



Pipeline Safety Program

The Oak Ridge National Laboratory (ORNL) provides specialized engineering and technical support to the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA). As a federal regulatory authority with jurisdiction over pipeline safety, PHMSA is responsible for ensuring the safe, reliable, and environmentally sound operation of the nation's network of natural gas and hazardous liquid pipelines. To assist PHMSA accomplish this mission, ORNL Subject Matter Experts (SMEs) who are qualified, unbiased, and experienced in dealing with specific pipeline safety issues and concerns provide support on an as-needed basis. ORNL SMEs have the ability to:

- understand technical details about pipeline integrity management and regulatory compliance topics,
- have knowledge about pipeline construction technology, inspection procedures, and operating practices
- recognize potential pipeline safety and regulatory concerns,
- alert PHMSA staff about noncompliance issues, and
- recommend corrective actions based on appropriate advanced technologies.



Principal technical task areas for ORNL SME pipeline safety support are:

1. nondestructive examination system validation,
2. specialized pipeline construction practices,
3. specialized engineering analysis,
4. specialized technical services and applications, and
5. expert advice.

Examples of ORNL Tasks Performed

Pipeline Incident Evaluations

ORNL SMEs evaluate pipeline incidents such as leaks and failures.

Pipeline Integrity Management

ORNL SMEs provide assistance in reviewing integrity management programs prepared by pipeline operators in accordance with Federal pipeline safety regulations.



In-line Inspection Tool

Instrumentation and Control Technology

ORNL SMEs review, troubleshoot, and advise PHMSA on new and existing measurement, sensor, inspection, and diagnostic systems. Work involves data interpretation from instrumentation systems and verification of the specified precision and accuracy of sensors.

Research Areas

Freight Flows

Passenger Flows

Supply Chain
Efficiency

Transportation:
Energy
Environment

Safety
Security

Vehicle
Technologies

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ORNL SMEs provide PHMSA with technical information about non-metallic materials for pipeline construction.

Technical Services

ORNL SMEs provide specialized technical services to assist PHMSA obtain laboratory data needed to evaluate pipeline incidents, determine causation, and resolve pipeline integrity management and regulatory compliance issues. A particular task may require the specialized services of SMEs who are knowledgeable and skilled in the following areas:

- calibration standards and techniques,
- cathodic protection,
- coating materials and application techniques,
- consensus code and standard requirements,
- corrosion engineering,
- data collection, integration, and analysis,
- defect characterization,
- electrical noise, grounding, and interference,
- environmentally sensitive areas,
- federal pipeline safety regulations,
- fracture mechanics and metallurgy,
- hydrogen and natural gas pipeline safety,
- in-line inspection methods and interpretations,
- instrumentation and control,
- laboratory testing,
- liquefied natural gas facilities,
- loss of gas or liquid containment,
- material science,
- measurement principles and techniques,
- natural phenomenon events,
- nondestructive examination standards and industry-accepted protocol,
- pipeline construction and repair,
- pipeline hydraulics and fluid handling equipment,
- pressure vessel technology,
- quality assurance,
- risk assessments and management,
- safety studies of automatic and remotely controlled shutoff valves,
- sensor technology and data acquisition,
- strain based design and manufacturing studies,
- stress analysis,
- tank construction, repair, and inspection, and
- welding procedures and welder qualification requirements.



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