

Challenge

Issue

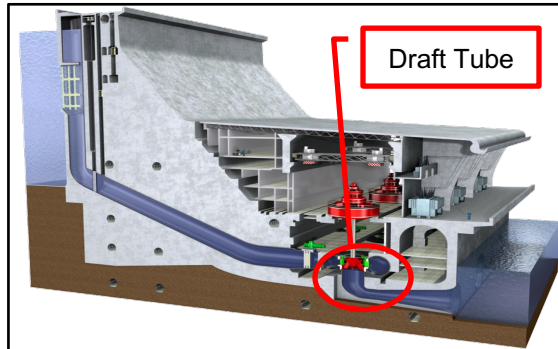
Severe vibration and cavitation in draft tube leading to loss of bolted steel plates. Shutdowns to repair/replace steel plates are expensive and require 30 days on average to complete.

Goals

Provide faster turnaround repair method that would resist hydraulic forces.

Root Cause

Flow at $>50 \text{ m}^3/\text{sec}$, along with high level of suspended solids during spring runoff also caused to concrete and rock walls.



Before: draft tube.

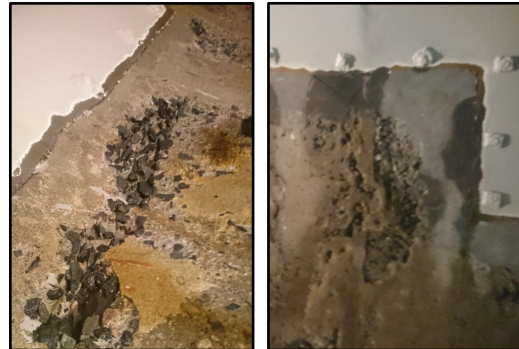
Solution

Preparation

Preparation high pressure water blasting was first used to remove loose concrete. This was followed by re-bolting loose plates and pressure grouting underneath.

Application

ARC 791 was applied directly to prepared concrete and bare rock wall at thicknesses ranging from 6 mm – 15 mm. This approach eliminated further bolting and eliminated air pockets where vibration could occur. Application carried out in <7 days.



In process: damaged areas with raw steel plate edge shown loose on left and reattached on right

Results

Client Reported

Initial application done in 1994 was inspected after five years and found in excellent shape. This led client to authorize repair on larger unit with same issue.

ARC repairs were carried out in <10 days and have continued to perform.



After: completing application of ARC 791