

Taking a Closer Look at Pipeline Regulations and Emerging Leak Detection Technology

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Biden Administration and Congress Focused on Reducing Emissions

Three Issues Dominating the Agenda:

- Climate Change & Sustainability
- Creating U.S. Jobs
- Increasing U.S. Manufacturing

Issues are driving legislative activity, regulatory action, and funding decisions

LDAR requirements are bipartisan (propelled forward by bi-partisan legislation passed in December 2020)

Huge focus on GHG emissions reduction efforts, in USA and globally. Result = PHMSA has new mission to minimize emissions.

POLITICO E&E News

Energy companies boost lobbying amid reconciliation fight

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Recent Legislative Activity to Address Pipeline Leaks

Legislation	Date of Passage	Summary	Result
Protecting Our Infra- Structure of Pipelines and Enhancing (PIPES) Act of 2020	December 2020	Requires the Pipeline and Hazardous Materials Safety Administration (PHMSA) write new leak detection safety regulations for all gas pipelines (T&D)	PHMSA undertaking process to update LDAR regulation
HR 2643, The Offshore Pipelines Safety Act Jurisdiction of both DOI's Bureau of Safety and Environment Enforcement (BSEE) and PHMSA	Pending No action in the Senate	 Bill seeks to establish requirements to address the environmental risks of decommissioned oil and gas pipelines on the seafloor Would need revisions to get through Senate 	If enacted, regulatory approach that is more expensive and less effective than Siemens Energy's Leak Detection solution

Many PHMSA Work Streams Underway, As Result of PIPES Act of 2020

FIPES ACT 2020 WEB CHART														
Rule Title/Subject/Docket No.	RIN	Rule Stage and Significance	Legislation	Description of Work Plan	Rulemaki (*actu	ng Timeline al date)	OST Date for Completing Review (45 days)	Date(s) Sent back to PHMSA	Date(s) Sent Back to OST	Current Staff PHMSA/OST Allocation **	Resource Constraints Affecting Process in PHMSA/ OST	OMB Date for Completing Review (90 days) (reginfo.gov)	Additional Details Affecting Rulemaking	Additional Comments on Rulemaking Status
OPS: Safety of Gas Gathering Pipelines	2137- AF38	Final Rule	PIPES Act 2020 Sec 112	Completed	PHMSA Complete/ To OST To OMB FR Pub	06/30/21* 08/31/21* 11/15/21*	08/16/21	07/09/21 07/21/21 09/24/21	07/15/21 07/22/21 10/05/21	9 staff PHMSA 5 staff OST		11/01/21	GPAC meeting held June 25-26, 2019.	NPERM published in FR on 1001/2019, Final Rule published on 11/15/2021, PHMSA received a petition for reconsideration on 12/15/2021, PHMSA demied the apelicable legislative mandate upon publication of the Final Rule.
OPS: Safety of Gas Transmission Pipelines: Discretionary Integrity Management Improvements	2137- AF39	Final Rule	Pipeline Safety 2011 Sec 5	Complete Final Rule	PHMSA Complete/ To OST To OMB FR Pub	09/07/21* 02/23/22* 06/07/22	10/22/21	11/15/21 12/15/21 01/26/22	12/10/21 01/25/22 01/26/22	9 staff PHMSA 5 staff OST	YES	5/24/2022	GPAC meeting held March 26-28, 2018.	NPRM published in FR on 10/01/2019.
OPS: Amendments to Parts 192 and 195 to require Valve Installation and Minimum Rupture Detection Standards	2137- AF06	Final Rule	Pipeline Safety 2011 Sec 4 and 8; PIPES Act 2020 Sec 113	Complete Final Rule	PHMSA Complete/ To OST To OMB FR Pub	09/24/21* 12/15/21* 04/08/22*	12/13/21	10/26/21 11/16/21 11/23/21	11/10/21 11/17/21 11/24/21	8 staff PHMSA 5 staff OST	YES	03/15/22	GPAC/LPAC meeting held June 22- 23, 2020.	Final Rule published in FR on 04/8/2022. NPRM published in FR on 02/06/2020.
OPS: Coastal Ecological Unusually Sensitive Areas	2137- AF31	Final Rule	PIPES Act 2016 Sec 19; PIPES Act 2020 Sec 120	Complete Final Rule	PHMSA Complete/ To OST To OMB FR Pub	09/07/21* 10/22/21* 12/27/21*	10/22/21	09/28/21	10/15/21	8 staff PHMSA 5 staff OST	YES	12/10/21	Public workshop held June 12-13, 2019.	PHMSA received a petition for judicial review and motion to stay the IFR pending its review on 0301/0202_IFF published in FR. on 12/27/2021 Effective on 02/25/2022. PHMSA completed the applicable legislative mandates unon nublication of the IFR
OPS: Gas Pipeline Leak Detection	2137- AF51	NPRM	PIPES Act 2020 Sec 113	Complete NPRM	PHMSA Complete/ To OST To OMB FR. Pub	05/27/22 07/14/22 10/28/22				8 staff PHMSA 5 staff OST	YES		PHMSA held public meeting May 5-6. 2021. PHMSA held public meeting on 2/17/2022.	
OPS: Safety of Gas Distribution Pipelines	2137- AF53	NPRM	PIPES Act 2020 Leonel Rondon Act Sec 202, 203, 204, and 206	Complete NPRM.	PHMSA Complete/ To OST To OMB FR Pub	05/16/22 06/27/22 10/12/22				8 staff PHMSA 5 staff OST	YES			
OPS: Amendments to Liquefied Natural Gas Facilities	2137- AF45	NPRM	PIPES Act 2016 Sec 27: PIPES Act 2020 Sec 110	Complete NPRM	f PHMSA Complete/ To OST To OMB FR Pub	06/30/22 08/18/22 12/07/22				8 staff PHMSA 5 staff OST	YES			
OPS: Class Location	2137- AF29	Final Rule	PIPES Act 2020 Sec 115	Hold GPAC meeting	PHMSA Complete/ To OST To OMB FR Pub	10/11/22 11/28/22 03/21/23				8 staff PHMSA 5 staff OST	YES			NPRM published in FR on 10/14/2020. Comment period closed 12/14/2020; planning GPAC.
OPS: Pipeline Operational Status	2137- AF52	NPRM	PIPES Act 2020 Sec 109	Complete NPRM	PHMSA Complete/ To OST To OMB FR Pub	11/03/22 12/22/22 04/14/23				8 staff PHMSA 5 staff OST	YES			
**Staff allocations listed in this chart i Projected Completion Dates based on ACRONVA(S med: OPS - Office of Di	**Staff allocations listed in this chart identify the total number of persons assigned to each rulemaking project. However, PHNSA and DOT staff are often assigned to multiple rulemaking teams and have additional tasks that prevent thein from working full-time on a single rulemaking project. Workplan Projected Completion Dates based on currently available information.													
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Updated 04/06/2022

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Three PHMSA Work Streams that Necessitate LDAR Solutions

Activity Triggered by PIPES Act of 2020

#1 Pipeline Operators Required to Update Leak & Emissions Plans (Section 114)

#2 Pipeline Shutoff Valve Requirement (Section 113)

#3 Final Rule on Pipeline Leaks (RIN 2137-AF51) (Section 113) Took effect on December 27, 2021 (one year after PIPES Act 2020 was passed into law)

- New Final Rule announced on March 31, 2022
- Rule goes into effect on October 5, 2022

- Still in development
- Final Rule expected on October 28, 2022

#1 Pipeline Operators Required to Update Leak & Emissions Plans (Section 114)

Took effect December 27, 2021

Revise Inspection & Maintenance Plans

- Pipeline operators must have revised their inspection and maintenance plans by December 27, 2021.
- Goal is to contribute to eliminating hazardous leaks and minimizing releases of natural gas from pipeline facilities

PHMSA To Inspect Plans, Along with State Regulators

- PHMSA and its state partners to inspect these plans
- PHMSA is conducting <u>enforcement</u> before enacting <u>regulations</u> on emissions – not the usual approach.

PHMSA Conducting Study for Congress

 Section 114 also mandates that PHMSA conduct a study and provide a report to Congress discussing best available technologies or practices for preventing or minimizing the release of natural gas by June 27, 2022

#2 Pipeline Shutoff Valve Requirement (Section 113)

Final Rule available at: https://www.federalregister.gov/documents/2022/04/08/2022-07133/pipeline-safety-requirement-of-valve-installation-and-minimum-rupture-detection-standards

Announced March 31, 2022. Takes effect October 5, 2022. Compliance by April 10, 2023.

Equipment Requirement

- Remotely controlled or automatic <u>shut-off valves</u>, or <u>alternative equivalent</u> <u>technologies</u>, required
- Applies to new and replaced onshore pipelines (6" or greater)
- Covers pipelines for natural gas, CO2, and other hazardous liques

Performance Standard

- Valves must be closed to isolate ruptured pipeline segment
- Closure must occur no more than 30 minutes after rupture identification

Pressure Monitoring

- Required upstream and downstream of valves and alternative equivalent technology, to better detect and isolate ruptures.
- Operators can integrate the pressure monitoring equipment required by this rule into future, or current, leak detection systems and analyses.

#3 Final Rule on Pipeline Leaks (RIN 2137-AF51) (Section 113)

PIPES Act set aggressive regulation deadline

- Section 113, mandates that the Secretary of Transportation promulgate a final rule pertaining to gas pipeline leak detection and repair by December 27, 2021, which is one year from the enactment of the law
- Too fast for PHMSA

Rulemaking underway, but will not finish until late 2022

- PHMSA goal was to publish proposed rule by May 2022, but this appears to have slipped
- October 2022 seems likely conclusion to this rulemaking (based on information available last week)

Watch the process, and engage

- Siemens Energy has already presented our leak detection solution to PHMSA
- PHMSA was impressed
- Today, PHMSA is technically conducting enforcement on leak detection without having a clear leak detection standard –they need to act

SE Partners with ProFlex Technologies for Pipeline Leak Detection



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Key criteria considered when developing this solution



Speed: Detect leaks in a few seconds before significant environmental damage occurs



Location: Pinpoint leak location typically to +/- 20 to 50 feet minimizing excavation cost/time to find leaks



Reduce Product Loss: Identify small leaks, dramatically reducing product loss, clean up costs, bad publicity, and environmental fines



Layered Security: Supplement existing leak detection systems for critical pipeline segments

Regulations: Be able to quickly respond to new/pending regulations





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Modified Negative pressure wave detection focused on performance



Detection typically within +/- 20 to 50 feet (within 7 to 20 meters)

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Modified Negative Pressure Wave vs Other NPW systems

- 1. Baseline Collection of Pipeline Pressure Data
- 2. Solution utilizes 1 khz pressure sample rate, temperature and fluid density (if required)
- 3. Using collected data, extensive data analysis is done to eliminate normal operating events
- 4. From this analysis, engineered digital signal processing algorithms are developed specific for the operating conditions
- 5. Extensive simulations are then run using collected data on engineered algorithms to confirm test leak events are detected and that no other normal events create a false alarm
- 6. Once a solution is developed it is deployed across customer pipeline section to be monitored
- 7. Additional small test leak events are created to verify that the leak detection system is operational and functioning as expected
- 8. Engineered cloud algorithms utilize customer furnished pipeline maps along with temperature and density at time of a leak event to accurately locate leak
- 9. Continual monitoring of system health and performance for duration of contract
- 10. Changes to pipeline operation and conditions can be collected remotely and if needed new algorithms can be developed and pushed electronically

Negative Pressure Wave Technology



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Implementation of is straightforward

Simple Six Step Process

- 1. Field test to determine feasibility
- 2. Determine hardware and location of (Field Processing Units) FPUs/Sensor Manifolds
- 3. Installation Supervision of all hardware
- 4. Tune your system to operating conditions
- 5. Operational handover
- 6. Ongoing maintenance and support



Overall goal is minimal impact on pipeline operations and staff

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Notification of leak detected

Leak notification is provided by:



Web-based UI



OPC UA connection from Siemens Energy cloud to Operations center



SMS/text message with lat/long information



Email notification to key people



Escalation if no acknowledgement of notification



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ProFlex Data Filtering in Action



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ProFlex Data Filtering in Action



Thank you for your time!



Questions?

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