

NATURAL GAS INFRASTRUCTURE¹



NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

The U.S. natural gas pipeline network is vast, including more than 210 individual pipeline systems that total more than 300,000 miles of interstate and intrastate transmission pipelines. The use of natural gas is increasing, both as fuel and feedstock for industry, and as a fuel for electric power generation. A leak or rupture anywhere in a pipeline system can release methane into the atmosphere and cause a significant disruption in transmission service. Natural gas infrastructure must continue to efficiently and cost-effectively support the production and delivery of natural gas as the system expands and becomes more complex without impacting safety, reliability, and security.

¹For FY 2019, this technology program area is funded by the Emissions Mitigation from Midstream Infrastructure, and the Emissions Quantification from Natural Gas Infrastructure budget lines.

Within NETL's Oil and Gas Recovery Portfolio, the Natural Gas Infrastructure program is creating revolutionary advances in manufacturing and integration processes enabling:

- A new and more robust generation of “smart” pipeline materials for longer-life and more resilient gathering, compression, transportation and storage system components.
- Sensor platforms (both conventional and embedded) that are capable of “real-time” identification and quantification of methane emissions.
- Timely pipeline system repair without further damage to assets or disruption of service.

IMPROVED RESILIENCY — Research develops novel coatings and pipeline materials to extend the operational life and further reduce leakage potential.

LEAK DETECTION AND RATE QUANTIFICATION — NETL work develops novel sensor platforms for “real-time” detection of leakage from pipelines, gathering systems, and other midstream infrastructure.

LEAK MITIGATION AND REPAIR — Research produces materials and tools to mitigate leakage from pipelines and associated infrastructure components with minimal disruption of service.

NATURAL GAS INFRASTRUCTURE TECHNOLOGIES WILL ENSURE SAFE, EFFICIENT TRANSPORT OF OUR NATION'S NATURAL GAS RESOURCES BY:

- Developing new materials, technologies, and processes that improve the reliability, resiliency, and security of pipelines and pipeline components carrying natural gas to end users.
- Reducing methane emissions to the atmosphere from midstream infrastructure.
- Minimizing stranded gas in pipeline infrastructure to ensure that full value of the resource is received by end users and full economic value is realized by stakeholders.
- Improving natural gas delivery in the United States with technologies that enhance the integrity, reliability, performance and economics of the nation's fossil fuel infrastructure by supplying novel materials and intelligent tools capable of automatic monitoring, control, and optimization.

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