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COAST GUARD OBSTRUCTS PREVENTIVE MAINTENANCE – NTSB

[Source: Excerpts from report NTSB/MAR-06/02, adopted April 4, 2006.]

The \$800,000 Fire

On the morning of October 17, 2004, a fire broke out in the engineroom of the U.S. small passenger vessel EXPRESS SHUTTLE II while it was entering the mouth of the Pithlachascotee River near Port Richey, Florida. The shuttle was returning from the Gulf of Mexico, where it had ferried 78 passengers to an offshore casino boat, and was on its way back to the marina operated by the vessel's owner, Paradise of Port Richey. Only the Master and two deckhands were on board when the fire broke out.

None of the crewmembers activated the vessel's fixed carbon dioxide fire suppression system. The crew attempted to fight the fire with portable fire extinguishers, but when the fire burned out of control, they prepared to abandon ship. A passing recreational boat rescued all three crewmembers.

The National Transportation Safety Board determines that the probable cause of the fire was a fractured, improperly installed fuel injection line that allowed diesel fuel to spray onto the engine and ignite. Contributing to the cause of the fire was the owner's failure to have a preventive maintenance program which could have identified the company's ongoing problem with the vessel's fuel lines (i.e., 13 fuel lines replaced in less than one year) before a failed line led to the fire. Contributing to the extent of the damage were the vessel's faulty fire detection system and the crew's failure to employ proper marine firefighting techniques. As a result of the fire, the vessel was declared a constructive total loss and the value of the vessel was \$800,000.

A Previous \$1,200,000 Fire

Previous NTSB Preventive Maintenance Issues

On Nov. 17, 2000, the T-Boat PORT IMPERIAL MANHATTAN experienced an engineroom fire that the NTSB determined could have been prevented if the vessel's owners had had an effective preventive maintenance program. The vessel was damaged to the extent of \$1,200,000.

In September 2001, the T-Boat SEASTREAK NEW YORK had an improperly secured lube oil hose that became brittle, broke and started a fire while 198 passengers and six

crewmembers were on board. Contributing to the cause of the fire was "lack of inspection and maintenance procedures" by the vessel's operator. Fortunately, the crew activated the CO₂ fire suppression system and the vessel suffered only \$81,000 in damage with no injuries.

In December 2002, the M/V PANTHER, another T-Boat, carrying 33 passengers including five children sank near Everglades City, FL with one serious injury. The NTSB discovered serious deficiencies in vessel maintenance. All of these were Coast Guard-inspected vessels carrying passengers for hire. This was recognized and still is a very serious issue.

NTSB Recommendations

The NTSB can only recommend, but only the Coast Guard can enforce. As a result of the PORT IMPERIAL MANHATTAN fire, the NTSB recommended to the Passenger Vessel Association (PVA):

"M-02-06 ó Provide your members with guidelines for developing a preventive maintenance program for all systems affecting the safe operation of their vessels, including hull and the mechanical and electrical systems.ö

The NTSB discussed the lack of Federal regulations regarding preventive maintenance for small passenger vessels as follows: öThe Coast Guard does not have specific regulations requiring a preventive maintenance program for small passenger vessels. The Federal regulators of other transportation modes recognize the importance of preventive maintenance to the safety operations and require that operators have a systematic program for performing inspections and maintenance.

öThe Federal Aviation Administration has promulgated for all airplane operators comprehensive maintenance requirements, which include provisions for inspections, repairs, and preventive maintenance.

öThe Federal Motor Carrier Safety Administration requires that every motor carrier systematically inspect, repair, and maintain, or cause to be systematically inspected, repaired, and maintained, all motor vehicles subject to its control. In addition, the Federal Railroad Administration has extensive inspection and maintenance requirements for locomotives, train cars, crossing signals, and tracks.

öBecause no authority other than the Coast Guard exercises oversight over domestic small passenger vessels, the Safety Board believes that the Coast Guard should require that companies operating domestic passenger vessels implement a preventive maintenance program for all systems affecting the safe operation of their vessels, including the hull and the mechanical and electrical systems.ö

As a result of the PORT IMPERIAL MANHATTAN fire, the NTSB issued this safety recommendation to the Coast Guard on July 3, 2002:

"M-02-5 ó Require that companies operating domestic passenger vessels develop and implement a preventive maintenance program for all systems affecting the safe operation of their vessels, including the hull and mechanical and electrical systems.ö

[GCMA Comment: The Coast Guard also has no preventive maintenance requirements for over 5,200 towing vessels which Congress also expects it to bring under inspection in the near future.]

The Coast Guard “Just Doesn’t Get It”

On Nov. 21, 2003, almost a year and a half later, the Coast Guard notified the NTSB: “We do not concur with this recommendation. Small passenger vessels are subject to a comprehensive set of regulations that are designed to promote vessel safety. The operators of these vessels are responsible for maintaining the vessel in compliance with all applicable regulations at all times. Additionally, the Coast Guard allows vessel operators to participate in the Streamlined Inspection Program (SIP) that enables the owners to more effectively manage the oversight of inspection requirements. We believe that the recommended requirements would be unnecessarily burdensome and duplicative of existing requirements. We intend to take no further action on this recommendation and request that it be closed.”

The NTSB Does Not Back Down

The NTSB patiently explained its position to Coast Guard officials as follows: The Safety Board generally agrees that small passenger vessel regulations are comprehensive in that they list the vessel components and devices that are subject to inspections and tests and stipulate the standards with which these devices must comply to allow for the safe operation of a vessel. However, regarding the upkeep of the vessel, the regulations state only that repairs and maintenance must be accomplished in compliance with existing standards. The regulations do not promote or require a vessel owner or operator to develop a systematic program for addressing repairs and maintenance. The continuing occurrence of small passenger vessel accidents that stem from maintenance failures demonstrates the need for vessel owners or operators to develop such programs. Preventive maintenance programs should not be considered “burdensome” to vessel operators but rather a means of improving the quality, reliability, and safety of a vessel and its operation. Such a program would help maintain the safety of a vessel between periodic Coast Guard inspections, which at present are often the only time a vessel’s condition and its safety systems are inspected and tested.

[GCMA Comment: If the NTSB had not cut itself off from investigating most towing vessel accidents in their Sept. 12, 2002 Memorandum of Understanding with the Coast Guard, they would find a real horror story of preventive maintenance shortcomings on vessels that have never been subject to Coast Guard inspections.]

The Commandant’s reply states that participation in the Coast Guard’s Streamlined Inspection Program (SIP) “enables the [vessel] owners to more effectively manage the oversight of inspection requirements. “Under the SIP, vessel owners and operators work with Coast Guard representatives to develop company and vessel action plans. Procedures for developing and approving those plans (46 CFR §8.530) specifically require a description of the company’s safety program, environmental protection program, and training infrastructure. They do not, however, specifically require a description of the company’s preventive maintenance program. Although participating in the SIP has good potential for improving overall vessel safety, it is not clear how the SIP can ensure proper preventive

maintenance on safety-critical vessel systems. According to the Coast Guard’s latest figures, only 29 small passenger vessels had enrolled in the program as of October 2003 (representing 0.29 percent of the 10,125 small passenger vessels the Coast Guard inspects). Those figures indicate that the SIP has generally been ignored by the small passenger vessel industry.

[GCMA Comment: Industry’s lack of participation in the Streamlined Inspection Program (SIP) shows that boat operators simply want the Coast Guard to inspect their vessels and then vanish! Likewise, only 7% of the owners or operators of the approximately 83,500 commercial fishing vessels make their vessels and crew available for voluntary dockside examinations. The Coast Guard has become increasingly irrelevant to commercial boat owners.⁽¹⁾] [⁽¹⁾Source: 2008 USCG Legislative Proposal]

On April 7, 2005, based on the correspondence received from the Coast Guard, the Safety Board classified Safety Recommendation M-02-5 “Open ó Unacceptable Response.”

The EXPRESS SHUTTLE II fire further demonstrates the need for vessel owners and operators to develop preventive maintenance programs. The operating company did not follow a regular maintenance schedule, did not keep adequate repair records, did not recognize that the vessel was experiencing a large number of failed fuel lines, did not follow the manufacturer’s guidelines for clamping and tightening the fuel lines, and most important, did not recognize that the failing fuel lines exposed the vessel and its occupants to the risk of fire.

The Safety Board remains convinced that regulatory requirements addressing the maintenance of safety-critical equipment on small passenger vessels are essential. Moreover, the Passenger Vessel Association’s (PVA) action in establishing readily accessible materials that vessel owners can use to establish preventive maintenance programs demonstrates industry acceptance of the importance of preventive maintenance.

The Safety Board therefore believes that the Coast Guard should reconsider requiring operators of inspected small passenger vessels to develop and implement preventive maintenance programs for safety-critical vessel systems, including the hull and the mechanical and electrical systems. Consequently, the Board reiterates Safety Recommendation M-02-5.

NTSB Assails Vessel for its Bungled Crew Response to the Fire Emergency.

After the engines failed, the first indication of the fire on board the 65-foot small passenger vessel EXPRESS SHUTTLE II was the white smoke the deckhands saw coiling from below decks. The deckhands tried to identify the source of the smoke by lifting a small access hatch to the engine space. They did not first notify the master or take the precaution of having a fire extinguisher at the ready before opening the hatch. The deckhands’ opening the hatch served only to feed the fire with oxygen. From what the deckhands told investigators, it is even possible that they left the hatch open.

After one of the deckhands informed the master of the smoke in the engine room, the crew continued to take actions that exacerbated the fire and the smoke conditions. First, the deckhands opened the larger hatch over the starboard engine, whereupon flames shot out. Then, after the master came down to the cabin, he and one of the deckhands again

opened the larger hatch while the other deckhand stood by with the portable extinguisher. That action fed more oxygen to the fire and allowed smoke to fill the cabin.

Even if the deckhand had been able to discharge the portable extinguisher, he would not have been close enough to the fire for the extinguisher to be effective. A portable extinguisher has a limited range and must be directed at the base of the fire to be effective. The deckhands' actions demonstrate that they were not properly trained in the use and limitations of the various types of fire extinguishers. Neither deckhand could tell investigators what kind of portable extinguisher they had used in fighting the fire on the EXPRESS SHUTTLE II.

The master's actions demonstrate that he too lacked training in using the vessel's firefighting apparatus. On discovering the extent of the fire, he left the cabin to retrieve the fire hose, then realized that the fire pump could not be activated if the engines were not running. It is possible that the master could have used that time to discharge the fixed carbon dioxide fire suppression system whose controls were located in the fuel room. However, by the time the master realized that the fire hose could not be used, the cabin had filled with smoke, and the crew had to evacuate.

Coast Guard regulations⁽¹⁾ require owners, charterers, masters, or managing operators to "instruct each crewmember, upon first being employed and prior to getting underway for the first time on a particular vessel and at least once every three months,ö about their duties in an emergency. [⁽¹⁾46 CFR §185.420.]

The regulations⁽¹⁾ require masters to "conduct sufficient fire drills to make sure that each crew member is familiar with his or her duties in case of fire.ö Neither deckhand on the vessel had undergone any emergency training, including fire drills, even though they had worked 1 and 2 months, respectively, for the vessel owners. [⁽¹⁾46 CFR §185.524.]

The master told investigators that he did the required fire drills öat least once a month, and when we get new deckhands, I do it more often.ö He said that he made sure the deckhands knew how to turn on the fire hose and where to direct passengers in case of fire. However, he said that he had never conducted a drill with either of the deckhands who were on the vessel the day of the fire "because they were new.ö

The master said the emergency drills were documented in a logbook that stayed with the vessel, and that the company did not keep a duplicate record of the drills in the office. Because the fire destroyed the logbook, the Safety Board could not determine when the company had last conducted the required emergency drills.

The Safety Board therefore concludes that on the day of the fire, the EXPRESS SHUTTLE II sailed without the owner, operator, or master having previously instructed the deckhands as to their duties in emergencies such as fires, as required by Coast Guard regulations.

Previous Accident Investigations

The Safety Board investigated past accidents on small passenger vessels where crew training in fire emergency procedures was a safety issue. In its report on the PORT IMPERIAL MANHATTAN fire, for example, the Safety Board found that the crewmembers on the vessel did not use proper firefighting techniques: thus, they were ineffective in controlling or extinguishing the fire. They did not take appropriate actions to prevent the heat and smoke of the fire from spreading to other parts of the vessel, which endangered their own safety and the safety of the passengers

on board. In the Safety Board's opinion the crewmembers' inability to appropriately respond to this emergency was the direct result of a lack of adequate training.

Establish Firefighting Training Requirements

As a result of its investigation of the earlier PORT IMPERIAL MANHATTAN fire, the Safety Board issued the following Safety Recommendation to the Coast Guard on July 3, 2002:

M-02-9: ö Establish firefighting training requirements for crewmembers on board small passenger vessels in commuter and ferry service.

On Nov. 11, 2003, the Coast Guard responded that it partially concurred with Safety Recommendation M-02-9, but that it believed öthe current requirements and recommendations are sufficientö and that it intended öto take no further action on this recommendation.ö However, Federal regulations do not require masters and deckhands on small passenger vessels to undergo formal firefighting training. Rather, the requirements⁽¹⁾ stipulate that newly hired deckhands be instructed as to their duties in an emergency and that masters hold ösufficient fire drillsö to familiarize crewmembers with their duties in case of a fire. The format and depth of the required instruction for new deckhands are left to the discretion of individual companies. The requirement for masters to hold ösufficient fire drillsö is also subject to discretionary compliance. Moreover, because masters are not required to complete training in firefighting techniques, they may not be prepared to train others or to evaluate the effectiveness of fire drills. [⁽¹⁾46 CFR §185.420 and §185.524.]

According to fire safety professionals and training materials such as those offered by the Passenger Vessel Association (PVA), effective marine firefighting, requires crewmembers to know about the various fire classes (A = paper and other common combustible materials, B = flammable liquids and gases, C = electrical, D = combustible metals such as magnesium), the basic chemistry of fire (fuel, heat, oxygen, chemical reaction), and the proper use of various extinguishing agents (water for cooling burning materials, dry chemicals or CO₂, for extinguishing a fire). Effective marine firefighting also requires practical knowledge of the sequence of steps crewmembers should follow in combating a fire on board a vessel. The first step is to locate the fire and report it. The next step is to prevent the fire from spreading by closing doors, portholes, ventilators, and other openings (hatches should not be opened). Finally, the fire should be extinguished by using appropriate agents and methods. Afterward, crewmembers should monitor the area in case the fire reignites.

Training Could Have Prevented This Loss

Because the crewmembers of the EXPRESS SHUTTLE II did not use proper firefighting techniques, they were ineffective in controlling or extinguishing the fire. Crewmembers delayed in notifying the master of the fire, and the master did not respond immediately to their warning. When the master saw smoke coming from the engine space, he should have realized that the fire was already beyond the first stage. The deckhands should have been instructed to secure the engine room ventilation and close all access to the space containing the fire. Instead, crewmembers opened the hatches to the engine room at

least three times, feeding the fire with oxygen each time. Next, the master made no attempt to activate the vessel's fixed CO₂ fire-extinguishing system, which neither deckhand even knew about. The deckhands had had no formal firefighting training and had participated in no fire drills during their employment with the company. The Safety Board therefore concludes that the crewmembers' firefighting efforts were ineffective in controlling or extinguishing the EXPRESS SHUTTLE II fire because they lacked adequate firefighting training and because the master did not take appropriate fire suppression measures.

In light of the evidence from this and previous vessel fires that it has investigated, the Safety Board believes that the Coast Guard should establish firefighting training requirements for crewmembers on board all small passenger vessels. The Safety Board recognizes that rulemaking by the Coast Guard to require firefighting training for crewmembers on all small passenger vessels will take time. Until such time as the Federal regulations are revised, the Safety Board believes that the owner of the EXPRESS SHUTTLE II should develop and implement a training program in marine firefighting for its crewmembers. To do so, they could use the training videos and written material related to basic firefighting, and marine fire safety that were developed by the PVA and that the organization makes available for a small fee.

The above recommendation to the Coast Guard builds on Safety Recommendation M-02-9, expanding it from commuter and ferry vessels to all small passenger vessels. On April 7, 2005, pending further action by the Coast Guard, the Safety Board classified Safety Recommendation M-02-08 "Open ó Unacceptable Response" because of the new recommendation stated above, Safety Recommendation M-02-9 is classified "Closed ó Superseded."

The first stage of a fire, known as the incipient stage,⁽¹⁾ begins at the moment of ignition. During this stage, the flames are localized and the fire is fuel-regulated (regulated by the configuration, mass, and geometry of the fuel). In the incipient stage, the oxygen content is within normal range and normal ambient temperatures still exist. ⁽¹⁾*Source: National Fire Protection Association, Fire Ignition and Development, Catalog No. V-54 (Quincy, Massachusetts: NFPA, 1998.)*

Interim Steps Are Necessary

Considering the time needed to promulgate new regulations regarding firefighting training for crewmembers on board small passenger vessels in commuter and ferry service, as recommended in Safety Recommendation M-02-9, on July 3, 2002, the Safety Board issued the following safety recommendation as an interim measure the Coast Guard could take:

M-02-10 ó Revise Navigation and Vessel Inspection Circular No. 1-91 so that it provides more in-depth guidance in training and drills for firefighting on board small passenger vessels.

The Coast Guard's response letter of Nov. 24, 2003, stated that it did not concur with Safety Recommendation M-02-10 because NVIC 1-91 was intended only to give general guidance to marine employers and masters and that it intended to take no further action. On April 7, 2005, the Safety Board responded that NVIC 1-91 "provides the Coast Guard's *only* guidance to the small passenger vessel industry

concerning fire training and qualifications of deckhands and that the list of tasks in the NVIC provides no guidance to deckhands on what they need to know in an emergency, what their responsibilities are or reference to further information, guidance or instruction. Pending further action by the Coast Guard, the Board classified Safety Recommendation M-02-10 as "Open ó Unacceptable Response." The Board continues to believe that NVIC 1-91 should provide detailed guidance, rather than only a list of tasks, regarding training and drills for firefighting on board small passenger vessels. The Board therefore reiterates Safety Recommendation M-02-10.

GCMA Comments to the NTSB

In a June 17th letter to Mark V. Rosenker, Chairman of the NTSB, GCMA commented on our review of NVIC 1-91 as follows:

Dear Chairman Rosenker,

(We) just reviewed NTSB/MAR-06/02, Fire On Board U.S. Small Passenger Vessel Express Shuttle II, in which Recommendation M-02-10 forms a significant part.

Our Association reviewed NVICs 1-91 and 1-95 as a part of MERPAC Task Statement #55. GCMA Director Glenn Pigott initiated this project and urged the Coast Guard's Merchant Marine Personnel Advisory Committee to look into this project that is covered in pages 10 through 30 of the attached GCMA Report #R-428, Rev. 1. **[Enclosure #1]** Since it made no progress through Coast Guard channels, our Association adopted the project and added a nine-page introduction that should provide you with our mariner views on training.

It is no wonder that the Coast Guard shies away from preventive maintenance. The Coast Guard refuses to concede (and has done so for the past 30 years) that a person serving as an unlicensed engineer, "deckineer," or deckhand on any vessel of less than 200 GRT requires any mechanical training whatsoever to perform his job intelligently because these individuals are not required to hold a Coast Guard license. This approach is extremely shortsighted, but has led to much larger problems exposed by the Coast Guard's refusal to concur with your recommendation M-02-10. Consequently, the whole sad story of the unsecured high pressure fuel line fracture that occurred on the EXPRESS SHUTTLE II is completely believable and will manifest itself again and again in many other ways.

It is also so tragic because this attitude has allowed and even encouraged vessel operators to use the cheapest available untrained labor. It has also denied hundreds, probably thousands, of our lower-level mariners useful mechanical knowledge and training they could use to improve their skills while also promoting safety.

We see that this basic training problem and its attendant ignorance extends far beyond small passenger vessels to other vessels especially towing vessels....

While revising NVIC 1-91 would be helpful, there is no requirement that anyone abide by the recommendations of ANY NVIC. We are pleased, however, that the Passenger Vessel Association responded to earlier recommendations for establishing a preventive maintenance program for their members. s/Richard A. Block, Secy, GCMA