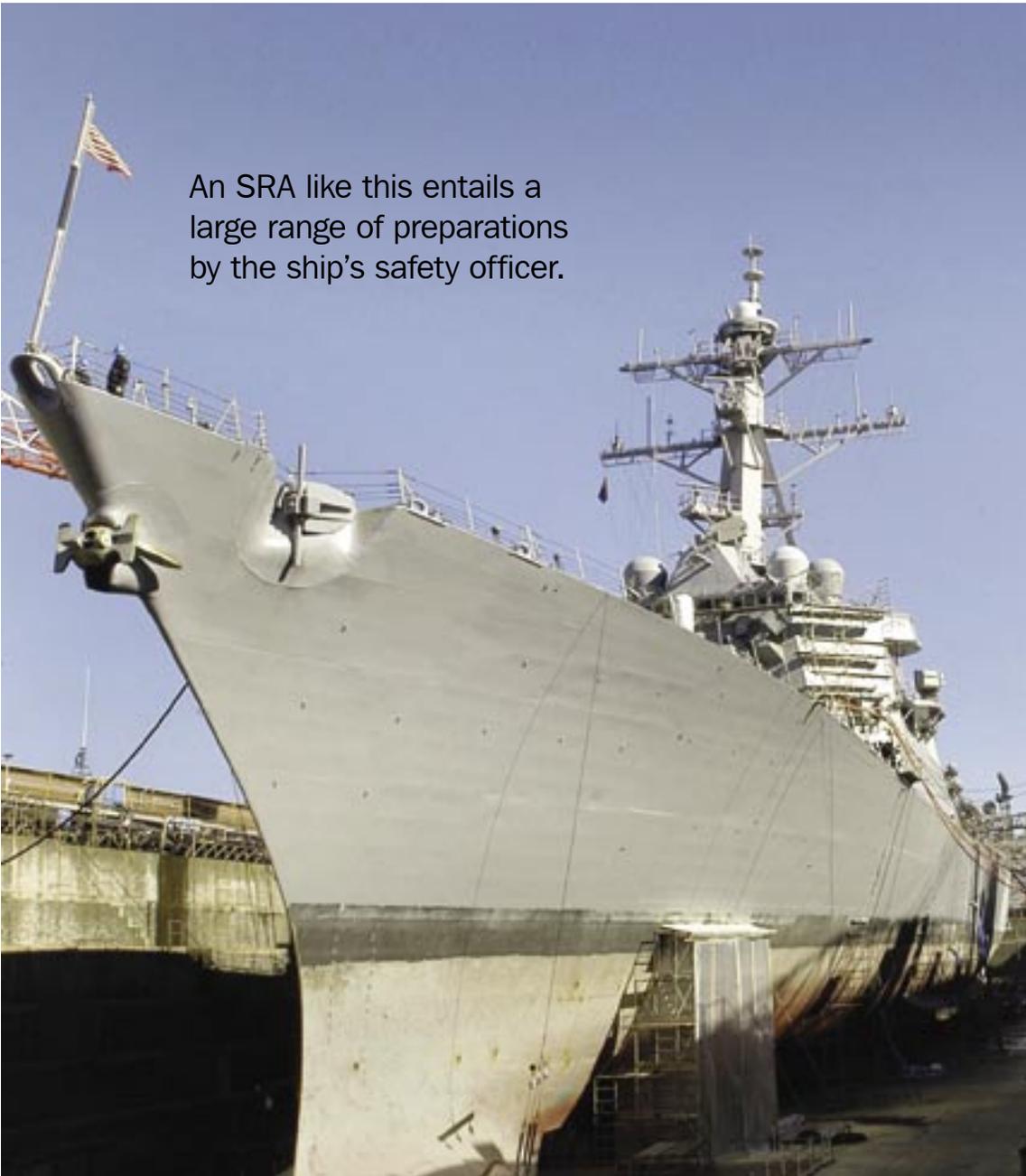
The contractors erected curtains to contain the dust generated by the grinding. They also provided ventilation to the space and stationed services on the pier to support their maintenance. Hoses led from the affected space to pierside. Does this picture sound industrial to you?

A week later, high demand on the ship's firemain drove pressure low, so the watch in damage-control central opted to start the No. 2 fire pump. No restrictions were in effect for operating this pump. Personnel followed engineering operational sequencing system (EOSS) and stand-clear procedures while they issued start-up warnings.

About an hour later, a contractor began extricating himself from underneath the deck plates where the grinding work was taking place. He lost his balance and extended his left hand under the No. 2 fire pump's coupling guard while trying to maintain his balance and partly severed three fingers. He also suffered a compound fracture to a fourth finger.

This mishap could have been prevented. As our schedules appear to become more compressed, continuous maintenance availabilities are being populated

An SRA like this entails a large range of preparations by the ship's safety officer.



Navy photo by PHAN Patrick L. Heil

with maintenance of increasingly industrial climates. During the CMAV referenced earlier, ship's force, SERMC (Southeast Regional Maintenance Center), and three contractor groups were working on board. Although this climate doesn't control the whole ship, shipwide awareness still is required to safely complete CMAVs. How do we encourage shipwide awareness? Here are some recommendations USS *Samuel B. Roberts* enacted:

***There must be a more formal flow of info from ship to contractors.*** Even though the contractors may not be working on the affected gear, they need to be notified to promote situational awareness. To do

this, contractor supervisors should meet with ship's force daily to verify operating conditions and safety precautions at the work site. This gathering gives ship's force the chance to brief contractors on any potential changes to configurations—just like we all do during an SRA.

***Command duty officers and duty safety petty officers should walk through identified work areas daily.*** Safety reps from each contractor should accompany them.

***Remind leadership at officer's call of industrial items in progress.***

Explain the hazards they pose to the crew and maintenance team.

***Consider tagging out items based on proximity to major work.*** Do this even though the items are not directly affected physically. ■

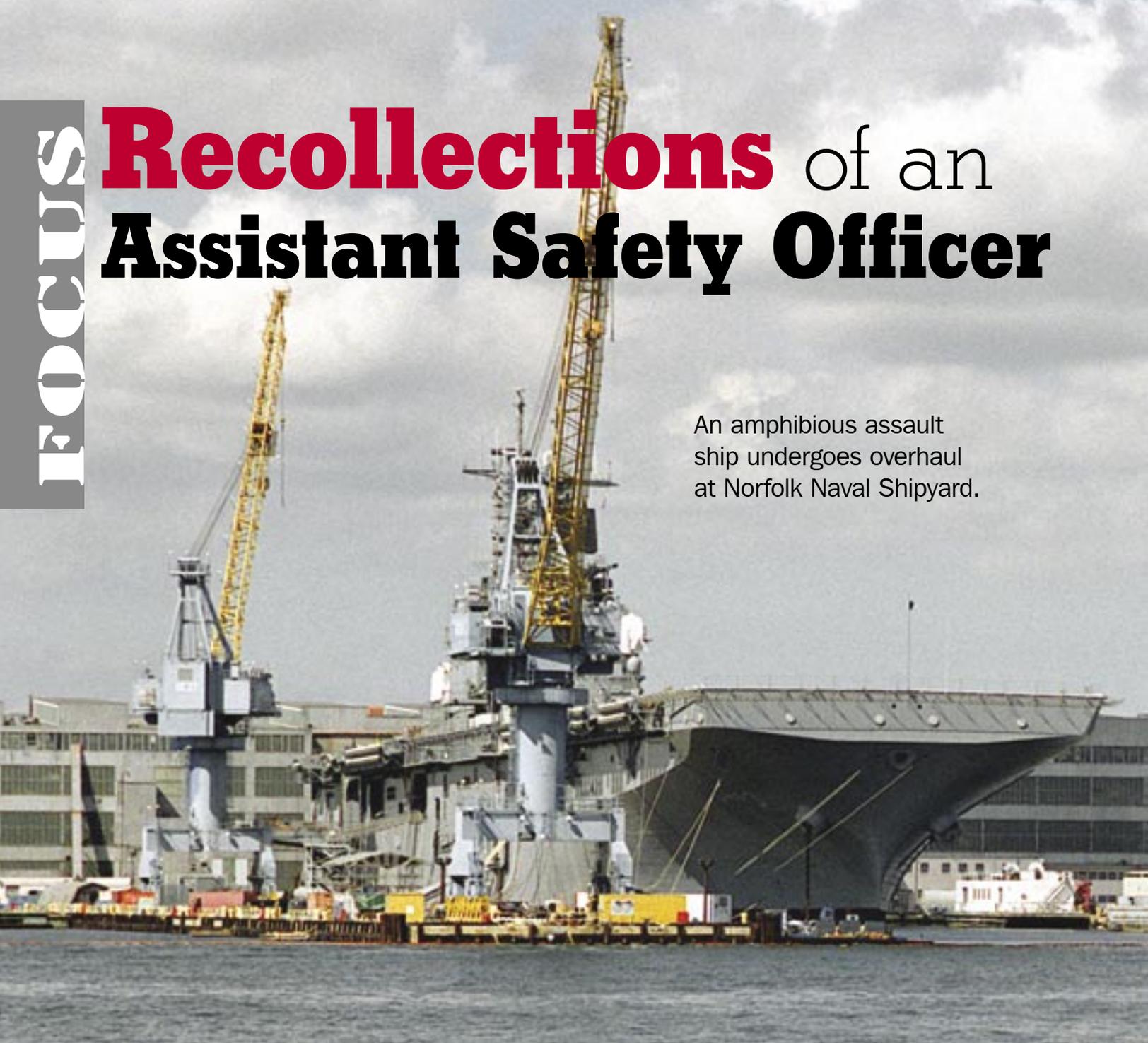
*The author was assigned to USS Samuel B. Roberts when he wrote this article.*

#### Resources:

- Guide to Safety in an Availability, <http://www.safetycenter.navy.mil/afloat/surface/downloads/availabilityguide.doc>
- ShipMain Modernization Process, <http://www.fmp.navy.mil/fmpactive/businesspolicy/FMPDocuments/shipmain.htm>
- ShipMain—Providing Optimal Fleet Maintenance Solutions, [http://www.navsea.navy.mil/innovation\\_template.asp?txtDataID=8959](http://www.navsea.navy.mil/innovation_template.asp?txtDataID=8959)
- ShipMain: The Changing Face of Ship Maintenance, [http://www.navy.mil/search/display.asp?story\\_id=15082](http://www.navy.mil/search/display.asp?story_id=15082)

# Recollections of an Assistant Safety Officer

An amphibious assault ship undergoes overhaul at Norfolk Naval Shipyard.



Navy photo by Don S. Montgomery

By Ltjg. David Murvihill

**S**ometimes, finishing that last 5 percent of a task seems to require as much effort as the first 95 percent. Before you decide that 95 percent is good enough, though, consider what the stakes are and what you're betting on.

How do you judge a successful overhaul? In our case, we spent six months in a shipyard with no major mishaps, injuries, or equipment damage. Now, I didn't say we were hazard- or mishap-free, but that was our

goal. Trying to prevent all mishaps may seem unreasonable, but don't write off this goal as being too difficult. Your extra effort could neutralize a serious hazard and perhaps save a life.

Consider the lessons learned from some of the mishaps we had during our overhaul. A shipyard worker was welding a bulkhead in a fuel tank. On the other side of the bulkhead was another fuel tank. Both tanks were certified gas-free by the shipyard gas-free

engineer, but the other tank wasn't certified "safe for hot-work." Two pipefitters were working in the second tank when residual fuel in it ignited. The pipefitters quickly extinguished the fire and prevented any injuries or damage.

Our investigation revealed that the shipyard's fire-watch personnel used improper procedures. Fire watches must be able to see both sides of a bulkhead. A second fire watch is necessary when the first one can't see both sides of a bulkhead. These watches must check for and remove all fire hazards around the hot-work area on both sides of the bulkhead. They also should establish some means of communication to report a hazardous condition or to stop all hot-work.

Before another mishap, ship's-force personnel covered a deck with paper as part of the precautions for painting a passageway. Three decks above, a shipyard worker was welding when a spark fell the entire distance—despite intervening ladders—and ignited some wet paint on the paper. There was a lot of smoke but no damage. The fire didn't spread because the paper was fire-retardant.

Again, the shipyard's fire watch didn't check carefully for hazards, install a protective barrier (in this case, a welder's cloth), or close the hatch. He also didn't post hot-work-warning signs. The ship's-force painters shared the blame for the fire because they didn't post the required warning signs, saying "No Smoking—No Hot-Work." Before entering a shipyard, the crew should cover equipment to protect it. Fire-retardant paper and Herculite will not burn without another source of fuel, so use them instead of flammable plastics to cover your gear.

One day, fuel from a leaking line filled a void. The sounding and security watch found the problem early, but ship's-force personnel couldn't isolate the leak until the fuel tank was pumped out. A hydrostatic test of the fuel system would have prevented this mishap.

One other time, a plumb bob punched a hole through the hull at the bottom of a sounding tube. The water level did not get above the bilges, so there wasn't any damage. It took years of corrosion and dropping plumb bobs to penetrate the striking plate and hull. While you're in drydock is a good time to check and repair your sounding tubes and striking plates.

Here are some suggestions that will help you when your ship is in overhaul:

### Shipboard

Make sure the quarterdeck watch standers wear

hard hats. A bolt falling from a crane missed one of our OODs by less than a foot.

Make sure the quarterdeck watch standers have the telephone numbers for the fire department, hazmat-recovery team, police, and ambulance. It's also important that they know at which pier the ship is berthed.

Exercise the in-port fire party in hazmat-spill response and emergency-rescue procedures. The Safety and Occupational Health Program Manual for Forces Afloat (OpNavInst 5100.19E, Appendix B3-A and B3-B), provides detailed information on hazmat-spill response. You can find guidance on emergency-rescue procedures in the Naval Ships' Technical Manual (NSTM), Chapter 074, Vol. 4, Rev. 3, Section 20.

You will find that the shipyard's safety regulations are different from the Navy's. Their regulations comply with OSHA instructions, which may not be as strict as the Safety and Occupational Health Program Manual for Forces Afloat. For example, OSHA instructions don't require chafing gear for leads and cords passing through doorways and hatches. Instead, they only require that the sheathing on the cable remain intact. I found several leads and cords chafed to the copper and immediately threw them off the ship. Placing a hard rubber collar or stopper around the leads or cords will keep a door from shutting on them.

The supervisor of shipbuilding, conversion and repair; the shipyard; or both will have a pamphlet regarding safety in the shipyard. Use the pamphlet to train your crew. The Navy's "Guide to Safety in an Availability" is available online at <http://www.safetycenter.navy.mil/afloat/surface/downloads/availabilityguide.doc>.

Shipyards have many flatbed trucks and pickups with drivers who will offer rides to the crew. Teach your people about the regulations that prohibit accepting such offers.

Attend daily safety walkthroughs. If you can't go, send a ship's representative. Your attention will directly affect the attention the shipyard pays to your ship.

### Off Duty

If the shipyard is located away from your home port, the number of off-duty mishaps probably will increase. People are uprooted, families are located elsewhere, the ship is unpleasant (if not uninhabitable), and the crew works harder. Recreation becomes more important because the crew no longer can do the things they normally do after working hours.



A Sailor from a ship in overhaul shoots pool at a base recreation center during his off-duty time.

Navy photo by MCSA Joel Carlson

Upon arrival at the shipyard, ask for information about the areas with a high crime rate. Check with local Navy facilities for a list of off-limits areas. Our lack of familiarity with the unsavory section of an adjacent town resulted in several injuries to crewmen.

Alcohol-related crashes, involving both motor vehicles and pedestrians, also probably will rise. Increased awareness and education and alternative forms of transportation (such as welfare and recreation vans) will help the situation. Other forms of entertainment (e.g., picnics and tours) also will help keep people out of bars.

Automobile crashes may increase as crew members drive home or visit surrounding areas. A seven-hour trip back to home port after a long day of work creates unsafe driving conditions. We started knocking off at 1730 on weekdays and 1130 on Fridays so our people could drive during daylight hours. Education on the hazards of nighttime driving also helps.

Athletic injuries also may increase. Providing

protective equipment and educating everyone keeps problems to a minimum.

If the CO regularly addresses safety and sets the example himself, the rest of the crew is apt to pick up on it. Our CO's motto was this: "Safety is a big part of the ship's routine, but safety issues have head-of-the-line privileges for command attention." Find and promote activities that stir up your crew and keep them interested. ■

*When the author (current whereabouts unknown) wrote this article, he was serving aboard a ship that since has been decommissioned. His points still are valid, though.*

#### Resource

- Safety in an Availability Shipyard Links (SIMAs/Repair Facilities, Government Offices, Shipyards), <http://www.safetycenter.navy.mil/afloat/surface/shipyardlinks.htm>

# A Sharp Reminder of What Can Happen When You're *Running* on Fumes

By IT1(SW) Joshua D. Bruegger,  
VAQ-137

**M**y wife and I recently were blessed with the birth of our second daughter. As any new parent likely will tell you, having an infant in the house teaches you lessons about sleep deprivation. In my case, I learned a painful lesson about the consequences of using tools while sleep deprived.

Not long after the birth, I decided the garage could use a facelift and some organization, so I drew up plans for a shelf system and set to work. I tend to get wrapped up in projects like this, and these shelves were no exception. Somewhere along the way, I decided slotted shelves would look more professional.

By 2200, I had the bottom two decks looking sweet, and after a 20-minute warning from my wife, I started notching the posts for the upper deck. Anyone reading this story probably has experienced that moment when enough of a project is done for the day, but one more thing catches your eye. It was during one of those moments when my wife returned, stood silently, and smiled at me. Genius that I am, I took her silence to mean 20 more minutes and plotted the best way to get the top shelf done before calling it a night... bad idea.

As it turns out, she was headed to bed. I should have followed but instead put chisel to task and continued chipping away, all the while wondering why she hadn't said anything.

The notch I was working was just a few inches above my head, and I already had roughed it out. I just was clearing the cutout when my brand new, half-inch Buck Bros. wood chisel slipped and drove into my left hand, just behind my thumb. All I could think about were the exposed tendons behind my left thumb—now there's something you don't see every day.

My initial reaction was annoyance with my stupidity. As I trudged up the stairs, shaking my head, the excruciating throb of severed muscle set in. After a two-hour trip to an emergency room and recounting my sob story to a disapproving nurse, I returned home and did what I should have done hours earlier: got some sleep.

In reviewing what I accomplished by working “just a little longer,” I realized several things, starting with the fact I didn't finish that one last shelf. I also didn't get to enjoy a few moments of quiet time with my wife between feedings. I injured my left hand, which reminds me even now that I should have called it quits when I had the chance.

Without enough sleep, I had the motor skills of a 3-year-old. My ability to make rational decisions obviously was impaired, and I neglected to evaluate the risks and benefits as I worked into the night. Had I taken time for even a cursory risk evaluation, I wouldn't have felt rushed to complete a job that, frankly, could have waited.

Before I perform another do-it-yourself task, especially something like a garage remodeling, I'll make sure I have the time to do the job correctly, without feeling rushed. When working with dangerous tools, I'll always ensure I'm well-rested and in the right condition to use the tools. Most importantly, I'll always go to bed when my wife tells me to—that's ORM at home! ➤

## Resources:

- Individual Off-Duty Risk Assessment Form (off-duty risk potential and intervention and prevention strategies), <http://www.safetycenter.navy.mil/ashore/articles/recreation/iraform.htm>
- 3,500 Sailors Help Refocus ORM (results of ORM task force from Naval Safety Center that met with Sailors in San Diego in January 2007 to discuss future of ORM), [http://www.news.navy.mil/search/display.asp?story\\_id=27561](http://www.news.navy.mil/search/display.asp?story_id=27561)
- Chisel Safety Tips, [http://www.stanleytools.com/default.asp?TYPE=STATICLEFT&PAGE=tooltips\\_chisels.htm&LEFT=left\\_solutions.htm](http://www.stanleytools.com/default.asp?TYPE=STATICLEFT&PAGE=tooltips_chisels.htm&LEFT=left_solutions.htm)
- Chisels—Essential Woodworking Tools (types of chisels, chisel construction, using a chisel, taking care of your chisels, etc.), <http://woodworking.about.com/od/toolsequipment/p/chisels.htm>



# "What's Behind That Missing Cover?" I Wonder

Navy photo by J02 Zack Baddorf

By Lt. Stephen Erickson,  
Naval Safety Center

Maybe you're a newly reported Sailor aboard your first ship... maybe you're a seasoned petty officer, chief, senior chief, or master chief petty officer... or maybe you're an officer. No matter who you are or how much time you've spent aboard ship, chances are you'll walk by an open access to a void or tank and think, "Ooh, I wonder what lies deep within that black hole?"

Would curiosity get the best of you? Would you decide to enter the space just to see what's inside, especially if there are leads and cords running into the space? If so, please remember one thing: Curiosity killed the cat.

I remember reporting to my first ship, USS *Harold J. Ellison* (DD-864). I walked around by myself, checking out the ship and seeing what was going on. Back in the old days, we didn't get a sponsor assigned to us. Lo and behold, what did I find but an access to a void in the main space with the cover removed. It

led into a dank, dark space deep within the bowels of ship. I wondered what was inside.

My mind was going a hundred miles an hour. Should I stay outside or go in? What could it hurt just to take a peek? But my gut told me to keep out. It was the best decision I made that day (I'll explain why later).

Finishing my impromptu tour around the ship, I ran into my LPO. I told him about the open void and asked if he knew why it was open. He began to explain in the classic first-class-to-fireman manner, in no uncertain terms, that no, he had no idea why the void was open. Then he asked me the ultimate question, "Did you go inside?"

"No," I replied. He seemed relieved. The next thing I knew, he grabbed me by my arm and hustled me over to the void. When we got there, he started to scratch his head and mumble, "No void label... no open void chit... no gas-free-engineering form... no



nothing!” Then he began his lecture (at least, that’s what it seemed like to me). In actuality, it was a lesson in gas-free engineering. Looking back, I was darn glad he did it.

My LPO explained that if I had entered this void without following the gas-free-engineering procedures, I could have found myself in one of two conditions. He said I might have been lying face down or up, gasping for air, or turning blue around the lips and not breathing. In other words, I could have been hauled out on a stretcher or in a body bag. This image definitely got my attention.

He then started explaining the gas-free engineering program to me, and I realized I needed to learn a lot more about it. I not only learned about it, but I began to live by it. As I climbed through the ranks, I held training with my people on its procedures. And even though it’s been 26 years since the initial incident sparked my interest, I’ve kept up with the continual changes in the program. And I can honestly say neither I nor anybody else who ever worked for me ever has gotten hurt from failing to follow gas-free-engineering procedures.

Is the gas-free-engineering program up to snuff on board your ship? The governing documents for maintaining this program are Naval Ships’ Technical Manual (NSTM) 074, Vol. 3, Rev. 4, and Vol. IV, Chapter 25, ComFltForComInst 4790.3, Joint Fleet Maintenance Manual (Rev. A, Change 6). These documents provide detailed requirements that everyone must follow, and they apply to all shipboard situations (including entering a tank, void or other confined space).

There are several good things about these manuals:

- They address non-routine instances when gas-free engineering is required (such as cold work and hot work).
- They describe IDLH (“immediately dangerous to life or health”) situations.
- They spell out how often shipboard personnel need to get gas-free-engineering training.

Some of the requirements change while you’re in an industrial environment, such as during an IMAV or

in a shipyard for a lengthy industrial availability. However, the basic requirements of this program never change, whether you’re underway or in port.

If you own this program, is your PMS current? Is it scheduled and done within the required periodicity? A common problem in this area is expired calibration gas for the four-gas analyzer. This calibration gas is only good for one year, so check the date on your bottles. If they are expired, order new ones as soon as possible.

Another common oversight I see during ship surveys is a lack of hydrostatic testing on SAR SCBAs and overhaul of the air regulators for these units. Your PMS should dictate when completion is required. If your PMS does not cover these requirements, get a PMS feedback report to your 3-M coordinator pronto.

I visit ships each month as part of a safety-survey team, and shipboard personnel usually tell me their gas-free-engineering program is “squared away” or “good to go.” Yet, once I begin looking at the program—administratively and materially—and check the level of knowledge at the deck-plate level, 80 percent of the programs don’t meet the minimum basic requirements of PMS, NSTM 074, Vol. 3, Rev. 4, and Vol. IV, Chapter 25, ComFltForComInst 4790.3, Joint Fleet Maintenance Manual (Rev A, Change 6).

Query the people who work for you, and find out just how much—or little—they know about the program. You might be surprised at the results. Teach your people about it. Make it a routine part of your divisional or departmental training once a week. Place notes in your Plan of the Day once or twice a week to get the word out; there’s enough information available to cover training and POD notes once a day for a year.

The more you and your personnel learn about the gas-free engineering program, the greater the chances you or one of your people will save a life or keep someone from being injured in a confined space. ■

#### Resources:

- Safety and Occupational Health Program Manual for Forces Afloat (OpNavInst 5100.19E), <http://www.safetycenter.navy.mil/instructions/default.htm>
- Ships’ Safety Bulletin, October-December 2006 (“Calling All Gas-Free Engineers: Are You ‘Licensed to Kill?’”), <http://safetycenter.navy.mil/media/ssb/issues/SSBOctDec06.pdf>
- Guide to Safety in an Availability (hand-out), <http://safetycenter.navy.mil/afloat/surface/downloads/availabilityguide.doc>

# My Price for Rushing Lib

By AT3 Jeffrey Pardee,  
Staff, ComPacFlt

**I**t was supposed to be the start of an outstanding detachment for our squadron to Anchorage, Alaska. We were flying there to be part of Operation Northern Edge and to enjoy a break from the normal days at home base.

The day started without a hitch. We arrived late in the afternoon, with plenty of daylight left to do our offload. Being an AT, I was responsible for making sure the classified gear was secured in a safe before anyone in my shop was released on liberty.

We arrived in the hangar from which we would be operating, only to find there was no safe in which to lock up our gear—a big problem, considering we were deep in thought about our liberty plans. Our division

officer called a point of contact from the Air Force base we were at to ask where the safe was. The POC said it was in a hangar on the other side of the base.

Our headache just had gotten bigger, given the fact the Air Force personnel had secured, and we knew a forklift wouldn't be available until the next day. We decided to go to the other hangar anyway, load the safe by hand, and transport it back to our assigned hangar by truck. We then would lock up our gear and get liberty call started.

Working for the AT shop in an E-2 command, we were used to moving safes and working with heavy objects. Our division officer, our chief, the detachment LPO, two other guys from the AT shop, and I

Navy photo by MC3 (SW) John Hyde



# erty: 16 Stitches

checked out the duty truck and headed to the other hangar.

We backed the truck into the hangar because it was raining. We figured by keeping the safe dry, there would be less chance of it slipping or falling while we were loading it into the bed of the truck. We even took off the tailgate to eliminate the chance of the 800-pound, five-drawer monster from breaking the tailgate. As all six of us were taking a breather after sliding the safe into position to load on the truck, one of the guys remarked, “Kind of heavy, isn’t it?”

Then came the moment of truth. We took our spots around the safe, using what we thought was proper ORM, and started lifting. Moments later, the safe came crashing down, crushing my right hand between the wooden pallet and the floor. My squadromates quickly rocked the safe to one side so I could pull my hand free.

A searing pain shot up my arm and spine, straight to my brain. My peripheral nervous system was so overloaded I went into instant shock. My whole body went numb and started shaking. I remember not being able to respond to all the questions about whether I was OK.

With so much blood flowing from my hand, I wondered if I had lost all my fingers. The guys grabbed a towel and wrapped my hand in it to try controlling the blood loss. My division officer drove me to the emergency room, where it took five nurses and two doctors to hold me down as they stitched me up.

Looking back at this event, I realize we all should have slowed down and taken a few more steps on the side of safety, starting with our arrival. We were all more concerned about going on liberty than we were about the job at hand. Our minds simply were not in the game.

An E-2C Hawkeye aircraft assigned to the “Wallbangers” of VAW-117 approaches to land on a carrier’s flight deck. (Inset) Here’s what the finger of the victim in this story looked like in the emergency room.

Our second mistake was not using a forklift to move the safe. We had been guilty on several other occasions of manhandling heavy objects, instead of taking time to use the right equipment and to do the job right. We should have waited until morning when a forklift would have been available.

Our third mistake of the evening was not wearing gloves. None of us had the proper PPE to be lifting anything. Gloves may not have prevented the safe from crushing my hand, but I’m convinced my injury would have been less serious.

Our skipper always is talking about the Swiss-cheese model and how, when everything lines up just right, a mishap occurs. I now personally know what he’s talking about, having endured 16 stitches, three broken bones in my finger, a lot of pain, and loss of feeling in the tip of my middle finger.

Since that incident, I’ve made it a point to stress ORM, PPE and not rushing jobs to everyone around me. I look back at that event as a wake-up call, and I hope others learn from my mistakes. Take the time to do the job right, and then worry about what you’re going to do on liberty. ➡

*The author was assigned to VAW-117 when he wrote this article.*

*As the Naval Safety Center ASCS who reviewed this article asked, “Who the hell was in charge of this evolution? I can’t believe both a chief and a division officer allowed their troops to try this feat. Eight hundred pounds divided by six people still equals more than 116 pounds apiece, and if everyone isn’t pulling his fair share, the per-person weight can climb like a ‘homesick angel.’”*

## Resources:

- Moving, Lifting Heavy Equipment (tools that make the job easier), [http://www.newsandtech.com/issues/2005/03-05/nt/03-05\\_bourlon.htm](http://www.newsandtech.com/issues/2005/03-05/nt/03-05_bourlon.htm)
- The Unsafe Safe (a shipboard detachment has to swap safes), <http://www.safetycenter.navy.mil/media/fathom/issues/JanMar02/TheUnsafeSafe.htm>
- Safe Lifting Technique (eight safety tips for lifting heavy objects), <http://physicaltherapy.about.com/od/ergonomics/qt/SafeLifting.htm>

# Explaining a Black Eye to Your Wife

By LCdr. Robert A. McCormick,  
Staff, ComTrAWing 6

**M**y wife and daughter emerged from Italian customs in Rome's Leonardo da Vinci Fiumicino Airport. It had been about four months since I had seen my wife, and I was meeting my 6-week-old daughter for the first time. I was certain the shiner I was sporting would take center stage, and my wife didn't disappoint me.

"What happened to you?" was the first thing she asked.

I explained we had had lots of free time on our deployment to Sigonella from February to August. Because the overland crews were on waivers, I only had been getting about 25 to 40 flight hours a month. The rest of the time, I had been playing a lot of racquetball—a great way to get some aerobic exercise and to burn off the stress of getting ready for my 2P (2nd pilot) board. The racquetball courts conveniently were located indoors, near the BOQ, and there was some great competition in the squadron.

I had taken my own racquet and racquetball goggles with me on deployment, and despite their getting fogged up when I really broke a sweat, I wore them regularly. I'd played many times with guys who didn't wear goggles (because of the aforementioned fogginess). I even had borrowed a different style PPE from the gym to avoid my own glasses' limitations (they really were scratched up). Every time I had gotten exasperated with my goggles and left them resting on my forehead, the proverbial hackles had come up on the back of my neck, and I inevitably had pushed them back down.

One day, I was playing with a particularly good player, who regularly beat me. I was making him work this day, though, to get his points. We came close together as he moved to counter one of my shots, and as he reared back to slam the ball into

the low corner, I took the impact of his racquet in my eye.

Play stopped, and he worriedly asked me if I was all right. I was a little woozy but had been wearing my goggles, so the plastic had spread the blow over my nose and the bones around my eye. We took a break to get some water and then resumed play. After the game (I don't remember if I managed to beat him, but the odds are against it), he looked over and told me I had a trophy. My prize was only cosmetic: a decent black eye that immediately was noticeable but not so swollen as to keep me off the flight schedule.

Besides flying for the Navy as a selected reservist, I'm a commercial airline pilot, so I need my eyes; they're my livelihood. Only God knows what would have happened had my goggles been resting on my forehead that day. My buddy's backswing went straight for the center of my eyeball, and I'm sure it wouldn't have been pretty. ■

*The author was assigned to VP-8 at the time of this incident.*

## Resources:

- Safety When Swinging Your Racquet (tips to protect participants), [http://www.surfermall.com/rball/swing\\_safety.htm](http://www.surfermall.com/rball/swing_safety.htm)
- Proper Eye Protection Is Vital (re: the more than 40,000 athletes who suffer eye injuries annually), <http://www.barksdaleservices.com/RacquetballSafetyArticle.doc>
- Rules of Racquetball (rallies, disputes, types of games, points and outs, etc.), [http://www.owl.net.rice.edu/~mmathnov/rac\\_hand-out\\_9\\_1.pdf](http://www.owl.net.rice.edu/~mmathnov/rac_hand-out_9_1.pdf)

# Who's Your Buddy When You're Out Cold?

By Ltjg. Patrick Stephens,  
VP-46

**O**n a rare sunny day at Whidbey Island, Wash., a young flight engineer's heart beat faster as he perched on his YZ450 dirt bike, contemplating the set of double jumps towering before him at a local track.

The 15-year dirt-bike veteran was wearing all the required protective gear when he attacked the doubles as he had done safely hundreds of times before. He also had used ORM and correctly mitigated the self-identified risks associated with this extreme sport. Hindsight, however, would prove he had overlooked one important aspect: the buddy system.

In spite of his experience, he lost control of his bike and knocked himself unconscious. He was lucky a fellow rider nearby saw the wreck and called paramedics, who took the injured Sailor to a hospital for treatment. Doctors there diagnosed a concussion and broken pelvis.

This situation could have been far worse if our Sailor had been riding alone. You can't count on a good Samaritan always being around to call for medical help. The buddy system would have ensured immediate recognition and treatment. Risk management is designed to bring some of the wisdom of hindsight to our attention, in the form of foresight, to mitigate risks and to be prepared for the unexpected. In other words, you learn from the mistakes of others.

Off-duty and operational risk management isn't a panacea to alleviate all risks in all situations. However, it can help to ask "what if" before it becomes a "what now." It's easy to Monday-morning quarterback a scenario and say someone should have done this or shouldn't have done that. The Navy spends a lot of time, money and effort to provide Sailors the tools to be safe. Those efforts undoubtedly have paid off in lives saved through the inception of NAMP (Naval Aviation Maintenance Program), NATOPS (Naval Air Training and Operating Procedures Standardization), and ORM.

Every action involves some level of risk, and our military needs people who will accept some of this risk to defend a nation.

Whether you're facing risk on the job or in everyday life, one of the best ways to minimize that risk is to have a buddy present to give you a sanity check and a helping hand. ➔

## Resources:

- Operational Risk Management (the basics: what it is, how to use it, etc.), <http://safetycenter.navy.mil/orm/generalorm/introduction>
- Operational Risk Management (news and hot items, application and integration and other training, links, tools and resources), <http://safetycenter.navy.mil/orm>
- The MSF Dirt Bike School (how to enroll, safety tips, etc.), <http://www.dirtbikeschool.com/>
- Riding Tips (setting up your bike, pre-ride checklist, etc.), [http://www.motoschool.com/dirt-bikes\\_table.htm](http://www.motoschool.com/dirt-bikes_table.htm)

# Keeping ORM Simple

By LCdr. Brent Tornga,  
VAQ-130

**M**any people get wrapped around the axle and create confusion and distaste for off-duty and operational risk management (ORM) when they overthink the principles and steps of this process.

For me, ORM doesn't take a 200-page instruction or a 50-slide PowerPoint presentation to explain. Rather, it takes a little practical application and one slide with about five bullets. It really is just common sense that can be used, no matter what you do.

Ask yourself a few questions before you engage in your next activity. Start by asking, "What am I going to be doing? Skiing the slopes? Changing the oil in my car? Moving an aircraft?"

How can I or someone else involved get hurt? What can I break or damage by not following a procedure? How do I prepare? These are just a few ques-

tions you should brainstorm to identify risks involved in the activity. You may come up with many more questions, some of which likely will have more than one answer.

For example, let's say you're going skiing. When asking the question about how you could get hurt, possible answers might include improper equipment, overconfidence, and/or unsuitable conditions. As you think about answers to this question, your attention could turn to questions about how you will get to the ski area. Is my vehicle prepared for winter-driving conditions? Will I need tire chains for my car? Do I have any chains? Is my car full of gas, oil, and wiper fluid?

After brainstorming some questions to identify the risks, you decide what you're going to do about the ones you identified—how you can minimize or manage them. In the skiing example, you would manage the

risk of getting to the ski area by checking your vehicle and the weather forecast. You also should check your route and ride with a buddy. Besides those precautions, you should take a cellphone; carry extra food, water, a blanket, and other clothing; and let someone know your plan (e.g., destination and expected time of return). Finally, you should identify the protective equipment you will need. Sounds like common sense—right? Well, that’s what ORM is all about.

To complete the risk-management loop, you must analyze the risks and your risk-control measures to see if they are appropriate and are working. If not, you must modify your controls. The risk may be too great to accept without changing your control measures.

Continuing with the skiing example, if you know the weather is clear at the mountain and at your point of origin but ignore the route to get there, you’ve failed to identify a risk and to put a control measure into place. If, however, you know the weather along the route is forecast to improve after 1000, or that the route is clear, you have minimized the risk. You still may need to get additional weather updates throughout the day as conditions change.

After the trip, ask yourself if you encountered anything that wasn’t forecast. Also ask, “Did I do what I could to prepare for contingencies?” If the answer is yes, you properly managed the risk and now are armed with a starting point for the next adventure. If, however, the answer is no, then you need to do more planning and better manage the weather-contingency risks for the next trip.

With practice, you will be able to assess the probability and severity of each risk. You can use numbers (e.g., 1 equals high, 5 equals low) or just general categories of high, medium and low. “Probability” is how likely the event will occur, and “severity” is the

measure or potential for injury, fatality, damage or loss of equipment. You have to identify the threshold you are comfortable with accepting when engaging in recreational or other off-duty activities. Someone in your chain of command usually will dictate the level of risk that is acceptable for on-duty activities. In either case, you must strive to reduce the risk’s probability or severity, or both. If your control measures don’t accomplish that goal, you must modify the measures or reconsider the activity altogether.

Remember, ORM is not an additional requirement. It’s a process that should be integral to all activities. It’s a philosophy—a way of life. It does no good just to read about it, attend lectures and briefs about it, and keep a laminated card in your wallet. The key to success is to do all those things, then accept it as a tool and put it into everyday mainstream use. Think of ORM as my **O**bligation to **R**educe **M**ishaps, using an **O**ld-fashioned **R**ight-thing-to-do **M**indset.

In its simplest form, ORM is based on common sense, so don’t overcomplicate it. Learn to think of it in terms of these questions: What am I doing? How can it bite me? What am I going to do to protect myself? How did it turn out? What have I learned? How can I do it better and safer next time? ■

#### Resources:

- Operational Risk Management (OpNavInst 3500.39B and MCO 3500.27), [http://safetycenter.navy.mil/instructions/orm/3500\\_39B.pdf](http://safetycenter.navy.mil/instructions/orm/3500_39B.pdf)
- Operational Risk Management Indoctrination Training, <http://safetycenter.navy.mil/presentations/orm/sourcefile/ormindoc.ppt>
- Operational Risk Management (introduction to ORM, why ORM, ORM terms, etc.), <http://safetycenter.navy.mil/orm/generalorm/introduction>



# The Cost of Being a True Oklahoman

By Ltjg. Dan “Fingers” Weston,  
VQ-4

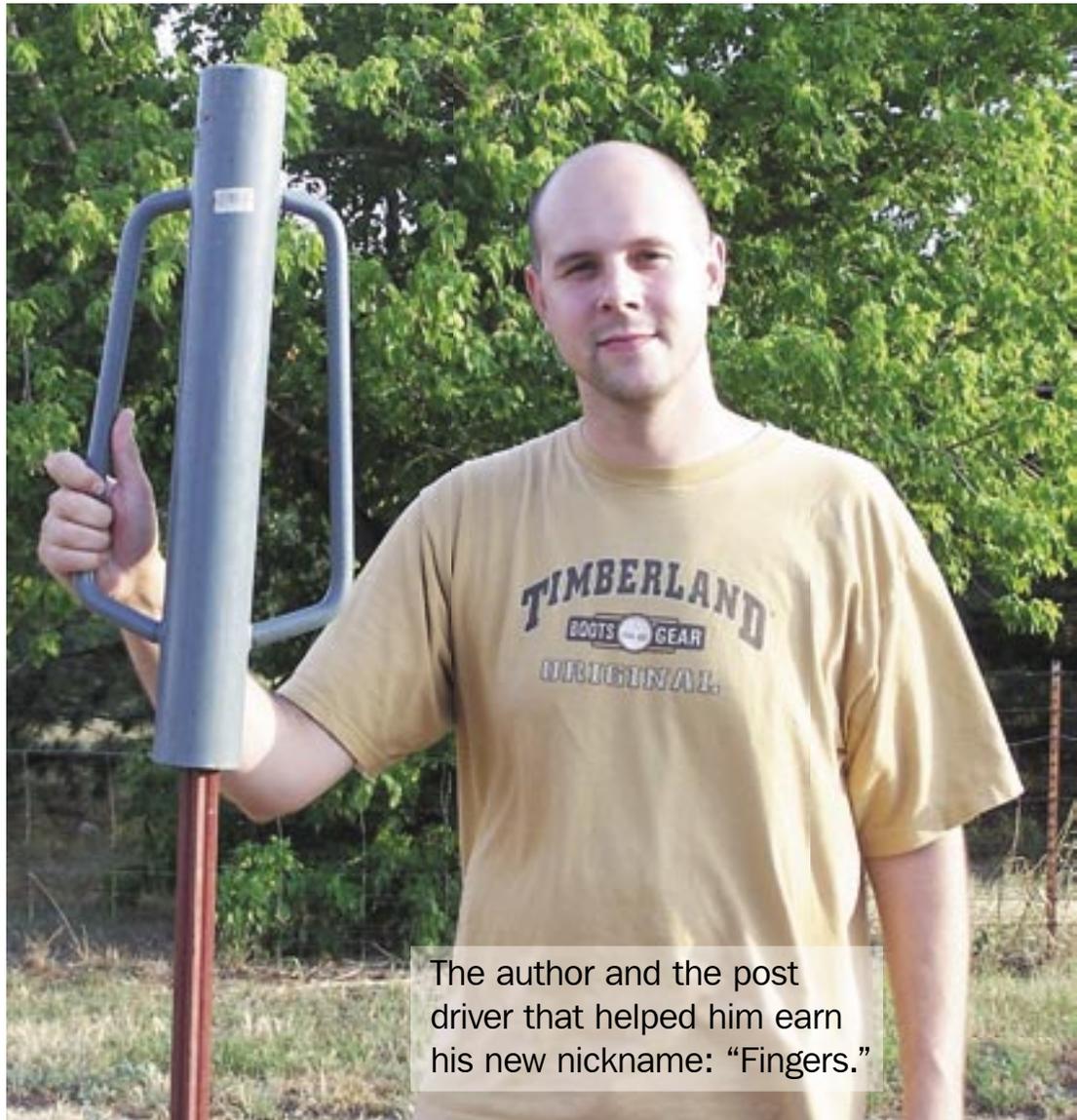
**I**t was a sunny Sunday, and my father-in-law and I just had returned from a hardware store. We had purchased several six-foot T-posts to fence in the back of our property. It was the middle of the day when we decided, on the spur of the moment, to start installing the posts. This lack of planning was our first mistake.

We grabbed a post driver *[a heavy, metal cylinder with a handle on either side, which slips over the top of the T-post]* and several posts and made our way across the property. I remember thinking, “I wonder how hard the Oklahoma clay is going to be,” while dreading the thought of driving 70 posts 2 feet into the ground. At least, with the two of us working, we could alternate.

Once we got started and had developed a rhythm, we worked pretty fast—mistake No. 2. We already were on our 20th post when I paused to check the depth and found I needed to drive the post a couple more inches. If I was lucky, one or two more good hits would do it.

I grabbed the driver and, not recalling that I already had driven the post almost 2 feet into the ground, misjudged the height I needed

to lift the driver off the post. I lifted the 20-pound driver over the post and, unknown to me, pulled it off center. I never would have thought such a small error could cost so much!



The author and the post driver that helped him earn his new nickname: “Fingers.”



The author's hand looked like this two days after the incident.

that went through the nail of my index finger.

A long recovery phase followed the pain of two broken fingers and surgery. My middle finger looked great while I was in the recovery room, but that all changed after leaving the hospital. By the time we had picked up a prescription and gotten home, my finger had darkened and turned cold. The gray turned to black, and the skin hardened. After several trips to the surgeon's office, we had to schedule the amputation of my middle finger. I saw the surgeon on a Wednesday. I'll never forget hearing him say,

"I think we will be able to save this one."

"Are we both looking at the same finger?" I wondered.

My physical-therapy appointments started immediately and continued three times a week for more than four months. The hard, black skin peeled away and, behold, a healthy, pink finger emerged. I'm waiting for the pins to be removed. I can't tell you how uncomfortable the pins are, but, at least, I still have all my fingers. They'll never be the same, and I'll have to battle arthritis and stiffness from now on, but that's OK.

I checked in at my present command—for my first duty as a naval flight officer—just 35 days before this incident. My command has been extremely supportive throughout the whole ordeal. Everyone plans on how they will stand out when they get to their new command; I assure you I hadn't planned my entrance this way. I never wanted to be known as "Fingers."

Looking back, there are many things I would have changed—not rushing probably would have changed the outcome. I did some risk management beforehand (pun intended), but this scenario never crossed my mind. Thank goodness my father-in-law and wife were there to help me. I keep wondering what I would have done if I had been working alone and something this serious had happened. ■

The driver shifted to the right about 3 inches, which placed the fingers of my left hand directly over the metal T-post when the driver came down. The force of the driver slamming down onto the post literally caused the bones in my fingers to splinter. "It was like stomping on a pack of ketchup," my wife said. It all happened in a split second. I was left wondering if I would lose my fingers, my career, or both.

I remember hearing a "thud," then noticing my hand; my fingers were deformed and bleeding. I yelled across the yard to my wife, who raced into the house to grab a first-aid kit. Because she only recently had moved to the area, it took a while for her to recall where the nearest emergency room was located.

Once we arrived at the ER, a doctor assessed my condition and called in a vascular hand surgeon to operate on my mangled fingers. "What a way to spend a beautiful Sunday afternoon!" I kept thinking to myself.

My middle finger, between the first and second joints, was shattered, with shards of bone sticking out through the skin. The nerves and tendons had been torn apart. One artery was severed, and another was crushed, causing my finger to turn a dusty gray. The damage was so bad it required major reconstructive surgery, a total of three metal pins, and more than 25 stitches. The surgeon didn't know if my middle finger would survive because of the lack of circulation.

My ring finger was broken at the second joint, with the extension tendon torn in half. My wedding ring had to be cut off because of the swelling. This injury required five pins and more than 10 stitches. I also ended up needing three stitches to close a cut

#### Resource:

- Saf-T-Driver (uses, safety features, etc. of T-post driver), <http://www.oklahomadesigntech.com/saftdriver.html>

# OSHA Shipyard Fire- The Minimum

**W**orking in a shipyard environment poses numerous challenges for the ships, shipyard employers, and non-contract and contract workers. A mistake or an omission in the basic standard operating procedures can create life-threatening events.

To help ship's force, shipyard employers, and various occupational workers better understand the OSHA Shipyard Fire Protection Standard (29 CFR Part 1915, Subpart P), excerpts from the OSHA website ([www.osha.gov/dts/maritime/standards/faqs.html](http://www.osha.gov/dts/maritime/standards/faqs.html)) follow. Please remember that OSHA regulations are the minimum requirements. Local shipyard fire-protection instructions may be more stringent than the OSHA standard.

**Question:** Who is required to comply with the new standard?

**Response:** The standard applies to shipyard employment. Contractors are covered only when they are engaged in shipyard employment. Excluded are employers who provide incidental services that do not influence shipyard employment, such as mail delivery or office supply services. The standard also does not apply to employment in general industry or construction; these employers are covered by the 29 CFR Part 1910 and 29 CFR Part 1926 standards, respectively.

**Question:** The standard includes requirements for fire-emergency plans (1915.502). Do I



still need to comply with the 1910.38 and 1910.39 standards requiring fire-prevention and emergency plans?

**Response:** Yes. Shipyard employers who currently are complying with 1910.38 and 1910.39 now also will be required to comply with the additional requirements of 1915.502. However, there is no need to produce three separate emer-

# Protection Standard: Requirements

gency plans; OSHA will accept one unified plan that meets all the requirements in 1910.38, 1910.39 and 1915.502.

**Question:** When multiple employers have responsibility for fire protection at a single facility, the standard requires the host employer or employers to coordinate their activities, assign fire-protection duties to other employers, and communicate relevant fire-hazard information to each other (1915.501(d)(1)(iii)). When the ship acts as a host employer, who is in charge: the ship's master, CO, or the shipyard employer?

**Response:** When there are multiple host employers, the standard does not designate or require either party to be "in charge" of the overall fire-protection activity. The employers are jointly responsible for determining which responsibilities will be assigned to each host employer. It is extremely important for the host employers to agree on the details of the incident command system that will be used in the event of a fire. If a fire occurs, a clear chain of command is needed to ensure the effectiveness of fire response and suppression activities.

**Question:** When employees are working in a space on



Navy photo by MC3 David Shen

board a vessel or vessel section that is equipped with a fixed fire-extinguishing system, the standard requires employers to protect employees from the accidental discharge of that system with physical isolation, or by providing employees with specific training (1915.506(b)). Does this requirement apply only to hot-work, or to any kind of work?

**Response:** The requirement applies to any work done in a space on a vessel or vessel section with a fixed fire-extinguishing system. While hot-work has the greatest potential for causing accidental activation of the system, other work, such as rigging material into or out of a space, also can result in accidental activation. Moreover, when a vessel is undergoing sea or dock trials, the employer must ensure that all fire-extinguishing systems remain operational (1915.506(c)).

**Question:** Is a fire watch always needed when an employee is performing hot-work, such as welding or cutting?

**Response:** Not always. A fire watch only is required under certain circumstances outlined in the standard at 1915.504(b) (e.g., when the following conditions are present during hot-work):

- (1) Slag, weld splatter, or sparks might pass through an opening and cause a fire.
- (2) Fire-resistant guards or curtains are not used to prevent ignition of combustible materials on or near decks, bulkheads, partitions, or overheads.
- (3) Combustible material closer than 35 feet (10.7 meters) to the hot-work in either the horizontal or vertical direction cannot be removed, protected with flameproof covers, or otherwise shielded with metal or fire-resistant guards or curtains.
- (4) The hot-work is carried out (performed) on or near insulation, combustible coatings, or sandwich-type construction that cannot be shielded, cut back, or removed, or in a space within which a sandwich-type construction cannot be inerted.
- (5) Combustible materials adjacent to the opposite sides of bulkheads, decks, overheads, metal partitions, or sandwich-type construction may be ignited by conduction or radiation.
- (6) The hot-work is close enough to cause ignition through heat radiation or conduction on the following:

- (i) Insulated pipes, bulkheads, decks, partitions, or overheads
  - (ii) Combustible materials and/or coatings.
- (7) The work is close enough to unprotected combustible pipe or cable runs to cause ignition.
  - (8) A marine chemist, a U.S. Coast Guard-authorized person or a shipyard competent person (such as a Navy-certified gas-free engineer) as defined in 29 CFR 1915, Subpart B, requires that a fire watch be posted. Also, NSTM 074, sections 074-10.8.4.1, 074-10.8.4.2, and 074-10.8.5, has additional requirements for U.S. naval vessels.

**Question:** Do I need to remove all combustible and flammable materials closer than 35 feet before performing hot-work?

**Response:** No. The standard states that you must evaluate hot-work areas to make sure the area is free of fire hazards (1915.503(a)(2)) and maintain fire-hazard-free conditions (1915.503(b)(1)). The most effective method is to remove combustible and flammable materials a safe distance away from ignition sources (35 feet). The next most effective methods are to shield the combustible or flammable material with metal or flame-resistant guards, use flameproof covers, or inert sandwich type material with appropriate precautions. When these methods are not used, a fire watch must be posted.

**Question:** Can an employee engaged in fire-watch duties also perform other kinds of work?

**Response:** No. When a worker is actively engaged in fire-watch duty, he or she cannot perform other duties (1915.504(c)(1)). Because the situations requiring a fire watch carry a high risk of fire, a fire watch must have only one task at hand—to watch for and respond to fires that occur during hot-work. The fire-watch employee also must have authority to stop the hot-work and assist with fire-prevention activities, such as wetting down a fire blanket, repositioning a fire curtain, and removing combustible debris that has entered the area. After the hot-work is completed, the fire watch must remain in the area for at least 30 minutes to ensure there is no further fire hazard, unless the employer or its representative surveys the area and determines there is no further fire hazard. During this 30-minute period, the fire watch can perform other duties.



**Question:** Are there situations where more than one fire-watch employee is needed?

**Response:** Yes. A fire-watch employee must have a clear view of all areas assigned. Depending on the specific circumstances, two or more employees may be required in the fire watch to ensure that all areas are within view. For example, a fire-watch employee may be needed on each side of a bulkhead on which hot-work is being performed. Similarly, where hot material from hot-work could spread or fall over more than one level, as in trunks and machinery spaces, a fire watch must be stationed at each affected level unless positive means are available to prevent the spread or fall of hot material.

**Question:** Can the fire watch or an employee performing hot-work be the designated employer representative to determine that it is safe to vacate the watch before the 30-minute period is over?

**Response:** Yes. The employer can designate any employee to perform this function. Of course, OSHA requires that person to have the necessary training, experience, or both to make appropriate decisions concerning the monitoring of recently completed hot-work. Also, NSTM 074, sections 074-10.8.4.1, 074-10.8.4.2, and 074-10.8.5, has additional requirements for U.S. naval vessels.

**Question:** Do I have to train all fire-watch employees with live-fire exercises?

**Answer:** Yes. Each fire-watch employee is expected to extinguish one fire, using a fire-extinguishing method the employee is likely to use (1915.508(e)). You do not have to use live-fire training for each medium or extinguishing method the employee may use; only one is required. Merely watching another employee extinguish a fire does not meet the requirements of the standard. ■

**When the weather outside is frightful,  
And a fire feels so delightful,  
If there's some place you just have to go,  
Heed advice about driving on ice and snow.**

