CONAGUA Intervenes on Two Pipe Sections to Prevent Failure

Two 99-inch pipes removed and replaced before failure on the critical Cutzamala pipeline

**Challenge**

The Mexican National Water Commission (CONAGUA) operates the critical Cutzamala pipelines, which supply water to about 5 million people living in Mexico City. The system features two parallel pipelines that stretch about 75 kilometers and are made of 99-inch Prestressed Concrete Pipe (PCP) and Prestressed Concrete Cylinder Pipe (PCCP). Both pipe designs utilize high strength steel prestressing wire as the primary strength member. PCP differs from PCCP slightly in that it does not have the steel cylinder core, but instead is made of stronger concrete.

To mitigate the risk of pipeline failure and ensure uninterrupted water service to Mexico City, CONAGUA needed to find and utilize technology that monitors the condition of PCP and PCCP.

**Solution**

In July 2012, CONAGUA completed an electromagnetic (EM) condition assessment of the Cutzamala pipelines using PipeDiver® technology, a free-swimming tool that allows for non-destructive condition assessment of pipelines while they remain in service. The EM assessment provided CONAGUA with a baseline condition for each pipe section.

After identifying the baseline condition of the Cutzamala System, CONAGUA began installing AFO monitoring technology and have completed about 70 kilometers (43 miles) on the two pipelines combined. The technology monitors the condition of prestressed pipe by recording the amount of wire breaks in each pipe section.

Pipeline monitoring was initially adopted for the Cutzamala system due to a number of failures that disrupted service. After realizing that complete replacement was too expensive and unrealistic, CONAGUA decided to install AFO.

**Results**

After prestressed wire break activity on the Cutzamala Pipeline in March 2013, CONAGUA intervened on two pipe sections that were badly distressed, taking quick and decisive action to prevent a failure. After shutting down the pipeline, it took only 24 hours to assemble a crew that included almost 100 people to verify and replace the damaged sections and return the critical pipeline to operation.

- One of the distressed sections had visible corrosion while the section directly next to it had wire break activity but no visible damage
- The use of AFO monitoring has been positive so far, with the system identifying wire breaks along the monitored sections allowing for the successful preventative repair of several pipe sections
- Preventing failures on the Cutzamala system is crucial for CONAGUA, as the pipelines supply water to a huge number of people in Mexico City