

Recommendations to Prevent Oil Spills Caused by Human Error 1995 Report to the Pacific States/BC Oil Spill Task Force

EXECUTIVE SUMMARY

Background

This report to the States/British Columbia Oil Spill Task Force compiles recommendations to prevent oil spills from oil-handling facilities, marinas and boatyards, tankers and tank barge tow vessels, and bunkering operations. These recommendations are provided pursuant to the 1994-1995 Annual Workplan objective to *Develop recommendations on human factor policies such as staffing levels, training standards, emergency procedures, alcohol and drug abuse screening, and quality assurance programs*. This objective in turn is based on our Five Year Strategic Plan objective to *Develop and encourage implementation of a model spill prevention program for both facilities and vessels*. Our Five Year Strategic Plan further states that "In developing spill prevention programs, it is our intent to be both consistent and effective, targeting real causes and working cooperatively with federal agencies, industry, and concerned citizens. The programs could include standards, guidelines, technical assistance, research, and educational programs..."

These spill prevention recommendations were compiled by the Task Force staff under the direction of the Task Force Coordinating Committee. They are based on standards, policies, and recommendations from the following sources: The Washington Office of Marine Safety, the Washington Department of Ecology, the Alaska Department of Environmental Conservation, the California State Lands Commission's Marine Facilities Inspection and Management Division, the Pacific Oil Spill Prevention Education Team and its members, the American Waterways Operators' Responsible Carrier Program, elements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code), and assorted papers, comments, and suggestions focused on preventing oil spills caused by human errors.

Because research in this area is ongoing and efforts to address human factors are at varying stages (for instance, ISM code implementation is not due until 1998; at the U.S. federal level, Coast Guard studies on crew sizes, adequacy of qualifications and training for tanker crews, and tanker crews' ability to take emergency actions are all subjects of current studies) these recommendations may be revised over the next few years to reflect ongoing research or regulatory changes, or to coordinate with other elements of our Spill Prevention Objective as these are completed pursuant to our Five Year Strategic Plan.

Nevertheless, these recommendations should be considered by our member agencies for implementation through either regulatory or through non-regulatory means as soon as feasible, consistent with each agency's procedures. The Coordinating Committee and Staff recommend that Task Force member agencies should make every effort to promote technical assistance, incentives, and awards programs, as well as dialogue with and within the private sector, to facilitate implementation of these recommendations. Each Task Force member agency should

also consider promoting private sector audit or certification programs to promote sound spill prevention programs. In addition, as is the case with all regulatory and outreach programs, member agencies should monitor reductions in spills which result from implementation of these recommendations, and adjust their prevention programs as necessary.

I. Recommendations to Prevent Spills Caused by Human Error at Oil Handling Facilities

These recommendations focus on management support for spill prevention programs, commitment of sufficient resources to such programs, and commitments to meeting or exceeding regulatory standards, using redundant safety systems, discouraging risk taking, and establishing annual performance benchmarks. Implementation of formal risk assessment and correction programs, and employee involvement, accountability, and performance incentives are also recommended.

We specify core topics for minimum training standards for all levels of personnel in this report, including both initial and continuing education recommendations. There are also recommendations for certification standards for training programs as well as program approval recommendations.

Recommendations on work hour limitations are included, as well as recommendations for corporate programs to ensure physical competency of employees responsible for an activity which could result in an oil spill. Security system inspections are recommended, as are written emergency procedures and drilling of those procedures.

II. Recommendations to Prevent Oil Spills by Boat Owners, Marinas, and Boatyards

These recommendations stress regular and careful boat maintenance, knowledge of best management practices for fueling, oil changes, or overhauls, and responsible management and disposal practices for used oil and oily wastes. This section also includes recommendations that marina operators implement effective runoff controls, provide technical assistance and education for their boat owners, and develop written agreements with those boat owners committing them to implement best management practices.

III. Recommendations to Prevent Spills from Tankers and Tank Barges

This set of recommendations covers management policies and programs, including monitoring of operations, maintenance, personnel policies, health and safety, waste management systems, and spill and near-miss incidents. Employee involvement and communications are addressed, and redundant safety systems and annual performance benchmarks are recommended. Several international standards are recommended for certification of management policies and programs.

Regarding watch practices, we include recommendations covering standards for navigation watch, anchor watch, engineering watch and security rounds. For both tankers and tank barges, we recommend written emergency procedures be

established by the vessel master to cover all possible emergency conditions and appropriate actions under such conditions.

Regarding personnel policies, we recommend that tanker and tank barge crew members be required to participate in a comprehensive personnel training program which covers vessel orientation, specific requirements for each position, regular refresher training, and frequent safety and response drills. We recommend that crew members be monitored for fitness and receive annual performance evaluations. Maintenance of detailed training, drill, and performance records is also recommended.

We recommend that owners and operators of all tankers meet the work hour and navigation watch standards set in OPA 90 while operating in the waters of West Coast jurisdictions. We also recommend that all licensed deck officers and the vessel's Person In Charge of oil transfers be proficient in English and that multinational crews use a common language understood and spoken by both the ships' officers and unlicensed crew.

We recommend that a tanker or tank barge owner/operator ensure that no crew member is under the influence of alcohol or illicit drugs while in a west coast jurisdiction's waters, and that regular physical exams and a policy requiring notification of use of prescription medications be required. We also recommend that while in a jurisdiction's waters, tank barge tow vessel masters should maintain a record of all crew members, and should have three licensed officers or tow operators on board during transit of coastal waters.

IV. Recommendations to Prevent Human Error Spills During Bunkering Operations

We recommend that Persons In Charge (PICs) of bunkering operations on both the receiving and delivering vessels or facilities should emphasize proper procedures and adequate communications during all phases of a bunkering operation, especially with regard to a pre-loading plan, a pre-transfer conference, voice and visual communications, emergency procedures, and safe access between vessels, or between a vessel and a facility.

We recommend that PICs ensure that the duties of all personnel involved in a bunkering operation are clearly defined and that training is provided. Furthermore, we recommend that owners and operators of vessels and facilities involved in bunkering operations within a jurisdiction's waters be required to demonstrate compliance with these standards by making relevant documents (logs, written policies and procedures, standing orders, pre-loading plans, declaration of inspection forms, and training materials) available upon request.

CHAPTER I:

Recommendations To Prevent Spills Caused by Human Error At Facilities

To prevent oil spills caused by human error at facilities which are located on or near the navigable waters of the West Coast - including pipelines except transmission pipelines covered by U. S. Department of Transportation regulations - and which transfers oil to or from a tank vessel or pipeline and stores, produces, handles, transfers, processes, or transports oil in bulk, the Task Force Coordinating Committee recommends that its member jurisdictions apply the following standards:

I. Recommended Management Policies and Programs

A. Management Support for Spill Prevention

- Facility and/or corporate management should establish policies, programs, and procedures which demonstrate a commitment to the spill prevention objectives as outlined in this document, and should commit sufficient resources to implement these policies and procedures.
- Management policies, goals, and objectives should be consistent with a commitment to meeting or exceeding referent standards of safety and spill prevention. Management should demonstrate a commitment to improving standards where needed.
- Management policies should require use of redundant safety systems, applying redundancy to both personnel and hardware.
- Management policies should reward cautious and careful behavior and discourage risk taking.
- Benchmarks should be set on an annual basis and performance evaluated against these benchmarks in order to provide for continuous improvement.

B. Risk assessment and Correction

- A risk assessment or audit program should be implemented to monitor the following: operations; maintenance; systems interface; personnel training; drill and exercise programs; waste management systems; and management practices.
- Correction plans should be developed in response to problems thus identified and implementation of those plans tracked and evaluated. This should include a process to identify near-misses in order to recognize frequent links in "error chains."
- Records should be maintained of all spills, including information on the source, cause, amount, and corrective action taken.
- Facility audit information should be shared among commonly-owned or managed facilities to promote the exchange of spill

prevention information.

C. Employee Involvement

- Management policies and programs should emphasize participatory management and provide all employees ongoing opportunities for input to design and implementation of spill prevention programs.
- Meaningful incentives and rewards should be provided for employee involvement at all levels.
- Likewise, accountability should be ensured at all levels; any violation of safety or spill prevention standard should be addressed, even if a spill was avoided.

II. Recommended Personnel Training Standards

A. Training Requirements:

- Key management, supervisory, operations, maintenance, and "indirect operations"¹ personnel (as well as contractors fulfilling such roles) should receive spill prevention training designed to promote job competency and environmental awareness for the purpose of preventing oil spills.
- Training should provide for comprehension by non-English speaking personnel.
- A facility should maintain a written statement which identifies all position titles subject to spill prevention training. In the case of indirect personnel, job types or work sites could be identified instead.
- Written descriptions of the specific training requirements for each position - including minimum hours - should be maintained at the facility.
- Training should address the core topics listed in Table I below; facilities may combine and integrate these topics as appropriate as long as they are addressed:
- Existing training programs required under 29 CFR 1910 (Process Safety Management) or 33 CFR 154.710 (Coast Guard Person In Charge requirements), as well as other state or federal training requirements judged equivalent by the state/province could be used or modified to meet these requirements.
- A facility should describe in writing its continuing education

¹Involvement in on-site operations in a capacity which involves risk of causing a spill; example: personnel involved in new construction.

requirements, including minimum hours. Continuing education should be provided annually and at minimum should provide:

- Refresher awareness on environmental sensitivity and oil spill impacts;
- Review and analysis of spills over the past year;
- Refresher training in emergency procedures; and
- A practice exercise in spill prevention procedures during an abnormal event for supervisory, operations, and

management personnel.

• Existing personnel at the time training requirements are adopted could be considered to have met the core requirements if the facility can document past training which meets the standards or the facility attests in writing how training and experience provide equivalent value.

• Facilities should require personnel clearly responsible for causing an oil spill to receive remedial training in addition to the standards recommended above.

• Facilities should develop minimum training and experience qualifications for trainers.

• In order to provide for employee feedback and program improvement, training programs should provide for and document employee evaluation of the training; program changes in response to employee evaluation should also be documented.

• Facilities should develop and maintain written prevention training materials and a record-keeping system to document training and certification requirements as described below. Such records should be maintained for 5 years in a central and accessible location.

B. Certification Program:

- A program to certify training for at least key supervisory and operations personnel is recommended.
- A facility should develop and maintain written certification procedures including:
 - Minimum competency requirements;
 - A process to develop and test competency involving written or oral examinations, observation of performance, and practice exercises; and
 - A process to issue and track certificates of competency.
- Records should be kept for 5 years which document:
 - Names and position titles;
 - Trainers' names;

- Signatures of trainee and trainer;
- Types and hours of training completed; and
- Results of tests and evaluation procedures.

- Recertification should occur at least every 3 years and should include participation in continuing education programs as referenced

above.

C. Program Approval:

- Task Force member agencies should require that such spill prevention training and certification programs be approved through an on-site inspection procedure. Such inspection should include evaluation of training materials, testing and certification records, and consultation with personnel.

- Program approval should be based on its ability to minimize the risk of spills and the risk of damage from spills, its ability to evaluate competency, and the integrity of the record keeping system. Member agencies should also consider the potential risk from a facility in terms of volume and types of oil handled, the number of personnel, and past history and inspection reports.

- Member agencies should notify inspected facilities within 30 days whether programs are approved, and if not, allow 90 days for correction of deficiencies.

- Member agencies should provide for conditional approval as long as certain precautionary measures are put into place until a facility receives full approval. Such measures could include:

- reduced oil transfer rates;
- increased personnel levels; or
- Restricting operations to daylight hours or favorable weather conditions.

- Member agencies should provide for expeditious or reciprocal approval of training programs established to meet other state or federal standards which meet or exceed these spill prevention training requirements.

- All approval, denial, or conditional approval decisions should be documented. Appeal procedures should be provided.

- Enforcement standards for noncompliance with these standards should be established.

- Member agencies should develop technical assistance programs which include a guidance manual to be used by facilities in development and implementation of their spill prevention

training programs.

III. Additional Spill Prevention Recommendations for Facilities

A. Work Hour Limitations

- Personnel involved in operational duties which could result in a spill, especially personnel engaged in transfer operations, should not work more than 16 hours in any 24 hour period, or more than 40 hours in any 72 hour period, or more than 72 hours in any period of seven consecutive days.

B. Physical Competency

- Facility owners or operators should institute programs designed to ensure that any person responsible for an activity that might result in a spill receives regular physical exams, is free of substance abuse, and is required to notify his/her supervisor of the use of prescription medications.

- A facility owner/operator should require drug and alcohol tests as soon as practicable after a spill event or when there is reasonable cause for concern.

- A facility owner/operator should conduct random drug and alcohol tests for safety sensitive personnel and assure that quality control procedures for testing are in place.

C. Language Proficiency

- Persons in Charge of oil transfer operations with vessels with multinational crews should be proficient in both English and a language common to the vessel crew, or use an interpreter during the Pre-Transfer Conference.

D. Security and Emergency Procedures

- Facility access should be limited to authorized personnel only.
- As part of a safety and security audit system, trained staff persons should conduct regular and frequent safety and security inspections of the facility. Problem notification procedures should be designated and inspections should be recorded.

- Written emergency procedures should be established by the facility's owner/operator to cover all possible emergency conditions and appropriate actions under such conditions. Such procedures should clearly identify all personnel assignments and duties under emergency conditions, including communications procedures.

- Emergency procedures should be regularly drilled and amended as necessary based upon drill or actual incident experience.

TABLE I: Recommended core topics for minimum training requirements

Core Topic	Operations and Supervisory	Management	Maintenance	Indirect Operations
Overview of all oil handling, transfer, storage, & leak detection or monitoring operations	–	Also, management's role	–	–
Operating procedures and checklists specific to each position	–		–	
Review of Risk analysis and hazard evaluation	–		–	
Recognition of human error risks and problem assessment skills	–	Recognition of human error risks & how to minimize	–	–
Preventive maintenance procedures	–		Also, equipment problem assessment	
Local environmental sensitivity & oil spill impacts	–	–	–	–
Facility's oil spill prevention plan	–	–	–	Only if facility personnel
Facility's operations manual	–	–	–	Only if facility personnel
Facility's spill contingency plan	–	–	–	Only if facility personnel
Decision-making skills, procedures, & responsibilities for handling emergency & abnormal situations	–	–	–	Only if facility personnel
Both routine & emergency communications procedures	–			Notification procedures
Overview of applicable spill laws and regulations	–	–	–	Only if facility personnel
Drug & alcohol use awareness	–	–	–	Only if facility personnel

CHAPTER II

Recommendations for Boat Owners, Marinas, and Boatyards to Prevent Small Oil Spills²

The States/British Columbia Oil Spill Task Force offers the following recommendations to boat owners and to the owners/operators of marinas and boatyards and their employees in order to prevent small oil spills that result from such operations.

Much of the oil spilled into our waters comes from small amounts chronically spilled from sources such as bilges, outboard motors, careless fueling habits, or improper disposal of used oil products. While each small spill may seem insignificant, the cumulative effect is immense and dangerous. Oil, fuel, and hydrocarbons hurt the natural life and the ecological balance in aquatic systems. These products damage marina structures and boats, cause safety problems, and have potentially costly implications associated with fines or remedial actions.

Any discharge of petroleum products to soil, water, sewers, or storm drains is illegal. Marinas also must comply with Clean Water Act requirements for storm water permits, oil spill reporting and cleanup requirements of the Oil Pollution Act of 1990, and nonpoint pollution guidance pursuant to the Coastal Zone Management Act. Following the recommendations listed below will ensure compliance with legal requirements and help protect the environment that the recreational boating public enjoys.

I. Oil Spill Prevention Recommendations to Boat owners:

- Avoid overfilling your vessel's fuel tank.
- Place oil absorbent pads in your bilge; wring them out in approved containers on shore and reuse them if possible.
- Keep engines well tuned.
- Check fuel and hydraulic lines regularly, and keep them secure and protected from chafing, abrasion, or accidental damage. If replacing or repairing hoses, make sure they are the right length (stretching or bending can cause leaks) and that all

² These recommendations were compiled from material produced by the Pacific Oil Spill Prevention Education Team (POSPEET) and its members, which include Fran Recht from the Pacific States Marine Fisheries Commission, who chairs POSPEET; Eric Olsson of the Washington Sea Grant program; Pat Buller of the Puget Sound Keepers Alliance; Bill Herbert and Kevin Fitzpatrick of the U.S. Coast Guard Sea Partners Program; and representatives from the Alaska Department of Environmental Conservation, the British Columbia Ministry of Environment, the Washington Office of Marine Safety and Department of Ecology, the Oregon Department of Environmental Quality, and the California Office of Spill Prevention and Response. These POSPEET members have also been provided with draft copies of these recommendations for their review.

connections are secure before reconnecting.

- Check for leaks if you need to replace oil frequently.
- Use drip pans and absorbent pads when draining oil; use funnels and suitable pumps when transferring or removing fluids.
- Let machinery and fluids cool to relieve pressure before starting repairs.
- To prevent accidental discharges from valves, post a schematic of all fuel and oil systems; label or color-code lines and valves.
- Disable automatic bilge pumps during repairs to prevent accidental discharge of contaminated bilge water.
- Use high quality oil to maximize the service life and reduce the amount of waste oil.
- Recycle used oil and oil filters; keep waste oil separate from oily debris and other fluids, so it can be recycled.
- Learn the location of spill response equipment at your marina and how to use it.
- Know where to dispose of contaminated oil cleanup supplies legally and properly.

II. Oil Spill Prevention Recommendations for the Owners, Operators, and Employees of Marinas and Boatyards:

- Provide means for recycling of used oil and oil filters, as well as for disposal of contaminated oil spill cleanup material. Provide segregated waste oil receptacles to reduce contamination of other wastes.
- Provide bilge pump-out services or information about such services.
- Locate and design fuel stations so that spills can be contained to a limited area.
- Provide spill response equipment such as absorbent pads and containment boom, and provide instructions on its use.
- Any discharge of oil to the ground, storm drains, sewer, or water is illegal. Provide notice to this effect and prohibit visible oil sheens from bilge water discharges.

- Drain fuel and oil tanks and clean bilges prior to vessel haul-outs or movement. If this is not possible, place absorbent pads in bilge spaces.
- Repair all leaking connections, valves, pipes, hoses, and equipment immediately.
- Provide drip pans, absorbent pads, and booms near fuel loading and repair areas.
- Keep repair areas well ventilated and provide sufficient and safe lighting.
- Before starting repairs, clear work area of oil and debris, be sure that engines and fluids have cooled, remove or extinguish all ignition sources, have a serviced fire extinguisher available, relieve pressure from closed fluid systems, drain used oil from equipment, and disengage automatic bilge pumps.
- Fuel nozzles should have automatic back pressure shut-offs.
- Implement effective runoff control strategies, especially around fueling and repair areas.
- Adopt a management policy that encourages employees and boaters to practice pollution prevention; provide spill prevention education through newsletters, billing inserts, classes, or posted notices.
- Encourage boat owners to sign an agreement with the marina to use best management practices such as those listed in Part I above.

CHAPTER III:

Recommendations To Prevent Spills Caused by Human Error for Tankers and Tank Barge Tow Vessels³

To prevent oil spills from tankers or tank barges which are caused by human error, the following standards are recommended:

I. Recommended Management Standards

A. Management Policies and Programs:

- Tanker and tank barge owners/operators should have mission statements, policies, procedures, and practices that demonstrate regular and frequent monitoring of the following: vessel operations; maintenance; personnel orientation, development, and training; health, and safety; human interface with technological improvements; waste management systems including oily wastes; spill investigation procedures; management practices; and the existence of error chains.

- Management should involve and reward all levels of personnel in identifying practices and procedures which reduce risks, should record and respond to near-miss incidents, and should provide for correction of all identified risks.

- Management should provide qualified shore based personnel to provide technical assistance and support for onboard management. The number of such personnel and the range of special technical disciplines should be adequate for the number and range of ship types operated.

- To further ensure links between the company and personnel onboard, a person should be designated ashore who has direct access to the highest level of management. The responsibilities of such a designated person should include monitoring the safety and spill prevention aspects of the ship's operations.

- Spill prevention program benchmarks should be set on an annual basis and performance evaluated against these benchmarks in order to provide for continuous improvement.

- Violations of safety codes should be addressed whether or not they result in an incident or injury; this standard should apply to all levels of personnel.

³ These recommended standards are not intended to apply to a vessel designated in its certificate of inspection as an oil spill response vessel.

- Management policies should require use of redundant safety systems, applying redundancy to both personnel and hardware.

Management

- Such management policies and programs should either be:
 - A. Certified as meeting the standards of:
 - The International Ship Managers Association's Code of Ship Management Standards; or
 - Det Norske Veritas's Safety/Environmental Protection System; or
 - Lloyd's Register's Quality Management System; or
 - The vessels's nation of registry for complying with the IMO's International Safety Management Code; **Or**
 - B. Include the following elements:
 - A policy statement committing management to personnel pollution prevention;
 - An organizational scheme that includes clear lines of authority communication, weekly shipboard safety meetings, an prevention program, and an environmental corrective measures program;
 - Performance measurement programs for management, employees, and agents. Such a program should incorporate both internal and external audit procedures.
 - Vessel visitation policies that require at least quarterly visits by shipboard management and operations, and to provide guidance in correcting problems. Such visits should be recorded in the ship's log.

Notes:

- *U.S. Federal and International standards pursuant to SOLAS require tanker owners and operators to comply with IMO's International Safety Management (ISM) Code by July of 1998. We recommend acceptance of ISM Code certification if external audits are performed by a member of the International Association of Classification Societies. We do not recommend acceptance of certification under the International Standards Organization (ISO) 9002 or 9004 codes because these codes do not include specific safety and environmental protection elements.*

- *The American Waterways Operators Responsible Carrier Program is an acceptable management certification code for tank barge owners and operators.*

- *We note that management system certification is a process which may take a number of years. If a tanker owner or operator has not completed the certification process, the company should describe the certification system being implemented, the company's progress in the system, and the schedule for completion.*

B. Bridge Resource Management for Tankers

- Tankers should use a bridge resource management system which incorporates at least the following standard practices:
 - Defined assignments, duties, goals, objectives, and priorities for each bridge team member covering the following situations:
 - All probable transit conditions (examples: open sea, coastal, restricted waterways, entering and leaving harbors, etc);
 - Emergencies including pollution incidents; and
 - Navigating with a pilot.
 - Clarification of roles and guidelines for communications among members and with pilots. To facilitate coordination with pilots, the vessel master should utilize a checklist which includes at least the following information:
 - Information requested by pilots according to federal (pilot must be informed of the draft, maneuvering characteristics, and peculiarities of the vessel) or state regulation, or standard procedure;
 - Responsibilities of each bridge team member and those with English proficiency; and
 - A passage plan for restricted waterways.
 - Comprehensive passage and voyage planning, including a thorough review of all pertinent navigational publications, plotting of intended courses on current nautical charts, and a pre-voyage meeting of navigation watch personnel to discuss the upcoming voyage.

II. **Recommended Watch Practices**

A. Navigation Watch for Tankers

- The navigation watch should include two licensed deck officers, a helmsman, and a lookout. One licensed deck officer may be a state-licensed pilot in pilotage waters.
- Lookouts should not be assigned other duties, should be posted in safe locations which allow for a full range of sight and hearing, and should have access to rapid and reliable communications with the officer in charge.
- In conditions of restricted visibility as determined and logged by the officer in charge, a total of three licensed deck officers should be used in addition to the helmsman and lookout.
- The names of navigation watch members should be logged in when duties are assumed.

Note: The current IMO/STCW standard calls for the composition of the watch to be adequate and appropriate to the circumstances, to provide for a proper lookout, and not to use the helmsman as a lookout while the helmsman is steering. The U.S. federal standard (33 CFR) requires two licensed deck officers and a helmsman while in U.S. waters. This recommendation for an additional deck officer under conditions of restricted visibility goes beyond federal standards, but only in non-pilotage waters. In pilotage waters a state-licensed pilot counts as one deck officer, so this recommendation is consistent with common practice of most companies which require that the Master and one other licensed deck officer be on the bridge in conditions of reduced visibility.

B. Navigation Watch for Tank Barge Tow Vessels

- The navigation watch for tank barges should consist of at least one licensed deck officer or tow vessel operator.
- When underway under restricted visibility conditions (as determined and recorded by the tow vessel operator), a lookout should also be posted. The lookout should have a full range of sight and hearing, and should have access to rapid and reliable communications with the tow vessel operator.
- The names of navigation watch members should be logged in when duties are assumed.

Note: Recommended standards are consistent with current and proposed federal standards.

C. Anchor Watch for Tankers

- A licensed deck officer should maintain watch from the bridge both while a vessel is being anchored and at least hourly while at anchor.

D. Engineering Watch for Tankers

- While a vessel is maneuvering to embark or disembark a pilot, docking, or anchorage, a licensed engineer should be in the engineering control room, or if the control room is not within the machinery space, in the immediate vicinity of the machinery space's emergency throttle controls.

E. Security Rounds for Tankers

- The vessel master should designate spaces on the vessel to be inspected for safety hazards such as fire hazards, defective machinery or safety equipment, hull or bulkhead integrity, pollution sources, or unsafe crew activities.
- Crew assigned to make security rounds should be provided with training and checklists, and should be instructed to notify the deck watch officer before taking corrective action.
- Such rounds should be recorded in the deck log and should:

- Be conducted every 2 hours, or every 4 hours if the vessel has a functioning automatic fire and flooding detection systems;
- Be logged by the deck watch officer; and
- Be conducted while the vessel is underway, anchored, or moored.

Note: 33 CFR and IMO'S STCW require the officer of the watch to make inspection rounds at appropriate intervals in port. This recommendation varies by defining "appropriate interval," by allowing trained crew members to replace officers of the watch for this duty, and by requiring security rounds while both underway and at anchor.

F. Security Rounds for Tank Barges

- Standards for security rounds for tank barges should be the same as those described above for tankers, except they should also include inspection of towing equipment and navigation lights for both the towing vessel and the barge when safe to do so.

- Moored barges should be inspected if attended by the tow vessel, or comply with 46 CFR § 35.05-15(B) if not attended by the tow vessel.

III. Recommended Emergency Procedures

A. Emergency Procedures for Tankers

- The vessel master should establish written procedures for effective response to the following emergency situations: shipboard fires; collisions and allisions; groundings and strandings; hull breach and structural failure; foundering and abandon ship; person overboard; oil spills; loss of propulsion, steering, electrical power, or throttle control; navigation system malfunction; and hazardous weather conditions.

- The vessel master should maintain written procedures for response to shipboard fires, abandon ship, person overboard, and oil spill response.

- The vessel master should maintain and post crew assignments and duties for emergencies including shipboard fires, order to abandon ship, person overboard, and oil spill response.

Note: International and federal standards require procedures and assignments for fire, abandon ship, person overboard, and oil spill response.

B. Emergency Procedures for Tank Barge Tow Vessels

- The vessel master should establish written emergency procedures should be established for shipboard fires, persons overboard, groundings and strandings, and lost barge retrievals.

Note: Only the recommendation that written procedures be developed for lost barge retrievals goes beyond federal standards.

IV. Recommended Personnel Policies

A. Training and Evaluation

• A comprehensive personnel training program should include at least the following elements:

→ VESSEL ORIENTATION: Newly assigned personnel who have not served on a vessel of the same design for more than 1 year should tour spaces designated by the vessel master and have egress routes identified.

→ POSITION-SPECIFIC REQUIREMENTS:

- Training in management skills for the vessel's master, chief mate, chief engineer, and senior assistant engineer;
- For the vessel's master and other licensed deck officers, training in bridge resource management, automated radar plotting aids and other bridge equipment, navigation, and ship handling;
- For the master and deck officers and licensed engineering officers, crude oil washing* and inert gas systems* (if the ship is so equipped), cargo handling, spill prevention and response, and fire fighting. (* applies to tankers only)
- Unlicensed ratings should also be trained in spill prevention and response and fire fighting. In addition, they should receive training in bridge or systems responsibilities according to their assignments.

→ ALL POSITIONS: Health and safety training; knowledge of cargo; prevention and emergency procedures; company policies & procedures; fire fire fighting.

→ REFRESHER TRAINING: All personnel should receive refresher training at least every 5 years*, including skills evaluation using both oral and written competency testing. (* American Waterways Operators recommended)

→ SHIPBOARD DRILLS FOR TANKERS: The following drills should be conducted and logged as indicated:

- A weekly fire drill;
- A monthly abandon-ship drill;
- Quarterly drills: oil spill response including at-sea lightering, emergency towing, and salvage operations; emergency steering; loss of propulsion; loss of electrical power; general emergency towing; and person overboard.

→ DRILLS FOR TANK BARGES: The following drills should be conducted and logged as indicated:

- Fire fighting and person overboard once per coastal voyage
- Lost Barge retrieval and spill response procedures reviewed once per coastal voyage
- Fire fighting, weekly for inland voyages
- Lost Barge retrieval monthly for inland voyages
- Spill response and person overboard quarterly for inland voyages

- Detailed training records should be maintained either on the vessel or at a central location. Records should cover training required to obtain a license or merchant marine document as well as the training described above. Records should include employee name, training date, training content; hours; and signatures of supervisor, trainer, and employee who received the training. Training records should be made available to state regulators within 72 hours of an official request.

- Vessel masters, chief engineers, and officers should monitor crew fitness for duty and immediately relieve any crew found unfit for duty. For purposes of this standard, crew should report all medical restrictions.

- If assigned to a vessel for more than six consecutive months per year, a crew member should receive an annual performance evaluation which identifies necessary training.

Note: *These recommendations add drills for loss of propulsion and electrical power, emergency towing, and man overboard to federally required quarterly drills. The fitness-for-duty recommendation reflects the international and federal standards, but applies them to all tankers in state waters regardless of flag state ratification of the STCW convention.*

B. Work hours

- Except in an emergency, no crew member should work more than 15 in 24 hours or 36 in 72 hours (administrative duties should be considered work). Drills should not be considered work.

- A licensed deck officer should not assume navigation duties when first departing a berth in state waters unless that officer has been off duty for at least 6 of the prior 12 hours.

Note: *There is no current international standard for work hour limitations in force, although most flag states have established overtime limits. Revisions to IMO's Standards for Training, Certification, and Watchkeeping recommend minimum rest periods, rather than maximum work hours. These recommendations would apply OPA 90 standards to all tankers operating in state or provincial jurisdictional waters, both U.S. and foreign flag. 46 USC 8104(h) limits tow vessel operators to no more than 12 in 24 hours, except in an emergency.*

C. Language Proficiency Requirements for Tanker Personnel

- All licensed deck officers and the vessel's Person In Charge of oil transfers should be proficient in English. Multinational crews should have a common language understood and spoken by both the ships' officers and unlicensed crew.
- All printed material onboard which provides safety, emergency, and operational instructions should be available in a language understood and spoken by the licensed officers as well as unlicensed crew.

Note: *Both the international and U.S. standards require all licensed deck officers to be able to communicate in English with shore stations and other vessels re: navigation. It also requires all watchstanders to be able to communicate with other watchstanders using a common language. This recommendation would also hold persons in charge of an oil transfer to the English proficiency standard, and adds a recommendation that all critical written material be printed in a language commonly used on the vessel.*

D. Physical Competency

- A tanker or tank/barge owner/operator should have an alcohol & drug testing program which assures that any person likely to abuse alcohol or use illicit drugs is not employed.
- A tanker or tank/barge owner/operator should require drug and alcohol tests as soon as practicable after a spill event or when there is reasonable cause for concern.
- A tanker or tank/barge owner/operator should conduct random drug and alcohol tests on personnel in safety sensitive positions and assure that quality control procedures for testing are in place.

Note: *The international standard requires that all watchstanders be fit for duty, and all flag states forbid the use of illicit drugs. The U.S. standard goes further in requiring random drug tests, pre-employment drug tests, and probable cause and post-incident drug and alcohol tests for watchstanders. The recommendations above would go beyond that to require random, pre-employment, probable cause, and post-incident tests for both drug and alcohol for all crew members in safety sensitive positions on all tankers, both foreign flag and U.S.*

E. Personnel Requirements for Tank Barges

- Two personnel, one of which is a certified tankerman, should be on the tank barge during oil transfers if the barge is receiving oil, unless:
 - Unrestricted views of all cargo tank openings are available and the topping off rate is reduced; or
 - The tank barge is equipped with USCG approved overfill devices and the topping off rate is reduced.

- Three licensed officers or tow vessel operators should be on a tank barge tow vessel and available for duty during transit of coastal waters.
- Tow vessels should maintain a list of crew members during transit in a jurisdiction's waters.

Note: *The U. S. federal standard requires only a tankerman during oil transfers.*

CHAPTER IV: Recommendations for Bunkering Operations To Prevent Spills Caused by Human Error

To reduce the frequency of oil spilled during bunkering operations on the West Coast, the Task Force recommends that its member jurisdictions apply the following standards to all bunkering operations to refuel self-propelled vessels of 250 barrel capacity or more:

I. Recommended standards for Receiving Vessels:

A. Pre-Loading Plan:

• The Person In Charge (PIC) for the Receiving Vessel should be responsible to prepare a Pre-Loading Plan in a language common to vessel personnel.

• This plan should be posted in an accessible location where it can be easily read.

- The plan should cover at least the following information:
 - Location and capacity of vessel's bunker tanks;
 - Level and type of fuel in each tank prior to bunkering;
 - Final ullage or innage and percent of each tank to be filled;
 - Sequence in which the tanks are to be filled; and
 - Procedures to monitor tank levels and valve alignments.

B. Training:

• Within 48 hours of the scheduled bunkering operation, the Person In Charge for the receiving vessel should conduct a training session for all personnel with oil transfer duties.

• Such a session should be conducted in a language common to both the PIC and the personnel receiving the training.

• This training session should cover at least the following:

- the pre-loading plan;
- transfer procedures and each person's duties and station;
- penalties and liabilities for noncompliance or for causing an oil spill;
- English phrases and hand signals for communication; and
- emergency shutdown procedures.

• If the frequency of a vessel's bunkering in a jurisdiction's waters makes this requirement redundant and burdensome, the jurisdiction should provide for a variance procedure.

Note: U.S. federal training requirements for PICs can be found in 33 CFR 155.710. 46 CFR 13 describes requirements for tankerman PIC endorsement. Requirements for a Dangerous Cargo certificate is outlined per the IMO Standards for Training, Certification, and Watchkeeping. The recommendations for training within 48 hours of a bunkering operation and for a written pre-loading plan exceed current federal or

international standards.

C. Watchstanders:

- The PIC should designate a person to stand watch at the point-of-transfer at all times during the bunkering operation.
- The PIC should also designate a person to be the deck-rover watch to visually monitor for spills on deck or over the side of the vessel, especially during changing over of tanks or topping off.

Note: Recommendations for a designated deck-rover to watch for spills and for a point-of-transfer watch to monitor the hose connection in addition to the PIC exceed current federal or international standards.

D. Duties and Work Hours:

- Except for the deck-rover, all personnel assigned bunkering duties should perform only those duties while the bunkering operation is in progress and during topping off.
- Personnel may not work more than 15 hours in any 24 hour period nor more than 36 in 72 (administrative duties should be considered work), except in an emergency, spill response operation, or drill.

E. Communication:

- The PIC for the receiving vessel should be responsible to ensure communication with the delivering vessel or facility by voice or visually, using voice, phones, radios, or hand signals.
- The PIC should be responsible to ensure that personnel assigned bunkering duties on the receiving vessel can use and interpret the hand signals for the following commands: stop; hold; okay; wait; fast; slow; finish.
- The receiving vessel PIC should notify the PIC for the delivering vessel or facility immediately before topping off begins.
- The PIC should require that s/he receive sounding reports on tank levels according to the monitoring procedure outlined in the pre-loading plan.

F. Record keeping:

- The receiving vessel master should be responsible to record the following information:
 - date, time, and attendance of training session;
 - that a pre-transfer conference was held;
 - records demonstrating compliance with applicable work hour restrictions.
- The pre-loading plan and declaration of inspection should be retained for 30 days from the date of bunkering.

G. Emergency Procedures:

- If any person discovers oil on deck outside of the containment area, or on the water, or believes that a spill is likely, that person should request immediate shutdown of the bunkering operation.

II. Recommended standards for Delivering Vessels or Facilities:

A. Operational Pre-requisites:

- Before a bunkering operation is initiated, the PIC for the delivering vessel or facility should ensure that:
 - A pre-transfer conference was conducted and a declaration of inspection was discussed and signed by both persons in charge; If the facility's or delivering vessel's PIC is not satisfied with the English proficiency of the receiving vessel's PIC, s/he should request an interpreter.
 - Communication between the vessels, or vessel and facility, is accomplished visually and by voice, telephone, or radio.
 - Procedures for notification of topping off have been discussed by the persons in charge.
 - Access is provided to and from the receiving vessel; and
 - The tankerman meets the certification requirements under 46 C.F.R. subpart 12.20, has received training annually, and is familiar with these standards.

B. Work Hours:

- Personnel involved in bunkering may not work more than 15 hours in any 24-hour period nor more than 36 in any 72 hour period (administrative duties should be considered work) except in an emergency or spill response operation. The PIC of the delivering vessel should be responsible to record compliance with this requirement.

Note: U.S. Federal work hour limits only cover receiving tanker vessels.

C. Emergency Procedures:

- The delivering vessel or facility's personnel should immediately activate the emergency shutdown device at the request of any person on the receiving vessel, or if communication with the receiving vessel is lost.

3. Recommended standards for Both Vessels or Facilities:

A. Pre-transfer Conference:

• Prior to bunkering, the PICs for the receiving vessel and the delivering vessel or facility should hold a pre-transfer conference as required by 33 C.F.R. Section 156.120. The PICs should meet in person unless the vessel master deems it unsafe to do so.

• A person proficient in both English and the common language for the vessel's officers and crew should be present at the conference. The receiving vessel should provide an interpreter at the request of the delivering vessel, the facility, the Coast Guard, or the state or province.

• The Conference should include discussion of the following:
→ the contents of the declaration of inspection;
→ communications procedures to be used when tanks are changed or topping-off begins;
→ emergency shut-down procedures and means;
→ identify the point-of-transfer watch and deck-rover for the receiving vessel;

• If bunkering is from a marine terminal, the PIC for the receiving vessel should ensure that the receiving vessel personnel also comply with the facility's operations manual.

Note: 33 CFR 155.710 (c) & (d) requires the PICs to agree to a common language or use an interpreter fluent in a common language.

B. Access:

• An accommodation ladder or some other means of access should be in place between the receiving vessel and the delivering vessel or facility. Such access should meet the standards in the International Convention for the Safety of Life at Sea, 1974 as consolidated in 1986 (SOLAS).

• If such access is determined by the vessel master to be unsafe due to weather or sea state, communication by radio or other reliable means should be provided instead.

Note: This recommendation for safe access to facilitate face-to-face communication between the PICs exceeds current federal and international standards.