BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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IN THE MATTER OF THE PETITION OF TRANSCANADA KEYSTONE PIPELINE, LP FOR ORDER ACCEPTING CERTIFICATION OF PERMIT ISSUED IN DOCKET HP09-001 TO CONSTRUCT THE KEYSTONE XL PROJECT	:	DOCKET NUMBER HP14-001 REBUTTAL TESTIMONY OF DAN KING

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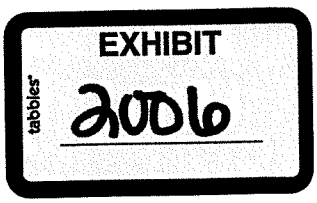
1. State your name and occupation.

Answer: My name is Dan King. My role at TransCanada is Vice-President of Engineering, Asset Reliability and Chief Engineer. I am responsible for ensuring the safety and reliability of TransCanada's pipeline assets.

2. Please state your professional qualifications and experience.

Answer: I have been with TransCanada for 32 years. During that time, I have participated in the design, construction, operation and maintenance of TransCanada's natural gas and oil facilities in Canada, the United States, Mexico and overseas. I lead a team of approximately 600 engineering and other professionals whose job it is to meet or exceed regulatory requirements in the design, construction and safe operation of TransCanada's pipeline assets. I hold a Bachelor of Science degree in electrical engineering from the University of Calgary. I am a member of the Association of Professional Engineers and Geoscientists of Alberta, the American Society of Mechanical Engineers, and the Institute of Electrical and



Electronics Engineers. I sit on the board of the Common Ground Alliance, which is a U.S.-based non-profit organization that promotes the importance of safe excavation around utilities. My resume is attached as Exhibit A.

3. Did you provide direct testimony in this proceeding?

Answer: No.

4. To whose testimony are you responding to in your rebuttal?

Answer: I am responding to the direct testimony of Evan Vokes. During the entirety of his employment with TransCanada, Mr. Vokes worked in an engineering group which I led.

5. Mr. Vokes states his opinion that the current management of TransCanada is a very significant technical threat to the safety of pipelines, including the proposed KXL pipeline. Please comment on the focus of TransCanada's management on pipeline safety, with respect to the operations and engineering function.

Answer: TransCanada's management is fully focused on pipeline safety as our highest priority. We are a recognized leader in the industry in developing and implementing safe construction and operations practices. Management review of the suitability, adequacy, and effectiveness of our pipeline integrity and protection programs occurs at every level of oversight at TransCanada. The senior governance structures for each of the management systems provide the highest level of management governance, overseeing the strategic aspects of management review and direction setting.

TransCanada builds safety and compliance into every aspect of our operations - starting with design and continuing through construction and operation of our pipelines. Not only is this the right thing to do, but there is no benefit to TransCanada, financial or otherwise, of cutting

corners on safety or compliance. TransCanada's success, from a business perspective, depends on building safe, reliable pipelines that service North America's energy needs on a long-term basis. TransCanada will not compromise safety - period.

Contrary to Mr. Vokes' comments, TransCanada does not profit from cutting prudently incurred safety-related expenses. From a business standpoint, we are paid to safely move products on behalf of our customers. If our systems are not designed properly or do not work reliably, that impacts our bottom line. It just makes good business sense to do things right from the beginning. We deliver critical energy products that we all rely on every day and the public, our regulators, and our shareholders expect us to do our jobs as safely as possible.

One of the primary tools for ensuring safety and compliance is the implementation of robust and rigorous quality management systems (QMS) for pipeline design and construction. The quality management system includes various checks and balances to ensure all pipelines are constructed in compliance with regulatory requirements, codes, and internal company specifications.

Pipeline projects are complex undertakings and there are many factors that may lead to issues during the lifecycle of a pipeline, but the quality management system operates to identify issues or non-conformances. Non-conformances are situations where code or internal specifications are not met in the initial construction. Should non-conformances occur, they are identified and corrective actions are developed and implemented prior to a pipeline being placed into service. The quality management system is comprised of a series of processes that apply to engineering design, procurement, and construction of pipelines. These processes include:

- Engineering design reviews;
- Specifications for materials, welding, and non-destructive examination (NDE);
- Qualification of suppliers and services;
- Inspection requirements and training for manufacturing, fabrication, and construction;
- Engineering reviews and audits of construction; and,
- Lessons learned and continuous improvement.

The quality, safety and inspection standards that TransCanada adheres to during construction are among the best in the world. Prior to putting a pipeline into service, non-destructive examination is carried out on all welds. Hydrostatic pressure testing is conducted at pressures well in excess of design operating pressures to prove the integrity of the pipeline. In-line inspection tools, known as smart pigs, are then used to measure and test for any defects in the pipe. Any anomalies that do not meet acceptance criteria are cut out and replaced prior to operations.

This department was fully and adequately staffed during Mr. Vokes' tenure with TransCanada. Moreover, since Mr. Vokes' departure in 2012, over 1,500 new employees have been hired into the TransCanada Operations and Engineering department, which is reflective of the Company's growth. Specifically, 241 net new permanent hires have been made in the Engineering and Asset Reliability team. The Materials Engineering department (which Mr. Vokes refers to as the Engineering Specialist department) currently employs 31 employees whose primary purpose is to support projects and ensure our standards are followed.

6. Can you discuss Mr. Vokes' position and responsibilities while at TransCanada?

Answer: In 2007, Mr. Vokes was hired on as an Engineer-in-Training (EIT). He worked in the welding team along with senior engineers and technologists. In the Province of Alberta, an engineer must have four years of suitable work experience under the supervision of a professional engineer before being eligible for professional engineering status (P.Eng.). As an EIT, Mr. Vokes worked under the guidance and supervision of a senior professional engineer. In July, 2009, Mr. Vokes received his P.Eng. He was then promoted to a junior engineer position. As a P.Eng., Mr. Vokes was moved into the Non-Destructive Examination (NDE) area. He worked under the guidance of a senior NDE technologist. In both the welding area and the non-destructive examination area, Mr. Vokes was responsible for identifying issues and addressing non-conforming work as a standard part of the quality control process.

7. **Mr. Vokes alleges that a rupture on the North Central Corridor Buffalo West pipeline was the result of cost/schedule decisions made by project managers, and specifically that the materials involved were understrength. Can you comment on that allegation?**

Answer: The failure was not caused by cost and schedule decision or by understrength materials. To the best of my knowledge and based on a good faith inquiry, TransCanada did not falsify any documents in this regard. TransCanada's finding is that the cause of this natural gas pipeline failure was a set of issues unique to this pipeline, its design, and operating temperature. These conditions are not directly relevant to the Keystone XL Project, but we do incorporate the learnings from all failures and quality issues into future projects and operations.

8. **Mr. Vokes alleges that substandard fittings are in service in the US and an equal number in Canada on the Keystone system. Can you comment on that allegation?**

Answer: All fittings in service on the Keystone system in Canada and the US are safe for continued operation of the pipeline. Every fitting in service has successfully undergone a hydrostatic pressure test to a pressure significantly higher than the maximum operating pressure.

Fittings were ordered stronger than required to meet the intended design. Because certain fittings came with less strength than ordered, TransCanada conducted an extensive engineering assessment to ensure the fittings were acceptable for design and operations, which included mechanical testing, stress analysis, and proof testing. TransCanada also applied composite reinforcement to specific fittings in consultation with PHMSA.

Both the National Energy Board and PHMSA have been heavily involved and engaged throughout this process. PHMSA initiated an independent third party engineering review of TransCanada's engineering assessment and the review confirmed the fittings within the pump stations meet burst pressure requirements, stress analysis requirements, and the design requirements for the maximum operating pressure (MOP) of the Pipeline. TransCanada would not be operating the system if we could not prove it was safe for operation.

9. **Mr. Vokes alleges that on the Keystone Phase II or Cushing Extension project, TransCanada engineers were forced into allowing the project to permit substandard inspection techniques on girth welds. Can you comment on that allegation?**

Answer: Keystone engineers specified industry-accepted non-destructive examination practices in accordance with federal code requirements, Company specifications,

and industry standards. Full time third-party auditors also were employed during construction activities to verify the inspection techniques being applied and the results of those inspections.

10. **Mr. Vokes alleges that there was a problem with the original design of the Keystone pump stations and that inspectors were penalized for a practice of "contractor self-inspection." Can you comment on that allegation?**

Answer: Keystone has safely transported almost one billion barrels of crude oil since 2010, thus validating the original design of the pump stations. I am not aware that TransCanada has penalized any inspectors for a practice of "contractor self-inspection." In fact, TransCanada requires Contractors to implement a quality management plan because we believe it is imperative that contractors take responsibility for the quality of their work. Requiring the contractor to implement a quality management plan, however, is just one of part of TransCanada's larger, multi-layer quality management program, which also includes inspection by TransCanada.

11. Mr. Vokes alleges a "salt induced microcracking" problem with pipe ordered for the Keystone XL pipeline. Can you comment on that allegation?

Answer: There is no phenomenon known as "salt induced microcracking" in the pipeline industry. Salt on the surface of the bare pipe can cause disbondment of the coating during the application process. Because of this, the pipe is cleaned prior to coating application, both in the mill and in the field, in order to remove any contaminants. Furthermore, the pipe is inspected through the use of a "holiday" detector, which identifies any gaps in the coating, both in the mill upon completion of coating application, and prior to the pipe being placed into the

ground, to verify that no coating disbondment has occurred. An above-ground close interval cathodic protection survey is performed on the pipeline after it has been lowered into the trench and backfilled to determine if there are any areas of coating disbondment as required by PHMSA special condition requirements.

12. **Mr. Vokes alleges that certain anomalies on the Gulf Coast section of the Keystone pipeline were the result of construction contractors not following the code of construction and inspectors not enforcing the rules. Can you comment on those allegations?**

Answer: TransCanada conducts various inspections throughout a project, including inspections after hydrostatic pressure testing. These inspections were effective in finding anomalies on the Keystone Gulf Coast pipeline. Coating damage and pipe body dents were all identified and repaired prior to any oil product being introduced into the pipeline and at no time posed a threat to the safety of the pipeline or to the environment. .

13. **Mr. Vokes alleges that on the Gulf Coast project there were extensive problems including pipe falling or ready to fall off skids, heavy equipment marks consistent with collisions with pipe, serious coating damage from pipe being mishandled, repair coatings not correctly applied, and pipe on top of large rocks. Can you comment on those allegations?**

Answer: As I have indicated, the purpose of TransCanada's multi-layer inspection system is to identify and remediate events or occurrences that do not meet our stringent construction standards. If there were instances of the issues cited by Mr. Vokes, they would have been identified and addressed by these inspections. Indeed, as I have testified, the Keystone

pipeline system has safely transported almost one billion barrels of crude oil since 2010, thus demonstrating the efficacy of our quality management system.

14. **Mr. Vokes alleges numerous quality failings on the Bison Pipeline project. Can you comment on those allegations?**

Answer: The Bison pipeline experienced a failure six months after being placed in service. The failure was caused by a back-hoe strike that was unreported. PHMSA had extensive involvement during the failure investigation and repair program. TransCanada conducted high resolution in-line inspections of the Bison pipeline, pipeline excavations, and an above ground close interval cathodic protection survey, and addressed all indications found to PHMSA's satisfaction. The Bison pipeline is in full operation. Other than at this one location, TransCanada did not find any other indications of external damage or other issues with the safe operation of the pipeline. As a result of this failure, increased numbers of inspectors and enhanced inspector training have been instituted on future projects.

15. **Mr. Vokes alleges that managers at TransCanada sanction unsafe construction practices to the benefit of cost and schedule. Can you comment on that allegation?**

Answer: As I have described, TransCanada employs a project management system based on industry best practices for quality management and project management to deliver large-scale construction projects. TransCanada is a leader in the use of advanced construction practices. This is demonstrated by our voluntary commitment to adopt special conditions related to the design, construction and operations of the Keystone XL project that are above the requirements in the applicable federal regulations and industry standards. In view of the

extensive internal and external checks on construction practices, cost and schedule concerns do not override adherence to safe construction practices. Contrary to Mr. Vokes assertion, TransCanada's business does not benefit from unsafe pipeline construction or operations. Pipelines that are unsafe cannot be operated and shippers will not move products through pipelines that are not reliable.

16. **Does this conclude your testimony?**

Answer: Yes it does.

Dated this 13 day of June, 2014.

Dan King

CERTIFICATE OF SERVICE

I hereby certify that on the 26th day of June, 2015, I sent by United States first-class mail, postage prepaid, or e-mail transmission, a true and correct copy of the foregoing Rebuttal Testimony of Dan King, to the following:

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RESUME FOR DAN KING

EDUCATION: Bachelor of Science in Electrical Engineering, Minor in Computer Engineering, University of Calgary, 1983
Ivey Executive Program, Ivey School of Business, University of Western Ontario, 1997

EXPERIENCE SUMMARY: Over thirty years of experience in the design, construction, maintenance, project and program management of pipeline and energy facilities in Canada and overseas. Experience includes:
- leadership of TransCanada's central engineering group
- leadership of Pipe Integrity planning for 42,000k pipeline system
- front line and senior level management of several different multi-disciplinary teams.
- program management of the implementation of a receipt point specific pricing system for the NGTL pipeline system.
- wide variety of project and program management activities
- Development, design and commissioning work on the instrumentation and control systems for pipeline facilities.

EXPERIENCE: **TransCanada & Predecesor Companies**

2009 to Present **Vice President – Engineering & Asset Reliability**
Leadership of engineering and asset reliability for O&E operations as well as broader engineering, operations and major project support services including engineering governance, risk management and specialized core technical support

2005 to 2009 **Director – Engineering**
Management of the Engineering department. Accountable for the reliability of all TransCanada's operated physical assets including pipeline, power and other energy assets. Provide engineering standards, owner engineering functions and engineering expertise to the corporation. Leadership for 12 managers, strategy and goal setting for the department, reorganization and other change initiatives.

2003 to 2005 **Director – Pipe Engineering**
Management of the Pipe Engineering department. Accountable for the development, implementation, standards and technical support for the pipeline integrity program at TransCanada. Leadership for 3 managers, strategy and goal setting for the department, reorganization and outsourcing of certain activities.

2000 to 2003 **Manager – Program Development – Pipe Engineering**
Management of a multidisciplinary group accountable for the development of the pipe integrity program for TransCanada. The group uses extensive quantitative risk management techniques to develop a $65 to $100 million per year program to ensure the safety of the pipeline system. Includes the management and planning activities for a staff of approximately 25 engineers and technologists, dealing extensively with regulators and other third parties.

1999 to 2000 **Manager – Materials, Standards and Technology**
Management of a services group accountable for: materials testing and failure analysis, Engineering Standards and Procedures management, Technology Program Management (R&D). Includes the management and planning activities for a staff of approximately 25 engineers and technologists executing a program of approximately $10 Million annually.

1998 to 1999

Program Manager - Products & Pricing Implementation
Customer Interface - Rates and Revenues
Responsible for developing and managing the program to implement the business process and computer system changes necessary to support the major change in Nova Gas Transmission's service and pricing offerings to customers. This change involves moving from the "Postage Stamp" toll to receipt point specific tolls.

1983 to 1998

Various Positions
Various line and leadership roles of increasing responsibility in the design, construction, commissioning and operations of natural gas and liquid pipeline facilities in Canada and overseas.

PROFESSIONAL ASSOCIATIONS:

- Association of Professional Engineers and Geoscientists of Alberta
- Institute of Electrical and Electronic Engineers
- ASME International