



Ice Harbor Lock & Dam Interim Risk Reduction Measures

U.S. ARMY CORPS OF ENGINEERS

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Project Description

Ice Harbor Lock and Dam is located on the Snake River about 10 miles above its confluence with the Columbia River. It is owned and operated by the Walla Walla District of the U.S. Army Corps of Engineers for power production, navigation, and recreation. Ice Harbor includes a dam, power plant, navigation lock, two fish ladders, removable spillway weir and recreation areas. Lake Sacajawea behind the dam extends upstream 32 miles with a surface area of 9,200 acres. The lake is surrounded by 3,576 acres containing recreation and wildlife habitat management areas.



Construction began in December 1955. The dam is a straight-line concrete gravity structure, approximately 2,822 feet long and 130 feet above the streambed. It features a 671 foot-long powerhouse, 86 by 675-foot navigation lock, and earthfill embankment.

Dam Safety Program & Public Safety

The U.S. Army Corps of Engineers owns and operates 635 dams nationwide. These dams serve a variety of purposes including navigation, flood risk management, water supply, irrigation, hydropower, recreation, and environmental enhancement. As part of the responsibility for managing these dams, the Corps has a comprehensive Dam Safety Program with public safety as its primary objective.

In 2005, the Corps initiated the Dam Safety Action Classification (DSAC) System as part of its overall dam safety program to optimize public safety. The DSAC system is a method of screening Corps dams to identify dam safety issues and deficiencies and establish a relative ranking of their potential risk to the public. The Corps then uses this rating system to establish a nationwide prioritization to focus funding first on dams and navigation locks that pose the greatest risks to the public.

Dam Safety Screening & Interim Risk Reduction Measures

The Corps is screening all its dams and assigning safety classification ratings based on two key factors: 1) an assessment of the probability (high, medium, low) of dam failure (based on confirmed or unconfirmed dam safety issues), and 2) the consequences if failure were to occur.

In May 2007, the Corps released Engineering Circular (EC) 1110-2-6064, *Interim Risk Reduction Measures (IRRM) for Dam Safety*. The circular includes a Dam Safety Action Classification Table to rate critical aspects of the dam based on known or suspected dam safety issues and engineering judgment. Using the DSAC rating system, each dam is classified from I to V, with DSAC-V being the “most safe” and DSAC-I posing the “most urgent” risk. The rating system also describes a policy for developing and implementing Interim Risk Reduction Measures (IRRM) to reduce the probability or consequences of unacceptable performance. These risk reduction measures may be either structural or non-structural. These interim measures are designed to minimize short-term risk to public safety while pursuing long-term, permanent solutions or further investigation reveals a potential failure mode is not probable.

Ice Harbor Lock and Dam Status

Ice Harbor Lock and Dam was classified as a DSAC-III “High Priority (Conditionally Unsafe)” primarily due to two potential failure modes: 1) overtopping/erosion of embankment/abutment and 2) upstream radial lock gate failure. Implementation of the proposed measures will reduce the probability and consequences of dam failure until long-term remediation is complete. Although the probability of dam failure is low, the consequences of failure are potentially high. Currently there is no evidence to suggest an emergency situation exists or is about to occur. However, the Corps identified conditions that don’t meet industry dam safety standards, and the risk to public safety is unacceptable. Therefore, we are taking priority actions to address potential dam failure.

Response to the DSAC Rating

In response to Ice Harbor’s DSAC-III rating, the Walla Walla District assessed the lock and dam’s safety and developed an Interim Risk Reduction Measures Plan to address high priority risks identified in that analysis.

Interim measures include immediate, short-term, and ongoing initiatives to minimize public risk. They are designed to better evaluate and reduce the probability of dam failure as well as reduce consequences of a failure. Prevention of loss of life is the first and foremost objective, followed by prevention of economic and environmental losses.

What the Corps is Doing Now

To optimize public safety at Ice Harbor, we are taking the following steps to reduce the potential of dam failure, loss of life, and economic and environmental impacts:

1. Update probable maximum flood and water surface profiles.
2. Complete a spillway hydrology/hydraulic study.
3. Relocate spillway power generator; provide seismic bracing.
4. Conduct upstream gate reliability analysis.
5. Develop a navigation lock operation plan.
6. Conduct a navigation lock monolith study.
7. Develop a right side closure plan.
8. Conduct a spillway bridge study.
9. Stockpile emergency sand and gravel.
10. Perform potential failure mode analysis.
11. Develop a dam surveillance plan.
12. Update potential failure mode analysis consequence area maps.
13. Conduct emergency exercises.
14. Update the emergency action plan.
15. Perform spillway tainter gate evaluation.

These and other short-term actions allow us to operate the dam, meet our public safety objectives, and continue to review Ice Harbor and pursue long-term repairs as appropriate.



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