Watercraft Marine

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SAFETY ALERT 02/24

Critical Risks of Remote Control Wires in Lifeboat Launching Systems

This safety alert addresses the dangers associated with the remote operation of davit systems on ships.

Background

Remote control wires are vital for ensuring the safe and controlled launching of lifeboats. However, these wires are susceptible to various failures that can result in catastrophic outcomes, such as uncontrolled lifeboat descent and, in extreme cases, loss of life.
The operation of launching appliances for lowering survival craft is typically performed using one of three distinct methods:

Modes of Operation:

1. **Direct Control**: The operator manually releases the winch brake at the winch directly via the brake lever.
2. **Remote Control from Inside the Lifeboat**: The coxswain pulls on a stainless steel wire, routed into the lifeboat through multiple sheaves and fittings, so as to operate the winch brake lever from inside the lifeboat.
3. **Remote Control from the Deck**: A remote lever at the vessel deck edge is connected to the brake handle by a stainless steel wire, routed through sheaves and pulleys, allowing the operator to monitor the lifeboat's descent while operating the winch remotely.

Incident Overviews

1. On one vessel a remote-control wire arrangement caused two separate failures:

- **First Incident:** During a lifeboat lowering operation with the crew on board, the remote-control lowering wire suddenly parted. Investigations revealed that poor spooling of the winch wire under the outer layers had caused a kink (Photo 3), which created a weak spot leading to the wire failure. Although the brake was automatically re-applied, averting immediate danger, this failure highlighted a critical vulnerability. If this had occurred during an actual abandon-ship situation, the consequences could have been far more severe.

- **Second Incident:** The following day, after replacing the failed wire, another test was conducted. The lifeboat crew boarded, and the coxswain used the remote-control wire to lift the brake and begin the descent. However, the new wire also failed to spool smoothly. This led to an unexpected payout of the wire, prematurely engaging the winch brake and causing the lifeboat to halt suddenly and swing erratically above the embarkation deck.
  Moments later, the swinging motion caused the wire to regain tension, lifting the winch brake arm once more and initiating an uncontrolled descent. While swinging, the skeg keel of the lifeboat struck the deck edge, causing the lifeboat to list over 90° (Photos 1 and 2). A crew member on deck promptly engaged the winch brake lever, stabilizing the situation. Any further inversion of the lifeboat could have resulted in catastrophic outcomes, including potential injuries or fatalities.

Photos 1 & 2: Lifeboat keel caught of deck due to excessive swinging during uncontrolled lowering

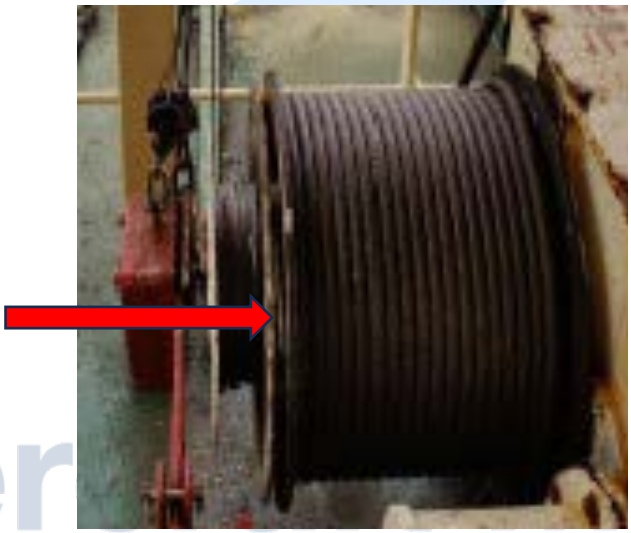

Photo 3:Poor spooling of remote control wire

2. Another incident where a remote-control wire arrangement caused damage of the winch brake.

- The crew was lowering the lifeboat without personnel onboard using the deck-mounted remote control lever when a loud noise emerged from the winch. Despite releasing the lever, the lifeboat continued lowering uncontrollably. The winch brake handle remained in the released position, and attempts to manually apply the brake failed due to tension in the remote-control wire. Moments later, the wire snapped, allowing the brake to re-engage and halt the lifeboat just before it reached the water.
  Inspection revealed that the wire had snagged on damaged areas of the remote wire drum, causing improper spooling and excessive lateral force on the brake, which deformed the brake handle (Photo 4) and damaged the brake unit housing (Photo 5). Although the damage was significant, the wire snapping prevented catastrophic failure. If the wire had not snapped, the brake housing could have been irreparably damaged, rendering the winch inoperative and compromising the lifeboat's operational readiness.

Photo 4: The brake handle forced laterally causing the brake housing to crack

Photo 5: The damaged brake housing

3. Finding remote control drums in damged and wasted conditions and remote control wires poorly reeved is becoming a regular occurance during third party inpsections.

Photos: 6, 7 & 8: Examples of damaged remote wire dums and incorrectly reeved remote control wire

These incidents underscore the critical need for proper inspection, maintenance, and operational practices to ensure the safety and reliability of lifeboat systems.

Root Causes

1. **Improper Spooling of Remote Control Wire:** Poor winch spooling can lead to kinks and the wire winding on itself. This creates excessive localised stresses, causing the wire to fail during lifeboat lowering.
2. **Damaged Remote Control Drums:** Corroded, worn, or physically damaged drums cause improper wire alignment and spooling, leading to snagging and excessive strain on the wire
3. **Incorrect Wire Specification:** Incorrect Wire Specification: Using wires with insufficient strength, flexibility, or rotation-resistant properties can lead to premature failure under operational loads. Rotation-resistant wires are essential in lifeboat launching systems to prevent torque build-up, reduce twisting, and ensure smooth operation through multiple sheaves and pulleys. Incorrect specifications can also result in wires that are more prone to corrosion or wear in marine environments.
4. **Incorrect Placement of Counterweight:** Improper positioning of the counterweight on the remote control wire can cause uneven tensioning or excessive slack, which may lead to improper engagement of the brake handle or snagging during operations.
5. **Improper Resetting Practices:** Failure to correctly reset the brake lever and remote control system after use may leave components under tension or misaligned, increasing the likelihood of malfunction during subsequent operations.
6. **Poor / Inadequate Maintenance Practices:** Stainless steel remote control wires require no greasing, as grease can harden over time, trap debris, obstruct movement, and hinder pulley rotation, leading to increased wear and snagging. Neglecting proper maintenance compromises system functionality and reliability.
7. **Innefective Inspections:** Evidence from these incidents suggests that routine inspections by the crew were not conducted in accordance with SOLAS requirements. Proper inspections would have identified damaged components, improper spooling, or worn wires, preventing many of these failures.
8. **Lack of knowledge on correct operation**: The crew lacked sufficient training on the correct use of remote control systems, leading to improper handling, misalignment, or failure to recognize early signs of mechanical issues.

Potential Consequences

- **Uncontrolled Lowering of the Lifeboat:** If the lifeboat cannot stop before reaching the water, it risks being dragged by the ship if the vessel is making headway. This can lead to significant damage to the boat and the hull.
- **Risk of Serious Injury or Loss of Life:** Failures occurring during lowering with personnel onboard pose a significant risk of injury or fatality due to uncontrolled descent, sudden impacts, or collisions with the hull.
- **Injury Risk to Coxswains Operating Remote Wires Inside the Lifeboat:** Snagged wires can cause severe hand and finger lacerations, broken bones, or, in extreme cases, amputation of fingers. This risk is heightened by the unsafe practice of wrapping the wire around hands for extra grip.
- **Injury Risk to Deck Crew:** Tensioned wires snapping or components failing under stress can cause parts to fly around the deck, creating a high risk of injury to nearby crew members.
- **Mechanical Damage to Equipment:** Excessive strain or improper operation can cause damage to the brake handle, winch housing, sheaves, or drums, rendering the survival craft inoperable and compromising the vessel's operational readiness.

Commercial Impact:

- **Crew Repatriation:** Costs and logistical challenges related to repatriating injured crew members.
- **Repair Costs:** Financial burden associated with repairing or replacing damaged lifeboat components.
- **Dispensation Requirements:** Inoperative lifeboats may require special dispensations, which could delay operations and affect vessel charters.
- **Off-Hire Scenarios:** Lifeboat issues could lead to vessels being taken off hire, causing revenue loss, loss of charters and operational disruption.
- **RightShip Rating Impact:** Safety-related deficiencies can negatively affect RightShip ratings and vetting inspections, potentially influencing future charter opportunities.
- **Class Conditions:** Additional surveys or inspections may be mandated to remove conditions of class, incurring further delays and costs.

Recommendations

1. **Routine Inspections**:
- Conduct thorough inspections of remote control wires, drums, sheaves, and pulleys before and after each use.
- Check for signs of wear, corrosion, damage, or improper spooling on all components of the system.
- Verify that the remote control wire counterweight is correctly positioned to ensure proper tension during operation.
- Ensure that inspections are carried out according to SOLAS and company-specific safety standards, with documented results and follow-ups on identified issues..

2. **Operational Precautions**:
- Perform test lowering of lifeboats without personnel onboard to identify any potential issues before live use.
- Train crew members to avoid unsafe practices, such as wrapping wires around their hands for added grip, which can lead to severe injuries.
- Ensure that the remote control wire and brake systems are reset correctly after each use to prevent unintended tension or misalignment.
- Monitor lifeboat lowering closely, especially during operations with the ship underway, to prevent uncontrolled descent or collisions.

3. **Maintenance Protocols**:
- Do not apply grease to stainless steel remote control wires, as lubrication is unnecessary and can lead to hardened grease buildup, restricting wire and pulley movement.
- Regularly clean all system components, removing debris and inspecting for damage or wear.
- Replace worn or damaged wires, drums, and sheaves immediately to maintain system integrity and functionality.
- Conduct periodic maintenance based on manufacturer recommendations and maritime regulations, ensuring that all components remain in optimal working condition

4. **Promoting Safety Through Near-Miss Reporting**

- Encourage the reporting of near misses to identify potential hazards, foster knowledge sharing, and develop best practices across the fleet. This proactive approach not only enhances safety awareness and operational standards but also serves as a critical driver in preventing more serious incidents.

5. **Procurement Standards**:

- Use high-quality, marine-grade stainless steel wires with rotation-resistant properties and components designed for marine environments to minimize twisting, ensure smooth operation through sheaves and pulleys, and provide high resistance to corrosion and wear.
- Ensure all parts, including wires, drums, and sheaves, meet or exceed applicable SOLAS and maritime safety standards.
- Procure spare components, such as remote control wires, to enable immediate replacement during inspections or following failures.

Conclusion

The incidents detailed in this safety alert highlight the critical need for proper inspection, maintenance, and operation of remote control wire systems in lifeboat launching. Failures in these systems can result in uncontrolled lowering, serious injuries, or operational downtime. By addressing root causes through routine inspections, correct maintenance practices, crew training, and the use of high-quality, rotation-resistant components, vessels can ensure safe and reliable lifeboat operations while remaining compliant with safety regulations.

For further guidance or technical assistance, contact Watercraft Marine where our lifeboat safety experts are available to provide support and ensure your vessels meet the highest safety standards.

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