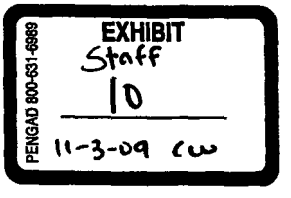
BEFORE THE
PUBLIC UTILITIES COMMISSION
STATE OF SOUTH DAKOTA

KEYSTONE XL PROJECT
DOCKET HP09-001

PREFILED TESTIMONY OF WILLIAM MAMPRE
ON BEHALF OF THE COMMISSION STAFF
SEPTEMBER 2009



BEFORE THE PUBLIC UTILITIES COMMISSION STATE OF SOUTH DAKOTA

PREFILED TESTIMONY OF WILLIAM MAMPRE

Q. Please state your name and business address.

A. My name is William Mampre. My business address is 7135 Janes Avenue, Woodridge, Illinois, 60517.

Q. By whom are you employed and in what capacity?

A. I am employed as a Vice President/Senior Project Manager by EN Engineering, an engineering and consulting firm specializing in pipeline design services for the oil and gas industry.

Q. Please describe your educational background and professional experience.

A. I hold a B.S. in Electrical Engineering from the University of Illinois at Urbana-Champaign. In addition, I have a MBA from the Dominican University in River Forest, Illinois. My professional experience consists of employment in the pipeline industry with EN Engineering and with Unocal Pipeline Company. My responsibilities at EN Engineering include the design and construction of pipelines and station facilities. At Unocal my responsibilities included the design and construction of pipeline facilities, management of pipeline operations including management of pipeline scheduling and control center operations, daily operations and maintenance, health and safety issues and concerns and management of various joint venture pipeline operations. My resume is included in Exhibit A.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission (Staff).

Q. Please state the purpose of your testimony in this proceeding.

A. Staff's main objective is to understand the Supervisory Control and Data Acquisition System (SCADA) proposed by TransCanada Keystone Pipeline, LP (the Applicant) in the application to build the Keystone XL pipeline on file with the SD Public Utilities Commission. I studied the application and relevant discovery materials to determine whether the Applicant's proposed system is adequate, meets all the requirements in 49 CFR Part 195 and will assist in safe operation of the proposed pipeline. Specifically, I studied the application and relevant discovery materials to determine, based on the available information whether the system will help operate the proposed pipeline in a safe manner and whether it can recognize if and when there is a release of product to the environment.

Q. What plans for leak detection are included in the Application (49 CFR 195.134)?

A. The Applicant states it will follow all requirements set forth in the Special Permit issued by PHMSA for the Keystone project in the eastern part of South Dakota. Conditions 25-33 of that Special Permit outline that the pipeline's Supervisory Control and Data Acquisition (SCADA) Systems must employ state of the art technology for leak detection. Additionally, the system must be approved by PHMSA prior to operation.

The applicant, in the current docket, submits it will use the Telvent SCADA system. The Telvent SCADA system is a leader in the industry in pipeline control and is used by many of the major pipeline companies in the USA.

Q. Is the leak detection system proposed by the Applicant a widely recognized system and will it adequately warn of a product release?

A. Yes. The Telvent SCADA system is based on four software types. The four software systems will cover the following four areas of detection:

1. SCADA monitoring by the OCC pipeline controller.

2. Volume based leak detection.

3. Computational pipeline monitoring/computerized leak detection system.

4. Accumulated loss/gain volume tracking.

Despite the use of a state of the art system, it is important that employees and pipeline operators receive training to properly recognize a release. In addition, procedures must be adopted to immediately shut down the pipeline in the event there is a question or concern regarding any data that may suggest a product release occurred. Both detecting a release and minimizing the time to shut down the pipeline to investigate is critical in minimizing the environmental damage. These procedures should be located in the Keystone operations manual. I reserve the opportunity to make a recommendation regarding detection and release mitigation until outstanding discovery questions are answered. I will supplement my testimony if necessary based on the Applicant's reply.

Q. What provisions are in place in the event of a disaster of the Operations Control Center (OCC)?

A. The Applicant will have a fully redundant backup Operations Control Center (OCC) located in a separate facility 22 miles from the primary OCC. The ability to fully man and operate from the backup OCC is reasonable and typical for major pipeline operators within the USA.

Q. What communications will be used to communicate to the pump stations, terminals and mainline block valves?

A. The systems proposed by the Applicant are typical and considered an acceptable practice in the liquid pipeline industry. Specifically, the applicant proposes utilization of satellite communications with wired phone lines with automatic dial back service. Additionally, the Applicant is considering the use of 900 mhz radio

links. This is a common practice within the pipeline industry. This is a proven and acceptable technology.

Q. Are the Applicant's proposed overpressure devices sufficient to protect the pipeline from over pressure and surges?

A. Yes. Generally, surge pressures are the biggest concern when reducing the design factor from 72% to 80%. The reduction in the design factor reduces the safety margins built into the design during upset conditions in the pipeline. Surges occur, for example, in the event of an unexpected shutdown of a mainline pump station, or the closure of a mainline block valve. An unexpected pump station shutdown can be caused from a sudden power loss, failure of the Variable Frequency Drive (VFD), failure of the pressure control valve or the activation of a pump/motor safety device.

With the reduced safety factor (80% vs 72%) and because of the non-compressible nature of crude oil, the concerns arise with the potential of surges exceeding the 110% of the Maximum Allowable Operating Pressure (MAOP) and the reduced safety factor.

For normal operations Keystone provided adequate information regarding its plans to protect the pipeline from over pressure by utilizing the following technology:

- SCADA system software at the OCC
    - Suction based discharge pressure algorithm
    - Suction based discharge pressure reduction algorithm
- Logic in the stations PLCs
    - Flow based discharge pressure deduction algorithm
    - Station control valve control to prevent pipeline over pressure
    - Speed control of motors with VFD to prevent pipeline over pressure

I have several remaining discovery questions, however, regarding the pipeline surge protection model that provides calculations from the transient model to show maximum surges along the pipeline. I will supplement this testimony, if necessary based on the answers received from the Applicant.

ENEngineering

William Mampre
Vice President, Transmission

Education

MBA, Dominican University, River Forest, Illinois
BS, Electrical Engineering, University of Illinois, Champaign-Urbana, Illinois,

Affiliations

Previous Director for the following pipeline companies:
Midwest, Chicap, Southcap, Badger, West Shore, Wolverine, Inland, Yellowstone, South Saskatchewan, Tecumseh & Platte

Previous Management Committee Member for the following companies:
Capline, Cushing Chicago, High Island, Whitecap, Ship Shoal

Previous Technical and Measurement Committee Member for the following companies:
Capline, Cushing Chicago, Chicap and Whitecap

Continuing Education & Training

40 hour OSHA HAZMAT training, Incident Commander
8 hour OSHA confined space entry training
Accident/Incident investigations
First Aid/CPR
HOZOP Team Leader Training
Hazardous Communications
Safe Work Practices and Procedures

Summary of Experience

Mr. Mampre is an engineering, operations and business development executive with over 28 years of diversified experience in the pipeline industry. Prior to joining EN Engineering he worked at Unocal Pipeline Company for over 20 years. At Unocal he was accountable for all phases of pipeline operations including daily operations, engineering, field measurement, system control and SCADA operations, right-of-way, maintenance, corrosion control, materials management and joint venture management. Other responsibilities included business development, project selection, alternative evaluation, financial analysis and project justification, design, installation and inspection.

Currently, Mr. Mampre manages a variety of natural gas pipeline and liquid petroleum projects for various client companies. A sample of Mr. Mampre's project experience is provided below.

Project Experience

Manifold Interconnect and Metering System, Minnesota

Project Manager for preliminary design, cost estimate and detailed design for the interconnection of an existing crude manifold to a new 600,000 barrel custody transfer meter station, prover, loop and control valve.

Crude Oil Terminal Expansion, Illinois

Project Manager for detailed design to redesign a crude oil terminal. The facilities included a 42-inch multi pig receiver, mainline pressure control, ultrasonic meter for line balance, manifold relief, 42-inch central manifold, 42-inch tank lines, electrical and control building, automation and control.

Exhibit A

William Mampre (Continued)
Vice President, Transmission

Project Experience (cont'd)

Crude Oil Pump Station, Illinois

Project Manager for the detailed design for a crude oil 800 MBPD pump station and launcher facility. The facilities included two 6000hp pumping units, expandable to 4 units, 36-inch multi-pig launcher for batching pigs, pressure control, ultrasonic line balance meter, electrical and controls building, VFD, substation, electrical and controls.

Crude Oil Metering Facility, Illinois

Project manager for the preliminary design, cost estimate, detailed engineering to deliver heavy crude oil between pipeline companies. Facilities included interconnect of manifold, five (5) PD meters, prover loop, flow and pressure control and road boring.

Expansion Project, Indiana

Project manager for preliminary design, feasibility study and final design to increase capacity on 14" pipeline systems project included 3,500 HP grass roots pump station, modifications to terminal manifolds, new 150 MBL storage tank, replacement of tank lines, 800 HP vertical can booster pump, new custody transfer meter facility, 5.5 miles of pipeline and upgrade of 3 meter stations, tuning of control valves for mainline pump stations.

Pipeline Expansion, Illinois

Project manager for the expansion of 200 mile 26" crude pipeline. Project included feasibility study, detained design and construction management to install 4 pump 3,000 hp pump stations, addition of four 5kva transformers, hydraulic study, control valve design pump modifications at four additional pump stations.

Preliminary Design and Cost Estimate, Ohio

Project manager for the preliminary design and cost estimate for an 82 mile pipeline. The cost estimate included the costs of materials, construction, environmental, ROW, survey, legal, risks and cash flows.

Reactivation of Pipeline, Missouri

Project manager for the reactivation of 160 miles of 12" products pipeline from Wood River, Illinois to Milan Missouri. Project included a hydrotest, reactivation of two pump stations and upgrade of 5 metering facilities.

Pipeline Expansion Project, Indiana

Project manager for the expansion of a products pipeline system. The facilities included a grass roots pump station, new 150 mbl tank, modifications to a terminal including new vertical can booster pump, replacement of tank lines and metering and interconnection to tank header, 5.5 miles of 12" pipeline and three custody transfer meter stations. Project included the design and material specifications.

William Mampre (continued)
Vice President, Transmission

Project Experience (cont'd)

Terminal Modifications, Indiana

Project manager for the design for the interconnection of a 24" crude pipeline to the terminal tank manifold. The facilities included the 1,500 feet of 24" pipeline, receiver, ultrasonic meter, densitometer, and connection of 9 storage tanks. Project included the design, material specifications, contractor bidding and selections.

HAZOP Products Tank Farm and Pump Station, China

Project Manager, facilitator and subject mater expert for a HAZOP Investigation and Safety & Operability Assessment for a new petroleum products pumping station. Project work included on-site inspections, client interviews (via translators), codes and standards compliance review, and report writing.

HAZOP Gas Compressor Station. Illinois

Facilitator and subject mater expert for a HAZOP on an expansion of a gas compressor station. Project work included leading the HAZOP study and preparation of the final report.

HAZOP Gas Compressor Station. Illinois

Facilitator and subject mater expert for a HAZOP on an expansion of a gas compressor station. Project work included leading the HAZOP study and preparation of the final report.

HAZOP Three Gas Meter/Regulation Facilities, China

Project Manager, facilitator and mechanical and electrical subject matter expert for a HAZOP on two new and existing meter/regulator station being expanded. The project work included on-site inspections, client interviews (via translators), codes and standards compliance review, and report writing.

20" Gas Pipeline, Oklahoma

Project manager for the preliminary design, cost estimate and detail and installation of 15 miles of 20" pipeline. Facilities included launcher and receiver facilities, metering, pressure regulation and 15 miles of pipeline.

20" Gas Pipeline, Kansas

Project manager for the replacement of 11 miles of 20" pipeline including one (1) directional drill, modification of interconnection facilities for bi-directional flow.

Interconnection of Two Terminals, Indiana

Project manager for the design and interconnection of a 30" pipeline between two terminals. The facilities included 30" lateral, interconnection to 9 tanks at each terminal, and vertical can booster pump. Project included the design, material specifications and contractor bidding.

William Mampre (continued)
Vice President, Transmission

Project Experience (cont'd)

30" Gas Pipeline, Indiana

Project manager for the design and construction of 7 miles of 30" gas pipeline and associated interconnection facilities. Project included the design, material procurement, contractor bidding and selection, construction inspection and project management

16" Gas Pipeline, Iowa

Project manager for the design and construction of 12.7 miles of 16" gas pipeline, including 7 directional drills, take station, two delivery stations including; filter separator, heaters, regulators and meters. Project included the design, material specification, contract bidding, construction inspection and project management. Project cost $12.9 million.

Line Replacement, Oklahoma

Project manager for the replacement of 3 miles of 20" pipeline. The project included the removing 3 miles of 26" pipeline and replacing with 3 miles of 20" pipeline including 1 directional drill, modification of 2 compressor stations for bi-directional flow. Project cost $2.5 million.

Confidential Pipeline Study

Project manager for the preliminary design and cost estimate for 400 miles of 30" gas pipeline system. Project scope included preliminary engineering and detailed cost estimate for engineering and project management, ROW, survey, environmental, materials and construction.

Confidential Pipeline Study

Project manager for the preliminary engineering and detailed cost estimates to increase gas supply to Minneapolis, Minnesota. Project scope included preliminary engineering and detailed cost estimate including 100 miles of 24" pipeline, 6,000 hp of compression, delivery facilities, upgrade of an existing pipeline system including 80 miles of 30" looping, 15,000 hp new compression and two regulator stations. Detailed cost estimate included engineering and project management, ROW, survey, environmental, materials and construction.

Confidential Pipeline Study

Project manager for preliminary engineering and detailed cost estimate for 170 miles of 24" gas pipeline system. Scope included preliminary engineering and detailed cost estimate for engineering and project management, ROW, survey, environmental, materials and construction.

Confidential Pipeline Study

Project manager for preliminary design and cost estimate for 200 miles of 8" pipeline project in the Midwest. Project scope included preliminary engineering, route selection, total project costs including ROW, environmental, survey, construction and materials for the pipeline and all interconnection facilities. Project completed in 2002.

William Mampre (continued)
Vice President, Transmission

Project Experience (cont'd)

Confidential Pipeline Study

Project manager for preliminary design and cost estimate for a 936 mile 30" pipeline. Cost estimate included the costs of materials, construction, environmental, ROW, survey, legal risks and cash flows.

Confidential Pipeline Study

Project manger for the preliminary design and cost estimate for 175 miles of 30" gas pipeline system. Project scope included preliminary engineering and detailed cost estimate for engineering and project management, ROW, survey, environmental, materials and construction.

Confidential Pipeline Study

Project manager for the preliminary engineering and detailed cost estimate for 25 miles of 30" gas pipeline and 6 miles of laterals. Scope included preliminary engineering and detailed cost estimate for engineering and project management, ROW, survey, environmental, materials and construction.

Confidential Pipeline Study

Project manager for the preliminary engineering and detailed cost estimate for 25 miles of 30" gas pipeline and 6 miles of laterals. Scope included preliminary engineering and detailed cost estimate for engineering and project management, ROW, survey, environmental, materials and construction.

System Expansion

Project manager for the feasibility study and detailed design for the expansion 250 mile pipeline system. The project include the upgrade of two compressor stations, addition of 5 regulators at two compressor stations, relocation upgrade of launchers and receivers, two ultrasonic meter stations, back pressure control station, two pressure regulator stations, uprate of 90 miles of 20" pipeline, looping of 20" pipeline, extension of 16" pipeline addition of 16" pipeline and meter regulator station.

Integrity Projects, Texas and Oklahoma

Project manager to retrofit 20" and 24" gas pipelines to accommodate internal inspection devices. Projects included the installation of launchers and receivers; replacement of short radius bends with long radius bends; replacement of reduced port mainline valves with full port valves; removal of tees and replace with tees with pig bars etc. Project cost $1.7 million.

Meter Station, Texas

Project manager for the design and installation of a 12" ultra sonic gas meter station.

Kankakee Meter Station, Illinois

Project manager in the design and installation of a 15 mbph custody transfer meter station between a 22" and 26" crude oil pipelines. Project included helical turbine meters, small volume prover, and automation. Total Project cost $1.5 million.

William Mampre (continued)
Vice President, Transmission

Project Experience (cont'd)

Conversion to PLC's, Illinois

Project manager for the upgrade of multiple pump stations from relay logic to state of the art PLC's.

SCADA, Illinois

Project manager for the upgraded of 12 year old SCADA system with state of art system. Additionally upgraded the communications system from leased lines to satellite communications.

Pipeline Conversion

Project engineer to the design and installation of the conversion of a 12" pipeline from crude to products. Project included multiple interconnections, addition of multiple scrapper traps, metering, hydrotesting, control and automation.

Meter Station, Texas

Project engineer for the design and installation of a custody transfer meter station for 10" pipeline capable of delivering 40 mbpd. Project included PD meters, bi-directional prover, electrical and controls.

Pipeline Reactivation, Utah

Designed and installation of reactivation of 66 mile 10" pipeline. Project included new manifolds, pumps and meter station, controls and SCADA System. Project Cost $1.0 Million.

East Breaks 159, 160

Off shore Louisiana, Gulf of Mexico: Installation of 12" and 10" crude oil pipelines and metering facilities in water depths up to 900'.

Offshore Metering System

Engineer in the design and installation of several offshore crude oil ACT units capable of delivering up to 50 mbpd.

Reactivation of Inactive Pipelines

Due to business development opportunities returned to service various pipelines from abandoned or inactive service. Projects included risk assessment, analysis of asset condition, smart pigging, hydrotest, pipeline modifications, and startup.

Metering Station, Texas

Project engineer for the design and installation of a custody transfer meter station for a 12" products pipeline system. Project included turbine meters, prover loop and automations and controls.

William Mampre (continued)
Vice President, Transmission

Project Experience (cont'd)

Line Decommissioning

After risk assessment coordinated the purging and or purging and removal approximately 350 miles of 4" to 20" pipelines.

Hydrotesting of Pipelines

Project manager for the hydrotest of 200 miles of 26" crude oil pipeline; 16 miles of 16" crude pipeline; 200 miles of 10" crude oil pipeline; 30 miles of product pipeline; 9 miles of 20" gas pipeline; 150 miles of 12" crude pipeline.

Internal Inspection Tools

Project engineer for the internal inspection of 200 miles of 26" pipeline; 66 miles of 10" pipeline; and 200 miles of 10" pipeline. The projects included the modification of launchers and receivers, review of logs, test digs, development of repair programs and execution of repair programs.

Meter Station, Illinois
Project engineer for the design and installation of a 500 mbpd crude oil custody transfer meter station, including PD meters, bi-directional prover loop and electrical and controls.

Line Balance Metering, Illinois

Project manager for the design and installation of pipeline line balance meters for a 500 mbpd crude oil pipeline system. Project utilized helical turbine meters.

Pump Station

Project manager for the design and installation of a 200 mbpd pipeline pump station. Project included a 500 hp vertical can booster pump, and 3500 hp mainline centrifugal pumping unit and meter station.

Regulatory Compliance

Coordinated business unit compliance with federal and state compliance including DOT, Texas Rail Road Commission, EPA, and OSHA. Responsibilities included training of employees in the regulations, qualifying risks, interpreting regulations, development of compliance recommendations and programs, conducting pre-inspection audits and representing the company in internal and regulatory and internal inspections.

Corrosion Control

Provided technical assistance to Corrosion Technicians for cathodic protection, interference, and internal and external corrosion.

Emergency Response

Lead teams in the development of Pipeline Emergency Response Manual, required in response the Oil Pollution Act of 1990. Served as Incident Commander for the Midwest Assets.