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REPLACING A PENSTOCK PIPE USING DIRECTIONAL DRILLING : CHRONICLE OF A NON-STANDARD JOBSITE

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REPLACING A PENSTOCK PIPE USING DIRECTIONAL DRILLING : CHRONICLE OF A NON-STANDARD JOBSITE

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ABSTRACT :

Nested in a geological environment shaped by the tumultuous tectonic history of the Alps, the hydroelectric power plant of Saint Martin de la Chambre, located near Grenoble (France) and supplied by a penstock pipe, was eventually shut down because of a landslide.

To bring the powerplant back into service, a new project was set up around the central idea of using directional drilling to rebuild the penstock pipe while taking into consideration both the geology of the area and the geomorphological context.

Overall, the project represents a 1000m drilling along a 450m drop (Δz), between the hydroelectric power plant of Chamorand and the chapel Notre-Dame de Beaurevers, right in the middle of the dauphinoise zone and in a geological environment that mixes marls, limestones, zones of compressions and faults. Furthermore, the landslide that caused the failure of the initial pipe created a lens of weakened soil, preventing any rehabilitation of the existing building. Lastly, the presence of a nearby stream named the Merderel had to be considered.

This project put a strong emphasis on the importance of intensive analysis of the geological context through direct field investigation by the geologist and precisely calibrated geotechnical and geophysical studies. This has

fueled a joint reflexion to find and set up the necessary techniques that ensured the smooth and risk-free realization of this outstanding project, in such a complex mountainous landscape.