

National Energy  
Board



Office national  
de l'énergie

File OF-SURV-INC-0202  
2 April 2012

To: All Companies under National Energy Board Jurisdiction  
Canadian Energy Pipeline Association  
Canadian Association of Petroleum Producers  
Provincial Pipeline Regulators

**Subject: National Energy Board (the Board) Safety Advisory 2012-01  
Overpressure Protection**

The Board is concerned with the recurrence of overpressure incidents on Board-regulated pipelines and related facilities, and has issued the attached safety advisory providing some preventative actions.

The Board requires companies to consider overpressure incidents to be hazards as these may lead to subsequent integrity issues. The Board expects this safety advisory to be widely circulated to company personnel and contractors involved in pipeline design, integrity, maintenance and operation on your pipeline system.

If you have any questions regarding this advisory, please contact Joe Paviglianiti at [joe.palviglianiti@neb-one.gc.ca](mailto:joe.palviglianiti@neb-one.gc.ca), 403-299-3864, or Nadia McCarthy at [nadia.mccarthy@neb-one.gc.ca](mailto:nadia.mccarthy@neb-one.gc.ca), 403-221-3008, or toll free at 1-800-899-1265.

Yours truly,

A handwritten signature in cursive script that reads "Sheri Young".

Sheri Young  
Secretary of the Board

Attachment

c.c. Mr. Larry Gales, Transportation Safety Board of Canada, facsimile 819-953-7876

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## Overpressure Protection

### Purpose

Overpressure incidents are a concern as they can lead to delayed or immediate failures of pipeline systems. In a preliminary assessment of overpressure incidents on pipeline systems the National Energy Board (the Board) notes the recurrence of overpressure incidents over time. The *Onshore Pipeline Regulations, 1999* (OPR-99) does not permit operating a pipeline beyond its design limits as determined under CSA Z662.

Overpressure incidents appear to be the result of a failure to identify all potential sources of overpressure, a lack of reliability, or a lack of redundancy of the overpressure protection and its supporting systems. Supporting systems could be communication and/or SCADA (Supervisory Control And Data Acquisition). This safety advisory provides examples of overpressure incidents and some preventative actions, and should be considered in addition to the Board's previous Safety Advisory (NEB SA99-1) on *Over-pressure Protection at Receipt Points*, issued in September 1999.

### Incident Descriptions

#### 1. Thunderstorm Damage

A liquid pipeline company reported an unexpected closure of a block valve during a thunderstorm. A lightning strike had caused damage to the valve actuator and local communication equipment. Due to the damage, pumping of liquids continued and resulted in an overpressure of 124% of the maximum operating pressure (MOP) on a 6.4 km segment of the pipeline.

#### 2. Erroneous Signal from Pressure Transmitter

An erroneous signal sent by a pressure transmitter resulted in an immediate shutdown of two mainline pumps of a liquid pipeline company. This caused an overpressure of 118% of MOP in their terminal suction piping. Since this incident, the company conducted a review of its historic data and noted fifteen previously undiscovered overpressure incidents for a period of seventeen months.

#### 3. Failure of a Gas Regulator

A pressure release valve (set to relieve at 3600 kPa) released sweet natural gas for more than one hour due to failure from normal wear and tear of a gas regulator of the fuel gas system. With time, the pressure relief valve also failed due to extended operation with probable chatter. This resulted in the system pressure reaching 4800 kPa (approximately 130% of the set operating pressure).

#### 4. Relief valves failed to operate as designed

A pump station of a liquid operator was placed in emergency stop mode following an interruption of data communication. With time, the products trapped in the facility expanded due to changes in the ambient air conditions. This resulted in an overpressure in the station equipment and piping, leading to a product release as the thermal pressure relief valves did not operate as designed at their set pressure points.



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### **Preventative Actions**

Clause 10.9.5 of CSA Z662-11 requires inspection, assessment and testing for overpressure protection systems. CSA Z662 is incorporated by reference into the OPR-99.

Due to recurrent overpressure incidents, pipeline companies should assess and update their overpressure protection and supporting systems as part of an overall pipeline and facility integrity management system. The following factors are provided for consideration during such assessments of the overpressure protection systems:

- past performance and reliability of all components;
- all the sources of overpressures, including potential failure scenarios of components;
- collateral effect of failure and whether one failure event can affect operation of the other components or the entire overpressure protection system;
- how redundancy of the components can be improved or implemented if not already in place; and
- whether pipeline and facility modifications affect the operation or reliability of the overpressure protection system.

In an event of an overpressure before resuming operations, companies must investigate to determine the root causes, assess the integrity of affected sections of the pipeline system and take remediation actions as appropriate.

The Board oversees compliance with the regulatory requirements for overpressure protection and incorporates the occurrence of overpressure incidents into its risk models for use in prioritizing regulatory oversight activities with respect to each company's integrity management system.