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 U.S. Army Corps of Engineers. Know your role. Listen to and follow instructions from local emergency management officials. The Corps doesn't normally issue evacuation instructions. 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 flood control dam located on the North Fork of the Clearwater River near Orofino, Idaho. Construction began in 1966, flood damage reduction operations began in June 1972, and power generation came online in 1973. The project includes the dam, reservoir, powerhouse, recreation facilities, wildlife mitigation and Dworshak National Fish Hatchery. The reservoir is 54 miles long and has a surface area of about 20,000 acres.

Public Safety is the Corps' Highest Priority

The U.S. Army Corps of Engineers' highest priority is public safety. While we cannot completely eliminate risk, we can reduce risk. The objective of the Corps' Dam Safety Program is to maintain public safety, make Corps dams safer and minimize risks. Since 2007, the Corps has used a risk-informed process to prioritize addressing dam safety deficiencies on a nationwide basis. Walla Walla District dams and appurtenant (dam-related) levees were screened and assessed for dam safety issues and deficiencies and their potential risk to the public. This led to a better understanding of specific conditions at dams, which has led to safety improvements. After dams and dam-related levees were assessed, the Corps categorized dams into five Dam Safety Action Classifications (DSAC) based on individual dam safety risk:

- DSAC 1: Very High Urgency
- DSAC 2: High Urgency
- DSAC 3: Moderate Urgency
- DSAC 4: Low Urgency
- DSAC 5: Normal

The dam safety classifications assist the U.S. Congress and the Corps in prioritizing funding for dam safety infrastructure improvements.

Dworshak Dam Status

Dworshak Dam was initially classified as DSAC 2 "High Urgency" in October 2007 because of engineering unknowns related to structural stability and foundation seepage of concrete gravity sections.

In May 2012, Dworshak Dam received a more favorable or safer DSAC 3 “Moderate Urgency” based on a completed “Phase 1 Issue Evaluation Study,” which improved Corps’ understanding of conditions at the dam. The primary reasons for the new ” Moderate Urgency” classification were 1) a confirmation of the robustness of dam design and historical performance of the structure; and 2) that potentially significant failure modes are a result of rare seismic events.

The Dworshak DSAC 3 means for confirmed and unconfirmed dam safety issues, the combination of life, economic or environmental consequences with likelihood of failure is moderate. The Corps considers this level of life-risk to be unacceptable except in unusual circumstances. Currently there is no evidence to suggest an emergency situation exists or is about to occur.

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 such as during a large flood or storm, significant amounts of water may need to be released, causing damaging flooding downstream. A fully-functioning dam could be overtopped when a very rare or infrequent 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 to be managed. To manage these risks, the Corps routinely inspects and monitors its dams. The Corps 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. Dworshak Dam IRRM include:

Completed Interim Risk Reduction Measures (as of February 2015)

- 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.

Ongoing/Remaining Interim Risk Reduction Measures (as of February 2015)

- Conduct emergency exercises: An internal (Corps only) tabletop exercise is planned for 2015.
- Update emergency action plan inundation maps: Updated inundation maps for the emergency action plan are planned to be completed and distributed in FY2015.
- 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. The next step is to identify the primary source of water still making its way through the dam, and determine repair alternatives.

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.

Updated Feb. 12, 2015 -1315