



## **The Fall Protection Cable that Changed a Dam: How a Simple Safety Upgrade Sparked Major Improvements**

**Jeff Wackowski, P.E., LaBella Associates; Todd Mueller, P.E., Colliers Engineering & Design**

The Cadyville hydroelectric plant is a FERC-regulated development located on the Saranac River a few miles west of Plattsburgh, NY. The concrete gravity dam is about 47 feet tall and includes a 237-foot-long concrete spillway, cast between the exposed bedrock of river. The dam owner initiated a project to upgrade the fall protection cable across the crest of the dam to allow for safe installation of seasonal flashboards. Field investigations and a growing to-do list of small items led to a multi-year dam improvement project. Construction efforts unearthed additional issues that had been buried for decades. A fall projection cable anchor foundation design evolved into an abutment upgrade, designed to withstand PMF hydraulic conditions. Excavation for the new foundation block led to partial replacement and structural upgrading of the existing abutment. Both sections included post-tensioned rock anchors – a first time for design and installation by the Engineer and requiring input from the owner's Dam Safety Engineer. This prompted the addition of Colliers Engineering & Design (CED) to the engineering team, to lend their expertise and guidance as the Owner's Engineer. Large cellular cofferdams were placed to facilitate the excavation and then moved to accommodate the expanded scope. Continual collaboration throughout the 2-year construction period between the engineering team, owner, contractors, and the field construction managers was necessary to adapt to the unknown field conditions. The technical teamwork between LaBella and CED resulted in a successful engineering solution for the Owner and improved both dam safety and personnel safety. To capitalize on the construction efforts of the fall protection project, the owner initiated additional concrete improvements at other parts of the dam. Multiple dives were conducted to configure the design and seating of 30-foot-tall steel cofferdams required to complete concrete repairs on the upstream face of the intake below the water level. The divers discovered unknown structures, which required further collaboration between all parties to adjust the repair scope and design a 3-sided custom steel box cofferdam. Ultimately, the team ended up completing the fall protection system, headwall improvements, the new cutoff wall, a new splash-wall to prevent soil erosion beneath the penstock, concrete surface repairs to the intake below water, intake deck crack repairs, concrete reconstruction of the intake vent, spillway surface repairs, and infilling two abandoned low-level release portals at the base of the dam.