

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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HP 22-002

IN THE MATTER OF THE APPLICATION :
OF NAVIGATOR HEARTLAND :
GREENWAY, LLC FOR A PERMIT UNDER :
THE SOUTH DAKOTA ENERGY :
CONVERSION AND TRANSMISSION :
FACILITIES ACT TO CONSTRUCT THE :
HEARTLAND GREENWAY PIPELINE IN :
SOUTH DAKOTA, :
:
:

**DIRECT TESTIMONY OF
JOHN GODFREY**

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1. Please state your name and business address for the record.

Answer: My name is John F. Godfrey. My business address is 5777 Frantz Road,
Dublin, OH 43017.

2. Have you previously provided testimony in this matter?

Answer: No.

3. Please describe your present employment.

Answer: I currently serve as a Senior Principal Consultant with the Integrity Solutions
and Compliance Department within the Energy Services Group of DNV GL USA, Inc. ("DNV").

**4. Please describe your educational background, employment history, and professional
affiliations.**

Answer: I have a Bachelor of Science in General Engineering with an emphasis in
Hydraulics and Strength of Materials from the University of Illinois, which I received in 1987. I
have over 35 years of experience related to pipeline design, construction, operation,
maintenance, regulatory compliance, and safety issues, including 22 years with hazardous liquid

pipeline operators. Over the years I have held various positions in pipeline engineering, operations, manufacturing, consulting, and asset integrity services. I have developed and managed Integrity Management Programs for pipeline companies. My experience also includes regulatory compliance, standards development, pipeline operations, pipeline design and construction, line pipe manufacturing, and non-destructive examination. I am a past Chairman of the American Petroleum Institute (“API”) Pipeline Integrity Committee, a past Vice Chair of the Pipeline Research Council International Materials Committee, and a previous member of the API Operations Technical Committee. A copy of my C.V. is attached as Exhibit A.

5. Are you being compensated for your testimony?

Answer: DNV invoices my services at the rate of \$525 per hour for my expert witness testimony in this matter. I am a salaried employee and not personally compensated specific to this testimony.

6. What is the purpose of your testimony?

Answer: The purpose of my testimony is to describe:

(1) DNV’s development of the international Recommended Practice (“RP”) for CO2 pipelines design, construction and operation, “DNV-RP-F104, Design and Operation of Carbon Dioxide Pipeline.”. This RP was in response to the emergence of carbon capture and storage as a key abatement technology for achieving a significant reduction of CO2 emissions to the atmosphere;

(2) Navigator’s retention of DNV to assess Navigator Heartland Greenway System (“NHG”) pipeline’s safety philosophy, concept development and premise, material selection and design against the requirements of DNV-RP-F104; and

(3) The results of DNV’s verification of Navigator’s proposed NHG pipeline.

7. Please describe the business of DNV.

Answer: DNV is the leading technical advisor to the global energy industry. We provide consistent, integrated services within technical and marine assurance and advisory, risk management and offshore classification, to enable safe, reliable, and enhanced performance in projects and operations. Operating in more than 100 countries, our over 12,000 professionals serve our customers in the maritime, oil and gas, energy, and other industries. DNV services span the entire value chain of carbon dioxide (“CO₂”) from capture and conditioning to compression, transport, utilization, and storage. DNV is a recognized global authority in onshore and offshore pipeline integrity asset management. Our subject matter experts (“SME”) are backed by industry-leading laboratories and research scientists for material testing, modeling and simulations, corrosion research, failure analysis, technology, and equipment. We build trust for industries, investors, and governing bodies globally from strategic planning through technology demonstration to operational excellence.

8. Has DNV done work for Navigator in connection with the proposed Navigator Heartland Greenway Pipeline?

Answer: Navigator retained DNV to perform PHAST air dispersion modeling, facilitate a safety risk analysis, and assess NHG pipeline’s safety philosophy, concept development and premise, material selection and design against the requirements of DNV-RP-F104.

9. Please describe the development and purpose of DNV-RP-F104.

Answer: The objective of this RP is to provide an internationally acceptable framework for the design, construction and operation of offshore and onshore CO₂ pipelines, with a focus on structural assessment and with the aim of obtaining an appropriate and consistent level of safety. Safety of the pipeline is emphasized though all phases, as described in section 3 of DNV-

RP-F104 on safety philosophy. The RP states that the overall safety philosophy for the pipeline shall be established, planned and implemented in the concept development, design, construction, and operation of CO2 pipelines. A copy of the RP has been filed confidentially as Exhibit B.

10. When did Navigator retain DNV to perform verification against the requirements in the RP?

Answer: March-May 2023

11. Please describe the scope of the design verification that DNV has completed for Navigator with respect to the Heartland Greenway Pipeline.

Answer: For technical assurance of assets, DNV offers a suite of services, including certification and verification of pipeline systems. The Scope of Work was defined between Navigator and DNV and includes verification in different stages via a Design Verification Report (“DVR”) which addresses unique elements associated with the transportation of CO2 addressed within DNV-RP-F104. The purpose of the DVR is to provide documentation that objective evidence has been presented, to confirm compliance with these requirements, and to document the work performed by DNV. To date, Navigator has retained us for the following sections of the RP:

- Section 3 (Safety Philosophy)
- Section 4 (Concept Development and Design Premises)
- Section 5 (Materials and Pipeline Design)

Each section is verified separately.

12. What work did DNV do to complete the verification process?

Answer: DNV’s scope of work included the following tasks and activities:

(1) Document Mapping. Mapping all Navigator supplied documents (engineering & construction specifications, other key / engineering documents) against the relevant sections of DNV-RP-F104.

(2) Document Verification. Review of key documents identified during the document mapping activity in stages (documents verified against DNV-RP-F104 Section 3, Section 4, and Section 5 requirements) starting from Section 3. The review is based on following categories of documents:

- NCO2V specifications
- Project design basis/design premise
- Engineering documents (i.e., calculations, if available at the time of review)

This process included verification of all mapped documents against each section's requirements for identification of potential gaps. DNV documented the requirements from DNV-RP-F104 in a spreadsheet. DNV's assessment and Navigator's responses are also included in this spreadsheet. Review of project design basis/design premise against DNV-RP-F104 requirements from relevant sections.

- Engineering document review

The engineering document review process includes the verification of calculations, if available at the time of the review.

(3) Deliverable: DVRs issued for each Section documents the verification against the relevant section of DNV-RP-F104 and includes the major findings and identifies ongoing design activities that need to be completed to meet the requirements of the relevant sections of DNV-RP-F104, if any.

13. Are the verifications completed?

Answer:

- Section 3 was completed on April 26, 2023, a copy of which is provided as Exhibit C.
- Section 4 was completed on May 15, 2023, a copy of which is provided as Exhibit D.
- Section 5 will be completed before June 1, 2023.

14. Please explain the results of the verifications that have been completed.

Answer: DNV finds that Navigator’s proposed design concept and premise would result in the NHG pipeline system complying with the requirements of Sections 3 and 4 of DNV-RP-F104, subject to adherence to the applicable codes, standards, specifications, and project specific plans/documents planned to be developed or finalized.

15. Are you familiar with PHMSA’s regulation of carbon dioxide pipelines?

Answer: Yes. PHMSA has regulated the transmission of CO₂ in dense or supercritical phase as a hazardous liquid in accordance with 49 CFR Part 195 for over 40 years. These are the same rigorous requirements that apply to other hazardous liquids, such as crude oil, anhydrous ammonia, and propane pipelines. The safety performance of CO₂ pipelines during this time has been excellent. No CO₂ pipeline leaks or releases have resulted in a fatality, injury to the public, impact to wildlife, or water contamination and only one injury, to a pipeline contractor, has been reported in the past 22 years.^{1,2}

¹ PHMSA Pipeline Incident Flagged Files, <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-flagged-files>, accessed 5-17-2023

² Prior to 2002 injuries were reported as “Bodily harm to any person resulting in one or more of the following: (1) Loss of consciousness, (2) Necessity to carry the person from the scene, (3) Necessity for medical treatment, (4) Disability which prevents the discharge of normal duties or the pursuit of normal activities beyond the day of the

16. How does DNV-RP-F104 compare to PHMSA’s regulation of pipeline design?

Answer: DNV-RP-F104 was produced specifically for CO2 pipelines. It should be recognized that CO2 pipelines at the scale that are associated with Carbon Capture and Sequestration (“CCS”) projects are novel to many countries. The RP provides detailed guidance for locations where the regulatory framework is not as established as in the U.S. DNV-RP-F104 can be considered complimentary to PHMSA regulations, offering detailed guidance for operators during all phases of pipeline design, construction, and operation.

17. Does Navigator’s request for the design verifications exceed what PHMSA regulations require with respect to pipeline design?

Answer: Yes. Conformance with DNV-RP-F104 and third party design verification as provided by DNV exceeds PHMSA requirements. In PHMSA’s regulatory scheme, PHMSA inspects new pipeline construction, commissioning, and subsequent operations to verify for themselves that regulatory requirements are met. By engaging DNV in design verification, Navigator has taken a proactive approach to compliance by adopting in a verifiable manner the recommended practices contained in DNV-RP-F104 in advance of PHMSA engagement.

18. Does this conclude your testimony?

Answer: Yes.

Dated this 25th day of May, 2023.

/s/John Godfrey
John Godfrey

accident”. This definition was replaced by Amdt. 195-75, 67 FR 831 in January 2002 with “Personal injury necessitating hospitalization”.