Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation

Draft Environmental Assessment (DEA)

Safety of Gas Transmission Pipelines:
Pipeline Safety: Class Location Change Requirements
Proposed Rule (49 CFR Parts 191 and 192)

June 2020

List of Acronyms

2011 Pipeline Safety Act	Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011
ANPRM	Advanced Notice of Proposed Rulemaking
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
C1 or C3	Class 1 or Class 3 gas transmission pipeline
DCVG	Direct Current Voltage Gradient
DOT	United States Department of Transportation
EIS	Environmental Impact Statement
FONSI	Finding of no Significant Impact
HCA	High Consequence Area
ICDA	Internal Corrosion Direct Assessments
ILI	In-line Inspection
IM	Integrity Management
IMP	Integrity Management Program
NEPA	National Environmental Policy Act of 1969
MAOP	Maximum Allowable Operating Pressure
NPRM	Notice of Proposed Rulemaking
PHMSA	Pipeline and Hazardous Materials Safety Administration
PSR	Pipeline Safety Regulations
RIA	Regulatory Impact Analysis
SMYS	Specified Minimum Yield Strength
USC	United States Code

1 Background

The Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Pipeline Safety (OPS) proposes changes to the Federal Pipeline Safety Regulations in 49 CFR Parts 191 and 192 (PSR), relating to requirements for a change in pipeline class locations.

PSR categorize natural gas pipelines into different classes based on the population density near a pipeline. As the population density near a pipeline increases, the potential harm from a pipeline incident increases. To mitigate the risk, the safety standards imposed on the pipeline increase commensurate with the increase in the population density. The PSR assign class locations 1-4 based on population. The class location increases as the number of buildings intended for human occupancy or other population indicators increase. Currently, when a transmission pipeline changes class location because the surrounding population grows, the authorized maximum allowable operating pressure (MAOP) is no longer commensurate with population density. The PSR in those circumstances require operators to confirm safety factors and to recalculate the MAOP of the pipeline. To bring the pipeline into compliance, the operator must reduce the MAOP of that segment of pipeline to reduce the stress levels, replace the pipe with a thicker and stronger pipe, or conduct a pressure test at a higher pressure to confirm the pipe can safely operate in the new class location. Alternatively, the operator to request a Special Permit in order to perform alternative risk control activities, based on IM principles and requirements.

Section 5 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 (2011 Pipeline Safety Act)[1] mandated that PHMSA evaluate, with respect to gas transmission pipelines, "whether integrity management system requirements, or elements thereof, should be expanded beyond high-consequence areas (HCAs); and (2) with respect to gas transmission pipeline facilities, whether applying integrity management program requirements, or elements thereof, to additional areas would mitigate the need for class location requirements." Consistent with this mandate, PHMSA has been considering alternatives that would maintain safety.

On July 31, 2018, PHMSA published an advanced notice of proposed rulemaking (ANPRM) in the Federal Register[2] to solicit feedback and comments regarding the revision of the PSR requirements for class location changes and whether they should allow for IM-type activities in lieu of the current required activities (e.g., pipe replacement, pressure test, or pressure reduction) and whether that modification would mitigate the public safety need for the existing class location requirements.

In addition to issuing the ANPRM, PHMSA issued a Notice of Inquiry[3] in 2013 and a gas transmission NPRM in 2016,[4] held Gas and Liquid Pipeline Advisory Committee meetings in 2014,[5]

[1] Pub. L. 112-90, § 5, 125 Stat. 1904, 1907-08.
[2] 82 FR 45750. The notice discussed several topics, including whether class locations should be eliminated entirely, whether a single design factor could be used in all situations, whether design factors should be increased for higher class locations, and whether pipelines without complete material properties records should be allowed to use a single design factor if class locations were eliminated.
[3] 78 FR 46560.
[4] 81 FR 20722; *see also* 84 FR 52180 (final rule).
[5] *See* https://primis.phmsa.dot.gov/meetings/MtgHome.mtg?mtg=95.

submitted a Class Location Report[6] to Congress in 2016, and issued a notice of regulatory review in 2017.[7] PHMSA considered the comments related to these issuances and meetings and reviewed PHMSA-issued Special Permits for Class 1-to-Class 3 (C1-to-C3) location changes. As a result, PHMSA concluded that an extension of IM principles beyond HCAs would not justify the elimination of class locations. PHMSA is proposing in the accompanying NPRM that class location regulations should be amended to include an IM type option and other defined pipeline safety measures for some in-service gas transmission segments where the class location changes from a Class 1 to a Class 3.

With this NPRM, PHMSA proposes to add a compliance option to the existing options for future C1-to-C3 location segment changes. The proposed option is similar to the IM conditions in class location change Special Permits and would maintain pipeline safety and provide additional flexibility for eligible operators.

[6] PHMSA, *Evaluation of Expanding Pipeline Integrity Management Beyond High-Consequence Areas and Whether Such Expansion Would Mitigate the Need for Gas Pipeline Class Location Requirements* (2016 Class Location Report), https://www.regulations.gov/document?D=PHMSA-2011-0023-0153.
[7] 82 FR 45750.

2 Introduction

This Draft Environmental Assessment (DEA) is prepared in accordance with Department of Transportation (DOT) Order 5610.1C,[8] the National Environmental Policy Act of 1969 (NEPA)[9], as amended, and the Council on Environmental Quality (CEQ) regulations for implementing NEPA.[10] When an agency anticipates that a proposed action will not have significant environmental impacts, the CEQ regulations provide for the preparation of an EA to determine whether to prepare an environmental impact statement or issue a finding of no significant impact (FONSI). If the EA indicates that the proposed action may have significant impacts to the natural or human environment, PHMSA must prepare an EIS. If the EA demonstrates that no significant impacts would occur as a result of the proposed action, then PHMSA may issue a FONSI. In accordance with the CEQ regulations, the EA must include brief discussions of the need for the proposal, alternatives, the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.

[8] https://www.transportation.gov/office-policy/transportation-policy/procedures-considering-environmental-impacts-dot-order-56101c.

[9] 42 U.S.C 4321 *et seq*.

[10] 40 CFR Parts 1501-1508.

3 Purpose and Need

This proposed rule would provide greater flexibility to pipeline operators, while maintaining or improving safety, in locations that have experienced or may experience population growth. This proposed rule would also respond to the above described Congressional mandate to consider the use of IM beyond HCAs and whether doing so could affect class location change requirements. PHMSA proposes adding a new method of compliance for future Class 1 to Class 3 changes beyond the four methods that are currently available to operators: (1) pressure reduction, (2) pressure testing, (3) pipe replacement, and (4) applying for and receiving a Special Permit that includes IM Special Permit conditions. The proposed rule method would maintain pipeline safety while reducing regulatory burdens and providing additional flexibility for operators. The proposed new method is similar to the existing Special Permit program for class location changes but does not replace the Special Permit program. It would effectively codify conditions under which this option is available without the need for a Special Permit.

4 Alternatives

This DEA discusses the environmental impacts of the "no action" alternative and the "proposed action alternative," which is the proposed rule.

4.1 No Action Alternative

Under the "no action" alternative, PHMSA would not revise the PSR. Under existing requirements, operators are required to confirm or revise their MAOP when the class location of a pipe segment changes. Currently, if a pipe segment's hoop stress and established MAOP are not commensurate with the present class location, and the segment is in satisfactory physical condition, the operator must reduce the MAOP of that segment of pipeline, conduct a new pressure test, or replace the pipe. Some pipeline operators have requested and been granted Special Permits that allow an operator to utilize the existing pipeline and MAOP but including IM Special Permit conditions.

4.2 Proposed Action Alternative

The proposed rule would amend the PSR. The proposed rule would add § 192.610 to codify conditions under which this option is available without the requirement of a Special Permit.

The proposed rule would add a new compliance option for pipeline segments changing from a C1-to-C3 location based on meeting the applicability criteria and conduct pipeline integrity assessments, remediation, maintenance surveys, remote control or automatic shut-off valves, documentation, and notifications, summarized below.

4.2.1 Class 1 to Class 3 Location Segment Applicability Criteria

The proposed rule allows transmission operators to confirm the MAOP or revise the MAOP by designating an affected pipe segment as an HCA and including it in an operator's IMP, subject to meeting the following applicability criteria in proposed § 192.618:

- The C1-to-C3 location segment change must have occurred after the effective date of the rule;
- The endpoints of the C1-to-C3 location segment must extend a minimum of 1-mile beyond both endpoints of the Class 3 location involved;
- The pipe segment must be able to accommodate an instrumented in-line inspection (ILI) tool;
- The hoop stress corresponding to MAOP of the C1-to-C3 location segment must not exceed 72 percent of specified minimum yield strength (SMYS) in the Class 3 location; and,
- The pipe segment must not: be bare pipe, contain wrinkle bends, lack material records for certain pipe attributes, lack pressure test records, contain certain kinds of pipe seam welds, or have a history of cracking, poor external pipe coating, or have a gas composition quality that contains deleterious contaminates, free-flowing water, and hydrocarbons.

4.2.2 Pipeline Integrity Assessments

The proposed rule requires that the C1-to-C3 location segment have an initial integrity assessment within 24 months of the location change and be reassessed using an ILI high resolution magnetic flux leakage tool, a high-resolution deformation tool with sensors and extension arms outside the tool cups, an electromagnetic acoustic transducer tool, and an inertial measurement tool, or an equivalent internal inspection device. The C1-to-C3 segment would be classified as an HCA as defined in § 192.903 and would require an integrity management program in accordance with Subpart O. The operator would also be required to conduct periodic reassessments using instrumented ILI tools in accordance with the assessment intervals in § 192.939.

4.2.3 Remediation

In addition to the evaluation, repair, and remediation scheduling requirements in § 192.933, the proposed rule requires that operators comply with additional remediation requirements as proposed in § 192.618. These requirements include:

- **Immediate repair condition**. Pipe wall thickness loss greater than or equal to 80 percent or the predicted failure pressure is less than 1.1 times maximum allowable operating pressure;
- **One-year condition**. Predicted failure pressure less than 1.39 times MAOP or pipe wall thickness loss greater than 40 percent;
- **Monitored condition**. Predicted failure pressure greater than or equal to 1.39 times MAOP or pipe wall thickness loss less than or equal to 40 percent; or
- **Special requirements** for crack anomalies including usage of an engineering critical assessment and possible replacement when cracking is over 20 percent of the pipe wall thickness.

The proposed rule requires all pipe, except pipe coated with fusion-bonded or liquid-applied epoxy coatings and excavations performed in accordance with § 192.614(c), to be inspected for cracking any time the pipe in the in-line inspection segment is uncovered and the coating is removed.

4.2.4 Maintenance Surveys

Proposed requirements include additional preventive and mitigative measures for maintenance surveys, and remediation of unprotected pipe segments. The additional measures include:

- Conduct **close interval surveys** with an interrupted on/off current at a maximum 5-foot survey spacing, evaluate in accordance with § 192.463 for unprotected pipe segments, and remediate the unprotected pipe segments within one year of the survey;
- Locate at least one (1) **cathodic protection** (CP) pipe-to-soil test station within the C1-to-C3 location segment, with a maximum spacing between test stations of one-half mile;
- Install and maintain **line-of-sight markings** on the C1-to-C3 location segment except in agricultural areas or large water crossings such as lakes where line-of-sight signage is not practical;
- **Conduct interference surveys** to address induced alternating current (AC) from parallel electric transmission lines and other interference issues such as direct current (DC) that may affect the C1-to-C3 location segment. If an operator finds the interference current is greater than or equal to 100 amps per meter squared, impedes the safe operation of a pipeline, or may cause a condition that would adversely impact the environment or public safety, an operator must correct these instances within 15 months of the interference survey;
- **Maintain depth of cover** in accordance with § 192.327 for a C1-to-C3 location segment or remediate area by adding markers at locations that do not conform with § 192.327, lowering the pipe, adding cover, or installing safety barriers;

- **Conduct right-of-way** patrols in compliance with § 192.705 at least once a month, not to exceed 45 days for C1-to-C3 location segments;
- **Conduct leakage surveys** at least once a quarter not to exceed 4½ months for C1-to-C3 location segments; and
- **Clear** the metallic short for **shorted casings** in the C1-to-C3 location segment no later than one (1) year after the short is identified.

4.2.5 Remote Control or Automatic Shut-Off Valves

PHMSA proposes the installation of mainline valves on both sides of the C1-to-C3 location segment, not to exceed 20 miles apart, that must be operational remote-controlled valves or automatic shutoff valves with pressure sensors on each side of the mainline valves. The same requirement applies to isolation valves on any crossover or lateral pipe designed to completely isolate a leak or rupture in a C1 to-C3 location segment. Additionally, these valves must be able to close within 30 minutes after a rupture is identified, must be operational at all times, controlled by a SCADA system, and monitored in accordance with § 192.631; and must have procedures and testing results reviewed at least once a calendar year, with intervals not to exceed 15 months.

4.2.6 Documentation

The proposed rule requires that each operator maintain for the life of the C1-to-C3 location segment a record of all actions implemented to comply with the requirements in proposed § 192.618(e), subpart J pressure tests, and pipeline assessments, surveys, remediation, maintenance, analyses, and any other implemented actions.

4.2.7 Notifications to PHMSA of Integrity Assessment Program for C1 to C3 Location Segment Changes

Lastly, the proposed rule requires each operator that uses the integrity assessment program for managing C1-to-C3 location segment to notify PHMSA electronically in accordance with § 191.22(c)(2). Such a notification must include details of each pipeline segment that experienced a class location change, which the operator will manage using IM.

5 Affected Environment and Environmental Consequences

A Class 3 location, as defined in 49 CFR 192.5(b)(3), is any class location unit[11] that has 46 or more buildings intended for human occupancy, or an area where the pipeline lies within 100 yards of either a building or a small, well-defined outside area, such as a playground, recreation area, outdoor theater, or other place of public assembly, that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period. The days and weeks do not need to be consecutive.

PHMSA subject matter experts conclude that the proposed inspection, operation, maintenance, remediation, documentation, and valve installation requirements in this NPRM would maintain safety over the life of the C1-to-C3 pipeline segment. Additionally, the proposed rule may reduce the number of pipeline replacements by allowing operators a method to monitor the integrity of a qualifying pipeline before the end of its useful life. Avoiding pipeline segment replacements could avoid the environmental impacts that result from excavation activities and the manufacture, transport, and installation of new pipeline segments.

PHMSA used historical incidents for pipeline mileage in Class 3 non-HCA locations (see Exhibit 1) to serve as a proxy for the “no action” alternative. As shown in Exhibit 1, from 2012 to 2018 there were 57 incidents that occurred in non-HCA onshore Class 3 pipeline locations, which resulted in 1 fatality, 722 public evacuations, and approximately $20.8 million in property damage.

In the proposed rule alternative, PHMSA expects some operators to switch from pipe replacement to the new proposed rule method and its associated IM requirements. Conceptually, these are pipelines designed for Class 1 – from an MAOP perspective – but operating in a Class 3 location with an integrity management program (IMP) in place. To approximate this case, PHMSA reviewed historical incidents and pipeline mileage in onshore Class 1 HCA locations. As shown in Exhibit 2, during this same timeframe, 11 incidents occurred in HCA Class 1 locations resulting in $5 million in property damages.

As described in the preliminary regulatory impact analysis (RIA) issued in this rulemaking docket, PHMSA estimates that about 23 to 36 miles of pipeline each year would switch from replacement to the proposed option, based on historical annual report data from 2012 to 2017. Additionally, by eliminating these pipe replacements, the proposed rule would also reduce the environmental consequences associated with excavation and construction. While the proposed pipeline maintenance requirements require numerous, yet isolated excavations, depending on the condition of the existing pipeline, PHMSA expects that these excavations for maintenance purposes would not be as extensive or impactful as those needed for pipeline removal and replacement. Under the proposed action, isolated and temporary excavations could occur for the life of a pipeline, due to the maintenance, inspection, and repair requirements required for continued operation without replacement.

[11] A class location unit is an onshore area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. 49 CFR 192.5(a)(1).

Exhibit 1: Onshore Transmission Incidents in non-HCA Class 3 locations

Year	*No. of Incidents*	*Total Damages ($US 2018)*	*No. of Fatalities*	*No. of Injuries*	*No. of Evacuations*	*Gas Released (MMcF)*
2010	4	$259,182	0	0	60	10,621
2011	3	$723,723	0	0	85	22,071
2012	8	$1,250,030	0	0	342	47,285
2013	4	$2,360,079	0	0	175	21,971
2014	10	$9,820,146	0	0	30	49,283
2015	8	$2,005,399	0	0	16	21,396
2016	5	$2,704,101	1	0	24	9,794
2017	2	$303,979	0	0	0	30,971
2018	1414	$1,434,123	0	0	0	67,862
Total	57	$20,860,761	1	0	722	281,218
Average Annual	6.3	$2,278,099	0	0	80	31,246
Average per Incident	na	$486,008	0.0	0.0	13	5,330

Source: PHMSA 2019. Note these incidents are comparable to those that would occur in the "no action" alternative.

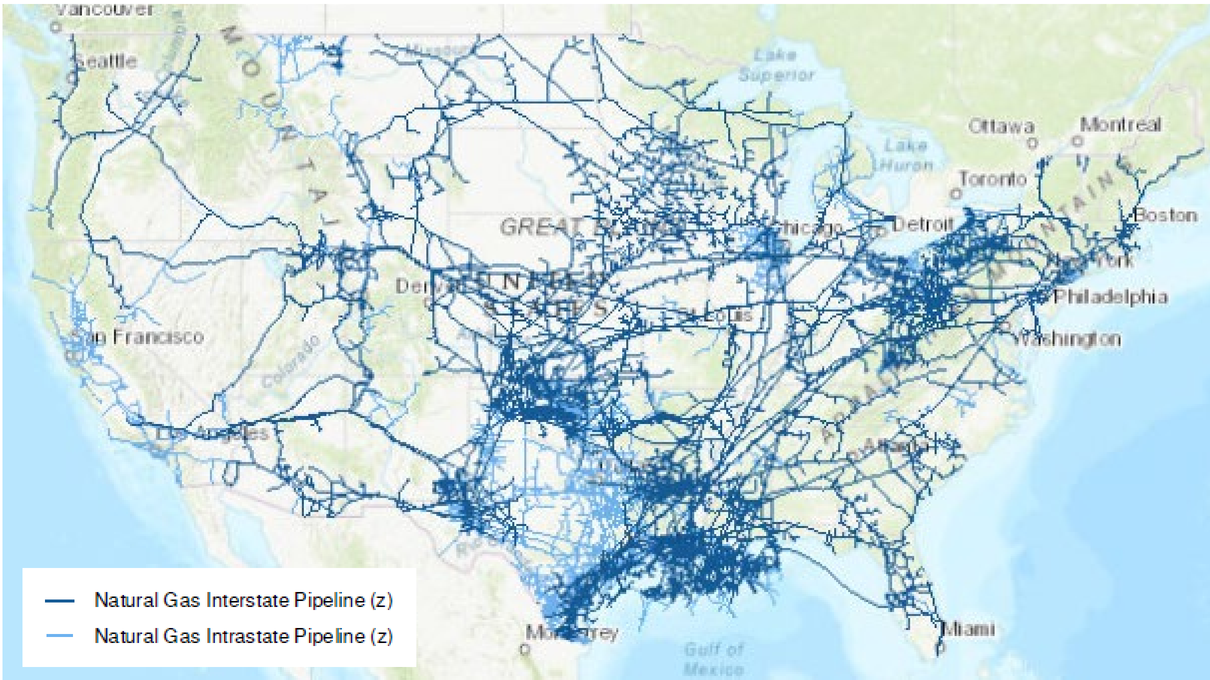
Exhibit 2: Onshore Transmission Incidents in HCA Class 1 locations

Year	*No. of Incidents*	*Total Damages ($US 2018)*	*No. of Fatalities*	*No. of Injuries*	*No. of Evacuations*	*Gas Released (MMcF)*
2010	0	$0	0	0	0	0
2011	1	$3,831,993	0	0	0	465
2012	1	$213,000	0	0	0	8,741
2013	3	$184,800	0	0	0	58,513
2014	2	$336,295	0	0	0	65,295
2015	0	$0	0	0	0	0
2016	1	$214,754	0	0	0	15,441
2017	3	$134,553	0	0	0	37,744
2018	0	$0	0	0	0	0
Total	11	$4,915,395	0	0	0	186,199
Average Annual	1.2	$546,155	0	0	0	20,689
Average per Incident	na	$446,854	0.0	0.0	0	16,927

Source: PHMSA 2019 Note these incidents are comparable to those that would occur in the proposed rule scenario.

Exhibit 3 presents the transmission pipeline network in the United States. While not all of the pipelines shown are subject to the proposed rule requirements, the map highlights the geographic scope and extent of the pipeline network and potential breadth of the affected environment. Therefore, the potentially affected environment is the land area in the United States where onshore C1 pipelines are located.

Exhibit 3: Gas Transmission Pipelines Map



Source: EIA 2020

Based on PHMSA's 2017 Annual Report, there were 232,768 C1 miles of pipeline, or about 78 percent of the total onshore transmission mileage.

Avoided environmental damage caused by reduced excavations include reduced impacts to soil, water resources, wildlife, and other ecological resources and processes. Pipeline excavations can result in increased siltation of nearby waterways. Siltation can negatively affect fish, especially fish reproduction; amphibians and reptiles; benthic organisms; and aquatic vegetation. For these reasons, reducing the number of excavations would have no significant adverse impact on the environment and could have a positive effect due to avoidance. Sections 5.1 to 5.17 provide a qualitative discussion of the environmental effects of the proposed rule and the no action alternative for each of these resources in more detail.

5.1 Aesthetics

In the "no action" alternative, PHMSA estimates that between 67 and 106 miles of pipeline may be replaced annually for class location changes. Based on an average segment length of approximately 0.26 miles, and assuming one excavation per segment, PHMSA estimates between 257 – 406 excavations in the baseline. Pipe replacement requires excavation and removal of the existing pipe and the construction, installation, and testing of new pipe. This would result in the use of heavy equipment and ground disturbance near the location of each pipe segment. In comparison, if operators choose to follow the means of response to class location change as proposed, they would need to update existing valves to make them remote-control or automatic-shutoff and add line markers, which are visible above ground. Updating valves does not change the size of the valve station, but slightly changes the appearance of valve stem that protrudes from the ground. These aesthetic impacts would be relatively small but permanent in nature. If pipeline operators are out of compliance with current valve spacing locations in § 192.179, they may install valves prior to utilizing the proposed provision, but these actions would not be a result of this rulemaking. On the other hand, pipeline replacement is temporary but potentially large in scope. Under the proposed action, operators would likely opt to excavate and replace pipelines less extensively and frequently but would be required to update existing valves to make them remote-control or automatic shutoff mainline valves and line markers for safety purposes that are permanent above-ground installations. PHMSA finds that the selection of “no action” or the “proposed actions” would not result in a significant impact to the human environment.

5.2 Agriculture Resources

This rulemaking applies to areas that have experienced a significant increase in buildings intended for human occupancy. Nonetheless, it is possible that agricultural resources could exist in these areas. Under the “no action” alternative, operators would need to replace pipeline segments to maintain the desired MAOP, which may disturb and negatively impact agricultural resources and operations for a limited time nearby. Under the proposed rule alternative, operators would include qualifying pipe segments in an IMP to avoid pipe replacement. This proposed rule could require the update of valves and require the placement of pipeline line-of-sight markers. The requirement for line-of-sight markers does not apply to agricultural areas where placement of a line marker is impractical. Overall, PHMSA believes that utilization of the provisions proposed in this rule would reduce agricultural disturbances associated with pipe excavation and replacement near the pipeline right-of-way.

5.3 Air Quality

PHMSA estimates that 23 to 42 miles of gas transmission pipelines that would be excavated and replaced annually in the “no action” alternative would instead be included in operators’ IMP under the proposed rule alternative. Excavations could disrupt soil approximately 25 to 50 feet on either side of the centerline of a pipeline. In addition, transportation and utilization of construction equipment required for excavation and equipment would also result in the release of air pollutants and particulate matter. One study estimated pipeline excavation work due to pipeline activity releases 0.02667 grams of inorganic dust (SiO_2 20-70%) per second of work (Tomareva et al. 2017). Airborne dust presents serious risks for human health. Particles larger than 10 μm can damage external organs – mostly causing skin and eye irritations, conjunctivitis and enhanced susceptibility to ocular infection. Inhalable particles (i.e. those smaller than 10 μm), can become trapped in the nose, mouth and upper respiratory tract, causing respiratory disorders such as asthma, tracheitis, pneumonia, allergic rhinitis, and silicosis (Terradellas et al. 2015).

The proposed rule alternative may prevent about 1.2 square miles of surface-soil disruption and related dust releases per year. Assuming a typical pipeline is about 3 to 6 feet underground, and excavations are required about 2 feet on either side of the center line of any pipeline, the proposed rule alternative may prevent the excavation of 4 million cubic feet of soil or earth per year. This would reduce the release of dust and other particles related to construction activities during pipe replacement and related transportation of heavy machinery. It would also reduce the potential adverse effects on human health caused by airborne dust.

In addition, pipeline replacement under the “no action” alternative results in the direct emissions of air pollutants, including greenhouse gases, from the manufacturing and transportation of steel line pipe and the related emissions from excavation and installation machinery. These impacts would be avoided if an operator chooses this compliance option for qualifying pipe segments. Essentially, the proposed rule alternative would extend the useful life of existing pipelines in good condition thereby delaying the manufacturing, transportation, and installation of new pipelines. Some of these benefits would be lost because the rigorous maintenance, inspection, and remediation actions that would be required for compliance would directly or indirectly cause some emissions. In conclusion, the selection of the “proposed action” would result in the release of less air pollution, including greenhouse gases, than would otherwise be released as a result of replacement of pipeline segments in response to a class location increase.

5.4 Biological Resources

Natural gas transmission pipelines that have recently changed from C1-to-C3 have undergone an increase in development of buildings or sites intended for human occupancy. Nonetheless, these areas may still contain a diverse mix of biological resources. The primary wildlife habitats and biological resources would be unique to each pipeline’s location. The proposed action would avoid the need to remove and replace a pipeline segment and the disruption or destruction of wildlife habitat along the pipeline right of way. As described above, the proposed provisions could result in excavations needed to comply with increased maintenance activities, depending on the condition of the pipeline. Overall, PHMSA believes that the proposed rule would result in fewer impacts to biological resources when operators opt for this method of compliance for qualifying pipelines that undergo a C1-to-C3 change.

5.5 Climate Change

Natural gas is composed primarily of methane (approximately 95 percent or more), with a smaller proportion of ethane, propane, and other hydrocarbons. Unburned methane is a potent greenhouse gas (GHG) with a climate forcing effect that is 28 to 36 times greater than that of carbon dioxide over a 100-year period (Intergovernmental Panel on Climate Change, 2013). The combustion or burning of methane, ethane, and propane releases carbon dioxide and water vapor. The combustion of impurities in the methane could result in the release of other GHGs, including nitrogen oxide. The climate effects resulting from emissions of GHGs include an increase in temperature and sea level rise; changes in weather patterns toward an intensified water cycle with stronger floods and droughts; and stress on ecosystems, especially in the Arctic, mountain, and tropical areas, resulting in the shift of species habitat range. The economic losses from climate change include reduced agricultural yields, human health risks, and property damages from increased flood frequencies, the loss of ecosystem services, and others.

In the “no action” alternative, pipeline replacement requires operators to empty the remaining unburned natural gas from the pipeline via a procedure called “blowdown.” Furthermore, the requirement in this proposed rule to convert valves to remote-control or automatic shut-down would stop the flow of natural gas more quickly and reduce the amount of natural gas that flows to the site of a failure. This would reduce the amount of carbon dioxide or unburned methane released into the atmosphere. Unburned natural gas would only be released in the event that ignition does not occur following a release.

Assuming that operators opt to utilize the provisions in the proposed rule, it would reduce the frequency and quantity of natural gas and GHG releases compared to the "no action" alternative because of fewer pipeline blowdowns, excavations, replacements, and incidents.

5.6 Cultural Resources

Any class location change compliance activities under the proposed rule, which include performing ILI assessments, conducting surveys, installing line-of-sight markers, and using SCADA systems, would be conducted within the boundaries of the previously disturbed pipeline right-of-way. Therefore, there would be no significant impact on any new cultural resources for both the "no action" alternative and the proposed rule.

5.7 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,[12] requires agencies to identify and address the disproportionately high and adverse human health and environmental effects of their actions on minority and low-income populations, including Indian tribes. Class 3 locations are generally determined based on population density, which do not consider income and racial demographics. The purpose of the proposed action is to provide transmission operators an additional means to address a class location change of C1-to-C3. Any activities associated with the proposed rule would be conducted within or adjacent to the boundaries of the existing pipeline right-of-way. Because transmission pipelines are distributed throughout the United States, as illustrated in Exhibit 3, and are located by operators based on transporting natural gas from a supply area to a customer, it is unlikely environmental justice communities will bear disproportionately high and adverse impacts on human health and the environment caused by the proposed action.

5.8 Geology, Soils, and Mineral Resources

C1-to-C3 pipeline segments are located in environments with a diverse mix of geology, soils, and mineral resources. These locations may be vulnerable to seismic hazards include earthquakes, surface faulting, and soil liquefaction.

However, the proposed rule affects only existing pipelines that are upgrading from C1-to-C3. The scope and duration of any activities associated with the proposed rule would have little to no permanent impact on geology, soils, or mineral resources near a pipeline compared to the "no action" alternative. In the "no action" alternative temporary disruptions to geology, soil, or mineral resources may occur if an operator excavates and replaces a pipeline segment.

5.9 Noise

The scope and duration of any activities associated with the proposed rule would not have a significant impact on noise levels near a C1-to-C3 pipeline compared to the "no action" alternative.

[12] 59 FR 7629 (Feb. 26, 1994).

In the "no action" alternative, temporary increases in noise may occur if an operator chooses to excavate and replace a pipeline segment due to construction activity. Under the proposed action, temporary noise impact could occur based on maintenance, inspection, and repair activities.

5.10 Recreation

The scope and duration of any activities associated with proposed rule would have little to no impact on recreation near a pipeline compared to the "no action" alternative. In the "no action" alternative, temporary disruptions to recreation may occur if an operator replaces a pipeline segment. Less extensive temporary disruptions to recreation may occur during intermittent repair activities during the life of a pipeline, due to the maintenance, inspection, and repair activities.

5.11 Safety

As similarly discussed in the NPRM and preliminary RIA, PHMSA expects that the proposed rule will at a minimum maintain an equivalent level of safety. PHMSA's analysis of historical incident data, documented in Section 5 of the preliminary RIA for the proposed rule, is consistent with this finding. In 2004, PHMSA published a document in the Federal Register explaining the consideration of Special Permit applications to waive requirements for pipeline segment replacement for areas that have experienced class location changes.[13] PHMSA explained the pipeline attributes that would disqualify pipeline segments from being eligible for a Special Permit and the inspection and maintenance activities that pipeline operators would need to comply with in the event that PHMSA issued a Special Permit for class location change. Since that time, PHMSA has continued to develop and strengthen these criteria and has issued twelve Special Permits that apply to pipeline segments in Alabama, Arizona, Colorado, Georgia, Kentucky, Louisiana, Michigan, Mississippi, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Tennessee, Texas, West Virginia, and Wyoming. No incidents have occurred on the pipeline segments subject to one of these Special Permits.

This rule allows operators to avoid replacing existing qualifying pipeline segments with new pipe with a higher safety margin. Pipelines are designed with a safety margin between the design operating pressure and the pressure at which failure would occur. Safety margins are necessary because pipelines can be subject to emergency situations, unexpected loads, operator error, and material degradation. Pipelines with a higher safety margin can withstand greater pressure or metal loss due to corrosion. However, compliance with the inspection and maintenance requirements required in order to utilize this provision ensure that anomalies that could lead to failure would be detected and repaired before they could pose a threat to safety. If an operator replaces a pipeline segment with higher safety margin pipe that would otherwise be required under § 192.611 to maintain MAOP, the pipeline operator would not need to comply with the inspection, maintenance, repair, and other safety requirements in this proposed rule.

As described in the NPRM, this compliance option is not available to pipeline segments with the following attributes that can be associated with increased safety risks:

- Bare pipe;
- Wrinkle bends;
- Missing material properties records;

[13] 69 FR 38948 (June 29, 2004).

- Certain historically problematic seam types;
- Body, seam, or girth-weld cracking;
- Pipe with poor external coating or with tape wraps or shrink sleeves;
- A leak or failure history within 5 miles of the segment;
- Pipe transporting gas that is not of suitable composition and quality for sale to gas distribution customers; and
- Pipe operated in accordance with § 192.619(c) or (d).

The provisions in the proposed rule also requires that the operator take actions to ensure that the pipeline is receiving proper cathodic protection (CP), which prevents external corrosion in the event of coating disbondment. This proposed rulemaking would require operators to conduct close interval surveys (CIS), the installation of CP test stations, and interference surveys to ensure the maintenance of coatings and reduce the numbers of immediate and scheduled repairs.

Based on experience with similar Special Permits, PHMSA believes that the requirements to inspect the pipelines using certain in-line inspection tools, along with more stringent repair and life of the pipeline monitoring criteria, could reduce the likelihood of pipeline failure in the C1-to-C3 location segment and between the nearest upstream in-line inspection launcher and the nearest downstream in-line inspection receiver. Furthermore, in the unlikely event of pipeline failure, the installation of remote controlled or automatic shut-off valves for pipelines subject to this proposed rule would significantly limit the amount of natural gas that flows to a failure site following an incident. Automatic shutoff valves installed in accordance with this proposed rule must be set so that, based on operating conditions and minimum and maximum flow model gradients, they will fully close within a maximum of 30 minutes following rupture identification. Automatic shutoff valve set-points must not be less than those required to actuate the valve before a downstream remote-control valve actuates. Reduced amounts of natural gas released can decrease the duration of risks posed by heat and asphyxiation.

5.12 Socioeconomics

PHMSA does not expect that this proposed rulemaking would have significant adverse effects on communities or economies. Furthermore, PHMSA does not expect the proposed rule to impose any significant compliance costs on pipeline operators or the communities in which they operate. In addition, the preliminary RIA concludes that these costs would have minimal impacts on the supply, distribution, or use of energy compared to the “no action” alternative, and no significant impacts on small businesses or on employment.

5.13 Transportation

The scope and duration of any activities associated with the proposed rule would have little to no impact on transportation infrastructure or roads near a pipeline compared to the “no action” alternative. In the “no action” alternative, temporary congestion may occur on roads near a pipeline due to construction activity if an operator replaces a pipeline segment.

5.14 Water Resources

Pipelines may cross wetlands, aquifers, groundwater resources, springs, floodplains, or surface waters. The proposed action is expected to reduce impacts to water resources that can result from excavation required for pipe replacement. The potential impact on water resources from activities such as installing line-of-sight markers is not likely to be significant because they involve minimal ground disturbance. The proposed requirements would not cause changes to groundwater recharge or flows.

In the "no action" alternative, operators who replace pipes may disrupt wetlands, springs, or other surface water resources near affected C1 pipeline segments. Pipe replacement may require the use of horizontal directional drilling, which may increase the risk of surface water contamination, as drilling mud may migrate through a potential fracture in the underlying rock or substrate.

Lastly, in the "no action" alternative where pipe replacement is required, installation of new pipe rarely affects floodplains, since pipes segments are installed near subsurface and all contours will be restored following the completion of construction activities.

5.15 Comparative Environmental Impacts of Alternatives

Implementing the proposed rule's additional preventative and mitigative measures enables a pipeline operator to improve their knowledge and understanding of a pipeline's integrity, accelerate the identification and repair of actionable anomalies, and help manage threats to public safety and the environment. In addition, implementing enhanced inspection and assessment practices throughout the C1 pipeline segment and between the nearest upstream in-line inspection launcher and the nearest downstream in-line inspection receiver, in lieu of replacing small segments of pipe, extends pipeline safety benefits to a much greater area along the pipeline. Avoiding pipe excavation and replacement averts environmental disturbances associated with replacement. Finally, the requirement to modify valves to make them remote-control or automatic shut-off reduces the amount of natural gas that reaches the release site, which reduces safety and environmental impacts following a release.

6 Determination of the Degree of Environmental Impact

PHMSA has preliminarily determined that the proposed action would not have a significant adverse impact on the environment. In considering whether an action meets the "significance" threshold, PHMSA analyzed the context and intensity of this action. PHMSA utilized the factors described in § 1508.27 of the CEQ Regulations. The context of this proposed rule could affect any location that, due to increases in buildings and sites intended for human occupancy, changes from C1-to-C3. As demonstrated in Exhibit 3, gas transmission pipelines exist throughout most of the country. In analyzing the intensity of this propose rule, PHMSA considered that avoiding the removal and replacement of pipeline segments avoids the environmental impacts associated with those activities. PHMSA believes that compliance with increased maintenance requirements will ensure that any anomalies that could develop into defects that threaten pipeline integrity are detected far in advance of a failure could occur on a pipeline with 0.72 design factor. PHMSA believes that the measures in this proposed rule will not negatively affect public safety or public health. PHMSA has issued Special Permits with conditions that mirror the provisions in this rulemaking since 2004 without any safety incidents or significant opposition, so PHMSA does not believe that this proposed rule would be considered "highly controversial." PHMSA originally developed the conditions that form the basis for the rulemaking based on its experience with the adoption of the integrity management regulations and its expertise in pipeline safety. Since that time, PHMSA has continued to study and strengthen the conditions to maximize safety.

PHMSA welcomes comment on any of the proposed provisions in this rulemaking and the EA's preliminary conclusions. If it is determined that no significant impacts would occur as a result of the proposed action, then PHMSA will publish a FONSI.

7 Agencies and Persons Consulted

Public involvement is a critical aspect of the NEPA process. PHMSA must consider any comments received from the public and other relevant stakeholders.

As discussed in Section 2.2, On August 1, 2013, PHMSA published a notice in the Federal Register (78 FR 46560) soliciting comments on whether expanding gas IM program requirements would mitigate the need for class location requirements in line with the Section 5 mandate of the 2011 Pipeline Safety Act.

Following this notice, in 2014 PHMSA sponsored Class Location Workshop to solicit comments on whether applying the gas pipeline IM program requirements beyond HCAs would mitigate the need for gas pipeline class location requirements.

Lastly, on July 31, 2018, PHMSA published an Advanced Notice of Proposed Rulemaking (ANPRM) in the Federal Register, "Pipeline Safety: Class Location Change Requirements," initiating this rulemaking and seeking comment on existing class location requirements for natural gas transmission pipelines. The ANPRM sought public comment as they pertain to actions operators are required to take following class location changes due to population growth near the pipeline.

8 List of Preparers and Reviewers

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