

Ports and Waterways Safety Assessment San Diego Workshop Report

Introduction

A Ports and Waterways Safety Assessment (PAWSA) Workshop was conducted for San Diego, California, on March 12 – 13, 2003. This workshop report provides the following information:

- Brief description of the process used for the assessment
- List of participants
- Numerical results from the following activities
 - Team Expertise
 - Risk Factor Rating Scales
 - Absolute Risk Levels
 - Present Risk Levels
 - Intervention Effectiveness
- Summary of risks and mitigations discussion

Strategies for further reducing unmitigated risks will be the subject of a separate report.

Assessment Process

The PAWSA process is a structured approach to obtaining expert judgments on the level of waterway risk. The process also addresses the effectiveness of possible intervention actions for reducing risk in the waterway. The PAWSA process uses a select group of waterway users / stakeholders to evaluate risk factors and the effectiveness of various intervention actions. The process requires the participation of local Coast Guard officials before and throughout the workshop. Thus the process is a joint effort involving waterway experts and the agencies / entities responsible for implementing selected risk mitigation measures.

This methodology employs a generic model of waterway risk that was conceptually developed by a National Dialog Group on National Needs for Vessel Traffic Services and then translated into computer algorithms by Potomac Management Group, Inc. Because risk is defined as the product of the probability of a casualty and its consequences, the model includes variables associated with both the causes and the effects of vessel casualties.

The first step in the process is for the participants to assess their expertise with respect to the six risk categories in the model. Those self assessments are used to weight the experts' inputs during all subsequent steps. The second step is for the participants to provide input for the rating scales used to assess risk. The third step is to discuss and then numerically evaluate the absolute risk levels in the waterway using pre-defined qualitative risk descriptors. In the fourth step, the participants discuss and then evaluate the effectiveness of existing mitigation strategies in reducing risk. Next, where risk is not well balanced with existing mitigations, the participants are asked to offer new ideas for further reducing risk. Finally, the effectiveness of various intervention actions in reducing unmitigated risk is evaluated.

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Geographic Area:

The participants defined the geographic bounds of the waterway area to be discussed.

- All of San Diego Bay, including the San Diego Entrance Channel out to the sea buoy. Mission Bay was NOT included in this PAWSA.

Numerical Results

Book 1 – Team Expertise

In Book 1, the participant teams were asked to assess their level of expertise compared to the other participant teams in the workshop for each of the six categories in the Waterway Risk Model. Overall, 54% of the participant teams placed themselves in the upper third, 33% in the middle third, and 13% in the lower third of all teams. This is typical of most PAWSA participants – they were invited to the workshop because of their acknowledged expertise and consequently rate themselves highly in the waterway risk model knowledge areas.

Book 2 – Risk Factor Rating Scales

Risk Factor	A Value	B Value	C Value	D Value
Vessel Quality	1.0	3.0	5.6	9.0
Deep Draft Mariner Proficiency	1.0	2.9	5.6	9.0
Shallow Draft Mariner Proficiency	1.0	3.1	5.7	9.0
Recreational Boater Proficiency	1.0	3.1	5.7	9.0
Volume of Commercial Traffic	1.0	3.0	5.3	9.0
Volume of Recreational Traffic	1.0	2.9	6.0	9.0
Traffic Mix	1.0	2.3	4.8	9.0
Congestion	1.0	2.8	5.1	9.0
Winds	1.0	2.5	5.2	9.0
Currents	1.0	2.7	5.0	9.0
Visibility Restrictions	1.0	2.9	5.7	9.0
Obstructions	1.0	2.0	4.5	9.0
Visibility Impediments	1.0	3.1	5.5	9.0
Dimensions	1.0	3.0	5.6	9.0
Bottom Type	1.0	2.5	5.3	9.0
Configuration	1.0	2.8	5.3	9.0
Personal Injuries	1.0	3.0	5.6	9.0
Petroleum Discharge	1.0	3.4	6.1	9.0
Hazardous Materials Release	1.0	3.3	6.0	9.0
Mobility	1.0	3.0	5.3	9.0
Health and Safety	1.0	2.9	5.4	9.0
Environmental	1.0	3.0	5.8	9.0
Aquatic Resources	1.0	2.9	5.5	9.0
Economic	1.0	3.0	5.7	9.0

Analysis:

The purpose of Book 2 is for the participants to provide input to the national risk assessment scales for the 24 risk factors in the waterway risk model. For each risk factor there is a low (Port Heaven) and a high (Port Hell) severity limit, which are assigned values of 1.0 and 9.0 respectively. The participants determined numerical values for two intermediate qualitative descriptions (the B and C values shown above) between those two extreme limits. On average, participants from this waterway evaluated the difference in risk between the lower limit (Port Heaven, A value) and the first intermediate scale point (B value) as being equal to 2.0; the difference in risk between the first and second intermediate scale points (C value) was equal to 2.6; and the difference in risk between the second intermediate scale point and the upper risk limit (Port Hell, D value) was 3.4.

Book 3 – Risk Assessment

Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personal Injuries	Health and Safety
3.5	4.3	1.1	3.2	8.3	3.3
Deep Draft Mariner Proficiency	Volume of Recreational Traffic	Currents	Dimensions	Petroleum Discharge	Environmental
2.1	7.1	2.3	4.1	5.7	4.3
Shallow Draft Mariner Proficiency	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Materials Release	Aquatic Resources
3.7	4.8	2.2	5.1	1.0	4.6
Recreational Boater Proficiency	Congestion	Obstructions	Configuration	Mobility	Economic
7.0	5.1	3.4	5.7	8.1	5.8

Legend:

A green highlight indicates that participants rated the factor risk less than or equal to 2.3. A red highlight indicates that participants rated the factor risk more than 7.7.

Analysis:

The participants evaluated the absolute risk level in the waterway by selecting a qualitative descriptor for each risk factor that best described conditions in the San Diego area. Those qualitative descriptors were converted to numerical values using the scales from the Book 2 results. On those scales, 1.0 represents low risk (Port Heaven) and 9.0 represents high risk (Port Hell), with 5.0 being the mid-risk value. In the San Diego area, 8 of the 24 risk factors were scored at or above the mid-risk value. They were (in descending order):

- Personal Injuries (8.3)
- Mobility (8.1)
- Volume of Recreational Traffic (7.1)
- Recreational Boater Proficiency (7.0)
- Configuration (5.8)
- Petroleum Discharge (5.8)
- Economic (5.8)
- Bottom Type (5.2)
- Congestion (5.1)

Book 4 – VTM Tool Effectiveness

Vessel Conditions		Traffic Conditions		Navigational Conditions		Waterway Conditions		Immediate Consequences		Subsequent Consequences	
Vessel Quality		Volume of Commercial Traffic		Winds		Visibility Impediments		Personal Injuries		Health and Safety	
3.5	2.5	4.3	3.5	1.1	1.1	3.2	3.7	8.3	5.5	3.3	3.0
OK		OK		OK		RISING		OK		OK	
Deep Draft Mariner Proficiency		Volume of Recreational Traffic		Currents		Dimensions		Petroleum Discharge		Environmental	
2.1	1.9	7.1	6.8	2.3	1.9	4.1	3.5	5.7	3.6	4.3	3.7
OK		OK		OK		OK		OK		OK	
Shallow Draft Mariner Proficiency		Traffic Mix		Visibility Restrictions		Bottom Type		Hazardous Materials Release		Aquatic Resources	
3.7	3.0	4.8	4.8	2.2	2.2	5.1	4.3	1.0	1.0	4.6	3.7
Maybe		OK		OK		OK		OK		OK	
Recreational Boater Proficiency		Congestion		Obstructions		Configuration		Mobility		Economic	
7.0	5.8	5.1	4.6	3.4	2.6	5.7	5.0	8.1	6.4	5.8	4.9
Maybe		OK		OK		OK		Maybe		OK	

KEY	
Risk Factor	
Book 3	Book 4
Consensus	

Book 3	Absolute level of risk
Book 4	Level of risk taking into account existing mitigations
OK	Consensus that risks are well balanced by existing mitigations
Maybe	No consensus that risks are adequately balanced by existing mitigations
NO	Consensus that existing mitigations do NOT adequately Balance risk
RISING	Mitigated risk level judged to be HIGHER than absolute risk level

Analysis:

The participants examined all risk factors and the effects of existing mitigations on those risks in the San Diego area. For 20 risk factors, the participants were in consensus that the risk was well

balanced by existing mitigations. Consensus is defined as 2/3 of the participant teams being in agreement. For 1 risk factor, there was consensus that risks were NOT adequately balanced by existing mitigations because of anticipated future events that will increase the risk level. For the other 3 risk factors, there was not good consensus on whether existing mitigations adequately reduced risk.

Book 5 – Intervention Effectiveness

Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personal Injuries	Health and Safety
OK	OK	OK	Waterway Changes	OK	OK
			1.9		
Deep Draft Mariner Proficiency	Volume of Recreational Traffic	Currents	Dimensions	Petroleum Discharge	Environmental
OK	OK	OK	OK	OK	OK
Shallow Draft Mariner Proficiency	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Materials Release	Aquatic Resources
Rules & Procedures	OK	OK	OK	OK	OK
1.0					
Recreational Boater Proficiency	Congestion	Obstructions	Configuration	Mobility	Economic
Rules & Procedures	OK	OK	OK	Waterway Changes	OK
2.7	Caution			2.2	

KEY

Risk Factor	Intervention	Intervention category which was judged most effective in further mitigating risk
Intervention	Risk Improvement	Expected improvement in risk level if new mitigation measures were implemented
Risk Improvement	Caution	No consensus alert

Legend:

The intervention category listed is the one participant teams choose most for further reducing risks. The Risk Improvement is the perceived reduction in risk when taking the actions specified by the participants. A green **OK** indicates that no intervention is needed and risk is balanced in the waterway, and a yellow **Caution** indicates that there was a difference between the most effective category and the category most selected by the participants for action. Intervention category definitions are:

Coordination / Planning	Improve long-range and/or contingency planning and better coordinate activities / improve dialogue between port stakeholders
Rules & Procedures	Improve rules, regulations, policies, or procedures (nav rules, pilot rules, standard operating procedures, licensing, RNAs, etc.)
Enforcement	More actively enforce existing rules / policies (navigation rules, vessel inspection regulations, standards of care, etc.)
Nav / Hydro Info	Improve navigation and hydrographic information (PORTS, BNTM, charts, coast pilots, AIS, tides & current tables, etc.)
Communications	Improve communications (radio reception coverage, signal strength, reduce interference & congestion, etc.)
Active Traffic Mgmt	Establish/improve a Vessel Traffic Service (info, advice & control) or Vessel Traffic Information Service (information & advice only)
Waterway Changes	Widen / deepen / straighten the channel and/or improve the aids to navigation (buoys, ranges, lights, LORAN C, DGPS, etc.)
Other Actions	Risk mitigation measures needed do NOT fall under any of the above strategy categories

Analysis:

For 3 of the 4 risk factors needing additional risk reduction action, the most selected intervention category had the largest risk improvement:

- Shallow Draft Mariner Proficiency – Rules & Procedures
- Visibility Impediments – Waterway Changes
- Mobility – Waterway Changes

One consensus alert occurred because the most selected category was not the most effective category. No consensus was reached, but the intervention category selected possibly offering the most risk improvement was:

- Recreational Boater Proficiency – Rules & Procedures

RISKS	RISK MITIGATION STRATEGIES
Vessel Conditions: Vessel Quality	
Today: • Deep Draft: ○ Subchapter T boats are generally of 1960's construction. ○ Most foreign vessels are regular visitors and in good condition. Few Port State Control (PSC) violations—low compared to the national average. Occasional problems with vessels that do not regularly call in the port. Very few flags of convenience visit the port. • Shallow Draft: ○ Most are regular visitors and are inspected. Vessels from Mexico are not inspected and are in worse condition. ○ Most U.S. vessels at G Street marina are in good shape, with exception of old tuna fleet. ○ Uninspected passenger vessels carrying less than 6 passengers are in good shape. ○ Several vessels that have been impounded (i.e., drug seizures or bank reposessions) are in bad condition. • Recreational boats generally are in good condition, particularly in affluent areas like Chula Vista. • Coast Guard identifies approximately 3-4 derelict vessels per week in anchorages. 1 per month found near Anchorage A8. Trends: • No trends discussed.	Existing Mitigations: • San Diego Harbor Safety Committee. • Commercial Vessels: ○ Regulations / inspections. Level of regulation / inspection increases with size of vessel. ○ PSC program. ○ Commercial fishing vessel inspections. ○ Uninspected vessel examination program. ○ Coast Guard targets high risk vessels for inspections. ○ Tank vessel examinations done offshore. ○ High interest vessel boardings (Section 415 boardings). ○ Classification society inspections. ○ International Safety Organization (ISO) programs. ○ International conventions (SOLAS, STCW, etc.) • Recreational Vessels: ○ Recreational vessel safety checks by Coast Guard Auxiliary and Power Squadron. 800 inspections annually. ○ Some marinas require boats to be inspected before renting a slip in that marina. ○ Factory inspection program for recreational vessels. ○ Yacht clubs require vessel inspections to participate in certain marine events. • Harbor Police boardings. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Vessel Conditions: Deep Draft Mariner Proficiency	
Today: • Generally mariners are proficient. • Typically, there are language challenges with foreign masters, including foreign naval vessels, which are not required to have pilots. Some near miss situations due to language barriers. Trends: • Dramatic improvement in the last decade. International regulations have been the catalyst. International Maritime Organization (IMO) and class societies--more stringent requirements for training and licensing.	Existing Mitigations: • Mandatory pilotage requirements for commercial vessels over 300 tons. • U.S. pilots board foreign naval vessels whenever possible. • Assist tug requirements (depending on vessel characteristics). Most freight vessels use tugs. • Sea marshals support pilots. • California law prohibits boating under the influence only for helmsman, not other safety related personnel on a vessel. Currently working to change law to apply to anyone in safety related position. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Vessel Conditions: Shallow Draft Mariner Proficiency	
Today: • High level of inexperience due to the large number of entry level mariners. • Licensing standards are too low. Training is focused on test taking, not on developing boat handling skills. • Commercial fishing season (May – Sept.) Problem with chronic fatigue for commercial fishing vessel personnel. Results in higher marine casualties during fishing season (July and August) • Sport fishing charter vessels tend to be assertive in navigation and do not comply with Rules of the Road. Trends: • No trends discussed.	Existing Mitigations: • STCW training requirements. • ISO requirements. • Coast Guard licensing standards. • Commercial vessel in-house training programs. • Commercial fishing: high experience levels. • Vessel owners have implemented higher internal standards for mariners (e.g., requiring 1600 ton license to operate 100 ton boat). New Ideas: • More stringent licensing requirements for the introductory licenses levels. Implement tests requiring practical demonstration of skills. Establish more stringent sea time requirements. • Increase Coast Guard investigations / follow up. Share information as lessons learned. • Better in-house training / mentoring under vessel captains to develop less experienced personnel.

RISKS	RISK MITIGATION STRATEGIES
Vessel Conditions: Recreational Boater Proficiency	
Today: • Most recreational boaters comply with Rules of the Road, particularly boaters who dock their boats at marinas. Significantly less compliance by those who do not dock at marinas (i.e., trailer sailors)—they come from outside immediate boating area and do not get boating news or education, and often do not carry appropriate boating equipment (e.g., charts). • Some recreational boats operate too close to commercial vessels (i.e., along side or do not yield right of way)—a result of curiosity or lack of knowledge. Particularly problematic with sailboats. • Many recreational boaters are renters and lack boating experience or education. • Difficult to prosecute Rule 9 Violations: ○ Requirement for clear identification of fault. ○ Requirements for witness to identify the vessel operator. Trends: • Less than 20 documented recreational boat accidents per year, including those involving boating under the influence.	Existing Mitigations: • Coast Guard and pilots association have educational programs including ride-alongs for recreational boaters. • Harbor Safety Committee (HSC) education subcommittee teams with marinas to promote boating safety. • Rental boat marinas' safety programs—require checkouts prior to on water operations. • Mentoring programs at some marinas for new and less experienced boaters—increases boater education and monitors boat maintenance. • Coast Guard Auxiliary and Power Squadron safe recreational boater courses (classroom and on-line) and boater outreach programs. • Coast Guard boardings resulting from Rule 9 violations—provide opportunity for education. • Presence of Harbor Safety Police: education outreach and prosecution of misdemeanor violations. Typical outcome is requirement for boater education. New Harbor Police Station. • Coast Guard MSO San Diego Boating Information Center. • San Diego Marine Information System (SDMIS) website provides harbor information, charts, weather information, etc. New Ideas: • Increase education / outreach beyond the waterfront, particularly for recreational boaters that do not live near the Bay. Television education campaign in surrounding counties, etc. • Mail CA boater regulations / laws with boat registrations. Distribute information to boaters visiting from outside CA. • Increase educational opportunities at marinas and rental boat operations.

RISKS	RISK MITIGATION STRATEGIES
Traffic Conditions: Volume of Commercial Traffic	
Today: • Volume of commercial traffic is generally not a problem. Most traffic is going in the same general direction (i.e., very few convergences). Rarely any delays due to volume. • Volume of commercial traffic relatively low compared to recreational traffic. • Deep Draft: ○ Navy vessels—in 2002, average 240 vessel movements per month (3,068 per year). ○ Commercial vessels—40-50 vessel movements per month. ○ Pilots—average 4 vessel movements per day. • Shallow Draft: ○ Most shallow draft vessel movements from 5 p.m. to midnight. ○ Shallow draft passenger vessels—40,000 movements / year. ○ Charter fishing vessels—45 vessel movements / day during peak season. ○ Commercial tugs—20-30 vessel movements / day. Two tugs typically required for deep draft vessel movements. ○ Navy –1,200 inner harbor movements / year. Trends: • Cruise ships transits increasing (from 120 to 150 / year). • Navy transits increased by 1,000 (from 2000-2003) due to deployments and other pre-deployment preparations / activity.	Existing Mitigations: • Deep Draft: ○ Harbor movement plans published daily by the Navy and pilots. ○ Navy and pilots communicate by radio (Channel 12) to deconflict vessel movements. ○ Escort vessels clear navigation channels for deep draft vessels • Shallow Draft: ○ Defer to deep draft vessels—can maneuver outside channel, if necessary. ○ Shallow draft passenger vessels run outside navigation channel 95% of time. ○ Pilots hired for non-local masters. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Traffic Conditions: Volume of Recreational Traffic	
Today: • 17,000 -18,000 registered boats in San Diego County. • 8,000 boats in San Diego Bay marinas. • Year around boating. Highest volume on weekends and holidays. • Marine Events: Fleet week, Parade of Lights, 4th of July, 2-3 regattas on the weekends. • Wednesday night “Beer Can” races do not require permit. • Heavy volume of sailboats, often in the navigation channels. • During tuna fishing season, 50-200 private vessels a day. Trends: • No trends discussed.	Existing Mitigations: • Recreational Vessels: - o Comprehensive plan / calendar published in <i>The Log</i> to facilitate coordination of marine events location, date, and time. - o Coordination of commercial transits with large, scheduled marine events. - o Marine event permitting process. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Traffic Conditions: Traffic Mix	
Today: • Multi-use waterway. • Conflicts occur with recreational boaters and commercial traffic. • Rule 9 violations are prevalent. Typically do not result in marine casualties, but in near misses. • Recreational boaters often lack situational awareness and understanding of commercial vessel maneuvering capabilities. ○ Commercial vessels use danger signals daily. ○ Recreational boaters do not yield to ferries and other shallow draft passenger vessels, which have limited maneuverability and stopping capability. ○ Recreational boaters lack awareness of tug / tow relationship. • Kayaks, sail boats, paddle boats, dinghies do not display lights when navigating at night. Particularly problematic for shallow draft passenger vessel transits to Coronado and commercial fishing vessels. Several close calls, but no reported marine casualties to date. Trends: • Downward trend in accidents. • Increasing numbers of recreational boaters in the Bay.	Existing Mitigations: • Yacht clubs monitor / police recreational boating events to reduce Rule 9 violations. • Mission Bay is alternate area for kayaks, jet skis, and other recreational boat activity. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Traffic Conditions: Congestion	
Today: • 30-40 marine events / year. Most are small. Only 10 require Coast Guard marine event permits each year. • Significant congestion during large marine events: Parade of Lights, sailing of the Star of India, Beer Can Races. • Most marine events are outside of the bay—often in Mission Bay. • Recreational activity / traffic in the vicinity of Buoy 15 moved to Buoy 17 because of interference with restricted waters. • Less navigation area available due to increasing number of restricted areas. • Most incidents and Rule 9 violations occur: ○ South of Ballast Point due to the narrow channel width and limited maneuverability due to strong currents. ○ Northwest of North Island due to restricted navigational channel and limited maneuverability due to winds. Trends: • Likelihood of increasing commercial traffic in the Bay.	Existing Mitigations: • No existing mitigations discussed. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Navigational Conditions: Winds	
Today: • Winds are generally predictable. • Winds rarely exceed 20 knots. • Cross channel winds: - o 12-16 knots near Ballast Point. - o Sweetwater Channel. - o Point Loma. • Occasional south winds from Point Loma to Shelter Island, which cause higher sea conditions in entrance channel. • Santa Anna winds are significant, but generally predictable several days in advance. • Lack of consistent wind is problematic for recreational sailboats navigating near channel. Trends: • No trends discussed.	Existing Mitigations: • SDMIS provides real time weather information. Sensors in three locations: National City, Ballast Point, 10th Avenue Terminal. Available on the web: www.sdmis.org . Maintained by the Port Authority and other port stakeholders. New Ideas: • No new ideas discussed.
Navigational Conditions: Currents	
Today: • Tidal currents are predictable. • Maximum current speed is up to 5 knots near Ballast Point, which causes some congestion; however, general maximum speed in the rest of the Bay is 2 knots. • Significant eddy near Ballast Point. • Cross current at G Street slips, submarine base, and 10th Ave (piers 10-2 and 10-7), cruise ship terminal, and past Buoys 7 and 8, (current set to the east). Trends: • No trends discussed.	Existing Mitigations: • SDMIS provides real time current information. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Navigational Conditions: Visibility Restrictions	
Today: • Morning fog daily until 10 a.m. • Fog density increases during winter and fall. • Fog reduces visibility less than 5% of time. • Afternoon fog sometimes occurs in South Bay. • Problem with recreational boaters / fishers tying up to buoys during mornings. Difficult for pilots to distinguish buoys from boaters. Trends: • Increasing fog in Southern CA.	Existing Mitigations: • All commercial vessels equipped with radar; 50% of recreational vessels so equipped. • Coast Guard imposes 3 mile visibility requirement for commercial vessels with inoperable radars to enter harbor. • Fog horns near Point Loma, Ballast Point, and Coronado Bay Bridge. • Coast Guard radio broadcasts during times of limited visibility. New Ideas: • No new ideas discussed.
Navigational Conditions: Obstructions	
Today: • Recreational crab / lobster pots near Harbor and Shelter Islands, Ballast Point, and outside Bay on the Zuñiga shoal. • Construction debris. Trends: • No trends discussed.	Existing Mitigations: • Good radio communication by mariners to port authorities (i.e., Port Authority, Coast Guard, Harbor Police) and other mariners regarding debris. • Quick response by authorities to remove debris / clear obstructions. - o Port Authority owns two boats to collect debris. - o Harbor Police react to debris reports. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Waterway Conditions: Visibility Impediments	
Today: • Front range light off Shelter Island is misaligned resulting in vessels on the range being outside main navigation channel near Buoy 5 inbound San Diego Bay. • A tree is starting to block range light. Property is maintained by the City of San Diego. • Proposal to moor retired aircraft carrier MIDWAY near cruise ship terminal; position could impede visibility for excursion vessels and cruise ships departing piers. • Buoy 17 is frequently hit by recreational boaters. • Background lights problematic ○ From G Street pier to Shelter Island. ○ East side of Ballast Point (make buoys difficult to see for smaller vessels). ○ Navy fuel pier lights obscure buoys. ○ Coronado City lights (when coming around from the west side of Point Loma). • Limited visibility from G Street pier into navigational channel. • Some commercial vessels show excessive lights. Trends: • Increasing number of background lights for security purposes.	Existing Mitigations: • Coastal Commission ordinances restrict construction that impedes navigation visibility. New Ideas: • Realign range lights. (Coast Guard plans to replace current light with sector light). • Study options to improve visibility of buoy lights; e.g., increase intensity of lights (particularly from Buoy 5 northward). • Minimize background lighting. Shield street lights. Enforce local ordinances for lighting. • Redirect lights at Navy fuel pier. • Require commercial vessels to turn off extra lights. • Examine options for addressing reduced visibility from the proposed location of the MIDWAY: ○ Review navigation risks of proposed location(s) using existing simulator data. ○ Install buoy off Midway stern to provide vessels departing the pier with adequate space for converging with channel traffic. ○ Ensure diligent broadcasts of underway activity to compensate for reduced visibility. Sound three short blasts before departing pier to alert channel traffic. ○ Require Automatic Identification System transmitters on shallow draft commercial vessels. ○ Relocate excursion vessels to north side of pier. • Coast Guard is examining options to install cameras throughout Bay that can be available to pilots via the web to assist with situation awareness.

RISKS	RISK MITIGATION STRATEGIES
Waterway Conditions: Dimensions	
Today: - Channel is 800 ft. wide until Buoy 15, and then decreases to 600 ft. afterward. However there is deep water outside the channel in many places. - Security zones: - Extend from the shore to the navigational channel. Navigation channel seems constricted near Navy carrier pier. - Security zone barriers are inside security zones. - Restricted area near Navy carrier pier goes into navigational channel—prevents vessels from stopping in the area. - Widest Navy carrier is 140 ft. beam at water lines / 250 ft. at deck. Most freight vessels are not deep draft and can yield to Navy vessel in the channel (except between restricted areas north of Ballast Point). - Coronado Bay Bridge can be a choke point for traffic. Pilots recognize outbound and inbound channels under bridge, most other vessels do not. - Degaussing range limits depth of channel near Ballast Point. - Previous attempts to straighten / widen channel at Buoy 16A were ineffective due to hard bottom. - Submerged jetties off North Island near degaussing range restrict channel width. Trends: - No trends discussed.	Existing Mitigations: - Current U.S. Army Corps of Engineers (USACE) studies for channel depth; no studies planned on channel width. - Aids to Navigation (ATONs). New Ideas: - No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Waterway Conditions: Bottom Type	
Today: - Bottom is composed primarily of mud and sand, with only a few hard bottom locations: - Buoy 16A (west of North Island). - Submerged jetty near Point Loma. - Point Loma. - Gas line on bottom exposed near Coronado Bay Bridge. Trends: - No trends discussed.	Existing Mitigations: - Dredging. - USACE conducts annual bottom surveys of channel. - National Oceanic and Atmospheric Administration (NOAA) completed comprehensive harbor survey 2 years ago. Revised charts to be release soon. - Port Authority take pier soundings annually. New Ideas: - No new ideas discussed.
Waterway Conditions: Configuration	
Today: - Areas of convergence: - Shelter Island (recreational and commercial fishing vessels). - Gloretta Bay. - North of Ballast Point (bait barge and submarine traffic). - Ferry operations from cruise ship terminal to Coronado. Trends: - No trends discussed.	Existing Mitigations: - Good visibility across North Island at bend. - Published transit schedules (ferries, cruise ships). - Bridge to bridge radio communication: - Commercial and Navy vessels use Channels 12 and 77. Channels are clear. - Small tug vessels use Channels 13 and 16. - Recreational vessels use Channel 16 (very busy on weekends). - Radio checks done primarily on Channel 9. - Biggest challenge is commercial to recreational communication. Most sailboats do not use/monitor radio. - ATONs. New Ideas: - No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Immediate Consequences: Personal Injuries	
Today: • Cruise ship capacity: 3,000 people. • Naval vessel capacity: 5,000 people. • Small passenger vessels: 1.2 million passengers / yr. Dinner cruise vessel capacity: 10-500 people. • Charter fishing vessel maximum capacity: 100 people; however most carry significantly fewer people. • Oceanside / San Diego ferry capacity: 149 people. • 4 Subchapter K boats (more than 150 passengers). Trends: • No trends discussed.	Existing Mitigations: • Mass Rescue Plan. • Burning ship plan—exercised every 3 years. Integrates all local emergency response personnel. • Fire departments and Coast Guard tour cruise ships monthly. • Mandatory drill requirements for cruise ships (man overboard and fire drills). • Subchapter T and K boats drill monthly (evacuation and fire). • Immediate availability of marine response assets: ○ Coast Guard Search & Rescue (SAR) small boats and helicopters. ○ Navy tugs. ○ Harbor Police. • Readiness / willingness of shallow draft commercial vessel industry to assist in marine response. • Cruise ship vessel design standards. • Narrow waterway / close to shore—facilitates response and recovery and provides options for voluntary grounding. New Ideas: • Formalize plan to incorporate shallow draft commercial vessels into response efforts.

RISKS	RISK MITIGATION STRATEGIES
Immediate Consequences: Petroleum Discharge	
Today: • Primary products: JP5, diesel fuel, and automobile gas. • Fuel barges: ○ Average capacity: 150,000 bbls. ○ Transit to 10th Avenue Terminal. Inner harbor transits to cruise ship terminal, National City Terminal, and ship yards. • Navy tankships / charters ○ Average capacity: 30,000 tons. ○ Transit to Navy fuel pier. ○ Transit to National City terminal (not fully loaded—not to offload). Trends: • Increasing movement of petroleum barge traffic with more cruise ship activity and freight vessels.	Existing Mitigations: • Area Contingency Plan. ○ Updated in 2000. Currently being revised. ○ Regularly exercised. ○ Requires use of Incident Command System (ICS). Important to integrate shoreline clean up. Ability to respond to worst case discharge—can be done, would strain resources. • PREP drill for worst case discharge (Feb 2002). • CA requirements for unannounced drills. Exceeds national standards. • Navy: ○ Primary consumer of fuel in the bay. ○ Ceased practice of topping off tanks while in the bay to reduce the number / volume of spills. ○ Navy Facility Reponse Team. ○ Navy is single largest oil spill response organization (OSRO). 85 trained responders spread throughout the bay. Training and equipment focuses on containment. Less focus on shoreline clean up. • 6 OSROs in San Diego area. (4 active, 2 others can be activated). • Coast Guard Pacific Strike Team. • MSRC located in LA/LB. • 6 or 8 other OSROs could respond within 24 hours. New Ideas: • No new ideas discussed.

RISKS	RISK MITIGATION STRATEGIES
Immediate Consequences: Hazardous Materials Release	
Today: • No HAZMAT transported in bulk. Trends: • No trends discussed.	Existing Mitigations: • No existing mitigations discussed. New Ideas: • No new ideas discussed.
Immediate Consequences: Mobility	
Today: • Most vulnerable areas: ○ Ballast Point – narrow channel. ○ Coronado Bay Bridge—would significantly affect mobility of South Bay and restrict operations of Navy Pacific Fleet with significant national security implications. ○ Navy fuel piers. Maximum most probable discharge 100,000 gallons. Trends: • No trends discussed.	Existing Mitigations: • Local salvage capabilities: ○ Port Readiness Committee and Coast Guard are discussing local commercial salvage capabilities. ○ Navy floating cranes within the port. • Non-local salvage resources: ○ LA/LB private salvage contractors available within hours ○ Navy SUPSAL located at Port Hueneme. • Navy oceangoing tugs regularly call in San Diego. • Due to strategic nature of waterway for Naval operations, anticipate that all resources would be made available for emergency salvage operations under federal direction if waterway were closed due to a marine casualty. New Ideas: • Study options to create a second channel into south bay through Silver Strand. • Widen channel at Ballast Point by removing submerged jetties to provide more navigation options for a partial channel restriction due to a marine casualty.

RISKS	RISK MITIGATION STRATEGIES
Subsequent Consequences: Health and Safety	
Today: • Catastrophic discharge could affect 100,000 people. • Fumes from large oil spill could affect residents near Point Loma (fuel barges) and Coronado Bay Bridge (10th Street / Navy piers). • Gas lines, power lines, Coronado water pipeline vulnerable in navigation channel near G Street Pier. • Navy Bravo Pier: Ordinance explosives handling. No military explosive cargo loading. Blast distance within Navy facilities. Trends: • No trends discussed.	Existing Mitigations: • City of Coronado evacuation plan. • Rapid dissemination of information by news media. • Unified HAZMAT team (San Diego City and County, Coast Guard, etc.) Immediate response teams to determine level of threat. New Ideas: • Improve coordination of federal and municipal emergency incident command system.
Subsequent Consequences: Environmental	
Today: • Environmentally sensitive areas: variety of endangered species-bird nesting areas, marine turtles: ○ High concentrations of bird activity near Ballast Point degaussing area. ○ South Bay. ○ Sweetwater National Wildlife Refuge. ○ Near National City powerplant. ○ Otay River. • High recreational use areas: Shelter Island, Harbor Island, Chula Vista, Embarcadero, Gloretta Bay. • Various scenarios of radiological release from Navy nuclear powered vessels. Trends: • No trends discussed.	Existing Mitigations: • ACP addresses: ○ Response. ○ Public notification and education. ○ ICS activation (required). ISC demonstrated effective during Super Bowl events. ○ High level of Navy training, prevention and contingency planning in the case of radiation discharge. Addresses short and long term impacts on population, environment, and the economy. New Ideas: • Better coordination between Navy and community on radiation preparedness / response.

RISKS	RISK MITIGATION STRATEGIES
Subsequent Consequences: Aquatic Resources	
Today: - Recreational harvesting is heavy year round: halibut, sand bass, white sea bass, and lobster. - No commercial fishing within the bay. - Municipal fishing piers off Shelter Island, near convention center, and Coronado. Trends: - No trends discussed.	Existing Mitigations: - Spill response mechanisms in place. - Natural Resource Damage Assessment. - San Diego will not use dispersants inside the Bay. New Ideas: - No new ideas.
Subsequent Consequences: Economic	
Today: - Port closure would primarily have regional economic impacts: - National City Terminal: Receives 20 auto carrier vessels / month (300,000 automobiles / year.) — highest number on west coast. Suspended shipments would impact automobile sales and rail and trucking industries. - Tourism; sport fishing (high season). - Cruise ships. - Sand (for construction). - Shipyards. - Port closure would affect readiness of U.S. Navy Pacific Fleet and would have national implications for security. Trends: - Little history of port closure: 1970s closure due to hurricane. 9/11 closure. 2002: 15 day labor strike shutdown.	Existing Mitigations: - Coast Guard sensitivity to port closure to ensure movement of commerce. - Alternative ports for cruise ships and cargoes. Most cargoes are imports (vs. exports) so commodities would be shipped to other ports. - Navy has ability to install temporary piers on Silver Strand. - Contingency plan for port closure. New Ideas: - No new ideas discussed.