Planning for emergencies and rehabilitation to improve operational safety at Spelga Dam, NI

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SYNOPSIS Spelga Dam (Northern Ireland) is a 28m high concrete gravity dam located in the Mourne Mountains in County Down, with a storage capacity of 2.7Mm³ and was originally constructed in 1957. In 2011 rehabilitation and maintenance work was undertaken to improve and maintain the operational safety of Spelga Dam. This work was relatively low cost but complex in nature with the works utilising innovative solutions.

The paper will expand on the following elements of this work:

- The creation of a new passage from the downstream face of the concrete dam to access the longitudinal gallery including the studies undertaken; the alternative solutions considered and the final solution which involved cutting through the concrete dam using both hydro-demolition and diamond wire cutting technology. A review of the pros and cons of the methods of construction, a summary of the findings of an examination on vibration limits and international standards for vibration limits; and details of the challenges encountered on site are also covered

- The inspection works of the 12 No. air-regulated siphons constructed in 1974, undertaken by abseiling, resulting in the specification of a new paint system and concrete repairs to the internal faces of the siphons. The history of the siphons, the surveying methods used, the development of the paint system, the testing undertaken and how the paint system was applied are described.

- The replacement of the wave deflector along the crest of the dam where an Armco road crash barrier was utilised in the design, covering the design as well as the challenges faced installing the wave deflector and how a ‘hanging’ mobile scaffold, which could be moved along the dam crest, was utilised to facilitate the fitting of the barrier.