



## **MARINE SAFETY ALERT**

### ***Inspections and Compliance Directorate***

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Washington, DC

Safety Alert 02-98

### **WIRE ROPE FAILURES**

The starboard lifeboat aboard a large freighter was lowered to facilitate securing the gear and stores in the boat. At approximately 9:40 a.m., stowage was completed and the boat was ready to be raised up to its inboard stowed position. Three men remained in the boat as it was being hoisted. The floating blocks connected with the davit arms and the davit arms started up the trackways. The davit arms were 23 inches up the trackways when, without warning, the forward lifeboat fall parted with a loud snap. All the men in the lifeboat were immediately dropped into the water as the boat swung, still being held by the after fall, against the after davit arm. Cause of the accident: Localized corrosion which caused thinning of the wires and thus the weakening of the strands. Failure occurred when the corrosion-reduced cross section was overloaded. Injuries: One man received a cervical sprain; another incurred a serious back injury, which caused considerable lost work time; the last man had his right ear drum perforated.

This accident description is, unfortunately, not unique. It is typical of a kind of accident which is repeated so often that even the casual observer cannot help but wonder at the mariner's failure to heed the safety measures which have been established to prevent such recurring accidents.

Standards and procedures for the care and maintenance of wire rope falls on lifeboat davits have long been established by both manufacturers and the U.S. Coast Guard; yet each year serious injuries to personnel and property damage are caused by the failure of wire rope falls.

These failures have two things in common: their cause, and the opportunity for their prevention. In nearly every case, such accidents are caused by the separation of the falls at a point which was inaccessible for proper maintenance and inspection when the davit was in a full upright stowed position. In nearly every case, the accidents could have been prevented had the davits been partially lowered to allow access to the entire length of the fall line for proper lubrication and inspection.

Wire rope, like complicated machinery, consists of many small interwoven parts that need lubrication. There isn't a mariner worth his salt who wouldn't acknowledge the necessity to keep an engine or winch well lubricated to achieve best results. Yet many of these knowledgeable seafarers ignore the necessity of keeping wire rope clean and well lubricated.

Most davits on shipboard are located so that they are continuously exposed to both sea spray and stack gas. The combination of salt water and engine or boiler exhausts creates acids which pit and corrode wire rope, providing bending and fatigue points which eventually lead to failures. This weakening can be prevented by proper cleaning and lubrication. In most cases investigated, this wear at stress points around sheaves and through blocks would have been visible to the naked eye had the entire length of the fall been examined by the lowering of the davit. Lowering the davit would have allowed access to those areas of the fall line which are normally inaccessible.

Another factor contributing to failures: the failure of crew members to periodically change the position of wire rope, allowing a piece of wire rope to remain in a single use position for the expected life of the rope. A ship is subjected to considerable vibration while at sea. This vibration is arrested sharply at the tangent point in the sheaves creating areas of potential fatigue failure. If the position of the rope is periodically changed by moving the boom position, the wear and fatigue is distributed more evenly along the length of the rope, thus reducing the chance of failure.

Modern wire rope is made to the highest engineering standards. By the use of many tests and controls during its manufacture, it is almost impossible for serious flaws to exist in the finished product. An accident in service with wire rope almost always results from poor maintenance procedures. To keep wire ropes in safe operating condition, clean and lubricate them frequently, and regularly change their stowage position.

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