DAM SAFETY UPDATE
DWORSHAK DAM AND RESERVOIR

U.S. ARMY CORPS OF ENGINEERS **BUILDING STRONG®**

What residents near dams should know

Living with flood risk-reduction infrastructure such as dams and levees comes with risk. Know your risk. Dams do not eliminate all flood risk, so it is important that residents downstream from the dam are aware of the potential consequences should the dam breach, not perform as intended, or experience major spillway or outlet works flows.

Living with dams is a shared responsibility of residents, local emergency management, and the Corps (USACE). Know your role. Listen to and follow instructions from local emergency management officials. Contact your local officials to learn about flood risk management decisions in your area. Consider purchasing flood insurance.

For additional information, see:
http://www.damsafety.org/media/Documents/DownloadableDocuments/LivingWithDams_ASDSO2012.pdf.
http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx.
http://www.nww.usace.army.mil/Missions/DamSafety.aspx.

Project Description

Dworshak Dam is a concrete gravity dam located on the North Fork of the Clearwater River near Orofino, Idaho. The reservoir is 54 miles long with a drainage area of 2,440 square miles. Dworshak provides flood risk reduction, hydroelectric power generation, water supply, recreation, and fish and wildlife benefits. Construction of Dworshak began in July 1966 and the project was placed in operation in March 1973. The dam is 3,287 feet long with a maximum height of 717 feet. The powerhouse has 400 megawatts of electrical generation capacity.

Risks Associated with Dams in General

Dams reduce but do not eliminate the risk of economic and environmental damages and loss of life from flood events. When a flood exceeds a reservoir's storage capacity, large amounts of water may have to be released that could cause damaging flooding downstream. A fully-functioning dam could be overtopped when a rare, large flood occurs, or a dam could breach because of a deficiency, both of which pose risk of property damage and loss of life. This means there will always be flood risk that has to be managed. To manage these risks, USACE has a routine program that inspects and monitors its dams regularly. USACE implements short- and long-term actions such as interim risk reduction measures (IRRM), on a prioritized basis, when unacceptable risks are found at any of its dams. The status of Dworshak Dam IRRM is provided below.

Dworshak Dam Status

Based upon the most recent risk assessment of Dworshak Dam in 2012, USACE considers this dam to be a moderate to high risk dam, among its more than 700 dams. The risks are primarily driven by potential for structural cracking due to a large seismic event. Currently there is no evidence to suggest an emergency situation exists or is about to occur.

Status of Interim Risk Reduction Measures

Completed Interim Risk Reduction Measures (as of January 2016)

- External stability study: Complete. The dam meets current criteria for external stability.
- Repair and upgrade instrumentation: The ARRA-funded instrumentation upgrade and automated system contract was awarded in June 2010 and completed by December 2011. The automated system is currently online and collecting data. Data evaluation is ongoing.

- Complete trunnion friction analysis: Contract for strain gauge instrumentation of trunnion gate bearings (the gate hinges for vertical raising) is completed and a report provided. Numeric evaluation of report data to determine trunnion friction is complete.
- Revise the dam safety emergency action plan: Revision finalized March 2014 and distributed to local emergency management officials.
- Conduct emergency exercises: An internal (Corps only) tabletop exercise was completed in April 2015. Emergency exercises will be a recurring activity.

Ongoing/Remaining Interim Risk Reduction Measures (as of January 2016)

- Update emergency action plan inundation maps: Updated inundation maps for the emergency action plan are planned to be distributed in FY2016.
- Complete finite element analysis: This study will analyze internal stresses to more adequately model existing cracks in the dam. Analysis is in progress (Phase 2 Issue Evaluation Study).
- Repair failed waterstops: Two 8-inch diameter urethane waterstop cylinders were installed in the Dam September-October 2010. The District's contractor sent a final report in February 2011 stating that the urethane waterstop material is functioning as designed, although engineers observed that even with new waterstops in place, nuisance water flow through the dam hasn't decreased. Design for foundation repairs is planned to start in FY2016.

Ongoing Risk Management

A Phase 2 Issue Evaluation Study is in progress and is tentatively scheduled for completion in fiscal year 2016, contingent upon resources. The purpose of the Phase 2 Issue Evaluation Study is to further reduce remaining uncertainties identified in the Phase 1 Issue Evaluation Study.