PCCP Inspection and Monitoring Tools Standardization

March 17, 2021
Agenda

• Overview of Prestressed Concrete Cylinder Pipe (PCCP)
• Pipe Protection Techniques
• PCCP Failures
• Why Standardize Technologies?
• Benefits of the Current Program
• Next Steps
Overview of PCCP

• Pipe is mostly used for large transmission mains because of its ability to withstand high pressures and loading

• Constructed with a concrete core, a thin steel cylinder, high tensile prestressing wires and a mortar coating

• Strength comes mostly from the prestressing wires, which keeps the concrete core in compression

• First manufactured in 1942
Overview of PCCP – WSSC Water

First Manufactured
1942

Research Inspection Techniques
1979

First Electromagnetic Inspection
2001

First Smart Ball
2008

First WSSC Water PCCP
1945

First Manned Inspection
1981

First AFO
2007

Current PCCP Program
2006 to present

16” and greater = about 350 miles constructed mostly mid 1940s to mid 1970s
Overview of PCCP – WSSC Water

• Backbone of WSSC Water’s transmission system is 145 miles of 36-inch and larger PCCP

• PCCP inventory distributed across Montgomery and Prince George’s counties

• WSSC Water has the third longest PCCP system in the country

• Over 100 miles of Acoustic Fiber Optic (AFO) monitoring (LONGEST IN THE COUNTRY)
Pipe Protection Techniques

Leak Detection – Smart Ball*
- Highly sensitive acoustic sensor locates very small leaks and gas pockets

Electromagnetic Inspection
- Detects wire breaks and pipe wall distress

PipeDiver*
- Free swimming tool used while pipe is in service

PipeWalker*
- Requires dewatering and confined space entry

PipeRobotics*
- Includes live video during inspections

* All tools are patented and/or proprietary by Pure Technologies
Pipe Protection Techniques

• Pure Technologies’ Acoustic Fiber Optic (AFO) Monitoring*

• AFO monitoring is an advanced warning system used to detect wire breaks in PCCP

• Over 100 miles of AFO monitoring (LONGEST IN THE COUNTRY)

• Real-time (24/7/365) broken wire wrap detection

• Web-based graphical dashboard with Cloud based data management system

* System contains some proprietary parts
PCCP Failures

- Most PCCP failures result from prestressing wire breaks
- Failures are often catastrophic
- Comes with an extremely high financial cost
- Each failure comes with an estimated price tag of $2,000,000
Why Standardize Technologies?

• WSSC Water PCCP program is built on PURE’s platform

• PURE is the ONLY vendor who can provide all the tools needed for effective program management

• Inspection tools are patented and/or proprietary and cannot be provided by others at this time

• All tools tested, validated and calibrated in WSSC Water system

• Over the years, PURE has acquired multiple competitors making them a single source for the services need

• Changing vendors to untested technologies now will risk pipe failures
Benefits of the Current Program

- PCCP Failures: 46
- PCCP Failures (Since 2010): 5*
- Averted Failures: 44

*4 pipeline failures on non-monitored pipes

ESTIMATED COST SAVINGS TO DATE

$88 M*

Based on an estimate of $2.0M per break
Next Steps

• Implement a 5-year program to test and validate other tools
  o Perform research to find other vendors and tools
  o Test and validate tools
  o Perform cost-benefit analysis

• After testing and validation, invite vendors to submit proposals
Next Steps

• Seeking Commissioners Approval of Contract No. 6815 in April 2021

• Contractor – PURE Technologies, US., Inc. (Columbia, Maryland)

• Contract Term – 2-year base with two 2-year options

• Base Term Upset Limit - $18.0 million for 2 years
  o MBE/SLBE negotiated participation – 5.5%

• Option Term Upset Limit – $18.0 million per term
  o MBE/SLBE negotiated participation – 5.5%
Questions?