

LOCH SLOY HYDRO-ELECTRIC SCHEME



Glenfield Invicta were awarded a contract by Dales Engineering Services Ltd for client Scottish and Southern Energy (SSE) to refurbish two Needle Discharge Valves – one 48” and one 12” on the Sloy Hydroelectric Power Station.

The Loch Sloy Dam, built as part of the Sloy Hydroelectric Power Station project. The Dam is **56m high and 357m long and raised the surface level of the loch by approximately 47m**. The resulting Sloy Reservoir has a 17km² direct catchment area, although various pipes and intakes have provided a further 63km² of the indirect catchment area. The total volume of water held in the reservoir by the dam is approaching 36 million m³, and a 3km long tunnel takes water from Loch Sloy to a valve house positioned approximately 197m above the tank. From the valve house, four DN2000 steel pipes carry the water down into the powerhouse that is situated on the west coast of Loch Lomond.
(See picture on left)

Jim McAllister Glenfield Invicta Project Manager - Engineering Site Solutions, explained about the valves and the company's involvement.

“The Needle Discharge valves are the original ones fitted in the 1960’s by Glenfield Invicta, and it is the first major refurbishment they have had. We still have the original drawings in our extensive drawings library that enabled us to understand what was needed for the refurbishment.”



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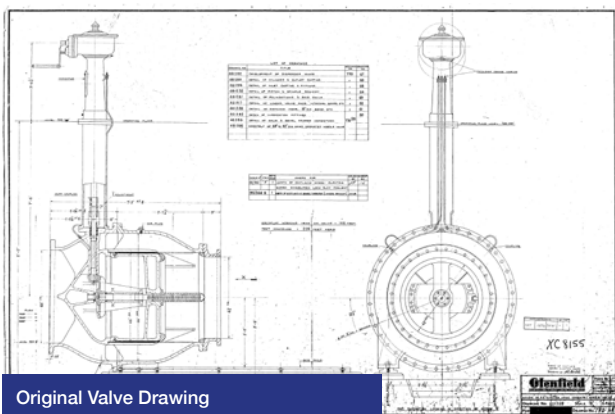
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The valves were originally removed by Dales Engineering Services Ltd and were delivered to our workshop. From there the Glenfield Invicta engineering team were able to remove and replace the bronze seat and face rings on both valves. The most challenging aspect of replacing the seat and face rings is ensuring that the 'bedding' or "lapping" between the seat and face rings was accurate. This is done by hand and is a highly skilled process; one which is fundamental to the successful and cost effective valve refurbishment.

Jim explained, "During the assembly, we have to rebuild all the gearing within the valve and replace the bronze piping for the grease lubricating pipe. We then have to undertake the 'lapping' element to match the seat faces - this is also carried out by hand. It entails introducing a marking dye on one surface and then closing the valve until the two surfaces are engaged. This indicates the high points on the surface that have not been dyed. It is then that the most intricate and skilled aspect of the works takes place. The engineer fitter has to file or grind the surfaces by hand until they are completely engaged and 'drop tight' – no leakage whatsoever! The valves are then fully assembled, painted and hydrostatically tested."

We received a visit from the Dales Engineering Services Limited and SSE Engineers who witnessed the successful testing of the valves post refurbishment. The SSE engineer commented that he looked forward to another 50 years of successful operation."



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