

PROJECT BRIEF

Strengthening and Prevention of Crack Propagation in a Power Station Generator Foundation using the TYFO® Fibrwrap® Composite System



Tenom, Sabah, Malaysia
April 1997



The Tenom Pangi Hydro Power Station was officially opened on April 11, 1985. It consists of three “Francis Turbines” units, each capable of generating 22 megawatts of electricity. The problem faced by the electrical contractor, who was re-commissioning Unit No. 3, was crack propagation in the reinforced concrete generator foundation wall. A solution had to be found prior to restarting the power plant. A preliminary investigation was carried out to map the type, width and extent of cracking in the generator foundation. Further checks using non-destructive testing were also carried out to identify the probable causes in order to enable necessary remedial measures to be carried out. Based on the investigation and testing, it was determined that the problem was caused by inadequate steel reinforcement and that high vibration loads caused by the turbine resulted in cracks in the generator foundation wall. A method of repair to seal the existing structural cracks using epoxy injection and also to arrest further crack propagation in the foundation by replacing the missing steel with the high strength TYFO® Fibrwrap® Composite System was put forth to the owner.

The TYFO® Fibrwrap® Composite System uses aerospace technology and materials, i.e. carbon/glass/aramid fibres and epoxy composites and works on the concept of wrapping structural members such as columns, beams, slabs and walls to enhance ductility and load carrying capacity of the members. This unique patented strengthening system was accepted by the owner for its ease of application as well cost effectiveness and ability to solve the problem in-order to get the power station back on-line without any further delay. The strengthening was completed in 5 days time to great satisfaction of the main contractor and owners.

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