Fiber Optic Sensing Association
Connect and Protect

July 25, 2022

The Honorable Pete Buttigieg
Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Mr. Secretary,

As Secretary of Transportation, you have the enormous responsibility of protecting our people and our environment by ensuring that the over two million miles of pipeline across our country remain safe. The Fiber Optic Sensing Association (FOSA) agrees with you that "pipelines are critically important[1]" and are essential to our daily lives. FOSA wants to work with you to ensure that they continue to be the safest and most environmentally responsible way to transport natural gas and petroleum products over long distances.

Our association is comprised of industry leaders in distributed fiber optic sensing (DFOS) systems and include companies and academic institutions that manufacture, install, test, evaluate, and support or use DFOS systems and equipment. Our members have delivered hundreds of mature, commercially ready, and viable solutions across the United States and around the world.

DFOS systems are sensor technologies used to constantly and consistently monitor pipelines, roads, bridges, railways, power stations, terrestrial and subsea power cables, international borders, critical infrastructure, and telecom networks. DFOS systems connect laser interrogator units to a fiber optic cable converting the optical fiber to an array of distributed sensors. The fiber becomes the sensor when the interrogator units inject laser light into the fiber to detect events along the fiber over very long distances.

Remote-sensing technologies like DFOS are making it easier and more cost-effective for pipeline operators to continuously monitor very long assets, inspect for problems, and proactively address potential concerns. DFOS has a well-proven capability of detecting smaller pipeline leaks with immediacy, providing high location accuracy. Because these systems rely on environmental vibrations, they are also well suited to detection of trespassing and/or excavation along pipeline rights of way – an important means of early warning of pipeline intrusion threats, typically before pipeline damage occurs.

[1] Washington Post, March 14, 2021, https://www.washingtonpost.com/washington-post-live/2021/05/14/transcript-transformers-recovery-with-transportation-secretary-pete-buttigieg/

The Protecting Our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2020 (P.L. 116-69), enacted into law on December 20, 2020, includes a requirement that your agency promulgate final regulations “not later than 1 year after the date of enactment” that require operators of regulated gathering lines, new and existing gas transmission pipeline facilities, and new and existing gas distribution pipeline facilities conduct leak detection and repair programs. Section 113, Leak Detection and Repair, states that the regulations must include minimum standards that reflect the capabilities of commercially available advanced technologies; the leak detection and repair programs must be able to identify, locate and categorize leaks; and must require the use of advanced leak detection technologies.

The American Petroleum Institute (API) recently completed a two-year project to update their leak detection *Recommended Practice* (RP) documents, specifically RP1130 (computational leak detection) and RP1175 (leak detection program management). Involved in the updates was a committee consisting of pipeline operators, industry engineers, consultants, and technology providers. These documents provide guidance to pipeline operators around the world on leak detection approaches, in an effort to promote pipeline safety.

An important part of the update was to review current state-of-the art pipeline leak detection methods, including the contribution of distributed fiber optic sensing (DFOS) technologies, which have become widely deployed since the last publication of the RPs. Industry guidance on pipeline safety should reflect the technologies that pipeline operators are actively using, so to provide more guidance on DFOS was timely, and several key updates to the documents help operators further understand their options for leak detection, including the performance that they might expect from different technologies.

For leak detection, the API documentation describes performance in the following categories: sensitivity, accuracy, reliability and robustness. An example of an update to the documents is the performance table for fiber optic “external” leak detection included in Annex D of the RP1175, which contains capabilities for leak detection that can significantly enhance pipeline safety. This table reflects the technology’s ability to detect smaller leaks, detect them faster, with higher locational accuracy, while withstanding changing pipeline operating conditions, such as differing flow regimes or product types (which presents challenges to point-measurement based systems). The result of this update to industry recommended practices, is that pipeline operators have clear guidance on the safety benefits that leak detection technologies such as DFOS can provide, including smaller overall leak volumes, reduced threat to the environment and the public and reduced operating costs.

We hope that PHMSA and other agencies around the world include these updates to the industry RPs in their continued reviews and updates of pipeline safety rulemaking, reflecting the technological progress that the industry is making to keep pipelines the safest mode of transportation for a variety of products.

Sincerely,

Dave Cunningham

Dave Cunningham
Chairman