

## PROPULSION LOSS PREVENTION

### **BACKGROUND:**

A significant percentage of propulsion failures occur on vessels with direct drive diesel propulsion plants. These problems typically occur when a vessel is reducing speed or changing direction, where a stop or backing bell is ordered. For example: While picking up a pilot, the vessel has to reduce speed often below the vessel's slow ahead bell; a stop bell is ordered to further slow the vessel; this is followed some time later by an ahead bell which, on occasion, is unable to be answered, typically due to a failure of the air start system. This type of propulsion system failure suggests that this evolution is the first engine operation in anything other than the ahead mode since the vessel departed the last port, and that the required testing in 33 CFR 164.25(a)(5) of the vessel's propulsion in the ahead and astern mode 12 hours prior to port entry was not performed. Since such testing would have likely revealed problems with the propulsion system, *it is apparent that a complete test of the propulsion plant in the ahead and astern modes is often not being done prior to port entry. While not testing may be permitted (upon notification to the Captain of the Port)* due to rough sea conditions prohibiting safely conducting the tests, the tests must in all other cases be conducted. Programming engine slow down to properly reduce from sea speed to maneuvering speed for temperature management should be managed to enable conducting the propulsion tests. Failure of the air start system upon first use at port entry has been shown typically to be due to problems that can be minimized by increased vigilance in checking or testing of the air system.

In addition to air start system failures, fuel switching is another (more limited) cause of failure. Though the incidence of propulsion failure due to fuel switching has decreased as a higher percentage of vessels now use one fuel type, vessels still utilizing two fuel types can minimize risk by conducting a positive risk assessment prior to initiating the change. Prior to switching fuels, the master (together with the pilot if embarked) should positively evaluate the situation, taking into account these and other factors:

- ◆ Traffic conflicts and general congestion
- ◆ Weather/sea/current conditions
- ◆ Vessel's current operating condition
- ◆ Local tug availability
- ◆ Proximity to navigationally challenging portions of the transit

In order to reduce the threat posed by propulsion losses, the Puget Sound Harbor Safety Committee has adopted the above and below actions to be conducted by vessels arriving in Puget Sound ports. Many of these suggestions are currently standard industry practice. The Puget Sound Harbor Safety Committee hopes that by describing propulsion loss information, and presenting this Standard of Care doctrine and Coast Guard expectations, the frequency and severity of propulsion losses can be significantly reduced.

### **PROPUSION LOSS PREVENTION: ACTION ITEMS**

#### **ENHANCED MAINTENANCE PROCEDURES (Starting and Control Air Systems For Direct Drive Diesels)**

1. Remove, clean, and replace filters as necessary
2. Inspect, clean O rings, repair and replace as necessary
3. Inspect, clean, and test air tanks as necessary, consider inner coatings
4. Inspect, clean, and test air lines. Conduct frequent blow downs to remove moisture.
5. Inspect and test air compressors
6. Install air dryers or heaters in the air start/receive system as necessary
7. Incorporate enhanced maintenance procedures into the vessel's ISM system.
8. Do not conduct maintenance on the starting or control air systems while underway in pilotage waters.

#### **PRE ARRIVAL TESTS AND VESSEL OPERATION:**

1. Follow the requirements of 33 CFR 164 including testing ahead/astern propulsion and actually backing down the vessel (Unless weather or sea conditions prohibit; you must report this to CVTS and the COTP to gain port entry).
2. Do not test propulsion in the Traffic Separation Scheme (TSS) or within 12 miles of the coastline unless you have permission from CVTS. Test farther from the coastline if onshore wind and sea conditions are severe and there is no immediately available tug; coordinate with CVTS. If testing at sea must be delayed for safety reasons, then report this to CVTS and request permission to conduct the test in the open but more protected waters of the Strait of Juan de Fuca before arriving at the pilot station.
3. Coordinate testing with CVTS. Although tests are required within 12 hours (not at 96 hour advance notice), the tests will be required in an area where tug assistance can be provided in a timely manner, if needed. The tests shall not be conducted on approach to the pilot boarding area off Ediz Hook or off Victoria.
4. Tests are also to be done prior to departure from the dock or while the vessel has tugs tethered/alongside.
5. Check air tank, air line pressures (Classification Societies and the U.S. Coast Guard set standards typically 12 starts are required).
6. Implement blow down procedures to reduce moisture in the air start system.
7. Insure a licensed engineering officer is in the engine control room while the vessel is in pilotage waters.
8. If fuel switching in confined and/or pilotage waters is necessary, then before switching fuel types, the master must carefully evaluate surrounding elements such as current or potential traffic conflicts, weather/seas/currents, tug availability and vessel operating condition, and proximity to navigationally challenging portions of the transit. If propulsion is lost during the switching evolution, then the master must immediately notify the Vessel Traffic System and obtain the services of the nearest tug(s).

**IN THE EVENT OF A PROPULSION OR STEERING LOSS**

**The master and/or pilot must:**

1. Obtain tugs immediately.
2. Immediately inform VTS Puget Sound and establish a communications schedule.
3. Track the vessel's position in relation to land, determine and monitor the drift rate.
4. Set the anchor detail.
5. Place the emergency generator on line.
6. Identify the source of the problem, conduct and test repairs.

**The U.S. Coast Guard will:**

1. Require immediate tug assistance.
2. Assist in locating nearest tug capabilities via Vessel Traffic System.
3. Issue Captain of the Port orders as appropriate to ensure required responses are undertaken.
4. Hire tug(s) directly if COTP order to obtain tug assistance is not complied with in a timely manner.
5. Require classification society inspection, technical representative oversight, and Coast Guard inspection and/or approval of repairs
6. Apply some or all of the above for partial propulsion or steering losses.