

U.S. PHMSA Mega Rule

○ Overview of the Mega rule

- The U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) issued the final part (Part 3) of the "Mega Rule" in August 2022, following the implementation of Part 1 in July 2020. PHMSA emphasized that the requirements outlined in the rule are essential to protect public safety, reduce environmental threats, and promote environmental justice for communities located near gas transmission pipelines.
- This regulation consists of a comprehensive set of rules aimed at improving pipeline safety by reducing pipeline failure rates. It was developed based on the lessons learned from the rupture and leakage incident involving Pacific Gas and Electric Company's pipeline in San Bruno, California, in September 2010.

○ Summary of the Mega Rule

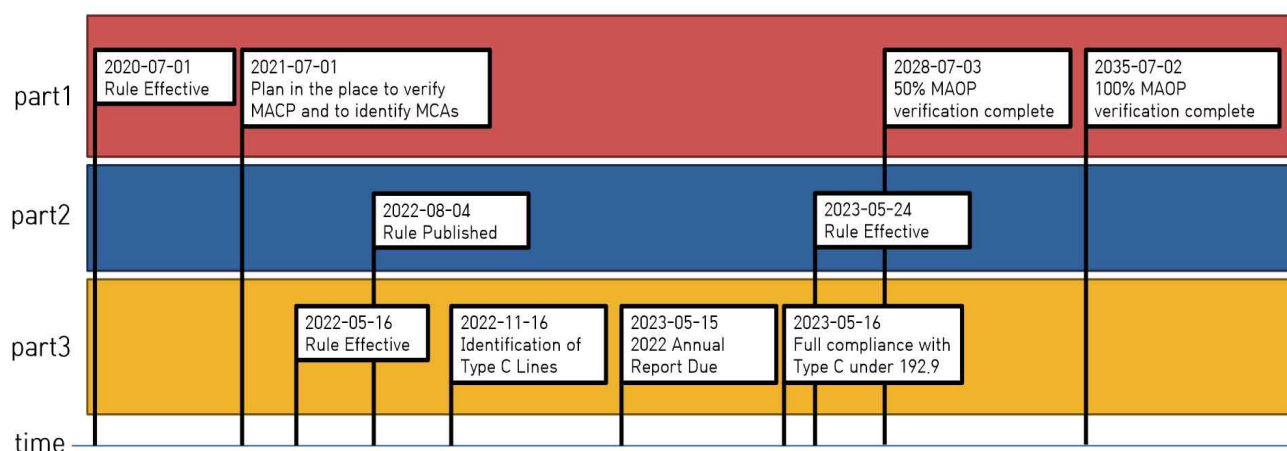
Part 1	Part 2	Part 3
• MAOP determination & reconfirmation • Material verification • Identification & assessment of moderate consequence areas • Analysis of predicted failure pressure • Assessment intervals & methods	• Inspection of pipelines following extreme weather events • Updates to corrosion control requirements • Updated & new repair criteria • Risk assessment requirements • Management of Change	• Affects gas gathering pipelines • Must report incidents and file annual reports • Data gathering to direct future regulations

- According to PHMSA regulation Section 192.607, pipeline operators must develop

and implement procedures for conducting destructive or non-destructive testing if they lack traceable, verifiable, and complete records as required in paragraph (b) of this section.

- Additionally, Section 192.624 requires pipeline operators to reconfirm and document the Maximum Allowable Operating Pressure (MAOP) for onshore steel gas transmission pipelines located in High Consequence Areas (HCAs) or Moderate Consequence Areas (MCAs).

○ Compliance Timeline for the Mega Rule



○ Pipeline Material Verification Using FRONTICS Instrumented Indentation Testing Equipment

- FRONTICS' instrumented indentation testing (IIT) equipment was validated as suitable for pipeline material verification through a DOT/PHMSA project conducted by the Gas Technology Institute (GTI). (Reference: DOT Project #729, "Validating Non-Destructive Tools for Surface to Bulk Correlations of Yield Strength, Toughness, and Chemistry," GTI Project Number 22428/22429, Final Report, 2021)
- Using FRONTICS' IIT equipment, pipeline operators can non-destructively and

accurately measure tensile properties and fracture toughness in real time from in-service buried pipelines. This enables the acquisition of traceable, verifiable, and complete material property data, as required by the Mega Rule.

- With reliable data on pipeline material properties, operators can establish effective integrity management programs, verify MAOP, and assess pipeline fitness for service in full compliance with PHMSA regulations.

