



US Army Corps
of Engineers®

ENGINEERING AND CONSTRUCTION BULLETIN

No. 2002-33 Issuing Office: CECW-ETE Issued: 16 Dec 2002 Expires: 16 Dec 2004

Subject: Wire Rope Failure - John Day Lock Upstream Lift Gate

Applicability: Information

1. On 17 November 2002, the upstream lift gate at John Day Navigation Lock on the Columbia River experienced a complete wire rope failure while the gate was being lowered. The cause of the failure is under investigation at this time. Preliminary investigation found that the probable cause of the failure was excessive wear resulting from insufficient lubrication. This bulletin is provided to promptly get the word out to the field about the failure and what to look for at other projects to avoid a similar incident. Another bulletin will be disseminated when the investigation is completed and a formal report written.
2. The vertical lift gate at John Day Lock lowers to open. It is raised and lowered by eight ropes (four ropes per side), 1-1/2 inch diameter, 6x19 IWRC Improved Plow Steel, right regular lay. The dry weight of the gate is over 200,000 pounds. A check of the original rope design revealed an adequate safety factor and an adequate drum diameter. The rope had been in service for about 11 years. The gate fell about 27 feet and sustained significant damage. The counter weight fell about 70 feet and its extent of damage is unknown at this time.
3. All eight ropes failed approximately 6 feet from their attachment point at the top of the gate. This location corresponds to where the ropes were in direct contact with the drum when the gate was in the raised position. The gate was kept in the raised position between lockages, which made inspection and lubrication of that portion of the rope that failed extremely difficult. The area where the ropes failed exhibited extreme wear and some surface corrosion.
4. It is recommended that the inspection and maintenance recommendations of EM 1110-2-3200, Wire Rope Selection Criteria for Gate-Operating Devices (Chapter 7 - Inspection, Maintenance, Retirement, etc; Appendix G - Inspection Report Checklist; and Appendix H - Lubrication and Lubricant Data) be reviewed and implemented as needed for all structures that have wire rope operated hoists. Special attention needs to be paid to areas where gaining access to inspect and maintain components is difficult to achieve. The use of inspection mirrors or even the installation of removable access covers or work platforms may be required.
5. Point of contact for this bulletin is Dan Casapulla, CECW-ETE, 202-761-5544.



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