

U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
Three-Layer Polyethylene Coating
Special Permit Analysis and Findings

Special Permit Information:

Docket Number: PHMSA-2017-0046
Requested By: Alaska Gasline Development Corporation
Operator ID#: 40015
Original Date Requested: April 14, 2017
Original Issuance Date: September 9, 2019
Effective Dates: September 9, 2019
Code Section(s): 49 CFR 192.112(f)(1)

Purpose:

The Pipeline and Hazardous Materials Safety Administration (PHMSA)¹ provides information to describe the facts of the subject special permit application submitted by the Alaska Gasline Development Corporation (AGDC), owner and operator of the Alaska LNG Pipeline,² to discuss any relevant public comments received with respect to the application for a special permit, to present the engineering/safety analysis, and to make public the findings regarding whether the requested special permit should be granted and if so under what conditions. AGDC requested a special permit for the Alaska LNG Pipeline to waive compliance from 49 Code of Federal Regulations (CFR) 192.112(f)(1). Section 192.112(f)(1) requires that “pipe must be protected against external corrosion by a non-shielding coating.” AGDC plans to use a three-layer polyethylene (3LPE) 3LPE external

¹ Throughout this special permit the usage of “PHMSA” or “PHMSA OPS” means the U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration Office of Pipeline Safety.

² Alaska LNG Pipeline refers to the approximately 807 miles of 42-inch natural gas transmission pipeline and not to any potential owners, operators, or entities associated with the Alaska LNG Pipeline. The special permit owner, operator, and applicant/permittee is Alaska Gasline Development Corporation. Please note that this pipeline does not transport liquefied natural gas (LNG). It will supply natural gas to a LNG facility for further transportation as LNG.

coating on the Alaska LNG Pipeline that may shield cathodic protection (CP) current from reaching the exterior of the pipe wall surface.

Pipeline System Affected:

The Alaska LNG Pipeline will be approximately 807 miles of 42-inch-diameter steel pipe for transporting natural gas from AGDC's gas treatment plant (GTP) on Alaska's North Slope to the liquefaction facility on the eastern shore of the Cook Inlet near Nikiski, Alaska. The pipeline will be mostly onshore, with a segment of offshore pipeline crossing the Cook Inlet. The onshore portion of the pipeline will be a buried pipeline except for short, above-ground special design segments, such as aerial water crossings and aboveground fault crossings. The Alaska LNG Pipeline's design has a maximum allowable operating pressure (MAOP) of 2,075 pounds per square inch gauge (psig).

The Alaska LNG Pipeline will traverse the state of Alaska. Construction will require the transportation of line pipe significant distances to remote regions. Fusion bonded epoxy (FBE) coatings, which are in common use in the contiguous U.S. (Lower 48), are susceptible to damage during transportation and installation. As a result, AGDC proposes to utilize 3LPE coatings, which consists of a FBE inner layer, a copolymer adhesive layer, and a polyethylene outer layer. 3LPE coatings have increased resistance to damage during transportation and installation.

The special permit will allow AGDC to use 3LPE coatings on the Alaska LNG Pipeline in order to reduce coating damage, and will allow the installation of a pipeline with fewer coating holidays and repairs. The special permit would include conditions to ensure the pipeline is constructed, operated, and maintained in accordance with 49 CFR Part 192 and to detect and remediate any CP shielding found along the pipeline.

Special Permit Request:

AGDC requested the use of 3LPE along the Alaska LNG Pipeline. Federal pipeline safety regulations require that natural gas transmission pipeline operators using alternative MAOP, as allowed in 49 CFR 192.112, 192.328, and 192.620, must provide pipe coatings that are "non-shielding" to CP. Since the 3LPE external pipe coating has attributes that can lead to shielding the pipe from CP, PHMSA has included certain conditions that AGDC must meet to minimize and mitigate the threat of shielding the pipe from the CP current.

AGDC will be required by the special permit conditions to develop and implement procedures for the Alaska LNG Pipeline to use 3LPE coating as summarized below:

1) Line Pipe Coating Requirements:

- a) Development of a coating procedure that meets specific quality standards;
- b) Inspections to confirm adequate coating thickness of each layer and that application complied with above-described procedure; and
- c) Use of high voltage holiday detector.

2) Field Joint Coatings:

- a) Coating content;
- b) Pipe preparation and coating application, including thickness; and
- c) Coating holiday detection in accordance with industry standard.

3) Integrity Management for Pipe Cracking:

- a) Electromagnetic acoustic transducer (EMAT) ILI tool 14 years after startup and every seven (7) years, thereafter;
- b) Assessments for cracking during excavations and direct assessment using certain tools; and
- c) Fracture mechanics analysis must be performed to evaluate cracking indications.

4) Interference Current Control:

- a) Interference surveys each calendar year;
- b) Currents from interferences sources like pipelines, electric transmission lines, etc. addressed within 12 months; and
- c) Engineering analysis of actions to address interferences performed every seven (7) years.

Special Permit Segment:

State of Alaska

The Alaska LNG Pipeline *special permit segment* is defined as: approximately 807 miles of 42-inch diameter pipeline originating in the North Slope Borough, traversing the Yukon-Koyukuk Census Area, the Fairbanks North Star Borough, the Denali Borough, the Matanuska-Susitna Borough, and the Kenai Peninsula Borough. The *special permit segment* terminates at the liquefaction facility on the shore of the Cook Inlet near Nikiski, Alaska.

The special permit allows the use of 3LPE on the 42-inch *special permit segment* with the implementation of the special permit conditions.

Public Notice:

On May 28, 2019, PHMSA published a special permit request in the Federal Register (84 FR 24594) for public comment. The public comment period ended on July 29, 2019, and PHMSA reviewed and considered all comments received through July 29, 2019. The special permit application from AGDC, pipeline route maps, public comments, final environmental assessment and finding of no significant impact, and special permit conditions are available in Docket No. PHMSA-2017-0046 at: www.regulations.gov.

PHMSA Overall Response and Considerations of Public Safety Concerns:

PHMSA published a Notice of Availability in the Federal Register on May 28, 2019, for four (4) special permit requests for the line pipe of the Alaska LNG Pipeline. (84 FR 24594, Docket Nos.: PHMSA-2017-0046, Usage of 3LPE Coating; PHMSA-2017-0044, Usage of Strain Based Design; PHMSA-2017-0045, Alternative Mainline Block Valve Spacing; and PHMSA-2017-0047, Usage of Crack Arrestor Spacing at www.Regulations.gov.) PHMSA requested comment on the special permit applications, the draft permit conditions, and the draft environmental analyses. The public notice comment period ended on July 29, 2019, and PHMSA reviewed and considered all comments received through July 29, 2019. PHMSA received a public comment concerning usage of fossil fuels, the building of the Alaska LNG Pipeline, and the building of a liquified natural gas (LNG) facility. PHMSA does not have siting authority over pipeline facilities. The public comment received did not submit concerns directed towards the special permit, the environmental assessment, or the special permit conditions, which were the issues within PHMSA's decision making authority and the intent of the public notice.

Operational Integrity Compliance:

PHMSA has reviewed this special permit request to ensure that integrity threats to the pipeline in the *special permit segment* are addressed in the operator's operations and management plan (O&M Procedures and specifications). PHMSA carefully designed a comprehensive set of conditions that AGDC is required to implement in order to operate the Alaska LNG Pipeline with 3LPE coating.

The full conditions can be reviewed in their entirety in the special permit, which can be reviewed on Docket PHMSA-2017-0046 at www.regulations.gov. The special permit conditions are summarized by topic in the below list.

- 1) Applicable Regulations
- 2) Maximum Allowable Operating Pressure
- 3) Plant-Applied 3LPE Coating Procedures and Qualification
- 4) Factory-Applied Coating Specification Requirements
- 5) Coating Application Quality Control Testing
- 6) Field Joint Coatings
- 7) Integrity Management for Cracking – Pipe Body, Seam and Girth Weld
- 8) Interference Currents Control
- 9) Annual Reports
- 10) Certification
- 11) Limitations

Past Enforcement History:

AGDC has no gas transmission pipeline (49 CFR Part 192) operating history or enforcement history.

Findings:

Based on the information submitted by AGDC and PHMSA’s analysis of technical, operational, and safety issues, and given the conditions that will be imposed in the special permit, PHMSA finds that granting this special permit to AGDC to operate the Alaska LNG Pipeline *special permit segment* with 3LPE coating will not be inconsistent with pipeline safety.

Completed in Washington DC on: September 9, 2019

Prepared By: PHMSA – Engineering and Research Division

Figure 1: Alaska LNG Pipeline Route

