

U.S. Department
of Transportation

United States
Coast Guard



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Activities New York

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16000
DeepDraft 10-00
August 07, 2000

George G. Sharp, Inc.
Attn: Charles Barker
Senior Engineer
635 Slaters Lane
Suite 200
Alexandria, VA. 22134

Subject: NEW CONTRUCTION

References: (a) Your letter July 14, 2000
(b) Title 46, U.S. Code of Federal Regulation, Part 199.210(b)
(c) Title 46, U.S. Code of Federal Regulation, Part 199.630(f)

We have reviewed your Safety Assessment, submitted with ref (a), and find that it provides a satisfactory alternative to the installation of primary lifesaving gear per provisions of refs (b) and (c). Your volumes are returned marked "examined."

Final approval for risk reducing features in lieu of carrying primary lifesaving gear will be determined after reviewing crew training and witnessing safety drills. Please feel free to contact Ken Concepcion of my staff at (718) 354-4289) if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "R. E. Bennis".

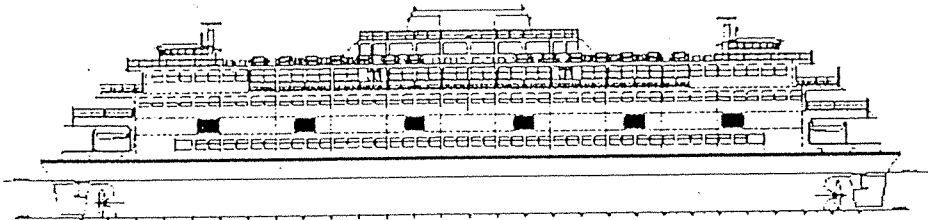
R. E. BENNIS
Captain, U.S. Coast Guard
Commanding Officer, Activities New York

Enclosures: New York City Ferry Safety Assessment (6 copies)

NTSB 02189

GEORGE G. SHARP, INC.

NEW YORK CITY FERRY SAFETY ASSESSMENT



Developed for the New York City Department of Transportation
by
George G. Sharp, Inc.

EXAMINED
U.S. COAST GUARD
SUBJECT TO COMMENTS IN
COMMANDER, COAST GUARD ACTIVITIES
NEW YORK LETTER OF

07/10/00 02/Draft 10-00

Kenneth R. Conception

BY DIRECTION OF THE
OFFICER IN CHARGE, MARINE INSPECTION NY
212 COAST GUARD DRIVE
STATEN ISLAND, NY 10305

June 2000

NTSB 02190

Section 1, Introduction

1.1 References:

- (a) 46 CFR Subchapter W, Lifesaving Systems for Certain Inspected Vessels
- (b) NVIC 1-97, Shipboard Management and Contingency Plans for Passenger Vessels
- (c) 46 CFR Subchapter H, Passenger Vessels
- (d) NVIC 9-97, Guide to Structural Fire Protection
- (e) 46 CFR Subchapter K, High-Capacity Small Passenger Vessels
- (f) NVIC 8-93, Equivalent Alternatives to 46 CFR Subchapter H Requirements Related to Means of Escape, Safe Refuge Areas, and Main Vertical Zone Length
- (g) Washington State Ferries Risk Assessment Final Report, June 30, 1999

1.2 Background.

The new ferry for New York City must comply with the lifesaving equipment requirements of reference (a). These requirements, which became effective on November 1, 1998, contain significant changes from past equipment requirements for the New York City Ferries. While this issue is of immediate importance for the new ferry, all New York City Ferries will have to comply with this requirement by October 1, 2003.

The new Ferry must comply with Subparts A, B, C, and E of reference (a). Subpart F contains optional exemptions for vessels on non-SOLAS Routes.

Significant changes in the new rules include:

- **SURVIVAL CRAFT.** 46/199.201(b) requires lifeboats and liferafts to accommodate all people on board, plus 25%. 46/199.630(g) reduces this requirement to a combination of lifeboats, liferafts, and inflatable buoyant apparatus (IBA) to accommodate 67% of the people on board. This alternative applies to vessels on protected routes, and assumes that for limited periods an IBA can accommodate 150% of its rated capacity.
- **MARINE EVACUATION SYSTEMS.** If there is not a suitable embarkation point for survival craft, marine evacuation systems will have to be installed. Embarkation decks 3 meters or more above the waterline require marine evacuation systems (46/630(d)(1)).
- **SAFETY ASSESSMENT.** 46/199.630(f) allows a safety assessment to support alternatives to full survival craft equipment. Passenger vessels may conduct a Safety Assessment, subject to approval by the local Coast Guard Officer in Charge, Marine Inspection (OCMI), that would assess the scope and degree of risks that the vessel would encounter, and determine alternatives to the survival equipment requirements. The Safety Assessment would have to consider both navigational safety and vessel management.

Section 1, Introduction

1.3 Issue.

What lifesaving requirements are appropriate for the New York City Ferry?

1.4 Discussion.

As an alternative to meeting the lifesaving equipment requirements of 46CFR199.201(b), the new ferry will seek an OCMI approved Safety Assessment, as permitted in 46CFR199.630(f). The guidelines for the Safety Assessment are contained in references (a) and (b). Further guidance on the vessel's safety features are contained in references (c) and (d). References (e) and (f), while not strictly applicable, contain useful interpretations and Coast Guard philosophies for vessels carrying in excess of 1000 passengers that will provide important background material for the OCMI approved safety assessment. Reference (g) studies safety issues similar to those that will be considered in this assessment.

The New York City Ferry fleet has provided many years of safe, reliable passenger service for its customers. It is not the intent of this study to introduce changes to this successful operation simply for the sake of change. Safety can be improved by analyzing potential catastrophic accidents and preparing contingency plans for those scenarios. Accident likelihood can be reduced through enhanced safety procedures and improved management. Accident consequences can be mitigated through the development of an effective casualty response plan. Reference (g) concluded that there are few scenarios on a typical commuter ferry run that would necessitate the evacuation of passengers into survival craft. This is equally true for the New York City ferries. Evacuation takes time, and exposes passengers to physical hazards. Seeking safe refuge aboard the ferry and awaiting rescue is a safer alternative. If passenger evacuation becomes necessary, the safest place for passengers to disembark is at the terminal, where normal passenger egress occurs. In the event of an emergency, ships force and external assets will stabilize the situation and the ferry will be brought into the terminal under its own power or with tug assistance. In the unlikely event that the ferry cannot be brought into the terminal, such as intentional grounding after damage, passengers will be transferred to another ferry, and then brought into the terminal.

1.5 Supporting Comments:

- The ferry will operate on a short, restricted route, with excellent emergency rescue resources readily available, including other ferries, tugboats, fireboats, police boats, USCG vessels, passenger vessels and local harbor traffic, and helicopters.
- The ferry operates entirely within Vessel Traffic Service (VTS) New York's area of responsibility. VTS New York has communication with all vessel traffic in the area, full radar coverage from multiple sites, and video cameras. VTS New York would be instantly aware of any problems with the ferry's operation.
- The ferry is designed to two-compartment subdivision, the highest level of damage survivability required by the Coast Guard. There are safe areas immediately adjacent

Section 1, Introduction

to the ferry route where the vessel can intentionally ground if compartment flooding ever posed a danger to passengers.

- For fire protection, the vessel is divided into two main vertical zones, and each deck contains out-of-zone refuge as per reference (f). This, combined with their very limited fire load, makes the interior passenger spaces the best safe refuges available.
- The best emergency egress for passengers is at their point of entry on the vessel. This is particularly true for physically and mentally disabled passengers, as well as the very old and young. Primary points of passenger entry are the main deck and saloon deck on both ends of the ferry.

1.6 Regulatory Requirements

The Safety Assessment alternative outlined in 46CFR199.630(f) must address:

The navigation and vessel safety conditions within the vessel's planned operating area, including:

- (i) The scope and degree of risks or hazards to which the vessel will be subject during normal operations.*
- (ii) The existing vessel traffic characteristics and trends, including traffic volume; the sizes and types of vessels involved; potential interference with the flow of commercial traffic; the presence of unusual cargoes; and, other similar factors.*
- (iii) The port and waterway configuration and variations in local conditions of geography, climate, and other similar factors.*
- (iv) Environmental factors.*

A comprehensive shipboard safety management and contingency plan that is tailored to the particular vessel, is easy to use, is understood by vessel management personnel both on board and ashore, is updated regularly, and includes:

- (i) Guidance to assist the vessel crew in meeting the demand of catastrophic vessel damage.*
- (ii) Procedures to mobilize emergency response teams.*
- (iii) Procedures for moving passengers from the vessel's spaces to areas protected from fire and smoke, to embarkation areas, and off the vessel. The procedures must include provisions for passengers with physical or mental impairments.*
- (iv) Lists of external organizations that the operator would call for assistance in the event of an incident.*
- (v) Procedures for establishing and maintaining communications on board the vessel and with shoreside contacts.*
- (vi) Guidance on theoretical, practical, and actual simulation training that includes the personnel or organizations identified in the plan so they can practice their roles in the event of an incident.*

Section 2, Risk Assessment

2.0 Risk Assessment. The navigation and vessel safety conditions within the vessel's planned operating area.

This section will consider the port and its navigating conditions, the vessel and its crew, and the hazards and risks faced by the ferry. This information is based upon interviews, casualty histories, and published information about the port.

2.1 The scope and degree of risks or hazards to which the vessel will be subject during normal operations.

2.1.1 The Ferry.

The new JFK Class ferry is designed for carrying about 4400 passengers and 30 vehicles. Seating capacity is planned for about 2575 passengers. Passenger accommodations are provided on the Main, Saloon, Bridge, and Hurricane Decks. Passenger access is provided on the main deck and saloon deck. Vehicles drive aboard on the main deck, using two lanes.

2.1.2 The Route.

The Staten Island to Manhattan ferry route is 5.2 miles long. A round trip is completed in one hour. Each leg of the transit takes approximately 18 minutes. Loading and unloading of passengers at each terminal takes approximately 12 minutes.

The ferry route keeps the vessels on the extreme right side of the main ship channel, Anchorage Channel. The ferry leaves St. George Terminal, Staten Island, crosses the Anchorage Channel, and follows the east side of the channel until passing Governors Island. After passing Governors Island, the ferry turns east in the vicinity of the entrance range to the East River, and then turns North, crosses the East River, and heads to Whitehall Terminal, Manhattan. Upon leaving Whitehall Terminal, the ferry heads west across Anchorage Channel, then follows the west side of the Anchorage Channel back to Staten Island, crosses the Kill Van Kull, and heads to St. George Terminal, Staten Island.

For most of its route, the ferry runs parallel to the vessel traffic flow. At the terminals, however, the ferry crosses perpendicular to the prevailing vessel traffic flow (Anchorage Channel, East River, Kill Van Kull). In addition, the ferry often maneuvers close to the terminals, which can also contribute to operational risk. The navigating risk is highest near the two terminals.

The Coast Pilot strongly encourages mariners to avoid transiting close to the ferry slips at Whitehall and St. George Terminals.

Section 2, Risk Assessment

2.1.3 The Crew.

The Crew and their license requirements are as follows:

<u>Position</u>	<u>License</u>
1 Captain	Inland Master Unlimited
1 Assistant Captain	1 st Class Pilot Unlimited (Upper Bay, North River Battery to George Washington Bridge, East River to Execution. Rock, Kill Van Kull)
1 Mate	Inland Mate
6 Deckhands	None
1 Chief Engineer	Chief Coastal Unlimited
1 1 st Engineer	3 rd Assistant Engineer
1 Oiler	None

All positions require break-in training.

2.1.4 The Schedule.

The ferry serves the public 24 hours per day, 7 days per week, year round. The schedule follows.

Weekdays

Midnight-6 a.m.	1 trip per hr
6-8 a.m.	3 trips per hr
8-9 a.m.	4 trips per hr
9 a.m. -3:30 p.m.	2 trips per hr
3:30-4:10 p.m.	3 trips per hr
4:10-7 p.m.	4 trips per hr
7 p.m.-midnight	2 trips per hr

Weekends

11:30a.m. – 7p.m.	2 trips/hr
Other times	1 trip/ hr

Section 2, Risk Assessment

2.2 The existing vessel traffic characteristics and trends, including traffic volume; the sizes and types of vessels involved; potential interference with the flow of commercial traffic; the presence of unusual cargoes; and, other similar factors.

2.2.1 VTS New York.

The single most important safety feature in the ferry's operating area is the presence of the Coast Guard's VTS New York.

VTS New York uses 13 radar sites and 18 cameras to continually monitor vessel traffic movement in New York's Upper Bay (as well as other areas that don't affect the ferry's operation). The VTS is staffed 24 hours per day, 7 days per week, with 6 watchstanders (minimum). The watch consists of a Watch Supervisor, a VTS Duty Officer, and 4 watchstanders who rotate through three positions (Sector Operators) on a continual basis.

During inclement weather, special events, and port emergencies, the VTS acts as an information clearing-house, collecting information from operators and passing it on to others who need that information. During such times the VTS Watch Supervisor and Duty Officer both remain on site in the watch office, and in extraordinary situations such as bad weather or marine events, extra staff is brought in.

A vessel checks in with VTS 15 minutes prior to its entry into VTS New York's AOR, on VHS Channel 11. Deep draft vessels should already have provided the port with 24 hour advanced arrival notification. VTS watchstanders enter the vessel's name and characteristics into the computer tracking system, if not already on file. The vessel provides the VTS with its Sailing Plan, and VTS provides the vessel with any port advisories that will affect the vessel's transit. The sailing plan includes the following information:

- Vessel name and type
- Current position
- Destination and ETA
- Intended route
- Length overall
- Deepest draft
- Dangerous cargo, if any

For vessels with pilots, this exchange of information is usually made with the pilot, who is intimately familiar with the port and local operating conditions. For tugs and other vessels, the vessel operator passes the information.

After check-in, the Coast Guard watchstander "launches" an icon on the computer screen that represents the vessel as it makes its transit. The radar provides a simultaneous reading of the vessel's position. If the tracking icon and the radar position grow too far apart, the watchstander will either update the icon position or contact the vessel to see if there is a problem.

Section 2, Risk Assessment

Throughout the transit in the Upper Bay the vessel maintains communication with the VTS on Channel 14. Traffic updates and critical port information is passed continually on this channel.

The VTS watch communicates with New York City emergency services (police, fire, and rescue) by means of a "911" land line and by Channel 17.

Vessels are required to notify the VTS if there is any change to the sailing plan, and must also notify the VTS upon leaving the VTS AOR.

2.2.2 Surrounding Vessel Traffic.

The Upper New York Bay is one of our nation's busiest commercial waterways. The VTS receives approximately 800 vessel movement reports on a given day, over half of which are in the vicinity of the ferry route.

Generally, collision risk is highest in the area of greatest vessel traffic congestion. The point of greatest vessel traffic congestion on the Ferry route is the section from St. George Terminal to Robbins Reef. Waterway usage statistics indicate that the vast majority of the large vessel traffic in the New York Upper Bay is using either the Kill Van Kull or the Military Ocean Terminal. Traffic operating North of this area comprises less than 20% of the port's total traffic.

In the vicinity of Whitehall Terminal the traffic consists mostly of smaller vessels, including commuter ferries, tug and barge traffic, and passenger vessels offering dinner and sightseeing cruises. These vessels are typically local operations that are very familiar with the ferry's operation.

Three commuter ferry companies operate high-speed vessels. They carry anywhere from 149 to 350 passengers, and operate at speeds of approximately 30 knots. They operate out of Pier 11, at the foot of Wall Street on the East River, and their route can cross the ferry route. Their speed increases the collision risk, particularly in reduced visibility conditions, but there are mitigating factors that reduce the risks for New York City Ferry passengers:

- High speed commuter ferry operations are conducted during peak commuter times, when other ferries are running, so post-casualty assistance would be immediately available.
- The commuter ferries are between 90' and 125' in length, and would likely not inflict passenger-threatening damage to the New York City Ferry, although they might sustain significant damage to themselves in a collision.
- The high-speed ferries don't carry vehicles or dangerous cargo, so a resulting fire would be unlikely.

Section 2, Risk Assessment

- The high-speed ferries maintain contact with VTS for special navigating conditions, and are very familiar with the New York City Ferry operating procedures.

Tugs often bring tows down the East River on hawser, cross the ferry route, and make up their tow on the North River. These operations occur at low speed, and the vessels are small when compared to the ferry. The New York City Ferry Operators are well aware of these tug and barge activities, and exercise care in their vicinity, particularly in bad weather or when strong currents are present.

The consequence of a ferry collision depends on the characteristics of the other vessel. Obviously, larger vessels carry the greatest risk of severe consequences resulting from a collision. As noted previously, the likeliest interaction with larger vessels will occur in the vicinity of St. George Terminal and Robbins Reef.

2.3 The port and waterway configuration and variations in local conditions of geography, climate, and other similar factors.

The main ship channel in the Upper Bay, Anchorage Channel, is approximately ½ mile wide, with a navigational depth of 45 feet. Entering the Upper Bay from the Narrows, the Stapleton Anchorage is to the west, extending from near the Verrazano Narrows Bridge to the Ferry Terminal at St. George, Staten Island. The Bay Ridge Anchorage on the Brooklyn side extends from Bay Ridge to Erie Basin.

Secondary Channels connect the Upper Bay with various terminals in the harbor. To the east, Bay Ridge Channel, Red Hook Channel, and Buttermilk Channel follow the Brooklyn Piers from The Narrows to East River. To the west, Claremont Terminal Channel and Pierhead Channel follow the New Jersey Piers.

The Kill Van Kull, at the northern end of Staten Island, connects Upper Bay and Newark Bay in New Jersey. Vessels entering Kill Van Kull must pass directly in front of the Ferry Terminal at St. George, Staten Island.

At the Battery, the Anchorage Channel splits, leading to the North (Hudson) River, and the East River (a tidal strait).

Shoals in the Upper Bay include Bay Ridge Flats, with depths of 5 to 20 feet on the east side of Anchorage Channel, and Gowanus Flats at the north end of Bay Ridge Flats. Jersey Flats, west of Anchorage Channel, is much shallower, with depths up to 6 feet.

2.4 Environmental Factors.

Weather plays an important role in navigation through its effect on visibility and on currents. Fog in the harbor is more closely related to land-type fog, and is common in the winter on clear, cold mornings. In the spring and early summer, the harbor is susceptible

Section 2, Risk Assessment

to advection fog. Fog usually peaks in the morning on the ferry route. Dense fog conditions, with visibility less than 0.25 miles, occur 28 days in an average year. The 24 hour, year round service schedule makes it necessary for the ferry to operate in reduced visibility, as well as all other weather conditions. VTS New York monitors local visibility conditions through operator reports, and provides regular updates to vessels transiting the area.

Harbor currents are another important issue. Spring currents include strong ebb tides, and currents can be particularly difficult in the vicinity of the "Spider," an area North of Governors Island at the mouth of the East River. Wind has a strong effect on currents, thus affecting tabular current predictions. The strongest winds are out of the west through northwest at 13 to 15 knots, from January through April.

Ferry operators are well aware of these visibility, currents and wind effects, and are able to compensate on their own vessel. A significant risk for the ferries from environmental factors is from operators of other vessels. Ferry operators monitor other vessels closely when these conditions exist, since other operators may not be as familiar with environmental effects in the local operating area.

Section 3, Risk Control

3.0 A comprehensive shipboard safety management and contingency plan that is tailored to the particular vessel, is easy to use, is understood by vessel management personnel both on board and ashore, is updated regularly.

3.1 Guidance to assist the vessel crew in meeting the demand of catastrophic vessel damage.

Contingency plans are provided in Appendix A for:

Fire and Explosion
Collision, Flooding, and Grounding
Loss of Power/Loss of Steering
Miscellaneous Contingencies.

3.2 Procedures to mobilize emergency response teams.

These procedures are included in the contingency plans, Appendix A. On the vessel, crew members will make up emergency response teams as per the Watch, Quarter, and Station Bill. External resources are summoned by VHS Radio. The two primary calls always go to USCG VTS New York and the Ferry Terminal Supervisor. VTS and the Terminal Supervisor mobilize the external response teams, contacting NYPD and FDNY by landline (911) or VHS Radio, Channel 17. The ferry can also make direct contact via VHS Channel 17, although initial contact through the VTS and Terminal Supervisor are preferred.

3.3 Procedures for moving passengers from the vessel's spaces to areas protected from fire and smoke, to embarkation areas, and off the vessel. The procedures must include provisions for passengers with physical or mental impairments.

These procedures are included in the contingency plans, Appendix A. The ferry is divided into two main vertical zones, and the uninvolved main vertical zone provides safe refuge from a fire. The ferries are designed for rapid access and egress for all passengers, including those with impairments. During rush hour operations, about 4400 passengers are disembarked within a 12 minute turnaround period. Crowd control will be handled by the crew and the PA system, until external help arrives. This external help will be in the form of the NYPD and FDNY marine units, as well as the USCG.

3.4 Lists of external organizations that the operator would call for assistance in the event of an incident.

As stated in paragraph 3.2, the ferry operator calls for assistance to the USCG VTS and the terminal supervisor. Once the call for assistance goes in, there are many high-quality resources readily available to provide that assistance. Section 4 describes these emergency response resources in detail.

Section 3, Risk Control

3.5 Procedures for establishing and maintaining communications on board the vessel and with shoreside contacts.

This is included in the contingency plans, Appendix A. Continuous contact is maintained with VTS New York and the Ferry Terminal Supervisor during normal operations.

3.6 Guidance on theoretical, practical, and actual simulation training that includes the personnel or organizations identified in the plan so they can practice their roles in the event of an incident.

Appendix B contains guidance on training, indoctrination, and safety management programs.

Section 4, Emergency Resources

4.0 Emergency Resources. This section describes the external emergency response resources available to the ferry.

4.1 New York City Police Department (NYPD).

The NYPD has marine units that operate 24 hours per day, 7 days per week. There are three bases, Charlie Base, Adam Base, and George Base. Charlie Base is located in Brooklyn, by the 69th Street Pier, and would be the first responder in an emergency involving the ferry. Adam Base, located in Howard Beach near JFK Airport, is about 40 minutes away from the ferry. George Base, located in College Point near LaGuardia Airport, is also about 40 minutes away from the ferry.

Charlie Base could have a boat on scene at the ferry within 15 minutes of a distress call, at any point in the ferry's run. During peak commuter hours this time may be reduced because the Harbor Charlie patrol boat remains underway during that time. Charlie Base has three 55' boats, a 36' boat, and a 30' boat. One of the 55' boats is designated to carry the SCUBA team, which is available 24 hours per day. Each boat carries three officers, except the 30' boat, which carries 2 officers.

The Adam and George Bases are similarly equipped, although they each have only one 55' boat.

To supplement the Police Harbor Patrols there is an emergency police helicopter stationed in Brooklyn that can deploy swimmers anywhere on the ferry run within 5 minutes of a distress call. In addition, the 122nd Precinct Headquarters Building is across the street from the St. George terminal, and police can board vessels there to be carried out to the ferry in an emergency.

4.2 New York City Fire Department (FDNY).

The FDNY has marine units that operate 24 hours per day, 7 days per week. There are three bases in the vicinity of the ferry operating area. These bases, Marine Companies 9, 1, and 6, are located in Staten Island, Greenwich Village, and Brooklyn Navy Yard, respectively.

Marine Company 9, which would be the first responder in a ferry emergency, has a 134' fireboat with 8 monitors, 20,000 gpm total capacity, and a single monitor maximum capacity of 7,500 gpm. This vessel is operated by a 7 person crew. Marine Company 1 in Greenwich Village has a fireboat with similar capacity, and Marine Company 6 has a fireboat with about one half of that capacity.

In the case of a major emergency, a "special call" would be made. Within 10 minutes, a full first alarm assignment would be at the ferry terminal, consisting of three 5-person engine companies, two 6-person ladder companies, a 6-person rescue company, a 6-person "fast truck," and a Battalion Chief. These fire fighters would either wait for the

Section 4, Emergency Resources

ferry to arrive in the terminal, or be transported out to the ferry by either a fireboat or another ferry.

4.3 United States Coast Guard.

The USCG Station New York has at least one 41' patrol boat at the ready status (B-0) 24 hours per day, 7 days per week. A second 41' patrol boat is B-0 in the summer, B-2 in the winter. Station New York has a total of four 41' patrol boats and two RHI's for emergency response purposes.

At the Military Oceans Terminal the USCG has two 65' and two 140' cutters, one of which is typically on B-6 status.

Further away, the USCG has resources at Kings Point and Sandy Hook, which are on B-0 status and are less than one hour away from the ferry operating area.

4.4 Other Ferries.

The rescue vessel of choice in an emergency would be another ferry. During most operating hours there are a minimum of two ferries operating at the same time. In the case of an emergency, the operating ferry would head to the nearest terminal, discharge passengers, and then go to the aid of the other ferry. By then rescue calls would have been called in, and emergency personnel can board the operating ferry.

In the middle of the night, only one ferry operates. Due to crew rotations and watch procedures, there is a 2 ½ hour period each night when a second full engineering crew is not on duty, and a 4 ½ hour period each night when a second full deck crew is not on duty. During these times, a rescue ferry could be mobilized in less than an hour.

The operator of a ferry encountering an emergency would contact the ferry terminal supervisor (on watch 24 hours per day, at each terminal). The operator would specify what help is required. If another ferry were required, the terminal supervisor would commence vessel preparations. In the terminal there is a qualified engineer and an oiler on duty 24 hours per day. These engineers would immediately start up the rescue ferry plant. As with the engineers, there are five deckhands on duty 24 hours per day. These personnel would be immediately dispatched to ready the ferry and embark emergency personnel as required. During these preparations the terminal manager would recall a Captain, which would be either a Port Captain or one of the Captains from the oncoming watch. There are two Port Captains for the ferry system, and one is available on call at all times.

When the Captain arrives, the ferry would be ready to go. This entire evolution can be carried out in less than one hour.

Section 4, Emergency Resources

4.5 Miscellaneous Assets.

Beyond the dedicated emergency assets listed above, there are many other resources in the Upper Bay area that might be called upon during an emergency.

4.5.1 Towing Vessels.

United Pilots towing vessels are available on call 24 hours per day, 7 days per week. While not emergency responders, they would be called upon to tow a disabled ferry back into port.

4.5.2 Army Corps of Engineer (ACOE) Vessels.

The ACOE operates debris collecting vessels during daylight hours, 7 days per week. The vessels are either catamaran design or tow catamaran type barges that have nets stretched between the hulls to pick up floating debris. They are operated by U.S. Federal Employees with appropriate licenses. These vessels have large deck areas and could serve as platforms for ferrying passengers or equipment in an emergency.

4.5.3 General Harbor Traffic.

The high volume of traffic in New York's Upper Bay almost guarantees that there will be a vessel in the immediate vicinity of a ferry if it has an emergency. A study of vessel traffic by VTS New York showed that for February 2000, there was an average of 10 vessels per hour at St. George every night during the hours of 2-3 am, excluding ferry vessels. The least number of non-ferry vessels recorded for that hour was 5, and the most was 19. There was a towing vessel underway in the vicinity during that hour on every day of the study.

Appendix A, Contingency Planning

A. Contingency Plans

This Appendix contains contingency plans for all of the mishaps that could be reasonably anticipated. These mishaps were selected through analysis of historical records, interviews of operators, stakeholders, and outside experts, and through engineering analysis.

For each of the three broad classes of mishap (Flood, Loss of Power, and Fire) there is a general discussion of anticipated casualties, prevention and mitigation measures. This general discussion is followed by detailed step-by-step contingency plans.

Appendix A, Contingency Planning

A.1 Collision, Flooding, Grounding

A.1.1 Collision, Flooding, Grounding Response

There is a risk of a collision, flooding, and grounding for the ferry. Only collision carries a significant potential of passenger injury, but all three will be covered in this section.

The preferred response to collision and flooding is to head to the nearest terminal and evacuate the passengers. Grounding does not pose any immediate physical danger to the passengers, but they must be removed from the grounded vessel as soon as it is safe to do so.

If the ferry cannot proceed to the nearest terminal, other actions must be taken to stabilize the situation. Intentional grounding of the ferry in the nearest shoal area will eliminate any danger of sinking. The ferry's route keeps it on the right side of the channel, and shallow areas are always nearby. If the ferry loses all power and starts to drift, the anchor can be deployed to prevent drifting.

In a collision, flooding, or grounding situation, the USCG, FDNY, and NYPD can be called upon for emergency assistance. This assistance can include crowd control and supplying standby vessels. Other standby vessels can be drawn upon from local vessel traffic, salvage tugs that are on continual recall notice, and other ferries.

The best way to get passengers off of the ferry safely is to reach a terminal and disembark as in normal operations. Under every contingency, the operator's first priority is to reach a terminal. In the unlikely event that the ferry cannot reach a terminal, the primary platform for evacuating ferry passengers is another ferry. This ferry-to-ferry evacuation will be done by means of a gangway specially designed for this purpose. The passengers will cross the gangway at main deck level under the supervision and assistance of crewmembers and emergency response personnel. The gangway will be stored at the terminal and brought out with the rescue ferry, along with emergency responders, to conduct the rescue. It will be capable of use on all ferries, to provide maximum versatility for fast response.

Appendix A, Contingency Planning

A.1.2 Collision, Flooding, Grounding Prevention and Mitigation

Collision, flooding, and grounding safety for the ferry is achieved by a coordinated package of prevention and mitigation features made available both by design and operational measures.

A.1.2.1 Collision, Flooding, Grounding Prevention Measures

The bridge team on the ferries is the most important collision prevention measure. License requirements, on-the-job training, and a drug testing program are all in place to ensure that passengers are provided a safe navigating team at all times.

The next most important collision prevention measure is VTS New York. The round the clock monitoring of Upper Bay traffic and periodic advisories makes the ferry route safe to operate upon.

The ferry itself has two pilothouses, each fully equipped and capable of operating the ferry independently. Using the other pilothouse underway can compensate for any navigation equipment failure, although the change from one pilothouse to the other is not instantaneous. Navigation equipment in each pilothouse includes a magnetic compass, gyrocompass and repeater, radar, VHF radio, and internal sound-powered phones.

A.1.2.2 Collision, Flooding, Grounding Mitigation Measures

The ferry will be designed to two compartment flooding standard. The main deck will not be submerged after any transverse watertight bulkhead is breached and two adjacent compartments are flooded. This is the U.S. Coast Guard's most stringent passenger vessel flooding standard.

Flooding due to mechanical failure (of pipes, valves, packing, etc.) will affect only one compartment. Flooding of one compartment will not seriously endanger the ferry.

Appendix A, Contingency Planning

A.1.3 Collision

Inform the Captain

Inform the engine room

Notify VTS by VHF Radio

Notify Ferry Terminal Supervisor by VHF Radio, have Manager call emergency services by "911" landline. Request FDNY and NYPD assistance as required, from marine patrols as well as land based assets to meet ferry at terminal.

Make an announcement over the PA system providing a status report to passengers

Assemble passengers at the assembly station

Head to the nearest terminal.

Assemble the damage control party

Locate the damage and assess its extent

Start all available pumps for dewatering

Isolate the damaged area, control the flooding, and reduce the free surface

Disembark passengers.

Locate and assess the damage

In case of fire, take actions as described under "Fire and explosion"

If there is any danger to passengers from the collision damage, take immediate action to stabilize the situation. Such action could be intentional grounding of the vessel, dropping anchor, or maneuvering the vessel alongside a barge or other rescue platform. Take actions described under "Abandon Ship."

Appendix A, Contingency Planning

A.1.4 Flooding

Inform the Captain

Inform the engine room

Notify VTS by VHF Radio

Notify Ferry Terminal Supervisor by VHF Radio, have Supervisor call emergency services by "911" landline if required. Request FDNY and NYPD assistance as necessary.

Head to the nearest terminal.

Assemble the damage control party

Locate the damage and assess its extent

Start all available pumps for dewatering

Isolate the damaged area, control the flooding, and reduce the free surface

Disembark passengers.

Appendix A, Contingency Planning

A.1.5 Grounding

Inform the Captain

Inform the engine room

Notify VTS by VHF Radio

Notify Ferry Terminal Supervisor by VHF Radio, have Supervisor call emergency services by "911" landline if required. Request FDNY and NYPD assistance as necessary.

Conduct damage survey of internal spaces

Refer to section on Abandon Ship if passenger evacuation is necessary.

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A.1.6 Abandon Ship

If at the terminal, evacuate through normal passenger egresses.

Abandon underway only after all other options have been exhausted

Assemble passengers in area of safe refuge until the emergency situation is stabilized.

Announce over the PA system the nature of the emergency and the intended action

Board local emergency response personnel from NYPD, FDNY, and USCG.

Bring second ferry alongside, place gangway between the two ferries at the main deck level.

Give instructions to the passengers on donning a lifejacket (if deemed necessary) and exiting to the rescue vessel.

Direct passengers to points of safety off the ferry.

Appendix A, Contingency Planning

A.2 Loss of Power/ Loss of Steering

A.2.1 Loss of Power/ Loss of Steering Response

The primary response for loss of power underway is to obtain assistance from a local towing vessel. There are local towing vessels on call 24 hours per day, and there are numerous towing vessels underway in the vicinity at any given time.

To stabilize the situation until help arrives, the ferry carries an anchor that can be deployed in an emergency.

A.2.1 Loss of Power/ Loss of Steering Response Prevention and Mitigation

Not under command and loss of power safety for the ferry is achieved by a coordinated package of prevention and mitigation features made available both by design and operational measures.

A.2.1.1 Loss of Power/ Loss of Steering Response Prevention Measures

The ferry has a live engine room watch to immediately respond to problems that would lead to loss of power.

The propulsion system is diesel-electric, with three diesel generators (one being a standby) in the engine room driving two motors on each shaft. There will be two shafts, one on each end of the vessel. Any single component failure in this system has a complete backup to prevent loss of power.

Similarly, if there is trouble with one navigation bridge, there is a second, physically separate navigation bridge available for use.

The ferry machinery is well maintained, regularly inspected, and routinely tested just prior to being placed in service for a day's work.

A.2.1.2 Loss of Power/ Loss of Steering Response Mitigation Measures

The trained and licensed engine room crew will respond quickly to casualties before they result in a loss of power.

If a loss of power occurs, the ferry carries an anchor that will hold it in place until the situation is stabilized and assistance can be obtained.

Appendix A, Contingency Planning

A.2.2 Loss of Power/ Loss of Steering

Inform the Captain

Inform the engine room

Notify VTS by VHS Radio

Notify Ferry Terminal Supervisor by VHS Radio, request assistance tug if necessary

Use other propulsion shaft, if possible

Engage local steering

Post lookouts and establish lines of communication between the steering gear room and the bridge

Deploy the anchor or run the vessel aground if necessary

Make an announcement over the PA system providing a status report to the passengers

Assemble passengers if necessary

Have a tugboat push the vessel back to dock and evacuate passengers

Refer to section on Abandon Ship if passenger evacuation is necessary.

Appendix A, Contingency Planning

A.3 Fire and Explosion

A.3.1 Fire and Explosion Response

There are three fire scenarios that are of concern for the ferry: Car deck fires; engine room fires; and, passenger space fires.

In all three fire scenarios, the basic response is to head to a terminal and evacuate the passengers via their normal exit points. Simultaneously, operators will attempt to control the fire and call for help to the Coast Guard VTS, the Ferry Terminal Supervisor, FDNY, and the NYPD, all by VHS radio. All four of these entities maintain 24 hour radio watch.

While the nearest terminal will typically be selected for the passenger evacuation, local circumstances such as prevailing winds may make proceeding to the farther terminal a better option. All else being equal, the Staten Island terminal is preferred since one terminal there is physically separated from the rest of the terminals.

In the event of a fire and simultaneous loss of power, a towing vessel would be called in, and the FDNY fireboat would be used for fire fighting resources. Standpipes at each end of the ferry are available to energize the fire main from the FDNY Fireboat.

The passengers will be directed by the ferry crew to assemble in a safe refuge during the initial fire response. Safe refuge for both car deck and engine room fires is the Saloon Deck, which is insulated from the car deck by both A-60 insulation and the car deck sprinkler system. The saloon deck and the decks above are divided into two main vertical zones. Passengers will be assembled in the main vertical zone that is farthest from the fire.

For passenger compartment fires, passengers will be assembled in the main vertical zone that does not have the fire. This protection will be sufficient for the 10 to 15 minute run back to the terminal.

Once at the terminal, the plan is to dock and disembark passengers as normal. NYPD and FDNY personnel will assist the ferry crew in handling the crowd. The car deck sprinkler system will be enhanced directly beneath the passenger egress area to provide extra protection in this area. This plan may be modified as circumstances dictate.

FDNY will direct the fire fighting effort. See Section 4 for a discussion of FDNY response capabilities. FDNY may direct passengers to remain in their area of safe refuge until the fire is brought under control.

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A.3.2 Fire and Explosion Prevention and Mitigation

Fire safety for the ferry is achieved by a coordinated package of prevention and mitigation features made available both by design and operational measures.

A.3.2.1 Fire and Explosion Prevention Measures

Combustibles are kept to an absolute minimum in the passenger accommodation spaces.

Furnishings are case type, metal framed and fire resistant, with non-combustible or approved veneers and trims (where installed), all combined keep the fire load well below the permissible 11 lbs/ sq. ft.

Smoking is prohibited on the ferries and the snack area has only minimal heat producing sources.

A.3.2.2 Fire and Explosion Mitigation Measures

Structural fire protection is installed as per 46 CFR Subchapter H

Combustibles are widely and evenly distributed, preventing isolated areas of high fire load.

Public spaces are all large and open, which would prevent a fire from going undetected.

By means of Bridge-operated fire doors, the ferry's public spaces are divided into two main vertical zones of approximately 150 feet in length. Similarly, the decks are isolated from each other by Bridge-operated fire doors for each stair access.

The car deck has an installed sprinkler system and A-60 insulation. The sprinkler system coverage is enhanced at both ends to knock down smoke and reduce heat in the event of a passenger evacuation from the Saloon Deck. The sprinkler system also has a standpipe at both ends, where FDNY can hook up their hoses to provide water to the system from a non-ferry source. The ferry is never far from a terminal. In the event of a car deck fire, there will be adequate time to complete a voyage and conduct a rescue from ashore.

The engine room has a dedicated CO2 system.

Fire hoses and portable extinguishers are located in convenient locations to put out small fires as they occur.

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A.3.3 Car Deck Fire and Explosion

Inform the Captain.

Notify VTS by VHF Radio

Notify Ferry Terminal Supervisor by VHF Radio, have Supervisor call emergency services by "911" landline. Request FDNY and NYPD assistance from marine patrols as well as land based assets to meet ferry at terminal.

Close fire doors.

Head to safest terminal, with preference being to the Staten Island side.

Inform the engine room and start fire pumps

Energize the car deck sprinkler system

Sound the general alarm

Announce over the PA system the nature of the emergency

Assemble firefighting party

Evacuate passengers to an area of safe refuge (stage 1 egress)

Check for injured passengers

Fight and control fire

Instruct passengers on egress route

Arrive in terminal, disembark passengers with the assistance of FDNY, NYPD.

Assist FDNY in fighting fire.

Appendix A, Contingency Planning

A.3.4 Engine Room Fire

Inform the Captain.

Notify VTS by VHF Radio

Notify Ferry Terminal Supervisor by VHF Radio, have Supervisor call emergency services by "911" landline. Request FDNY and NYPD assistance from marine patrols as well as land based assets to meet ferry at terminal.

Close fire doors.

Head to safest terminal, with preference being to the Staten Island side.

Start fire pumps

Engine room crew fights and controls fire

Sound the general alarm

Announce over the PA system the nature of the emergency

Assemble firefighting party

Evacuate passengers to an area of safe refuge (stage 1 egress)

Check for injured passengers

If fire cannot be controlled, abandon engine room and activate CO2 flooding

If vessel power is lost, notify VTS and Terminal Supervisor. Drop anchor if necessary. Towing vessel will be dispatched by Terminal Supervisor. Make up to towing vessel, proceed to port.

Instruct passengers on egress route

Arrive in terminal, disembark passengers with the assistance of FDNY, NYPD.

Assist FDNY in fighting fire.

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A.3.5 Passenger Space Fire

Inform the Captain.

Notify VTS by VHF Radio

Notify Ferry Terminal Supervisor by VHF Radio, have Supervisor call emergency services by "911" landline. Request FDNY and NYPD assistance from marine patrols as well as land based assets to meet ferry at terminal.

Close the fire doors.

Head to safest terminal, with preference being to the Staten Island side.

Inform the engine room and start fire pumps

Energize the car deck sprinkler system

Sound the general alarm

Announce over the PA system the nature of the emergency

Assemble firefighting party

Evacuate passengers to an area of safe refuge (stage 1 egress)

Check for injured passengers

Fight and control fire

Instruct passengers on egress route

Arrive in terminal, disembark passengers with the assistance of FDNY, NYPD.

Assist FDNY in fighting fire.

Appendix A, Contingency Planning

A.3.6 Bomb Threat

Inform the Captain

Notify VTS and Ferry Terminal Supervisor by VHF Radio, have Supervisor call emergency services by "911" landline. Request NYPD assistance from marine patrols if necessary, as well as land based assets to meet ferry at terminal.

Head to safest terminal, with preference being to the Staten Island side.

If at a terminal, call NYPD

If underway, conduct a walk-through search of the vessel.

Upon arrival at terminal, disembark passengers immediately

Appendix A, Contingency Planning

A.4 Miscellaneous Contingencies

A.4.1 Oil Spill

Identify and secure the source of the spill

If fuelling or transferring oil, stop immediately

Remove or disable potential ignition sources

Inform the Captain

Contain the spill using onboard equipment

Keep passengers away from the affected area

Inform the Coast Guard and Terminal Supervisor

Continue cleanup operations.

Appendix A, Contingency Planning

A.4.2 Man Overboard

Upon sighting a person overboard, throw a ring lifebuoy with lifeline into the water

Inform the Captain

Contact VTS by VHF Radio

Stop the engines

Launch the rescue boat

Recover the person

Follow the procedures under "Medical Emergency" as appropriate

Appendix B, Safety Management

B. Safety Management

In this appendix, training, drills, and safety equipment inspection and maintenance programs are detailed.

B.1 Training and Drills

This section provides guidance on practical, and actual simulation training that includes the personnel or organizations identified in the plan so they can practice their roles in the event of an incident.

B.1.1 Training materials.

Training material will be maintained on board the ferry, and at the Director, Ferry Operations Office. This material will consist of a manual and audiovisual training aids. Only the manual is kept aboard each vessel.

- (1) The training manual is maintained on one of the navigating bridges, and is available to any crew member upon request. Audiovisual training aids and the training manual are kept at the Director, Ferry Operations Office.
- (2) The training material explains in detail--
 - (i) The procedure for donning lifejackets;
 - (ii) The procedure for mustering at the assigned stations;
 - (iii) The use of all lifesaving and rescue equipment;
 - (iv) The use of anchors;
 - (v) Man Overboard, including the launching of rescue boats;
 - (vi) The recovery of rescue boats, including stowage and securing;
 - (vii) The hazards of exposure and the need for warm clothing;
 - (viii) The best use of the rescue boats;
 - (ix) The use of firefighting equipment;
 - (x) All other functions contained in the muster list and emergency instructions; and,
 - (xi) Post-accident reporting procedures and drug testing.

B.1.2 Familiarity with emergency procedures.

- (1) Every crewmember with emergency duties assigned on the muster list must be familiar with their assigned duties.
- (2) As new passengers embark, a safety announcement must be given immediately before sailing or immediately after sailing. The announcement must be made on the vessel's public address system or by other equivalent means likely to be heard by the passengers. Information cards or posters may be used to supplement the briefing, but may not be used to replace the announcement.

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B.1.3 Drills

- (1) Drills must, as far as practicable, be conducted as if there were an actual emergency.
- (2) Every crewmember must participate in at least one fire drill every week. Fire drills must, as far as practicable, be planned with due consideration given to the various emergencies that may occur, including car deck, engine room, and passenger space fires. Each fire drill must include—
 - (i) Reporting to stations and preparing for the duties described in the muster list for the particular fire emergency being simulated;
 - (ii) Starting of fire pumps and the use of two jets of water and the car deck sprinkler to determine that the system is in proper working order;
 - (iii) Checking the firemen's outfits and other personal rescue equipment;
 - (iv) Checking the relevant communications equipment;
 - (v) Checking the operation of watertight doors, fire doors, and fire dampers and main inlets and outlets of ventilation systems in the drill area; and
 - (vi) Checking the necessary arrangements for subsequent abandonment of the vessel.
- (3) Every crewmember must participate in at least one abandon ship drill every (). Abandon-ship drills must include—
 - (i) Summoning persons on board to muster stations with the general alarm followed by drill announcements on the public address or other communication system and ensuring that the persons on board are made aware of the order to abandon ship;
 - (ii) Reporting to stations and preparing for the duties described in the muster list;
 - (iii) Checking that persons on board are suitably dressed;
 - (iv) Checking that lifejackets are correctly donned; and,
 - (v) Deployment of the evacuation gangway.
- (4) Man Overboard drills must be conducted, and as far as is reasonable and practicable rescue boats must be launched with their assigned crew aboard and maneuvered in the water, each week.
- (5) Emergency lighting for mustering and abandonment must be tested at each abandon-ship drill.
- (6) The equipment used during drills must immediately be brought back to its fully operational condition. Any faults and defects discovered during the drills must be remedied as soon as possible.

Appendix B, Safety Management

B.1.4 Training

- (1) Onboard training in the use of the vessel's lifesaving appliances, including rescue boats and equipment, and in the use of the vessel's fire-extinguishing appliances must be given as soon as possible but not later than 2 weeks after a crewmember first enters employment with the ferries.
- (2) The crew must be instructed in the use of the vessel's fire-extinguishing and lifesaving appliances at the same interval as the drills. Individual units of instruction may cover different parts of the vessel's lifesaving and fire-extinguishing appliances, but all the vessel's lifesaving and fire-extinguishing appliances must be covered within any period of 3 months.
- (3) Every crewmember must be given instructions that include, but are not limited to--
 - (i) The problems of hypothermia, first aid treatment for hypothermia, and other appropriate first aid procedures such as CPR;
 - (ii) Any special instructions necessary for use of the vessel's lifesaving and rescue appliances in severe weather and severe harbor conditions; and
 - (iii) The operation and use of fire extinguishing appliances.

B.1.5 Records

- (1) When musters are held, details of abandon-ship drills, fire drills, drills of other lifesaving appliances, and onboard training must be recorded in the vessel's official logbook, or the ferry operation's training record if the training is held ashore. Logbook entries must include--
 - (i) The date and time of the drill, muster, or training session;
 - (ii) The survival craft and fire-extinguishing equipment used in the drills;
 - (iii) Identification of inoperative or malfunctioning equipment and the corrective action taken;
 - (iv) Identification of crewmembers participating in drills or training sessions; and
 - (v) The subject of the training session.
- (2) If a full muster, drill, or training session is not held at the appointed time, an entry must be made in the logbook stating the circumstances and the extent of the muster, drill, or training session held.

Appendix B, Safety Management

B.2 Indoctrination: Voyage Tasks

The following steps are taken in the typical ferry trip. New employees must be familiar with all of these steps during their break-in.

1. Assemble passengers in terminal
2. Embark passengers
3. Brief Passengers on safety measures using public address system
4. Survey local traffic
5. Contact local traffic as required
6. Check harbor conditions
7. Confirm engine and navigation equipment operation
8. Contact VTS and in bad weather make security call to all vessels in vicinity
9. Scan area around vessel while getting underway, make whistle signals
10. Maneuver vessel away from berth
11. Observe and evaluate vessel response
12. Monitor indicators
13. Communicate with other river traffic and VTS
14. Evaluate hazards from other traffic
15. Take evasive action as necessary
16. Maintain course and speed
17. Approach Destination
18. Make security announcement, advising which berth will be used (for visually impaired) and warn of hard landing when necessary
19. Adjust speed for safe docking and dock
20. Disembark Passengers.

B.3 Operational Readiness, Maintenance, and Inspection of Lifesaving and Firefighting Equipment

B.3.1 Operational Readiness

Before the vessel is placed in service and at all times during the voyage, each lifesaving appliance and all firefighting gear must be in working order and ready for immediate use. Firefighting equipment must be visually inspected prior to the vessel being placed in service daily. Anything other than full readiness must be cleared with the OCMI.

B.3.2 Maintenance

- (1) The manufacturer's instructions for onboard maintenance of lifesaving appliances and firefighting equipment must be on board the vessel. The following must be provided for each appliance:
 - (i) Checklists for use when carrying out the inspections required under this section.
 - (ii) Maintenance and repair instructions.
 - (iii) A schedule of periodic maintenance.
 - (iv) A diagram of lubrication points with the recommended lubricants.
 - (v) A list of replaceable parts.
 - (vi) A list of sources of spare parts.
 - (vii) A log for records of inspections and maintenance.

B.3.3 Spare parts and repair equipment.

Spare parts and repair equipment must be provided for each lifesaving appliance and component that is subject to excessive wear or consumption and that needs to be replaced regularly.

B.3.4 Weekly inspections and tests.

- (1) Each rescue boat and launching appliance must be visually inspected, and one launched, to ensure readiness for use.
- (2) The general alarm system must be tested.

B.3.4 Monthly inspections

Each lifesaving appliance and all firefighting gear must be inspected monthly using the checklists to make sure the appliance and the equipment are complete and in good working order. A report of the inspection, including a statement as to the condition of the equipment, must be recorded in the vessel's official logbook.

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B.3.5 Annual Inspections

Annual inspections must include the following:

- (1) Each rescue boat must be stripped, cleaned, and thoroughly inspected and repaired, as needed.
- (2) Each davit, winch, fall, and other launching appliance must be thoroughly inspected and repaired, as needed, once each year.
- (3) Each item of survival equipment with an expiration date must be replaced during the annual inspection if the expiration date has passed.
- (4) Each battery clearly marked with an expiration date and used in an item of survival equipment must be replaced during the annual inspection if the expiration date has passed.

B.3.6 Periodic servicing of launching appliances and release gear

- (1) Launching appliances must be serviced at the intervals recommended in the manufacturer's instructions or as set out in the shipboard planned maintenance program.
- (2) Launching appliances must be thoroughly examined at intervals not exceeding 5 years and, upon completion of the examination, the launching appliance must be subjected to a dynamic test of the winch brake.
- (3) Rescue boat release gear must be serviced at the intervals recommended in the manufacturer's instructions, or as set out in the shipboard-planned-maintenance program.
- (4) Rescue boat release gear must be subjected to a thorough examination by properly trained personnel familiar with the system at each inspection for certification.
- (5) Rescue boat release gear must be operationally tested under a load of 1.1 times the total mass of the rescue boat when loaded with its full complement of persons and equipment whenever overhauled or at least once every 5 years.

B.3.7 Maintenance of falls

- (1) Each fall used in a launching appliance must--
 - (i) Be turned end-for-end at intervals of not more than 30 months; and,
 - (ii) Be renewed when necessary due to deterioration or at intervals of not more than 5 years, whichever is earlier.
- (2) As an alternative to paragraph (1) of this section, each fall may--

Appendix B, Safety Management

- (i) Be inspected annually; and,
- (ii) Be renewed whenever necessary due to deterioration or at intervals of not more than 4 years, whichever is earlier.