

IID Drop 3 Hydroelectric Plant Drop 3 Unit 2 Repairs 200265 Project Description

The Drop 3 Unit 1 and Unit 2 hydraulic turbines are part of the Imperial Irrigation District's hydroelectric power generation system on the All-American Canal with 85 MW of installed capacity. Drop 3 Unit 1 and Unit 2 are operated remotely and are located 23 miles east of Calexico, CA off highway 98. Both units are horizontal Kaplan type turbines originally designed by Allis Chalmers and each rated at 4,400 KW. Unit 2 was commissioned in 1967. Either unit has not undergone a major overhaul.

In the recent past, Drop 3 Unit 2 blade servomotor, main shaft and adjustable Kaplan blade runner experienced severe oil leaks originating from the blade servomotor, main shaft and adjustable Kaplan blade runner requiring Generation staff to initiate an informal request for proposal, which included turnkey services, materials, equipment, supervision, labor and testing to complete the required services.

On February 16, 2022, a site assessment was performed with the participation of three contractors, including Voith Hydro Inc. as the Original Equipment Manufacturer. Generation staff received three responses: Voith, TurbinePROs and Thompson/HCMS.

As of May 20, 2022, Unit 2 was shutdown due to an increase in water leakage rendering the waste water collection pit pumps unable to pump out the collected fluid. Water leakage is directly related to oil leakage.

The IRFP scope of work requirements were designed to quickly identify the source of oil leakage and implement repairs or recondition the turbine parts. To assess the condition of turbine components the unit will be disassembled, including removal of the generator rotor, outer headcover and wicket gates. The replacement parts that are expected to be required in the blade servomotor and the runner hub will take time for manufacturing after the contractor has cleaned, inspected and verified damaged parts measurements. Every effort will be made to decrease manufacturing time.

Generation staff evaluated the responses and selected the best contractor based on best value in terms of cost, requirements, experience and technical qualifications. Furthermore, Generation staff had interviews with other users that required similar services provided by the selected Contractor. In addition to providing on-site technical supervision, on-site installation crew and repair services as required to return the unit to production, the Contractor will also participate in the start-up of the unit to ensure acceptable performance of the turbine. IID Generation maintenance personnel will provide craft labor as required during reassembly of the turbine and generator. There will be components discovered during the inspection that will need repair. As these component repairs are not at present apparent, the Contractor will be considered to perform component repairs/refurbishment as needed. IID Project Management will track the progress and costs of the hydraulic unit major overhaul.

In Summary:

Drop 3 Unit 2 hydraulic turbine has experienced severe oil leaks originating from the blade servomotor, main shaft and adjustable Kaplan blade runner and require the repair and/or reconditioning of these components to eliminate the risk of compromising the economics of Unit 1 by forcing a significant outage. Restoration of the integrity of the turbine parts will assure that optimal energy output, reliability of operation and environmental soundness will be maintained.