

FLIGHT-DECK

A Special Issue From **Mech**

# AWARENESS

A Basic Guide for Amphibious and Small-Deck Ships

Second Edition



A Naval Safety Center Publication  
[WWW.SAFETYCENTER.NAVY.MIL](http://WWW.SAFETYCENTER.NAVY.MIL)



# Foreword

The flight deck of an amphibious or small-deck ship is no less dangerous than that of our largest aircraft carrier. It is one of the most dangerous places in the world and commands respect. We have learned many lessons over the years, and, too often, it is the hard way. We have made many improvements in flight-deck equipment, firefighting gear, and personal protective equipment. These items have helped to make this workplace cleaner, better and safer. Despite these improvements, the smallest distraction still can put Sailors and Marines at risk.

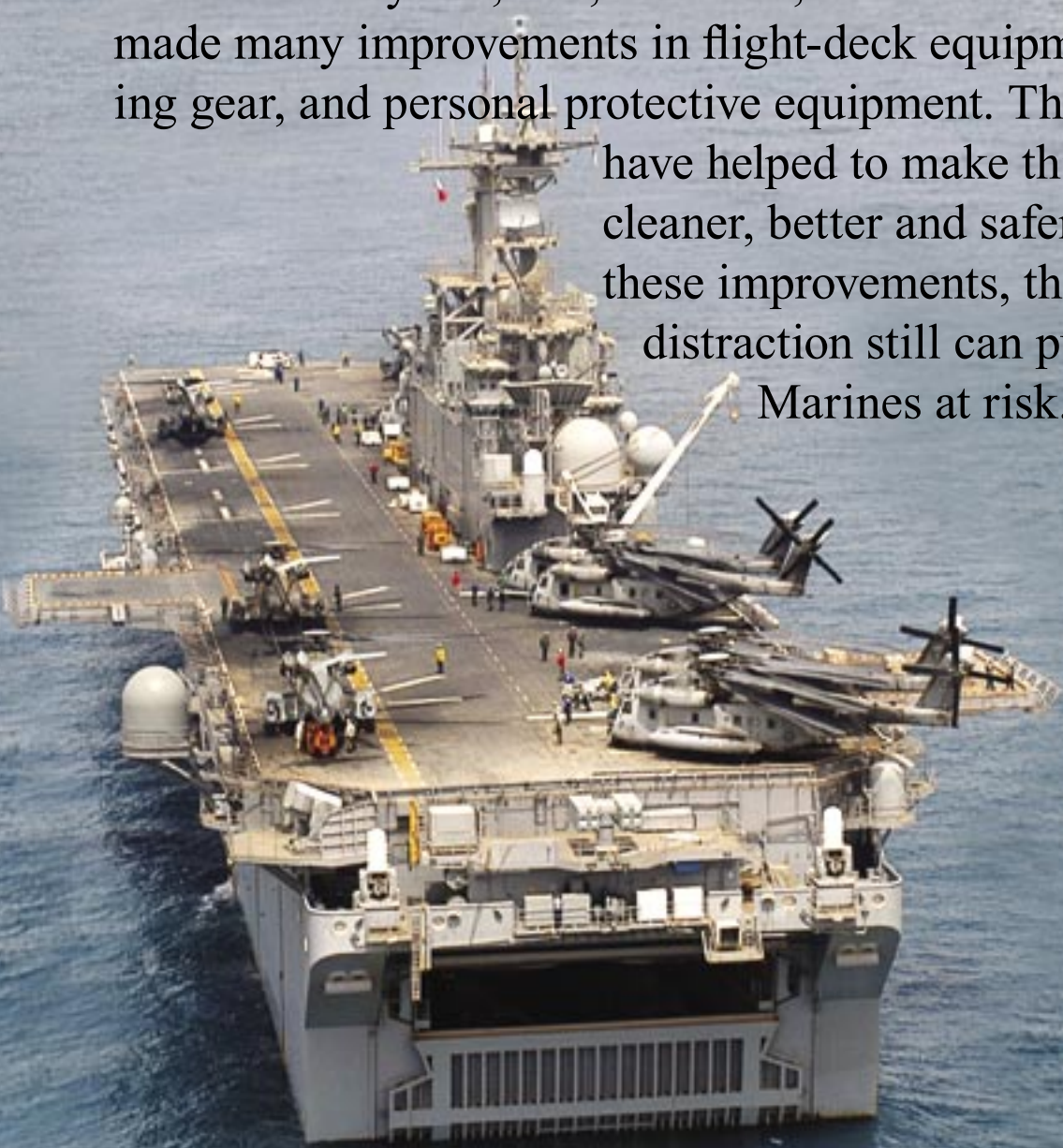


Photo by PH3 Angel Roman-Otero



Admiral's Corner  
From Commander, Naval Safety Center

# Keeping the Flight Deck Safe



We are in the midst of an effort to reduce mishaps by 50 percent in two years. We know that operational risk management (ORM) has helped us to identify and assess hazards. That effort allows us to make risk decisions and to implement controls to reduce existing risks. Another part of ORM is to supervise the overall process. This point is critical because it helps us to lead and to teach our Sailors. The lessons learned from prior mishaps will work to minimize the dangers and hazards of the flight deck.

This new edition of the Flight-Deck Awareness Guide for Amphibious and Small-Deck Ships will help to make sure that today's Sailors and Marines are combat-ready and knowledgeable on how to stay safe. It gives our flight-deck crews a few tools to avoid injuries, damage to equipment, and death. Mishaps waste our time and resources, and they take away our most precious assets: our people. The better you understand the flight deck, required personal protective gear, and firefighting equipment, the more capable your ship. You also are more able to protect yourself and others.

As you read this guide, remember the lessons learned on other amphibious ships that have

suffered major accidents, or look at the larger decks, like *Forrestal*, *Enterprise* and *Oriskany*. These ships suffered major mishaps that caused numerous deaths and massive destruction. Think of the people who have walked the decks of your ship—some no longer with us because of their sacrifice to keep other shipmates safe or because they simply lost focus.

The flight deck of any ship remains a place where rotor wash or jet blast can blow you down or overboard. Taxiing aircraft can run over you, engines can suck you up and spit you out, and a flight-deck or hangar-deck fire can injure you or your shipmates.

Sailors and Marines don't experience these horrifying events. Let this guide help you avoid them. Absorb this information; it will keep you from becoming a statistic. Use this guide to learn about the flight deck for the first time or to refresh your memory about situational awareness, safety zones, hazardous areas, and useful equipment.

This guide is not the only reference for flight-deck safety, but its information will increase your awareness, will add to your previous training, and will help to keep you safe.

RADM Dick Brooks

Photo by PH3 Robert Ellis



Photo by PH3 David K. Simmons



Photo by LCpl. Tony Vega

Second Edition

Pride and Professionalism



Photo by PH3 John Taucher



Photo by PH3 Jose Ponce

Background photo by PH2 Richard J. Brunson

# The Workplace...

The flight deck of an LHA or LHD, with 30 or more aircraft (rotary and fixed wing) and more than 200 Sailors and Marines, is an extremely dangerous place to work. In fact, one of the most hazardous places in the world.

The hazards of the daily routine come in many forms, from searing jet exhaust or whirling helicopter rotor blades to ground support equipment(GSE). Jet exhaust can propel crew

members off their feet and over the side or cause burns to exposed flesh in seconds. Near supersonic rotor blades can turn anything in their path to sliced cheese. Tow tractors and mobile fire-fighting vehicles can appear out of nowhere and create new speed bumps. Unwary people can fall prey to any and all of these hazards.

Working on smaller decks is even more confined but no less dangerous than the carrier flight deck. People move in many directions, and, to the unknowing observer, it looks chaotic. It's like an orchestra—each section performs a part of the overall symphony in amphibious assault ship (AAS) flight operations.

Crew members are highly trained and specialized. They perform specific, vital functions in the dynamic, coordinated flow of flight operations. Each person wears a color-coded jersey, cranial, and Mk-1 life preserver (float coat) that denotes responsibility and assigned area during aircraft launch-and-recovery operations.



Photo by PH3 Lance H. Mayhew Jr.



Photo by PH1 Jeffrey Truett

# *The People...*



*The Air Officer*, commonly known as the Air Boss, supervises flight-deck operations and controls aircraft within a designated zone from Primary Flight Control (Pri-Fly), the AAS control tower. The “Boss” maintains radio contact with airborne aircraft in the control zone and phone contact with Air Operations Control Center/Helicopter Direction Center (AOCC/HDC), bridge and flight-deck control. The Air Boss directs the V/STOL LSO, Flight-Deck Supervisor, LSEs, and V/STOL Launch Officers during all takeoff, landing, deck movement and associated evolutions. The “Boss” communicates with the flight-deck crew using the 5MC for general information and specific warnings and a two-way radio system to direct and coordinate operations on the flight deck.



*Assistant Air Officer*, commonly known as Mini Boss, aids the Air Boss by making sure that the plans, orders and instructions are carried out. The Mini Boss acts as the assistant department head and also functions as the air-department training coordinator.



*The Vertical/Short Takeoff and Landing Signal Officers*, commonly known as the LSO, under the supervision of the Air Boss, are responsible for launch and recovery data, as well as the visual control of V/STOL aircraft immediately before landing. The primary responsibility for determining acceptable pilot performance, in carrier approach, rests with the LSOs. It is their responsibility to wave off aircraft that are not in an acceptable approach position to permit a safe landing. The LSOs shall be pilots, squadron-qualified, and directly responsible to the air officer for LSO duties aboard the ship.



*The Maintenance-Liaison Officer* shall make sure that the aircraft handling officer is kept continuously apprised of aircraft status and main-

# The People...



tenance requirements and shall maintain liaison between the air department and the squadron's line and maintenance personnel. This Marine's normal station rotates between flight-deck control and the squadron's maintenance control. He or she is free to move about the flight and hangar deck.

officer, or chief petty officer. This Sailor shall report directly to the air officer for the performance of aircraft launch duties. The flight-deck supervisor shall be thoroughly familiar with each type of aircraft and be able to recognize proper and improper aircraft functioning just before launch.



*The Landing Signal Enlisted*, commonly known as the LSE, works under the supervision of the Air Boss and is responsible for visually signaling the helicopter, thus assisting the pilot in making a safe takeoff or approach and landing. This person is responsible for directing the pilot to the desired spot and for ensuring general safety conditions of the flight-deck area, including control of the flight-deck crew. The LSE shall make sure that, on signal, helicopters safely are started, engaged, armed, launched, recovered, de-armed (safed), and shut down. They also make sure that all tiedowns are removed before liftoff and secured after landing. Hand signals

## Yellowshirts

*The Aircraft Handling Officer (ACHO)*, commonly known as the "Handler," is responsible to the Air Boss for planning and controlling all aircraft movement on the flight and hangar deck, including the coordination of aircraft elevator runs. This person directs the update of the aircraft spotting and maintenance status boards to reflect the current status of all embarked aircraft. The Handler also coordinates flight- and hangar-deck spotting with the squadron maintenance liaison-officer, aircraft intermediate maintenance, supply, ordnance and operations departments for flight operation and maintenance requirements.

*The Flight-Deck Supervisor* shall be a qualified flight-deck fly petty officer, leading petty



are advisory in nature, except for waveoff and hold, which are mandatory.

*The Vertical/Short Takeoff and Landing (V/STOL) Launch Officer* is designated in writing by the ship's commanding officer and has been

# The People...



Photo by PH3 John Taucher



Photo by PH1 Jimmy D. Lee



trained by aircraft squadron or qualified ship's personnel. This person shall report directly to the Air Boss for the performance of his launch duties. The launch officer shall be thoroughly familiar with the NATOPS flight manual and shipboard operating bulletins for the specific types of aircraft and must be able to recognize proper and improper aircraft characteristics just before launch.

*The Flight-Deck Officer* is responsible to the air officer for safely moving and securing aircraft on the flight deck. This person oversees the training and maintenance on all aircraft handling and firefighting equipment. The flight-deck officer is responsible for supervising and training all aircraft directors, chock and chain handlers, trac-

tor drivers, elevator operators, and crash-and-salvage personnel and is normally the V-1 Division Officer. This person's jersey and Mk-1 float coat are stenciled "Flight-Deck Officer," and cranials are yellow, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

*The Crash-and-Salvage Officer*, commonly known as the "Air Bos'n," is responsible to the Air Boss and flight-deck officer for training the crash-and-salvage crew in aircraft firefighting, aircrew or personnel rescue, aircraft-salvage procedures, and associated equipment maintenance. This Officer's jersey and Mk-1 float coat are stenciled "Air Bos'n," and the cranials are yellow, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

*The Flight-Deck Chief* is the principal assistant to the flight-deck officer and provides supervision and technical expertise to support flight operations. This person's jersey and Mk-1 float coat are stenciled "Flight-Deck CPO," and the cranials are yellow, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

Photo by LCpl. Richard O'Connor



# The People...



*The Flight-Deck Aircraft Director* is responsible to the flight-deck supervisor for safely moving aircraft on the flight deck and is normally an LSE. The director is in charge of an aircraft-handling crew that consists of six people: a tractor driver, plane captain, two safety observers, and two chock and chain handlers. These Sailors' jerseys and Mk-1 float coats are stenciled with crew number. Their cranials are yellow, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

## Redshirts

*Crash and Salvage* – The flight-deck “fire department” operates all mobile firefighting vehicles and aircraft salvage equipment. They are responsible for providing initial aircraft fire-fighting efforts, aircrew or personnel rescue, and aircraft salvage. Their jerseys Mk-1 float coats are stenciled “Crash/Salvage.” Their cranials are red, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

*Aviation Ordnance Officer*, commonly known as the “Air Gunner,” is responsible for

breaking out aviation ordnance specified in the air plan. The aviation ordnance officer is responsible for moving ordnance from the magazines to the assembly area, and from the assembly area to the flight deck. This person's jersey and Mk-1 life preserver are stenciled with a black stripe and “Air Gunner,” and the cranials are red, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

*Explosive Ordnance Disposal (EOD) representatives* immediately shall be available on the flight deck during all launch and recovery operations when aircraft are carrying weapons or ordnance. They dispose of, disarm and neutralize ordnance involved in an aircraft crash or fire or that is otherwise defective. Their jerseys have “EOD” stenciled on the front and back. Their cranials are red, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

*Ordnance Handlers*, commonly known as “B-B Stackers,” come from ship's company and embarked squadrons. The ship's aviation ordnance personnel are responsible for moving ordnance from magazines to the assembly areas and are required to assemble and move all weapons from assembly areas to staging areas. Embarked personnel shall move all weapons from staging areas to

Photo by PH3 Brian Fleske



Photo by PH2 Alicia Tasz



# The People...



aircraft. Movement shall be via a direct and safe route. Their jerseys have black stripes and their squadron designator or ship billet stenciled on the front and back. Their cranials are red, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.



Photo by PH3 Calvert T. Frantom

mishap prevention, monitor surveillance programs, investigate in-house hazard reports, and many additional duties. Their jerseys and Mk-1 float coats are stenciled with a green cross. Their cranials are white, with a green cross, placed on top of the 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

*The Combat Cargo Officer (CCO)* is responsible for the safe and orderly flow of troops, passengers, mail, and cargo. This Officer's duties include compiling troop and passenger manifests, doing a preflight brief for troops and

## Whiteshirts

*Safety Officer/Safety Petty Officers* oversee flight operations to make sure all activities follow established safety procedures. In addition, they continuously assess risk, provide training in



Photo by PHAN Maebel Tinoko



Photo by PH1 Shane T. McCoy

# The People...



passengers, and making sure people transiting the flight deck do not cause a FOD hazard and are escorted. The CCO must be familiar with load capacities and restrictions, survival equipment carried, and emergency escape procedures for all aircraft models expected on board for logistic purposes. Wearing a jersey and Mk-1 float coat stenciled “Combat Cargo” or “CCO,” this person’s cranial is white, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

*Medical: Flight-Deck Corpsmen* are positioned in the flight-deck, battle dressing-station (BDS) to provide immediate medical assistance and treatment to flight-deck personnel. Their jerseys and Mk-1 float coats are stenciled with a red cross. Their cranials are white, with a red cross placed on top of the 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

## Blueshirts

*Aircraft Handling Crews/Chock and chain personnel*, commonly called “blueshirts,” are responsible to the aircraft director for installing and removing chocks, tie-downs and other aircraft-handling equipment. Their jerseys and



Mk-1 float coats are stenciled with their crew number. Their cranials are blue, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

*Tractor Drivers* are responsible the pre- and post-operational check out and for safe operation of GSE, including tow tractors and mobile electrical power plants (MEPPs). Their jerseys and Mk-1 float coats are stenciled “Tractor.” Their cranials are blue, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

*Elevator Operators*, commonly called “EOs,” operate aircraft elevators, under the supervision of a qualified safety observer, to move aircraft and equipment from the flight and hangar decks



# The People...



as needed. They also assist the Handler in maintaining the aircraft spotting and status boards in flight-deck control. Their jerseys and Mk-1 float coats are stenciled “E.” Their cranials are white, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

from stations located on the flight and hangar decks. Their jerseys and Mk-1 float coats are stenciled with an “F.” Their cranials are purple, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

## Purpleshirts

*Aviation Fuels Officer*, commonly known as the “Fuels Bos’n,” is responsible to the Air Boss for efficiently and safely operating aviation-fuel systems and for managing the aviation-fuel quality-control program. Their jerseys and Mk-1 floats coat are stenciled “F.” Their cranials are

purple, with three vertical, reflective, international orange stripes placed on top of the white reflective tape.

*Aviation Fuels Crews*, known as “Grapes,” are responsible to the Fuels Bos’n for the safe operation of the aviation-fuel system. They fuel and defuel squadron aircraft

## Greenshirts

*Squadron Maintenance Personnel* are responsible for doing routine and corrective maintenance on embarked aircraft. They coordinate specific maintenance requirements with the maintenance-liaison officer to assist the Handler in determining aircraft spotting needs. Their jerseys and Mk-1 float coats are stenciled with a black stripe, broken by the abbreviation of their specialty, such as P/P for Power Plants. Their cranials are green, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.



Photo by PH3 Summer M. Anderson



Photo by PHAN Kevin S. O'Brien



Photo by PH3 Joshua Word

# The People...



Photo by PHAN Robert Brooks

*Ground Support Equipment Maintenance Personnel* are responsible for doing routine and corrective maintenance, as well as troubleshooting aircraft support equipment. Their jerseys and Mk-1 float coats are stenciled with a black stripe, broken by the abbreviation S/E. Their cranials are green, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

*Photographers* are responsible for photographing and videotaping flight operations for historical



Photo by PH2 Michael B.W. Watkins

documentation and media requests. Their jerseys and Mk-1 float coats are stenciled with a "P."

Their cranials are green, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.

Photo by PH1 Mike A. Pendergrass



## Brownshirts

*Plane Captains* make sure aircraft are inspected and serviced before and after each flight. They supervise start-up procedures and are responsible for the cleanliness and general condition of their aircraft. Their jerseys and Mk-1 float coats are stenciled with their squadron designator. Their cranials are brown, with a 6-inch square of white reflective tape on the back shell and a 3-inch-by-6-inch piece on the front shell.



Photo by PH2 Felix Garza Jr.

Photo by PH3 John Taucher

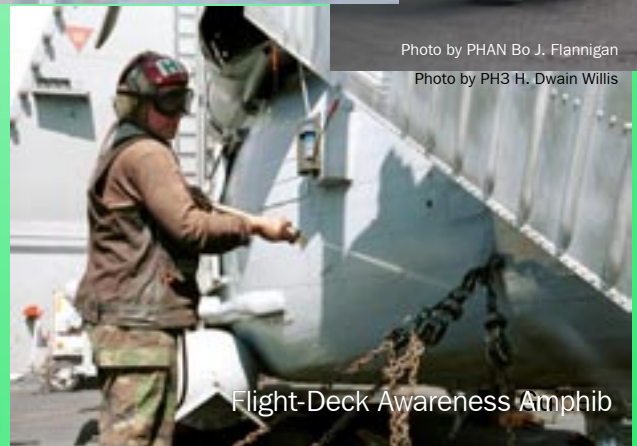


Photo by PHAN Travis Ross



Photo by PHAN Bo J. Flannigan

Photo by PH3 H. Dwain Willis



Flight-Deck Awareness Amphib



# Flight-Deck Firefighting

## **Aqueous Film Forming Foam (AFFF)–**

Primarily used for Class B fires, it is the preferred agent for combating aircraft fires. It can be used effectively on deep-seated Class A fires as a wetting agent.

*VLA Marking.* At each AFFF station, an 18-inch-wide green stripe shall be painted up and over the wheel stop coaming with 3-inch-high white letters “AFFF” painted in the center of the vertical section of the coaming. At locations where coaming is not installed, the deck edge at each station shall be marked with a green 18-inch square

and the letters and numbers of the station shall be marked with white characters 5 or 6 inches high. When

the station is located along the island structure, the bulkhead above each AFFF station shall be marked with a green, 18-inch, square-shaped symbol.

*Operation.* Each AFFF station should have a placard with the operating instructions visibly posted. Personnel assigned to flight-deck duties should get a briefing on operating specifics from a yellowshirt before working on the flight deck.

**CO<sub>2</sub>** – Primarily used on Class C fires, it can be used for Class A and B, but it provides

little to no reflash protection.

*VLA Marking.* At each CO<sub>2</sub> bottle stowage location, a 12-inch-wide red stripe shall be painted up and over the wheel stop coaming with a white 3-inch-high “CO<sub>2</sub>” designation painted in the center of the vertical section of the coaming.



Where there is no coaming, the deck edge at each CO<sub>2</sub> bottle stowage location shall be marked with a white, 18-inch-diameter circle. A facsimile of a CO<sub>2</sub> bottle (15 inches high and 4 inches wide) is painted in the circle.

**Purple “K” Powder (PKP)** – Primarily used for Class B fires, it can be used on Class A fires and is considered a last resort for Class C fires. When using PKP, be aware that it provides little to no reflash protection

*VLA Marking.* At each PKP stowage location, a 12-inch-wide red stripe shall be painted up and over the wheel stop coaming with a white 3-inch-high “PKP” designation painted in the center of the vertical section of the coaming. Where there is no coaming, the deck edge at each CO<sub>2</sub> bottle stowage location shall be marked with a white 18-inch diameter circle, with a red 5- or 6-inch-high “PKP” designation centered in the circle. When the location is along the island, the bulkhead above each PKP bottle stowage location shall be marked with a red painted circle, 15 inches in diameter. The letters shall be painted with white 5- or 6-inch-high characters.



**Saltwater** – Primarily used on Class A fires.  
*VLA Marking.* At each saltwater station, an 18-inch-wide red stripe shall be painted up and over the wheel-stop coaming with a 3-inch-high yellow letter “W” painted in the center of the vertical section of the coaming. At locations where the coaming is not installed, the deck edge at each station shall be marked with a red isosceles triangle (18 inches high and 18 inches wide at the base) with a yellow 5- or 6-inch-high number painted in the center.

*Note: Saltwater fire stations should not be used during aircraft or Class Bravo fires, as it will wash away the protective blanket that AFFF provides.*



### **Flight Quarters**

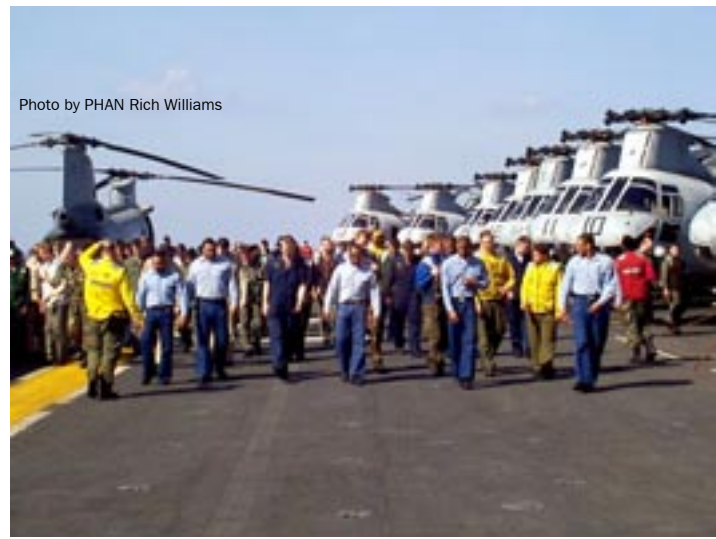
*Flight Quarters Stations* shall be manned when directed and as prescribed in the ship’s watch-quarter-and-station bill. Squadron personnel shall man aircraft as appropriate.

*Flight Quarters Clothing.* All people working stations on the flight or hangar decks, aviation fuels, and ordnance spaces shall wear flight-deck safety shoes or flight boots. Those personnel assigned flight quarters stations on or above the hangar deck shall wear jerseys as prescribed by LHA/LHD NATOPS, 00-80T-106, Appendix E. Flight-deck personnel shall wear a cranial with goggles and sound attenuators and the Mk-1 life preserver with dye marker, whistle, and survival light.

### **FOD**

*Foreign Object Damage Hazard.* All deck areas, particularly the flight deck, shall be inspected before, and monitored throughout flight operations to make sure these areas are clear of foreign objects, such as rags, pieces of paper, line, caps, nuts, bolts, or other objects. These loose items can be caught in air currents, blown around in exhaust, or sucked off the deck, causing damage to aircraft or injuring people.

Photo by PHAN Rich Williams



FOD walkdowns are held after flight quarters have been announced but before the first launch. They can be done at any time deemed necessary during flight operations and should be held before starting night operations. Personnel not standing watch should participate. Form a line across the width of the flight deck, and, in the direction of the supervisors, walk slowly from bow to stern, searching for bolts, screws, safety wire, or other solid items that could be ingested into an engine intake, causing severe damage or even an engine failure.

### **Night Vision Goggle (NVG) Operations**

NVGs afford pilots, aircrew, and flight-deck crews improved night visual acuity. Operating with NVGs provides increased safety, better comfort levels, and improved operational capabilities over unaided, night, shipboard-flight operations. However, inherent NVG limitations, such as field of view, depth perception, and environmental interference, require comprehensive



Photo by JOC Jon E. McMillan

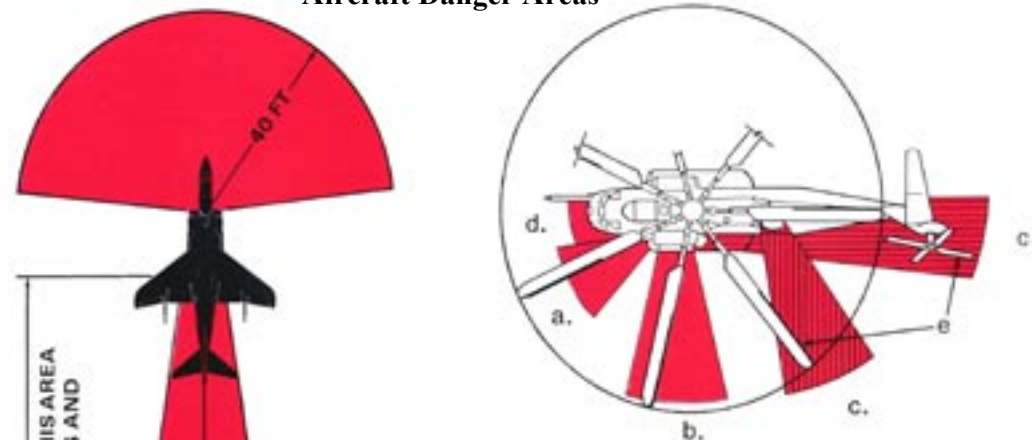
training, awareness, and strict compliance with established procedures to make sure NVG ship-board flight operations are completed safely.

Ship's lighting and light discipline are critical to NVG performance and to safe flight operations. Lighting configurations and intensities will vary with ambient conditions and the

proficiency and preferences of aircrew or flight-deck crews.

All unnecessary lights, either external or visible from the landing pattern, shall be secured during NVG operations. Hangar bay lights shall be off or hangar bay doors shall be closed while doing NVG operations.

### Aircraft Danger Areas

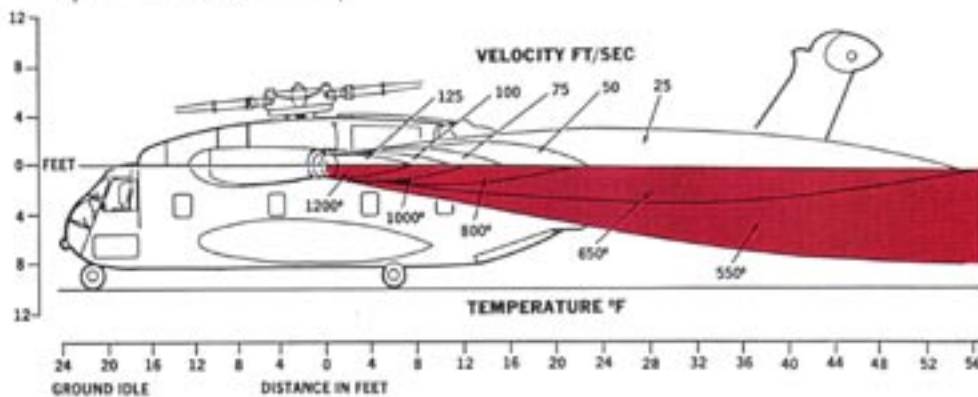


#### AIRCRAFT DANGER AREAS

- a. Inlet Suction
- b. Turbine Blade Failure
- c. Engine Exhaust
- d. APP Heat Exhaust
- e. Main Rotor Blades and Tail Rotor Blades

#### WARNING

Rotor downwash created by the MH/CH-53E helicopter is greater than that produced by any other fleet helicopter. Potential downwash hazard may extend as much as 300 feet from the MH/CH-53E. Under zero wind conditions, maximum average velocities occur at 49 feet from the rotor center (1.25 times rotor radius) and can vary from 50 to 95 knots depending on aircraft gross weight. This downwash is sufficient to blow aircraft chocks, tie-down chains and personnel over the side. All loose gear shall be properly secured to prevent missile hazards.



AIRCRAFT DANGER AREAS

# The Do's of Flight-Deck Safety

1. Know your absolute limits. Fatigue is deadly.
2. Wear a complete and proper flight-deck uniform when working on the flight deck. This includes:
  - A. Cranial, properly marked with reflective tape and with approved goggles and sound attenuators attached.
  - B. Mk-1 life preserver. Make sure your float coat is maintained in accordance with current PMS standards.
  - C. Flight-deck safety boots. Steel toe, non-slip soles.
  - D. Flight-deck jersey. Sleeves rolled down.
  - E. Gloves.
3. Be FOD-free. Remove and properly stow jewelry, pens, note pads, etc. before entering the flight deck.
4. Always enter the flight deck from the island.
5. Keep your head on a swivel.
6. Watch out for your shipmates.
7. Know and support the ship's FOD program.
8. Participate in FOD walkdown.
9. Take part in all flight-deck drills.
10. Know the location of the nearest firefighting equipment.
11. Know how to operate firefighting equipment.
12. If you see something wrong or unsafe, tell your supervisor or a yellowshirt immediately.
13. Comply with direction provided by supervisors and yellowshirts.
14. Never approach a turning helicopter without permission from the LSE. Approach from the forward quadrant only in plain view of LSE and aircrew.
15. Always assume that an aircraft is running if the cockpit is manned.
16. Extend your arm in front of your body when walking in front of jet intakes or behind jet exhaust if you are unsure the aircraft is running. This precaution is especially important at night.
17. Know aircraft danger areas.
18. Help out when aircraft are being pushed by hand.
19. Properly stow power cables, tools, and aircraft-handling equipment when they are not being used.
20. When told to clear the flight deck for an emergency, do so immediately.
21. STAY ALERT!

# The Dont's of Flight-Deck Safety

1. Do not come on the flight deck during flight operations unless you have a job to do there.
2. Do not come on deck without the complete and proper flight-deck uniform.
3. Do not wear jewelry, such as neck chains, wrist bracelets, or rings while working on the flight deck, in the workcenter, or on aircraft.
4. Do not have sleeves or goggles up during flight operations.
5. Do not walk close to aircraft with engines running. Stay at least 25 feet from intakes and tail rotors. Avoid jet exhaust and helicopter main-rotor blades by 150 feet, if possible.



6. Do not work or pass underneath a moving aircraft.
7. Do not allow yourself to be on the outboard side of taxiing aircraft or turning helicopters. Many people have been blown into catwalks or overboard.
8. Do not come onto the flight deck from the port side during flight operations.
9. Do not ever turn you back to aircraft that are landing or taking off. These are most the dangerous times, and you must be ready to respond.
10. Do not sit anywhere on the flight deck during flight operations. Once again, if there is an emergency, you must be ready to respond.
11. Do not sleep on the flight deck.
12. Do not try to stand up immediately if you are blown down by jet exhaust or rotor downwash. Grab a pad-eye and hang on until the danger has passed.
13. Do not walk in front of or directly behind aircraft being armed or de-armed with forward-firing ordnance.
14. Do not start an aircraft with a fueling hose attached.
15. Do not leave external power cables lying on deck. Always stow properly.
16. Do not stand in front of mobile firefighting equipment. In an emergency, you could get run over.
17. Do not cross elevator stanchions when they are in the raised position.
18. Do not go onto deck-edge elevators without wearing a float coat.
19. Do not loiter on the flight deck. If you don't have work to do, go below.
20. Do not be a "Lookey Lou" during emergencies. Clear the flight deck.
21. Do not feel like you are "superman." The "It can't happen to me" and "I'm bulletproof" syndromes repeatedly have been disproved.

## Jersey and Cranial Color Reference

### Flight-Deck Clothing

Personnel	Helmet*	Jersey	Jersey/Float Coat Symbols
Aircraft Handling Crew and Chockmen	Blue	Blue	Crew Number
Aircraft Handling Officers, CPO, LPO	Yellow	Yellow	Billie Title
Elevator Operators	White	Blue	E
LSE (Crew Directors)	Yellow	Yellow	Crew Number
Squadron Maintenance Crews	Green	Green	Black Stripes and Squadron Designator
Medical	White	White	Red Cross
Messengers and Telephone Takers	White	Blue	T
Ornance	Red	Red	Black Stripes and Squadron Designator/ ship's billet title
Photographers	Green	Green	P
Plans Captains	Brown	Brown	Squadron Designator
Crash and Salvage Crews	Red	Red	Crash/Salvage
Tractor Driver	Blue	Blue	Tractor
AMC Maintenance Crews	Green	Green	Black Stripes broken by abbreviation of specialty that is, PP (Power Plants)
Aviation Fuel Crew	Purple	Purple	F
Aviation Fuel Officer	Purple	Purple	Fuel Officer
Combat Cargo	White	White	Combat Cargo
Safety Observer	White	White	Green Cross

- Notes:**
1. The life preserver, vest type, U.S. Navy Mk 1, is designed for prolonged wear while engaged in flight deck activity and is available in colors identical to those listed above.
  2. Helmets for all personnel shall be marked with a 6-inch square (or equivalent) of white reflective tape on the back shell and a 3-inch by 6-inch piece (or equivalent) on the front shell. Helmets shall have a 2-inch piece of velcro on the left shell and velcro on the survival light.
  3. Combination cranial helmets for the following personnel shall be marked with three vertical reflective international orange stripes, 1-inch wide, evenly spaced, placed on top of white reflective tape:
    - a. All officers
    - b. Flight and hangar deck chief petty officer and leading petty officer
    - c. Crash and salvage chief petty officer and leading petty officer
    - d. EOD team members
    - e. Squadron's entrance officer
    - f. Ship's air gunner
  4. The ordnance armory/safety supervisor at night shall have two red standard waste bander) with two 4-inch bands equally spaced on the crown.
  5. Helmets for all single personnel who have not completed the flight deck observer qualification shall be marked (front and rear) with a "T" using 1-inch wide blue reflective tape over existing reflective tape (front minimum 2-inch tall, rear minimum 3-inch tall lettering).
  6. Helmets for all LSEs and Aircraft Directors under instruction shall be marked (front and rear) with a "LD" using 1-inch wide blue reflective tape evenly spaced over existing reflective tape (front minimum 2-inch tall, rear minimum 3-inch tall lettering).
- \* Combination cranial.

The air ops branch and communications and marketing department at the Naval Safety Center produced this guide to provide the fleet with a tool to improve awareness, to increase readiness, and to save lives. If you need more copies of the guide, download or view the web version at [www.safetycenter.navy.mil](http://www.safetycenter.navy.mil) or call the Naval Safety Center at 757-444-3520 (DSN 564) Ext. 7256.

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# Real-Life, Flight-Deck Stories

The Flight-Deck Awareness Guide for Amphibious and Small-Deck Ships describes the workplace, people and hazards that exist on board. You know now from reading this booklet that the flight deck can be a dangerous place for someone who loses situational awareness, even for a second. This section will share stories of tragic incidents that damaged aircraft or equipment and injured or killed shipmates. The purpose for this section is to show you how bad things can get for a clueless, careless or brazen Sailor or Marine.

## Stick With the Basics (*Mech*, Summer 2004)

An amphibious ship's Air Bos'n shares a story about his well-trained, motivated and thorough team. They had been through all the required courses and had worked together for some time. He was confident in their abilities. After more than 20 days of flight ops, his team had their first incident. It was a simple error, like so many other mishaps. A Sailor had to park a P-25 mobile firefighting vehicle (MFFV) in a designated spot on the flight deck. A more junior Sailor was the safety observer, and he jumped off the unit as the driver backed up. His boot got tangled in the tire well, and his foot was run over. That Sailor was injured slightly, but it could have been much worse.

## Feeding a Harrier (*Mech*, Summer 2003)

A Marine tells the story of his near-miss with death. He had to do a post-flight engine wash and got a little too close to the action.

He had been at sea for three months and had become a little lax. He watched the jet land, get tied down, and turned over to a plane captain. Before the PC shut down the Harrier, he signaled the pilot for a compressor wash. He got a thumbs up and began the wash. It was windy, so the Marine moved a little closer to the intake. His comm cord suddenly was sucked off his float coat and into the engine. It bounced around and was shot back out, hitting a blueshirt. The engine had minor damage, but the Sailor was not injured.



PH3 John Taucher

## Why Solid Matter Matters (*Mech*, Spring 2002)

Darting under an aircraft, a Sailor hit an antenna and cut his head. The wound required 21 staples to close. He wasn't wearing a cranial.

This incident happened on a P-3, but the lesson learned applies to anyone who works on the flight or hangar deck and must maneuver around aircraft in tight spaces. Wear a cranial anytime you are around an aircraft; you never know when a simple job will turn into a painful experience.



## Static Shocker (*Mech*, Spring 2004)

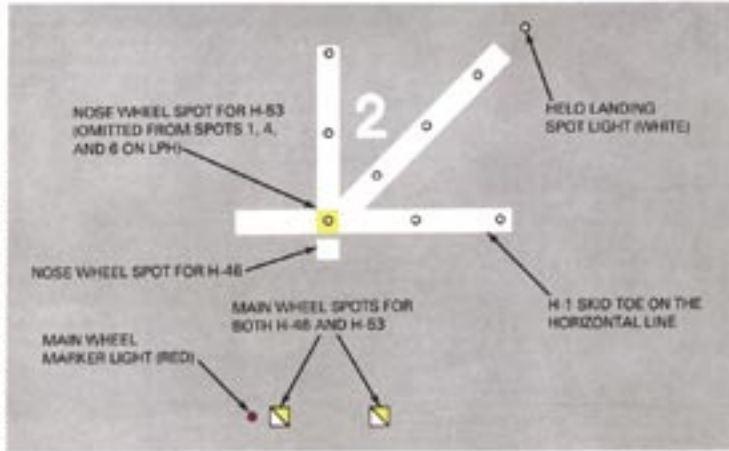
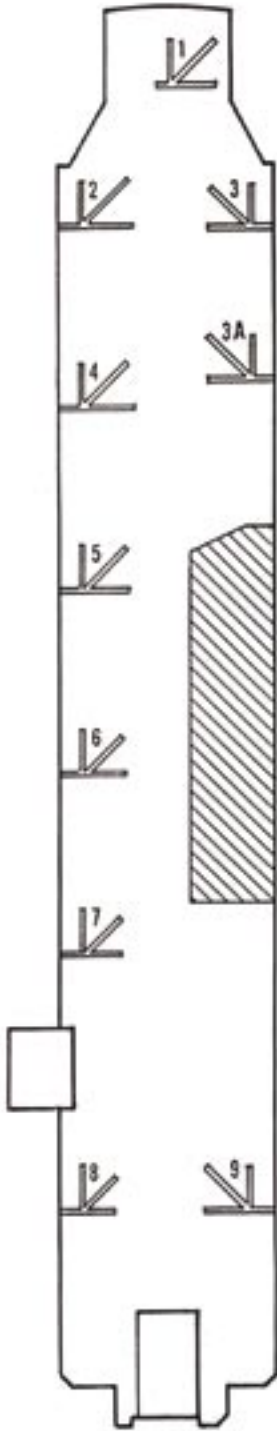
A recovery-assist landing on a "small boy" went sour. The lead hook-up person got shocked when the trail failed to connect the ground for the probe. The task, again, was simple, but bad communications caused an injured shipmate.

The trailing hook-up person thought that a tug on the float coat was a signal that the grounding wire was about to be connected. It's supposed to be used to tell the lead person that the probe fully is connected. Because of this error, when the leader touched the aircraft's grounding cable with the probe, he got the zap of a lifetime. In fact, he was dragged off the flight deck and taken to medical. He recovered and admits his own errors in the brief. He did not make sure his assistant was trained, trusted his shipmate's word, and did not verify his partner's experience.

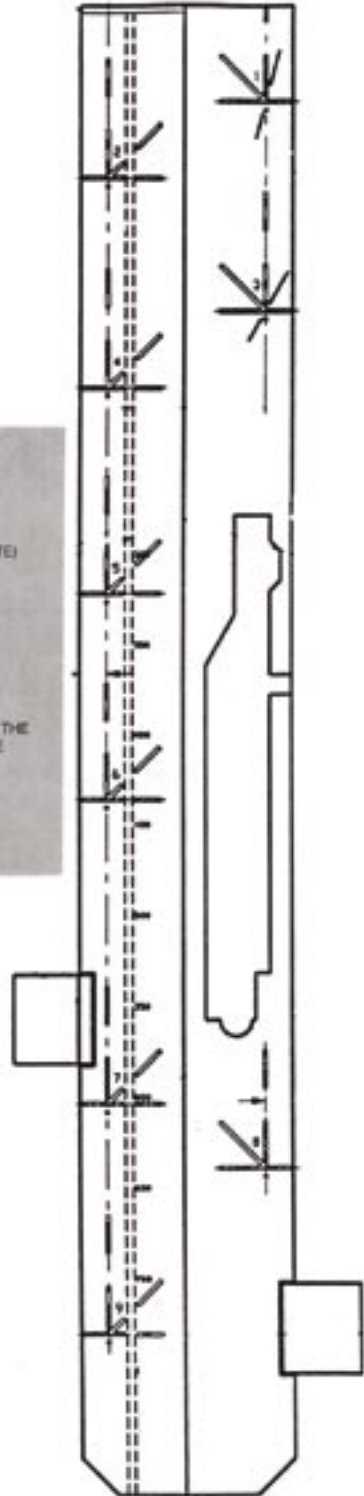




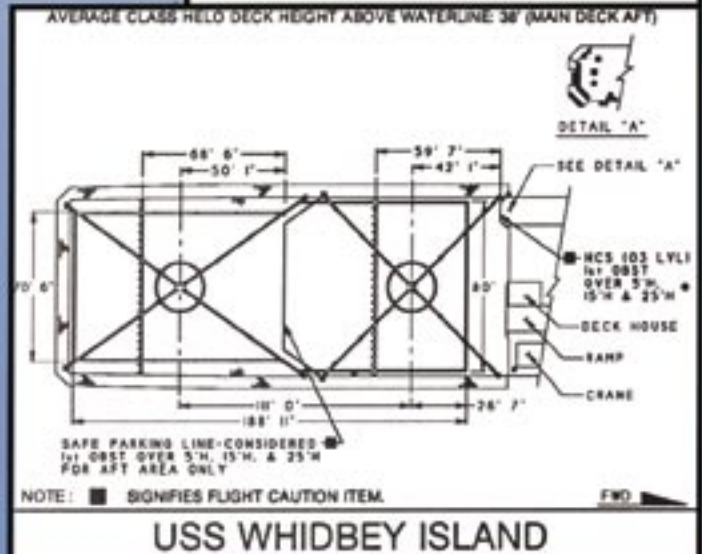
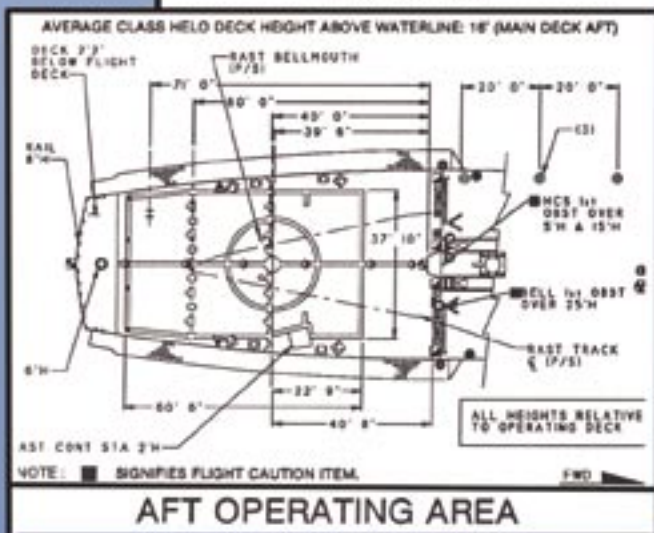
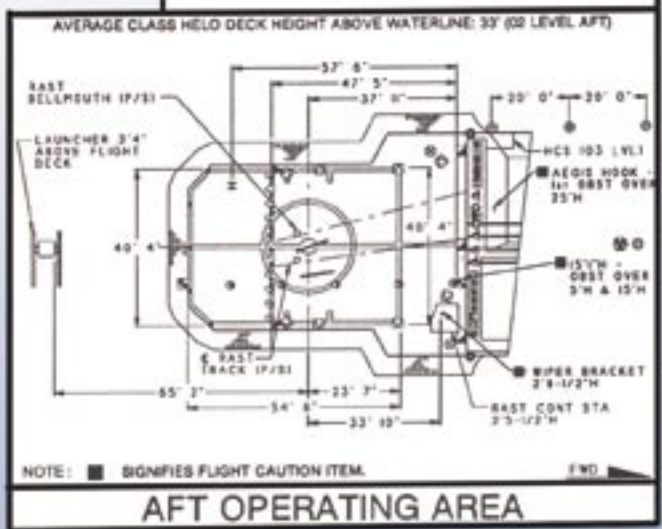
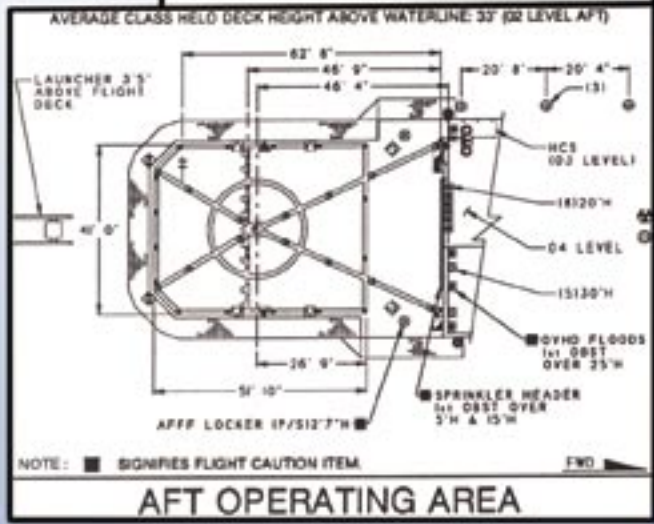
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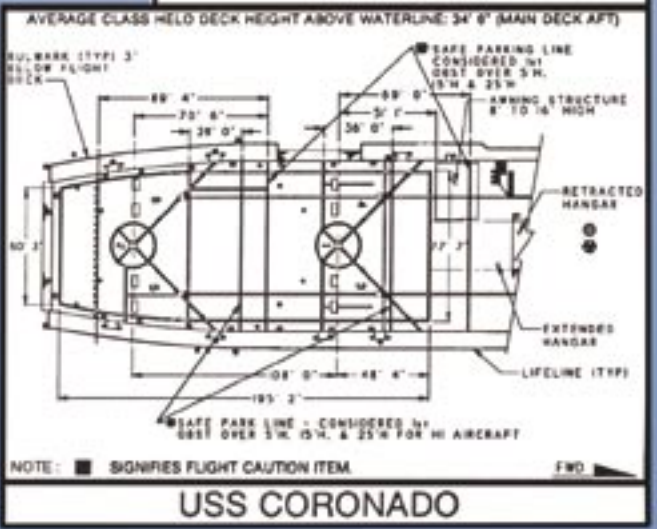
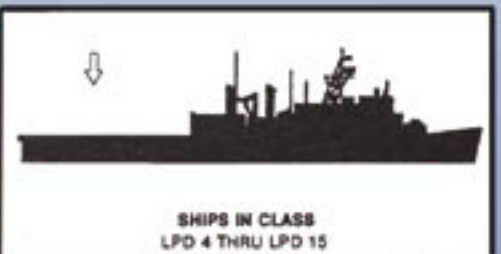
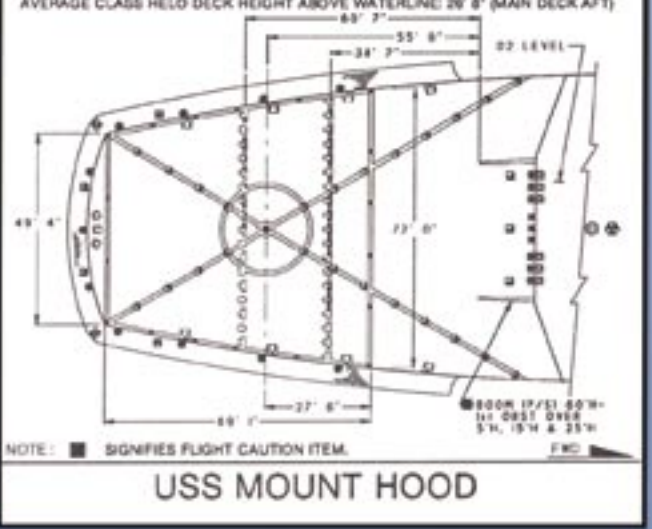
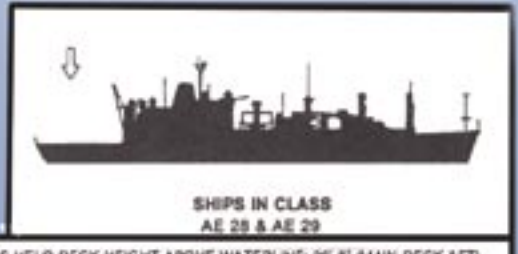
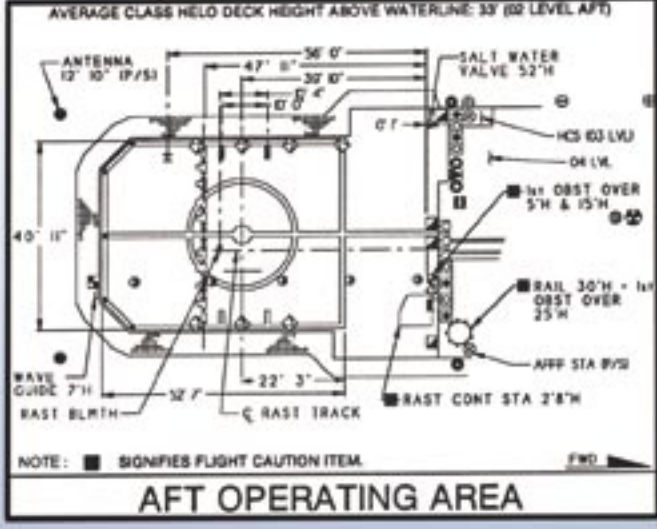
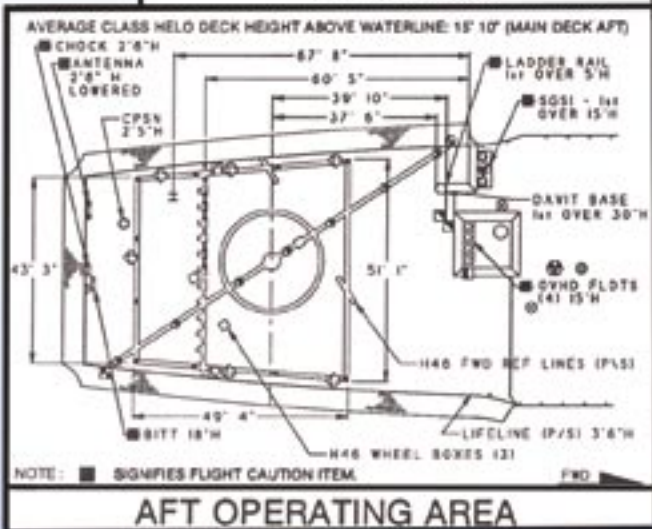
# LHD



# Flight-Deck Layouts



# Flight-Deck Layouts



# Flight-Deck Layouts

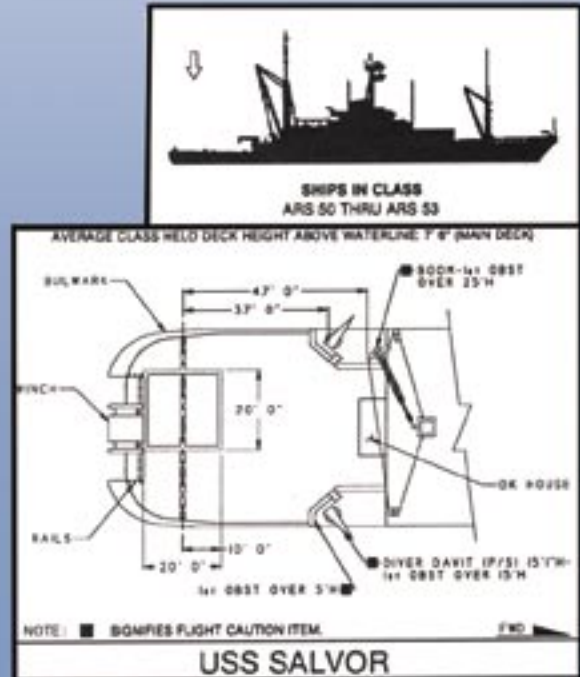
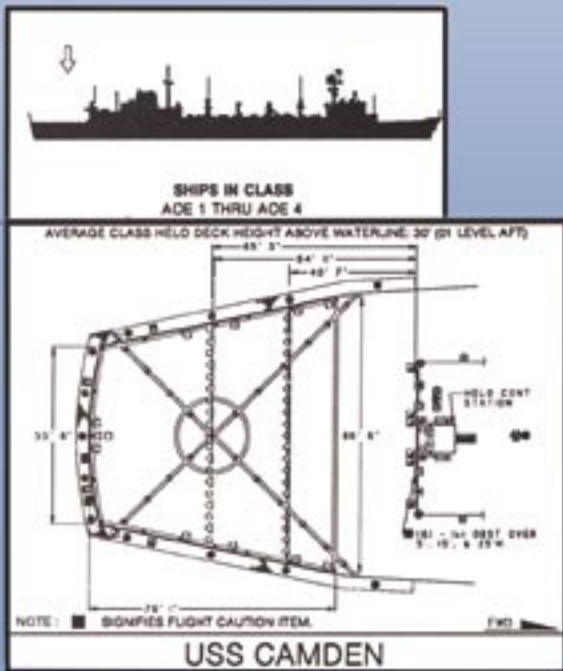
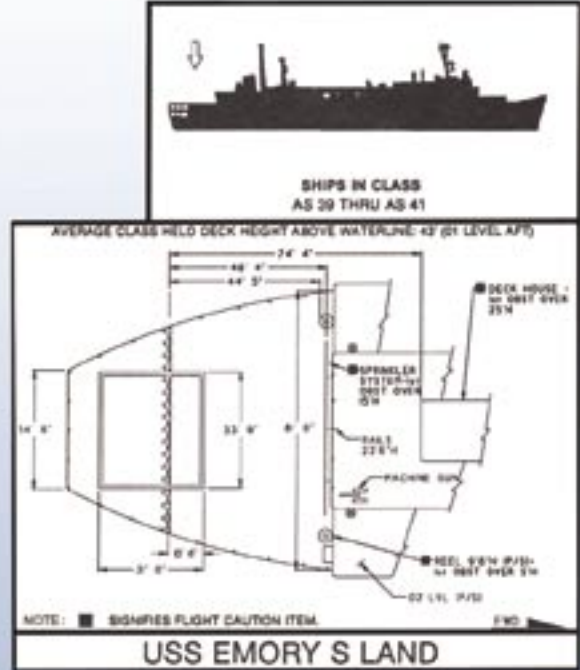
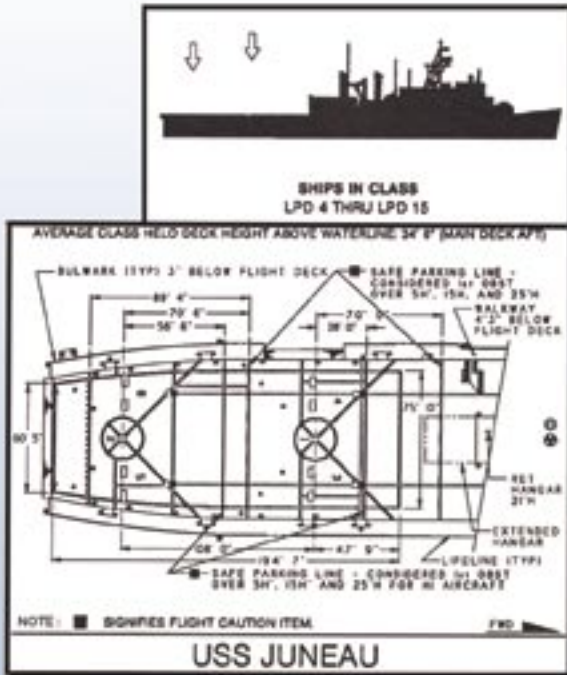


Photo by LCDr. Bob Meeker

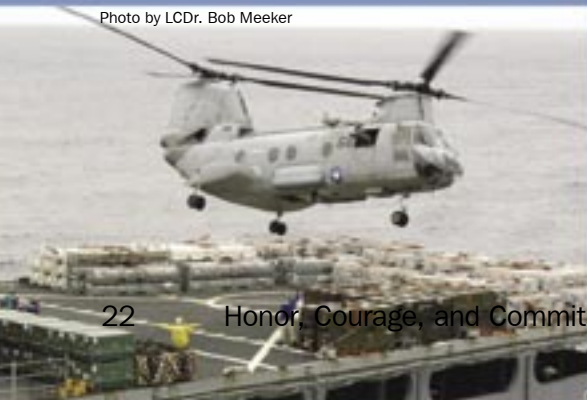
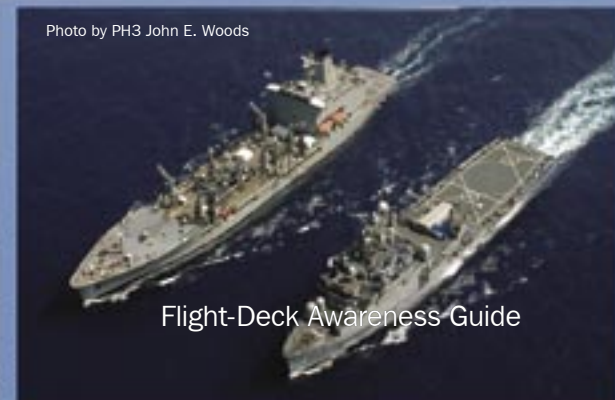


Photo by PH3 John E. Woods



# Air Department References for Amphibious and Small-Deck Ships

Manuals, instructions and other documents needed for flight-deck operations and qualifications:

- (a) NAEC 51122, *Amphibious Assault Ship Aviation Facilities Bulletin No. 1A*
- (b) COMNAVSURFLANT 3700.1F, ARQ - *Aviation Readiness Qualifications*
- (c) Visual Landing Aids (VLA) General Service Bulletin No.8 (Current Revision)
- (d) NAVAIR 00-80R-19, *NATOPS U.S. Navy Aircraft Crash and Salvage Operations Manual*
- (e) NAVAIR 17-1-114, *Inspection and Proof Load Testing of Lifting Slings Restraining Device for Aircraft and Related Components*
- (f) NAVAIR 00-80R-14, *NATOPS U.S.NAVY Aircraft Fire Fighting and Rescue Manual*
- (g) NAVAIR 00-80T-106, *LHA/LHD/LPD/MCS NATOPS Manual*
- (h) NAVAIR 00-80T-109, *NATOPS Aircraft Fueling*
- (i) NAVAIR 00-80T-113, *NATOPS Aircraft Signals Manual*
- (j) NAVAIR 00-80R-14-1, *NATOPS U.S. NAVY Aircraft Emergency Rescue Information Manual*
- (k) NAVSHIPTECHMAN S9086-S3-STM-010, Chapter 555(V1), *Surface Ship Firefighting Manual*
- (l) OPNAVINST 5100.19 CNSL/CNSP INST 3502.2E, *Surface Force Training Manual, Navy Safety Precautions for Forces Afloat*
- (m) OPNAVINST 3120.32, Chapter 8 – *Precedence, Authority and Command, Standard Organization and Regulations of the U.S. Navy (SORM)*
- (n) NAVSHIPTECHMAN S9086-S3-STM-010, Chapter 634, *Deck Coverings*
- (o) NAWC 4.8.10.4, *Air Capable Ship Aviation Facilities Bulletin No. 1H*
- (p) NAEC 51122, *Amphibious Assault Ship Aviation Facilities Bulletin No. 1A*
- (q) NAVSHIPTECHMAN S9086-S3-STM-010, Chapter 542, *Gasoline and JP-5 Fuel Systems (Surface Ships)*

- (r) NWP 3-04.1M, *Shipboard Helicopter Operating Procedures*
- (s) Specific Technical Manuals/Manufacturer Instruction Manuals for JP-5 System and Associated Equipment (Pumps, Filters, Nozzles, etc.)
- (t) NAVSHIPTECHMAN S9086-RK-STM-010, Chapter 631, *Color Coding of Piping and Valves*
- (u) PMS 5420/6653, PMS for JP-5 System/Test Equipment
- (v) AEL 2-830024025, *Aeronautical Material, Mooring Aids and Equipment for Helicopter Operations*
- (w) AEL-2-150004097, *JP-5 Fueling and Defueling Aircraft*
- (x) COMNAVSURFPAC/COMNAVSURFLANT Instruction 3100.3G, *LHA/LHD/LPD/MCS Air Department*
- (y) NAVAIR 17-1-537, *Aircraft Securing and Handling Procedures with Organizational, Intermediate, and Depot Maintenance for Aircraft Restraining Devices and Related Components*
- (z) NAVAIR 19-25-514, *Operation and Intermediate Maintenance Instructions with Illustrated Parts Breakdown, Firefighting Vehicle A/S32P-25 (WP 005)*

*Listings current at time of printing.*



# Damage...



# Injury...



# Death...

They're all just a heartbeat away when you work on the flight deck. For help in maintaining your situational awareness, check out our website: [www.safetycenter.navy.mil](http://www.safetycenter.navy.mil).

