

DOLGARROG POWER STATION - HIGH HEAD INCLINE PIPELINE ACCESS POINTS & BEARING REPLACEMENT



Project Brief

Design, manufacture and installation of 2 no. new pipe expansion joint sections each with an access hatch, 6 no. pipe bearing stools and 4 no. pipe bearings.

Project Team

Client: Innogy Renewables UK Ltd.
Main Contractor: USL Ekspan

Background Information

The 6km High Head pipeline in Conwy North Wales feeds vital water from Cowlyd reservoir to turbines in Dolgarrog's Power Station generating hydro-electric power. The structure is a 1.8m diameter (reducing to 1.2m) riveted single carbon steel pipeline located above ground and supported on concrete plinths. The gradient of the pipeline with the adjacent ground varies approximately from 0 to 40 degrees.

Innogy Renewables (responsible for maintaining the pipeline schemes) had identified sections of the High Head pipeline requiring refurbishment and renewal. A section of the pipeline running down a steep gradient known as the 'incline' also needed new removable pipe sections and additional access points that would allow personnel and equipment safe entry in and out of the pipeline to carry out future internal inspections and maintenance work.

USL Ekspan's Workscope

USL Ekspan, with 14 years' experience of maintaining the High Head pipeline, were contracted by Innogy Renewables to design, manufacture and install 2 new pipe sections with internal expansion joints and access hatches, 6 pipe bearing stools and 4 pipe bearings.

Pre-works on this project required: establishment and set-up of site compound; procurement of specialist sub-contractors; site logistics and preparation of heavy plant and hydraulic equipment for pipe lifting and jacking operations and given the location this would be on extremely difficult terrain.

Initial exploratory works of the existing pipe sections and the surrounding ground included: inspections; 3D surveys; geotechnical testing and data collation of materials and dimensions. This formed the criteria for design and manufacture, ensuring the new pipeline joint sections, bearings and access hatch positions were suitable for the purpose and the environment they would function in. This also enabled design of temporary works for the removal and replacement phases.

Prior to commencement on site, each stage of installation was checked and pre-signed for client approval. To facilitate all site removal and installation operations, these were scheduled to run during fixed 'outage' times (draining and shut down of the pipeline).

The new 3m long expansion joints, each weighing 6 tons, would now enable the pipeline to thermally expand and contract. Throughout the bearing and spool replacement works, all reinstated concrete was tested to ensure correct strength and quality is maintained for the environment it will be exposed to. This project's timely and successful completion is attributed to efficient planning and collaboration of USL Ekspan and all external partners involved.



Pipeline Incline - new installed pipe expansion joint section supported on new bearing stools, complete with internal access hatch.



Jacking of pipeline free of existing concrete plinth enabling works for installation of new USL Ekspan pipe bearing.



New installed USL Ekspan pipe bearing complete with new concrete bearing plinth.

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