William Preston Lane Jr. Memorial (Bay) Bridge

Dehumidification System Update

BBRAG Meeting

January 3, 2024

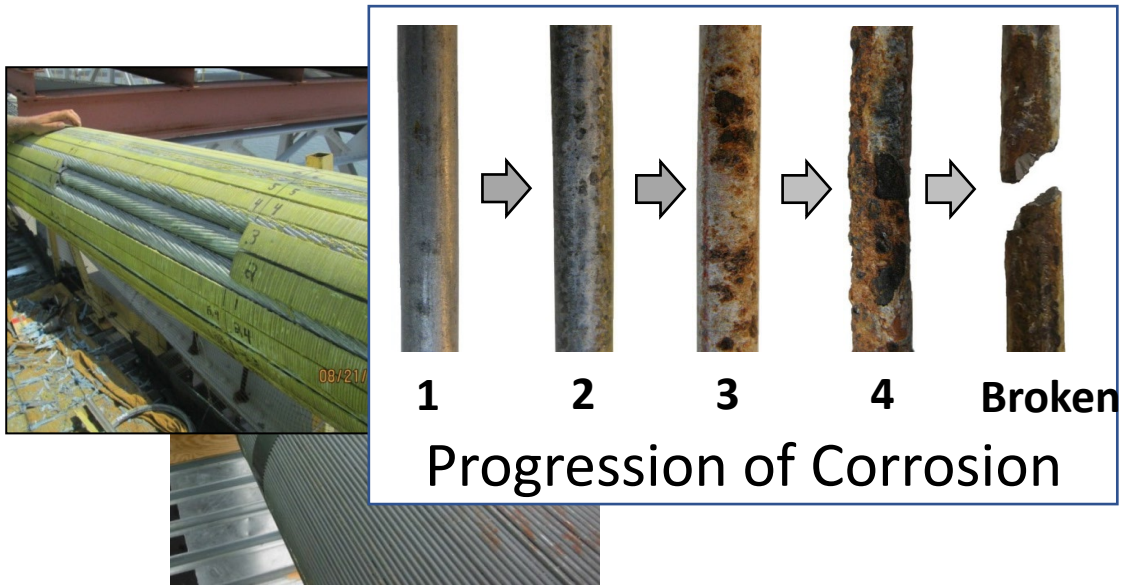
Maryland Transportation Authority

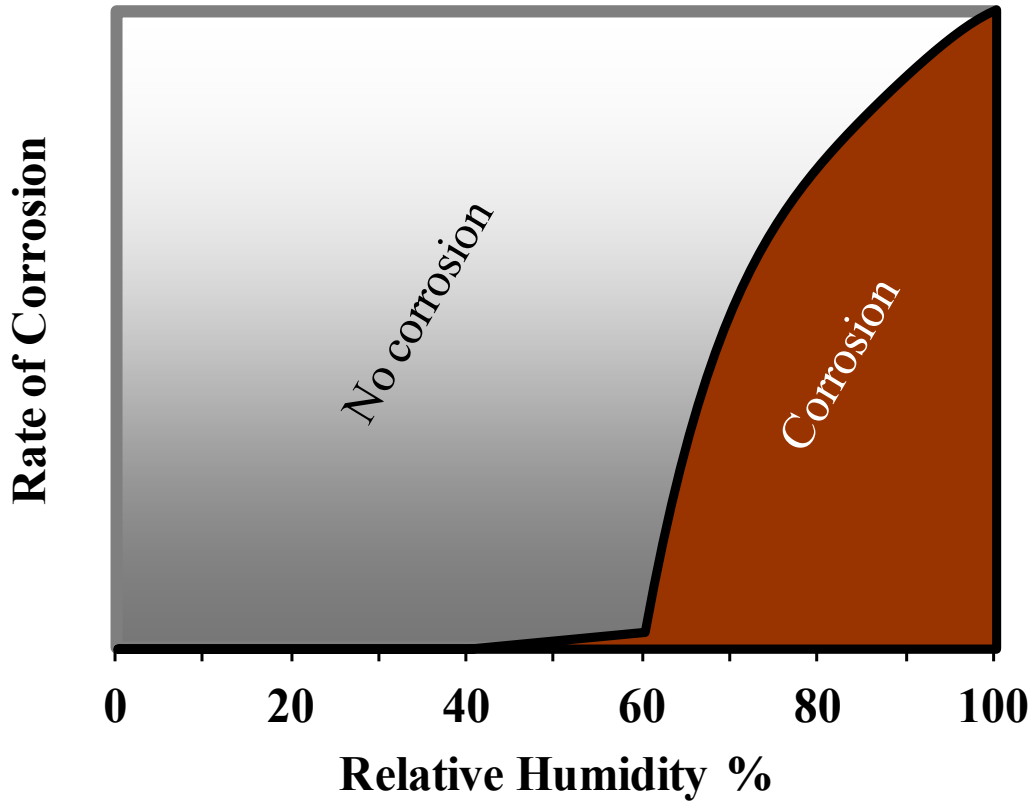
Overview

- The first main cable dehumidification system installed in North America
- The system is comprised of both main cable and anchorage dehumidification systems
- The Westbound Bridge (North) system was commissioned in Feb 2014
- The Eastbound Bridge (South) system was commissioned in Nov 2015
- Routine maintenance and monitoring of the system since installation
- Systems are approaching 10 years old

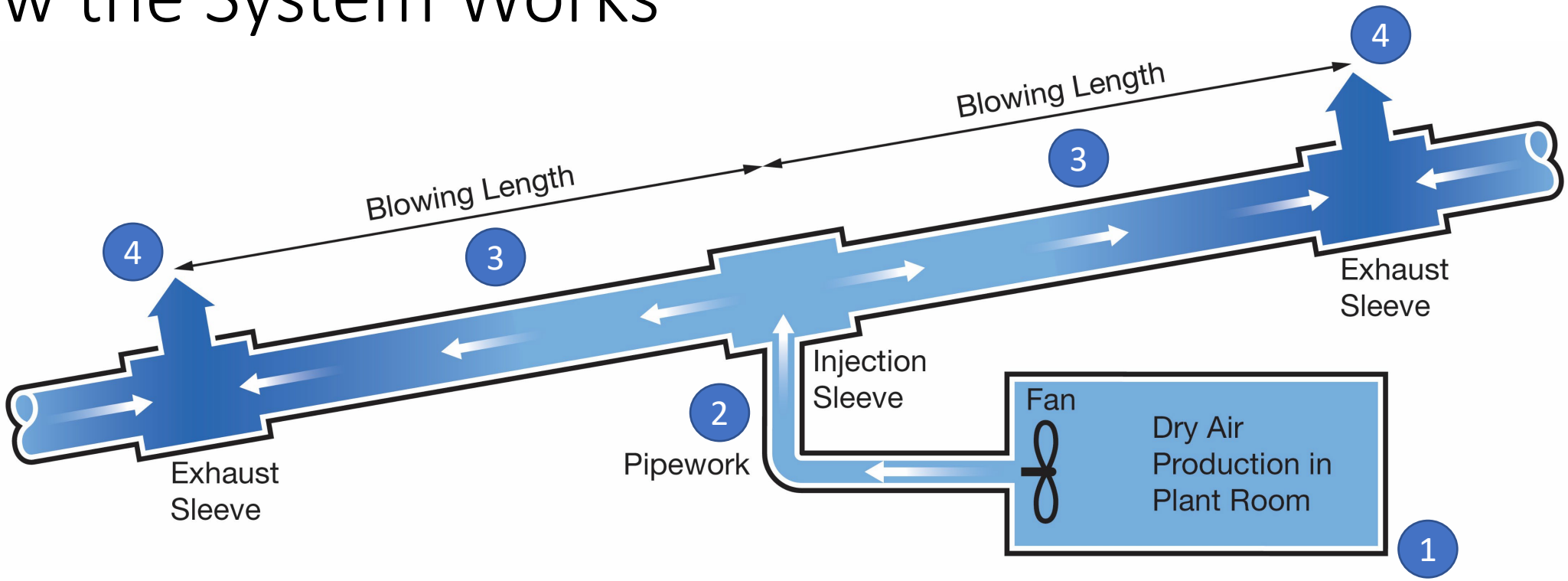
Purpose of the System

- Initially remove trapped water from within the cables, then
- Maintain dry conditions within the cable to protect cable wires from further corrosion





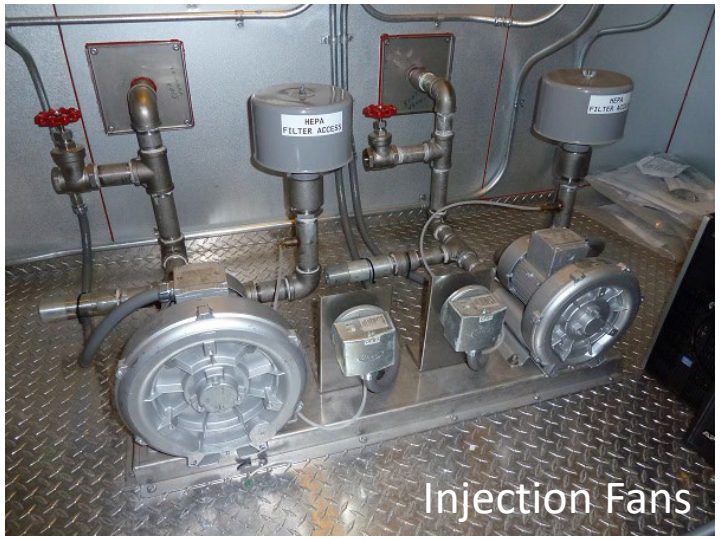
How the System Works



1. A volume of dry air is produced in the plant room
2. Fans supply dry air through pipework from the plant room to the cable
3. Dry air travels from the injection sleeve to the exhaust sleeve collecting trapped water
4. Water (moist air) is expelled from the cable at the exhaust sleeve

How the System Works


Plant Room

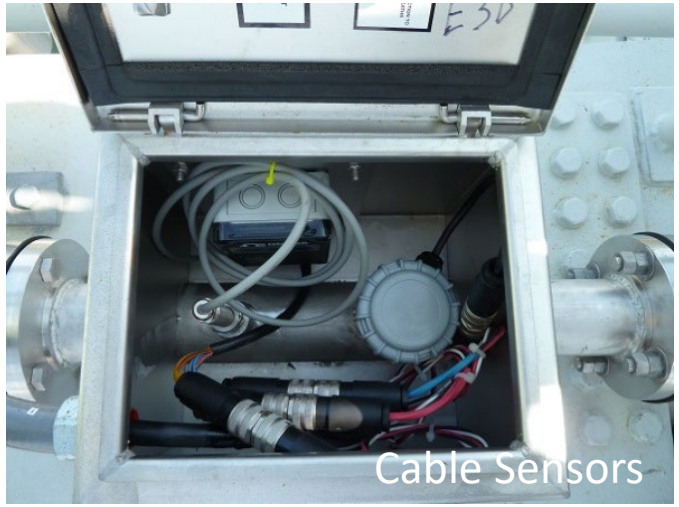


Injection Fans


Dry Air Pipe

Injection Sleeve


Exhaust Sleeve


Cable Sensors

System Data & Reports

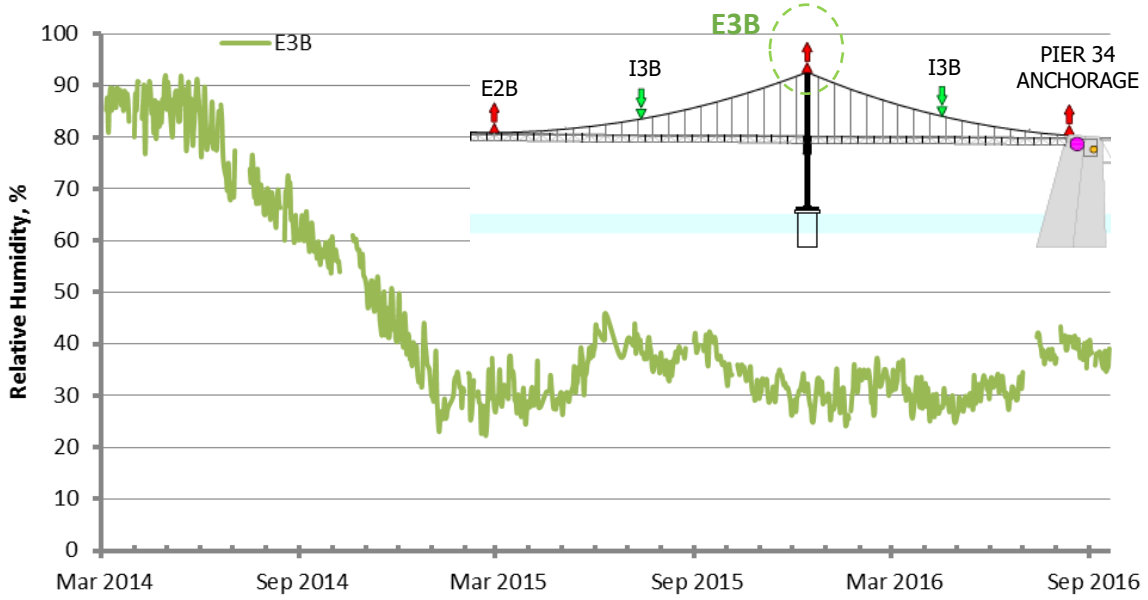
Remote Monitoring System

Monthly/Quarterly/Annual maintenance visits have been performed since installation.

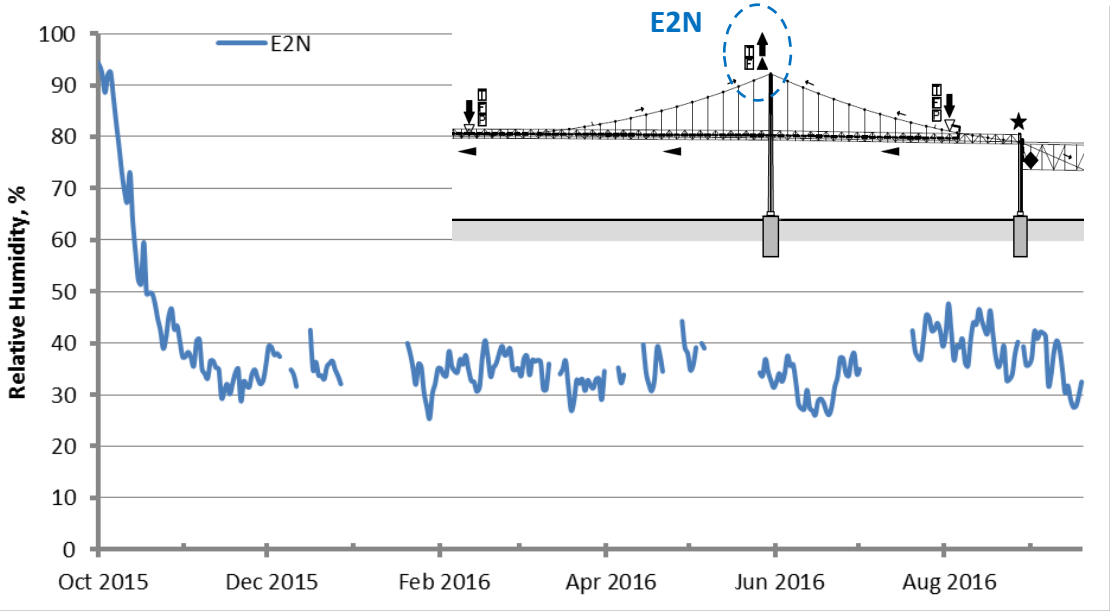
Remote monitoring of the system is performed with screenshots distributed weekly

System Data & Reports

Tower Top Exhaust Sleeve (E3B)



Tower Top Exhaust Sleeve (E2N)



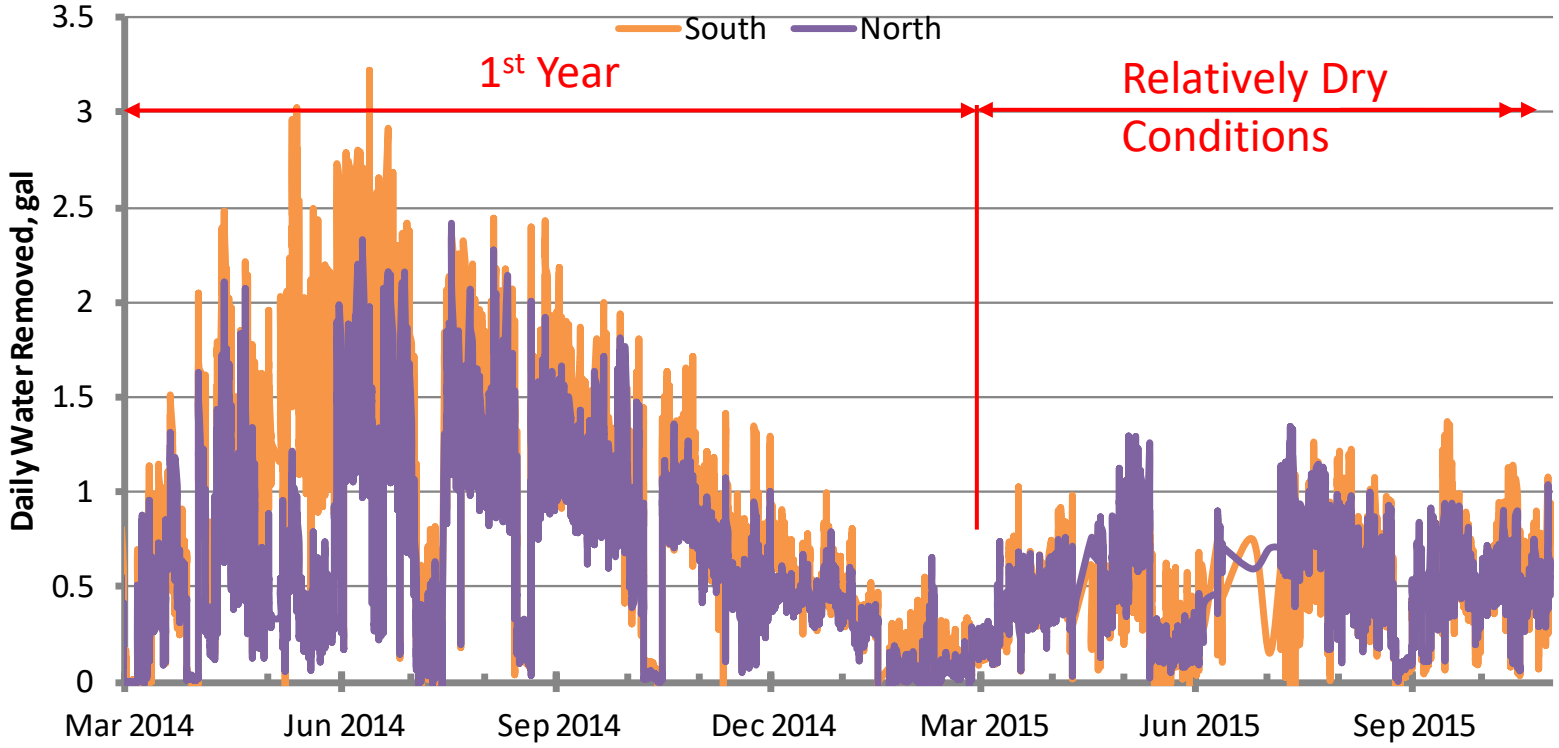
Westbound Bridge

After commissioning, humidity in the cables was reduced to non-corrosive levels within 9 to 12 months

Eastbound Bridge

After commissioning, humidity was reduced to non-corrosive levels within just 2 months due to higher air flow in the cable

System Data & Reports



During the 1st year, trapped water inside the cables was removed at a rate of up to 2.5 gal/day. The system then maintains the cables in relatively dry condition.

Latest Results & Maintenance Efforts

Even though system is intermittently interrupted, the high-quality, heat-sealed wrapping of the cable helps to keep water out of the cables.