

Acoustic Monitoring of Prestressed Concrete Cylinder Pipe

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Corrosion of prestressing wire in Prestressed Concrete Cylinder Pipe (PCCP) and other structures is a widespread concern for owners and managers responsible for these facilities. The general inaccessibility of the pipe and prestressing wire makes evaluation difficult, costly and often inconclusive. Random examination of prestressing wires by excavating or internal inspection of the pipe wall gives only a very localized knowledge of the prestressing wire condition. Recently, two non-destructive technologies have been developed that enable more detailed condition assessments of PCCP, SoundPrint[®] and P-Wave.

SoundPrint is an acoustic monitoring technology that is inserted into pipelines under full pressure and flow to detect wire breaks as they occur. The technology consists of multiple hydrophones that detect acoustic anomalies in the pipeline and transfer the acoustic data to a data acquisition system. The data acquisition system has software that can identify the acoustic events associated with wire breaks and other acoustic events of interest (e.g. concrete delaminations).

The P-Wave technology involves electromagnetically exciting the outside windings of the PCCP to detect existing wire breaks. With this technology the pipeline must be dewatered. Subsequently, technicians will enter the pipeline with the equipment and traverse the subject portion of pipe. Reports will provide an approximate number of existing broken wires.

Recent developments have seen permanent acoustic systems employed in Wastewater systems to manage large diameter PCCP lines. In addition recent case studies will be discussed highlighting the issues pertaining to management of PCCP.