

Washington

Adapting Oilfield Technology to Solve Water Seepage Challenges at a Hydroelectric Dam

Hydraulic pipe cutter delivers safe, efficient, and cost-effective casing removal

Innovative Solution for Dual String Casing Removal

In Washington, an operator launched a modernization and safety project for a hydroelectric dam that required drilling and casing more than 200 boreholes into bedrock for grout and cement slurry injection to reduce water seepage.

After grouting, dual-string casings—140 mm steel and 112 mm PVC—needed to be cut and removed at the lakebed to eliminate underwater hazards. Conventional single-blade cutters proved ineffective, and diver-assisted methods posed high costs and significant safety risks.

To overcome these challenges, WIS adapted proven oilfield technology, proposing a 3-5/8" OD pipe cutter with three hydraulically actuated knife blades. This design enabled cutting both casing strings in a single trip, streamlining removal operations.

The solution successfully cut and recovered casing from over 200 boreholes, minimized HSE exposure, delivered significant cost savings, and demonstrated the value of cross-industry innovation by applying oilfield tools to hydroelectric infrastructure projects.

CHALLENGE

- Cutting a complex dual-string casing: 140 mm outer steel and 112 mm inner PVC
- Restricted 3.86" ID of inner string allowed minimal clearance for cutter activation
- Cement grout slurry injected between strings increased cutting resistance
- Limited industry experience cutting PVC with hydraulic pipe cutters created operational uncertainty

SOLUTION

- Deployed a 3-5/8" OD hydraulically actuated pipe cutter
- Selected knife blades to provide sufficient radial force despite tight annular clearance
- Blades dressed with crushed carbide for durability and efficient cutting across steel and PVC
- Surface-based cutting operations eliminated high-risk underwater methods

RESULT

- Successfully cut and recovered dual-string casing from over 200 boreholes
- Validated adaptability of oilfield hydraulic cutting tools for hydroelectric infrastructure
- Surface-based cutting minimized personnel risk compared to diver-assisted alternatives
- Achieved significant project savings through an efficient, repeatable cutting method

