



# **ERCB PIPELINE REGULATORY OVERVIEW**

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**NACE Calgary Section  
Elemental Sulfur Mini-symposium**

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Calgary Chamber of Commerce  
Calgary, AB**



# ERCB Mission Statement

To ensure that the discovery, development and delivery of Alberta's energy resources take place in a manner that is fair, responsible, and in the public interest.



# Field Surveillance Mission

We work with stakeholders to protect the public, the environment, and the resource through inspections, community education, and incident response

# Internal Re-Alignment

- A new internal regulatory alignment process has brought the Field Surveillance and Technical Operations groups together under the same umbrella, and are now known as the Field Surveillance and Operations Branch.



# Field Surveillance

- Within Field Surveillance there are 10 Field Centres across the Province with over 140 employees.
- Responsibilities include, but are not limited to field inspections/investigations, incident response, stakeholder engagement, and public complaints to name a few.

# Technical Operations


- The Technical Operations Group is based out of the Calgary Head Office and has approximately 45 employees.
- Responsible for technical reviews, non-routine application review, regulatory development, memberships on technical associations/committees and more.
- Technical resource for Field Surveillance.

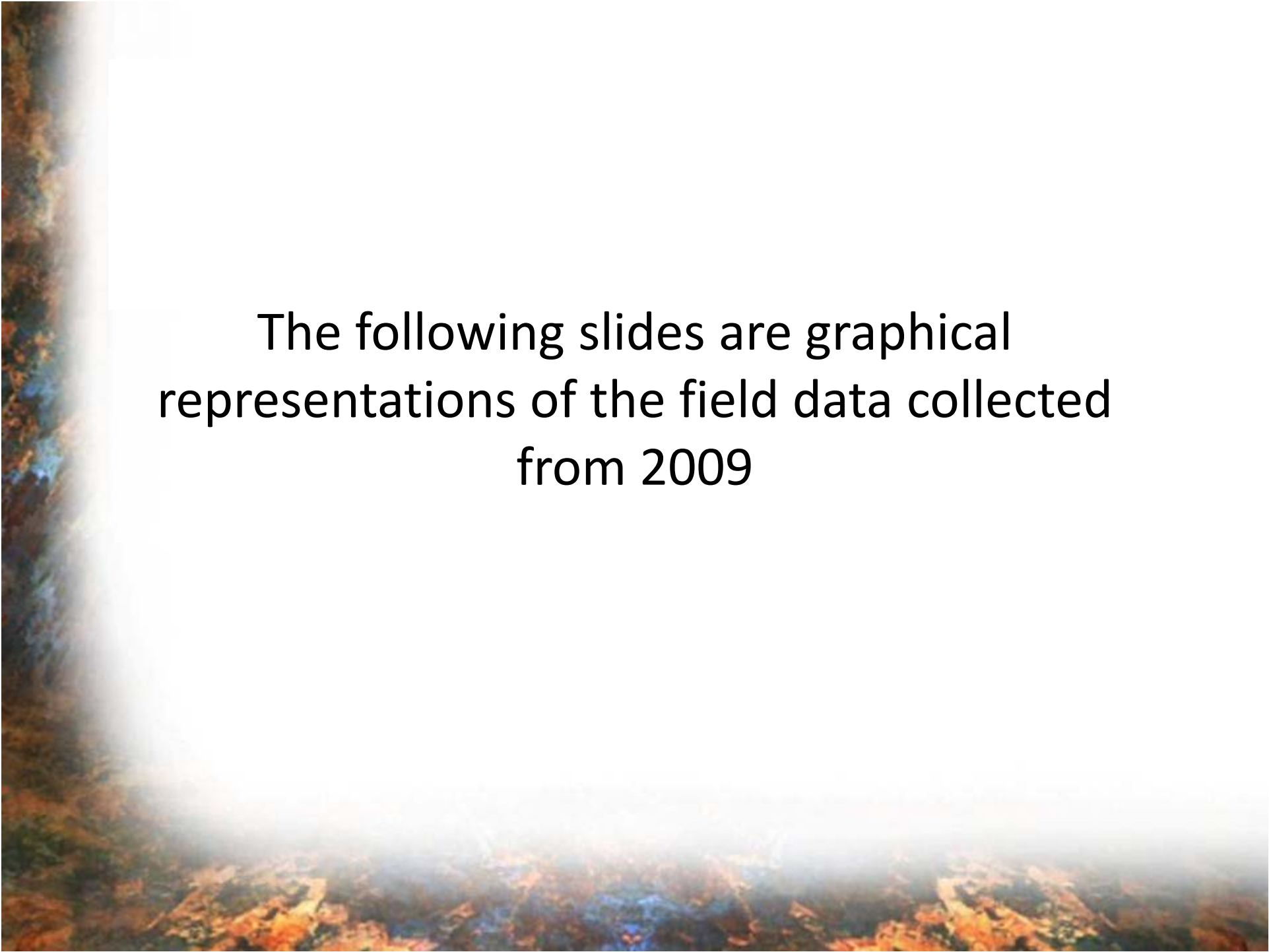
# Field Surveillance-Pipelines

- Completed over 730 inspection/investigations in 2009
- Inspectors main focus is: construction inspections, pressure test inspections, operations inspections, failure investigations and incident/complaint response.

# Pipeline Inspection

- The purpose of pipeline inspections is to achieve compliance with applicable ERCB Directives, Alberta Pipeline Act/Regulations and Canadian Standards Association (CSA Z662-07) to help ensure safe and efficient construction and operations of pipelines.

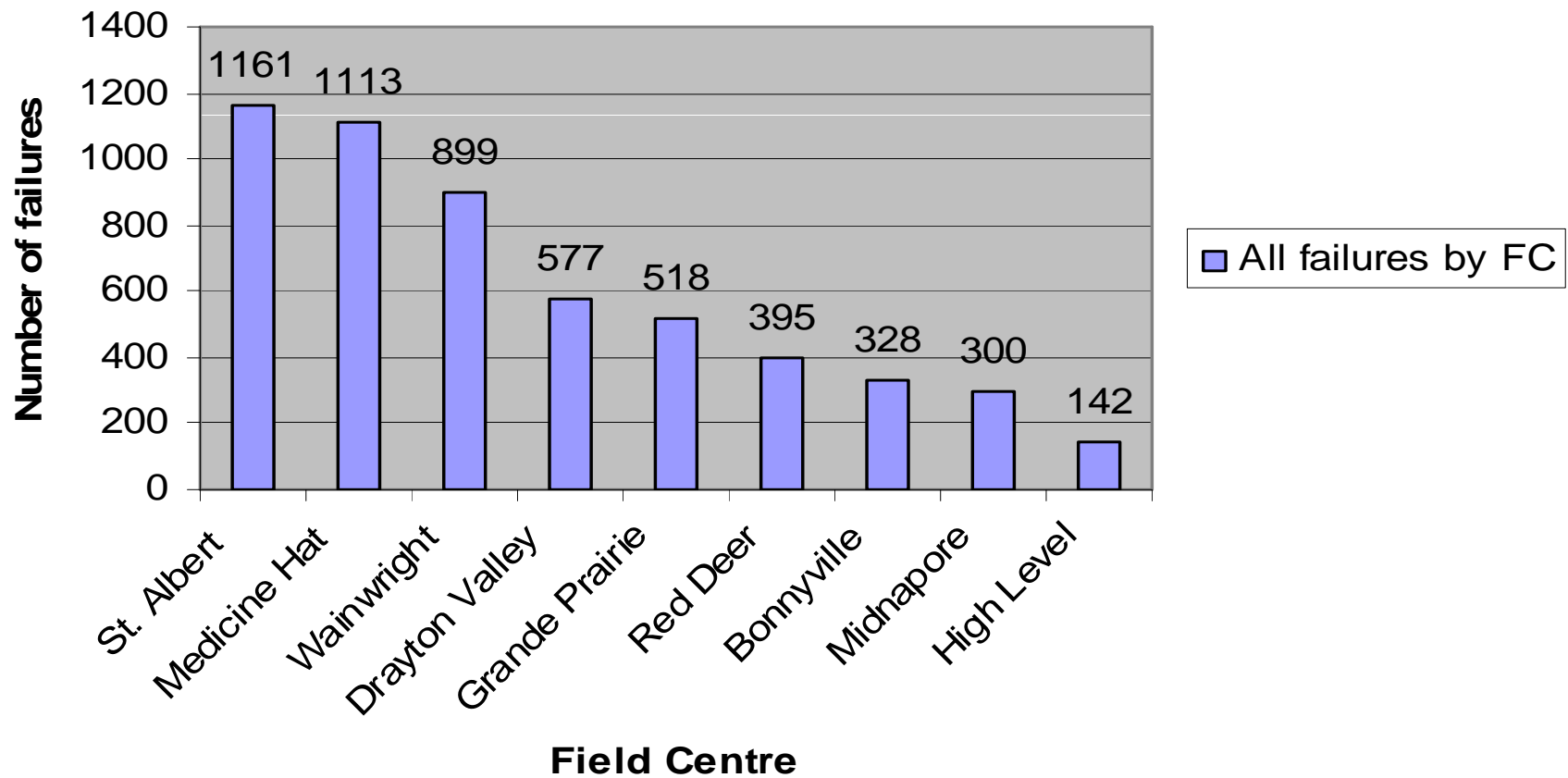
- 
- Pipeline Failure Investigations take up the majority of all Inspectors time-Reactive
  - The Field Surveillance Pipeline Technical Specialist spends a lot of time trending, tracking and analyzing the field data to determine the high priority areas to focus Inspectors efforts.



The following slides are graphical representations of the field data collected from 2009

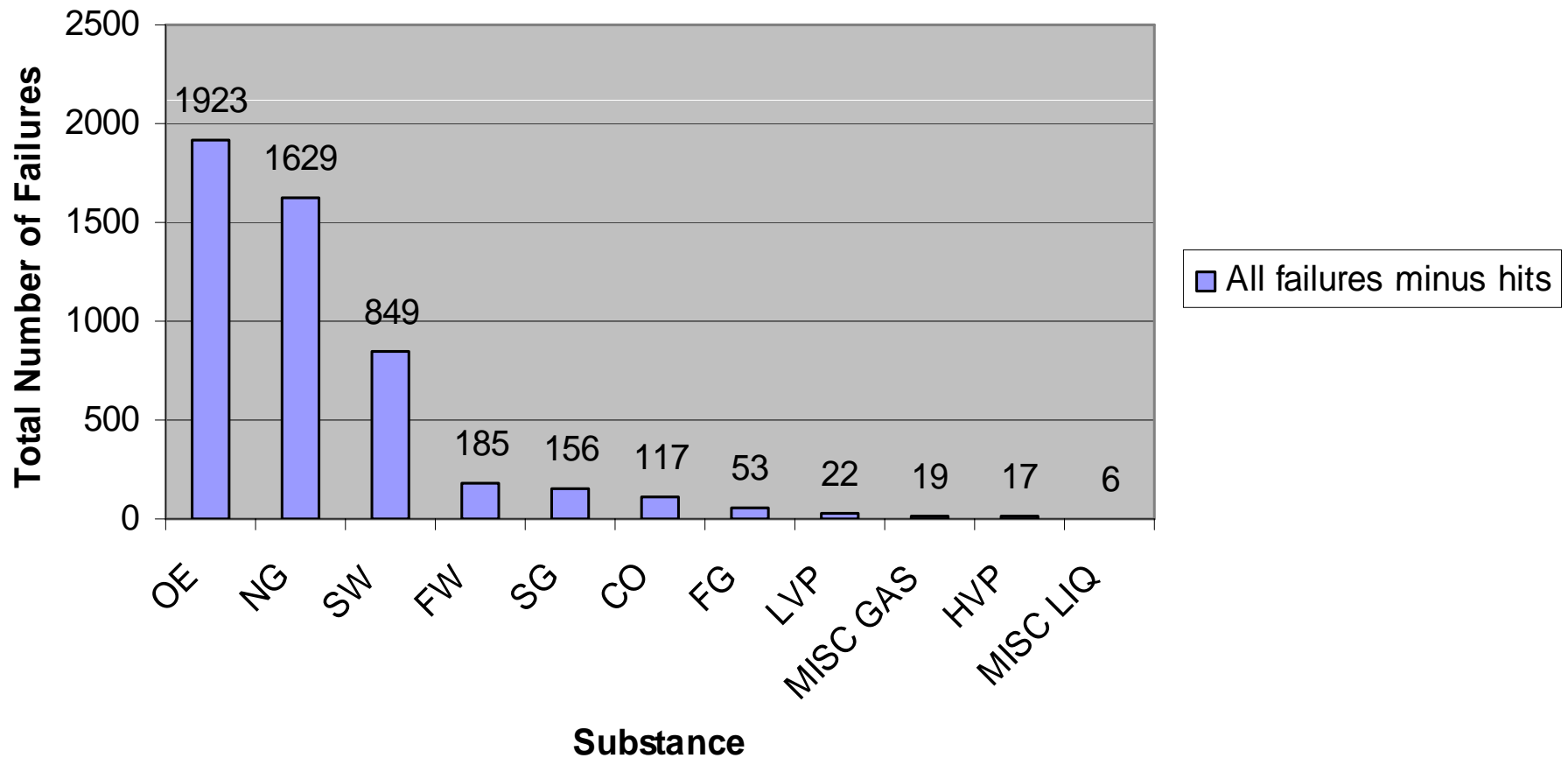
# All pipeline failures by Field Centre Jan 1, 2004 – Dec 31, 2009, 5433 failures

**All failures by FC, Jan 1, 2004-Dec 31, 2009,  
5433 Failures**



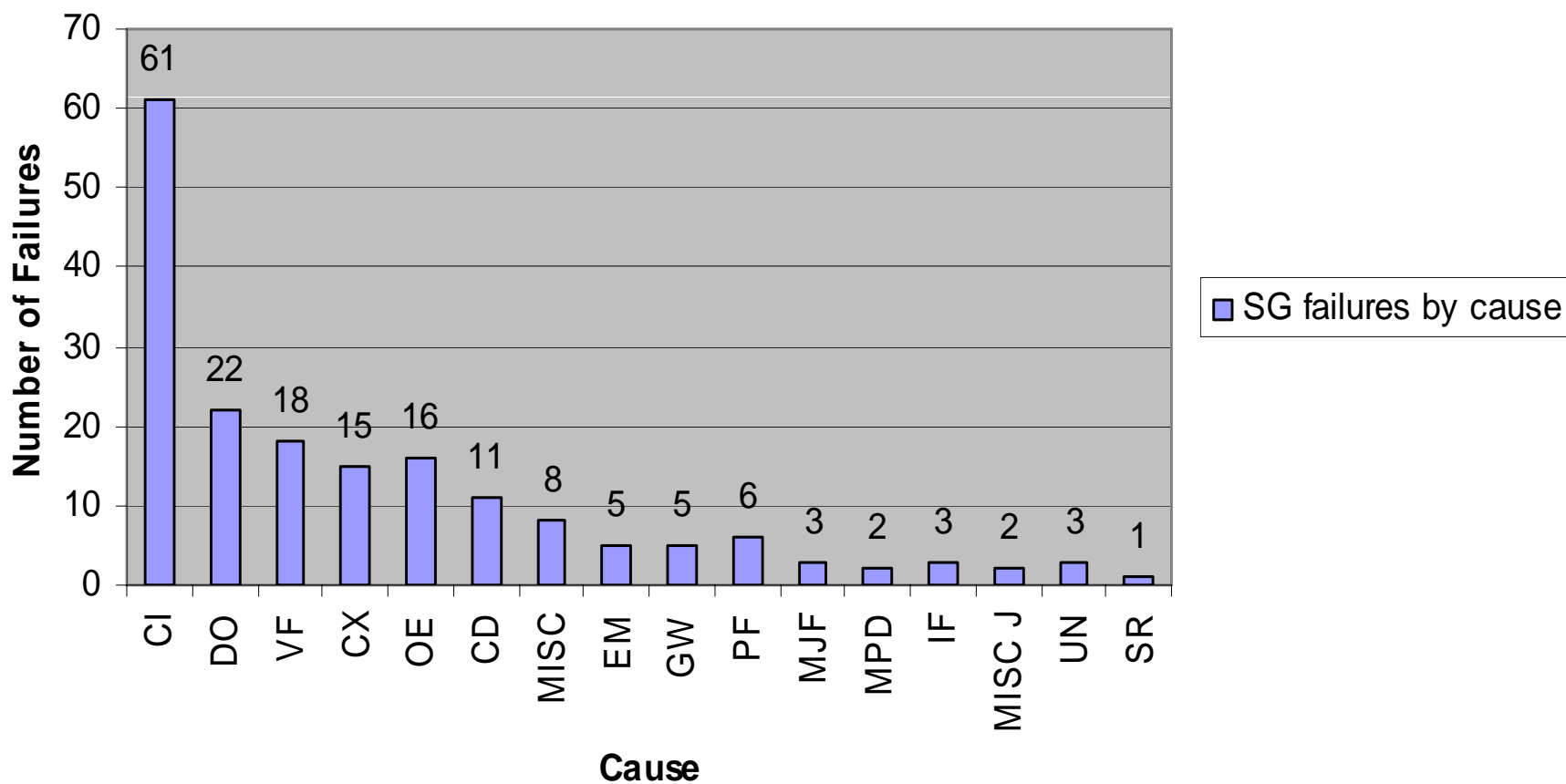
# All pipeline failures by substance minus hits, Jan 1, 2004-Dec 31, 2009 4976 Failures

All Failures by substance, minus hits, Jan 1, 2004-Dec 31, 2010, 4976 Failures



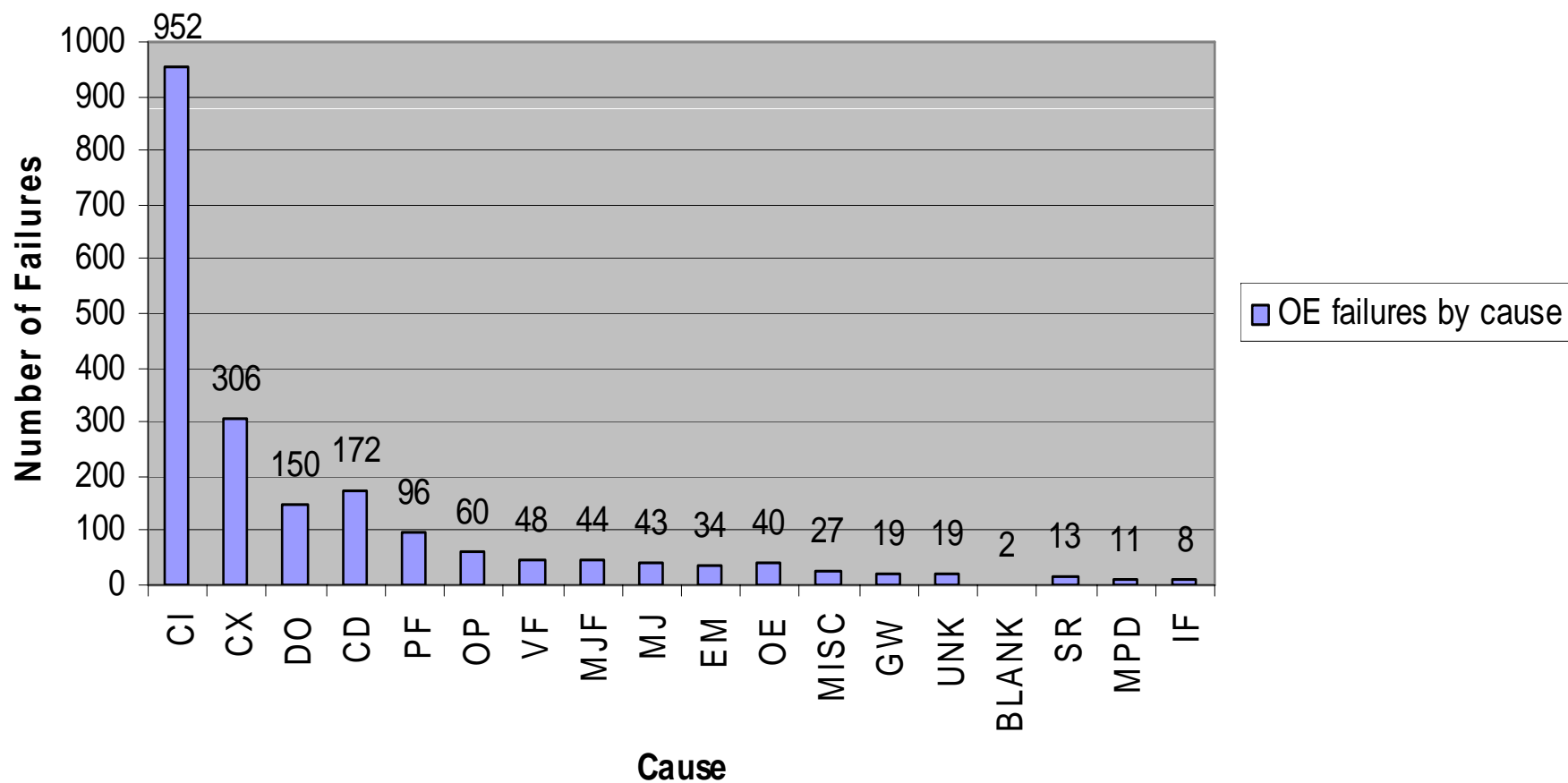
# Sour Gas line failures by cause, Jan 1, 2004-Dec 31, 2009, 181 Failures

**Sour Gas line failures by cause, Jan 1, 2004-Dec 31, 2009  
181 Failures**



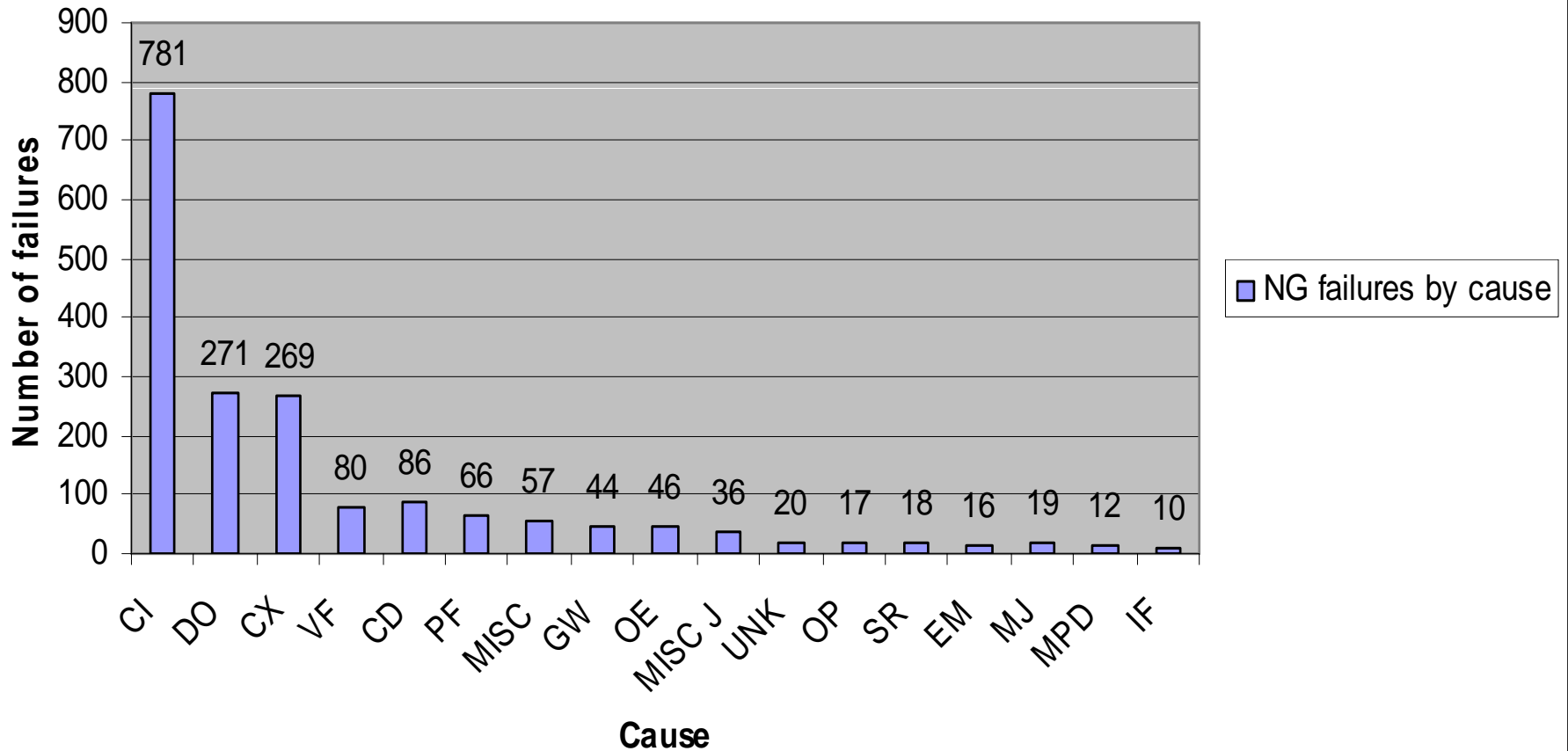
# Oil Emulsion line failures by cause, Jan 1, 2004-Dec 31, 2009, 2044 Failures

Oil Emulsion line failures by cause, Jan 1, 2004-Dec 31, 2009, 2044 Failures



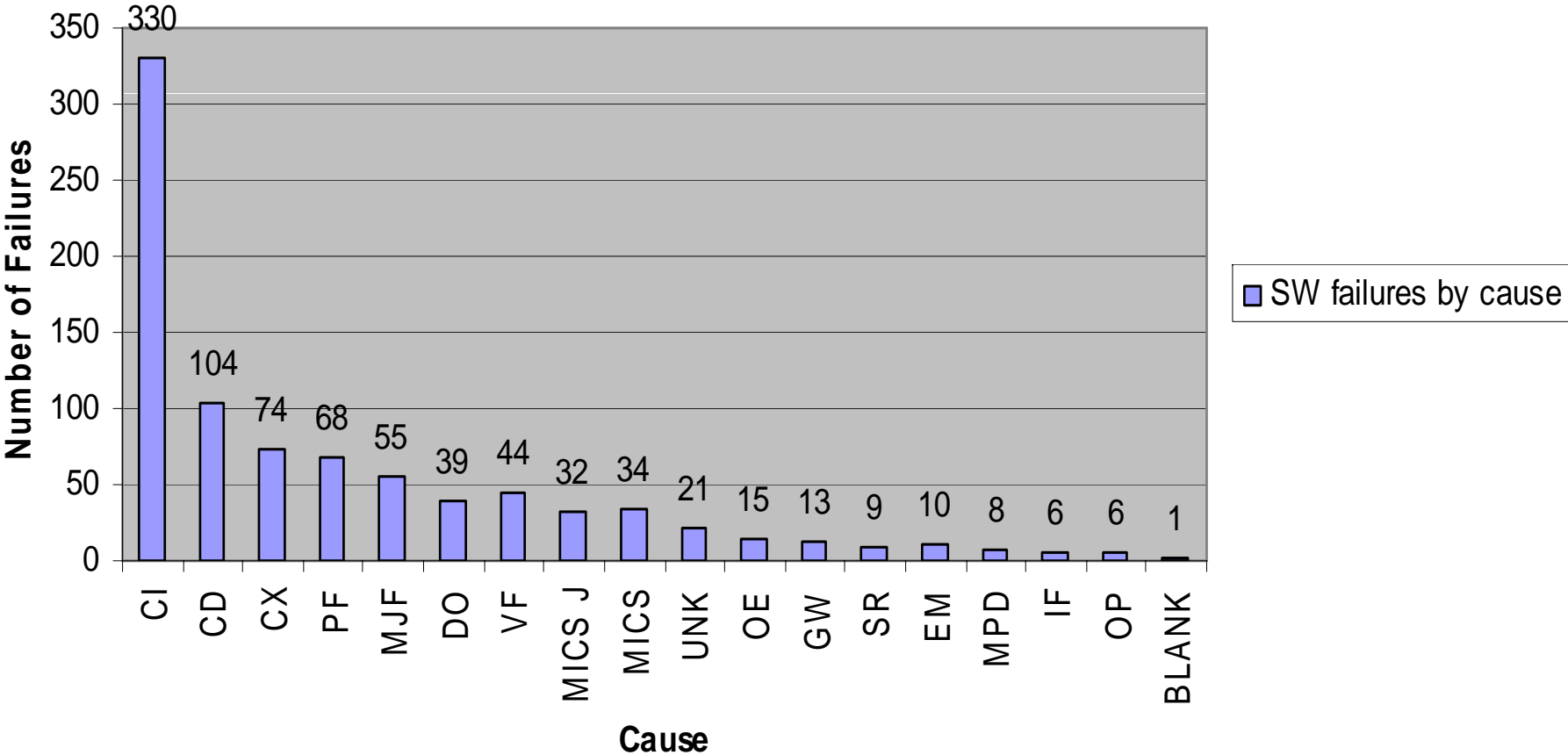
# Natural Gas line failures by cause, Jan 1, 2004-Dec 31, 2009, 1848 Failures

Natural Gas line failures by cause, Jan 1, 2004-Dec 31, 2009, 1848 Failures



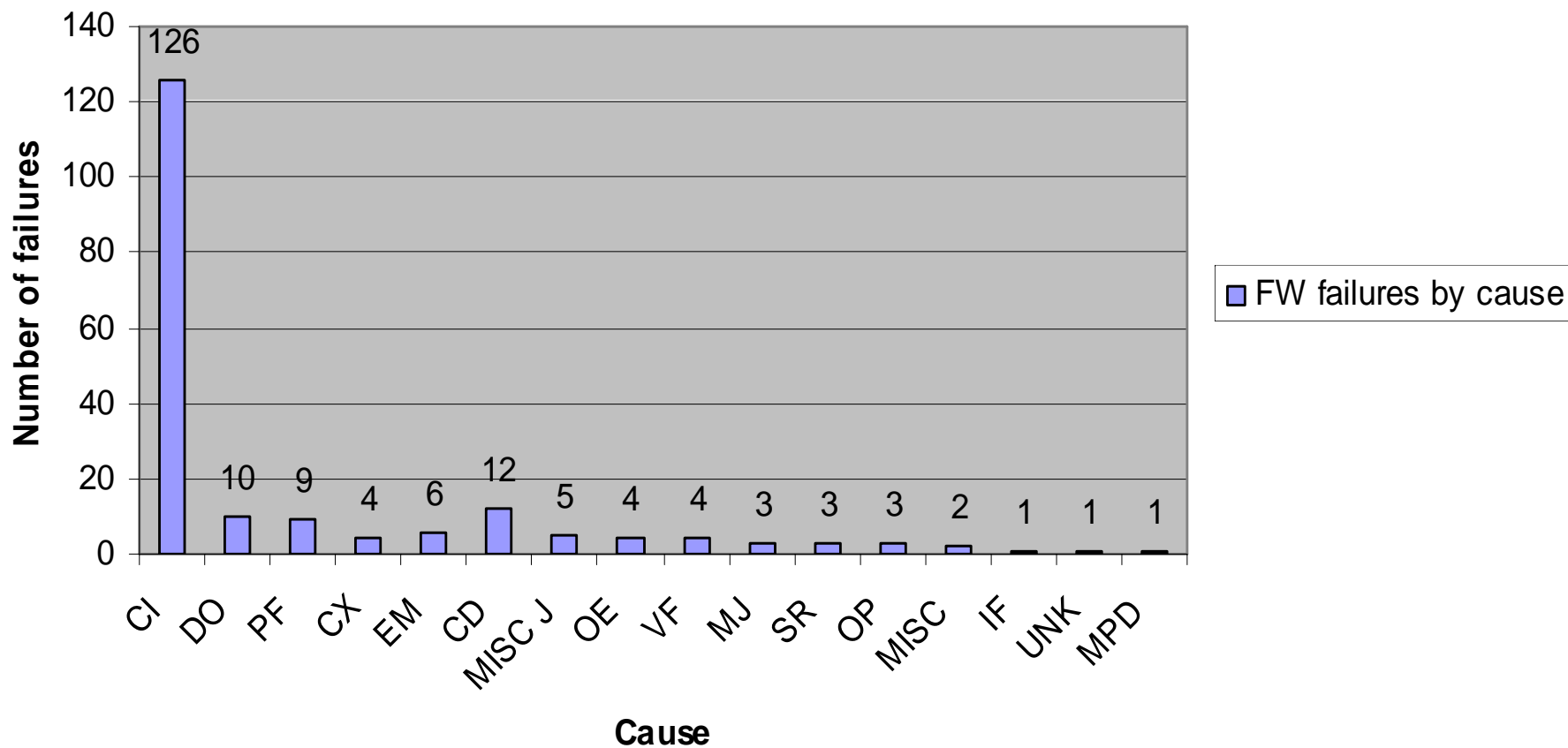
# Salt Water line failures by cause, Jan 1, 2004-Dec 31, 2009, 869 Failures

Salt Water line failures by cause, Jan 1, 2004-Dec 31, 2009  
869 Failures



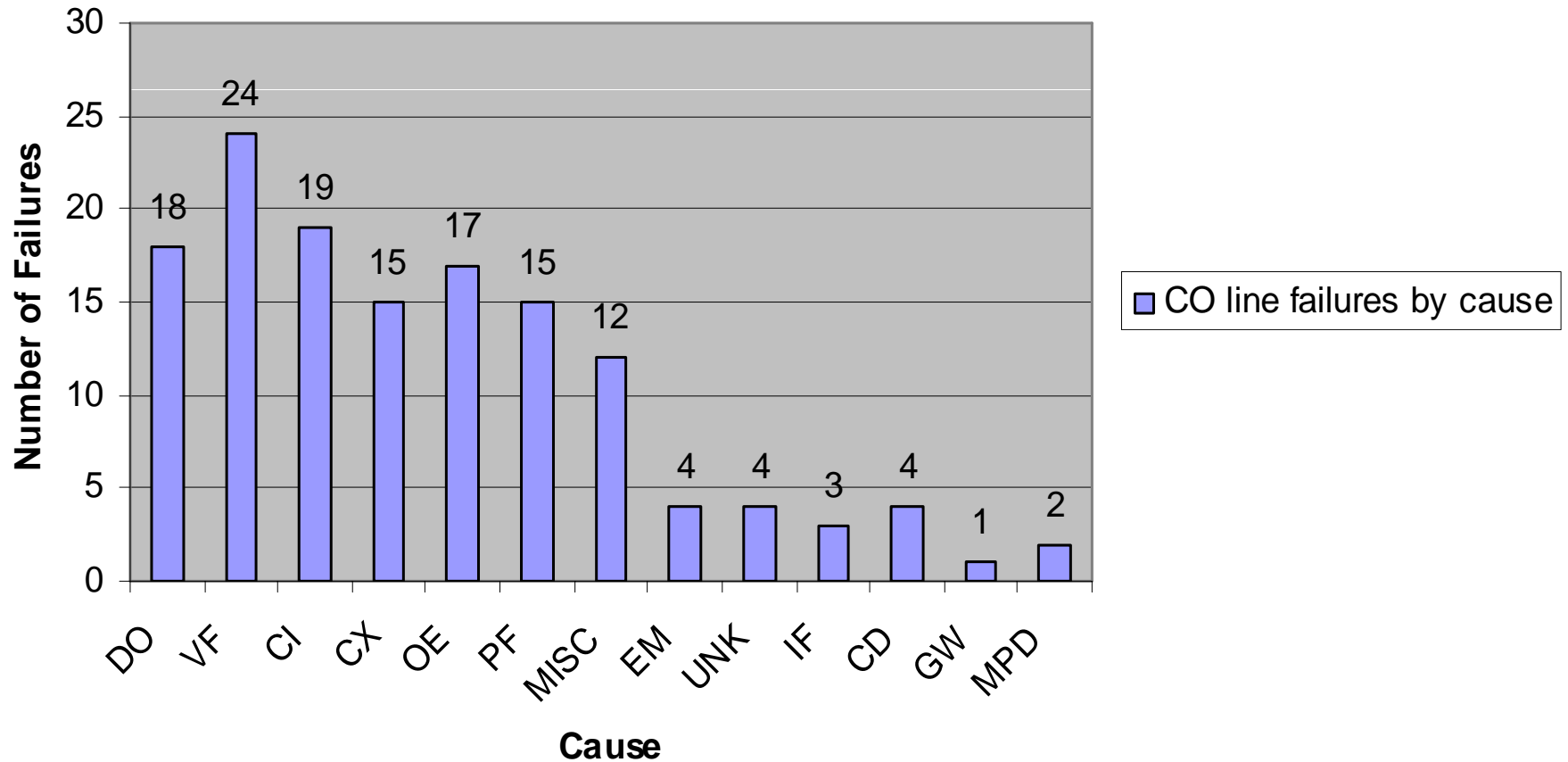
# Fresh Water line failures by cause, Jan 1, 2004-Dec 31, 2009, 194 Failures

Fresh Water failures by cause, Jan 1, 2004-Dec 31, 2009, 194 Failures



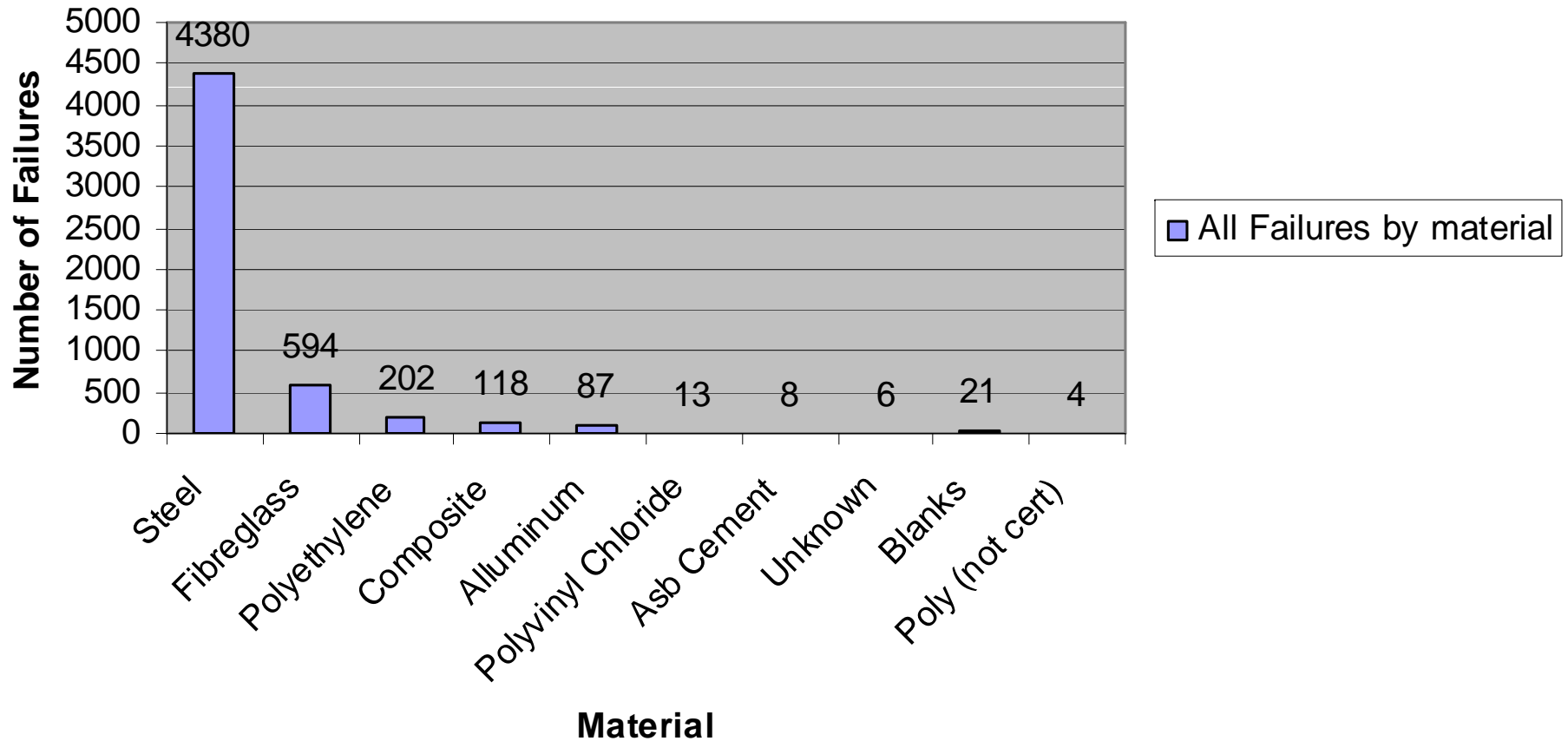
# Crude Oil line failures by cause, Jan 1, 2004-Dec 31, 2009, 138 Failures

Crude Oil line failures by cause, Jan 1, 2004-Dec 31, 2009  
138 Failures



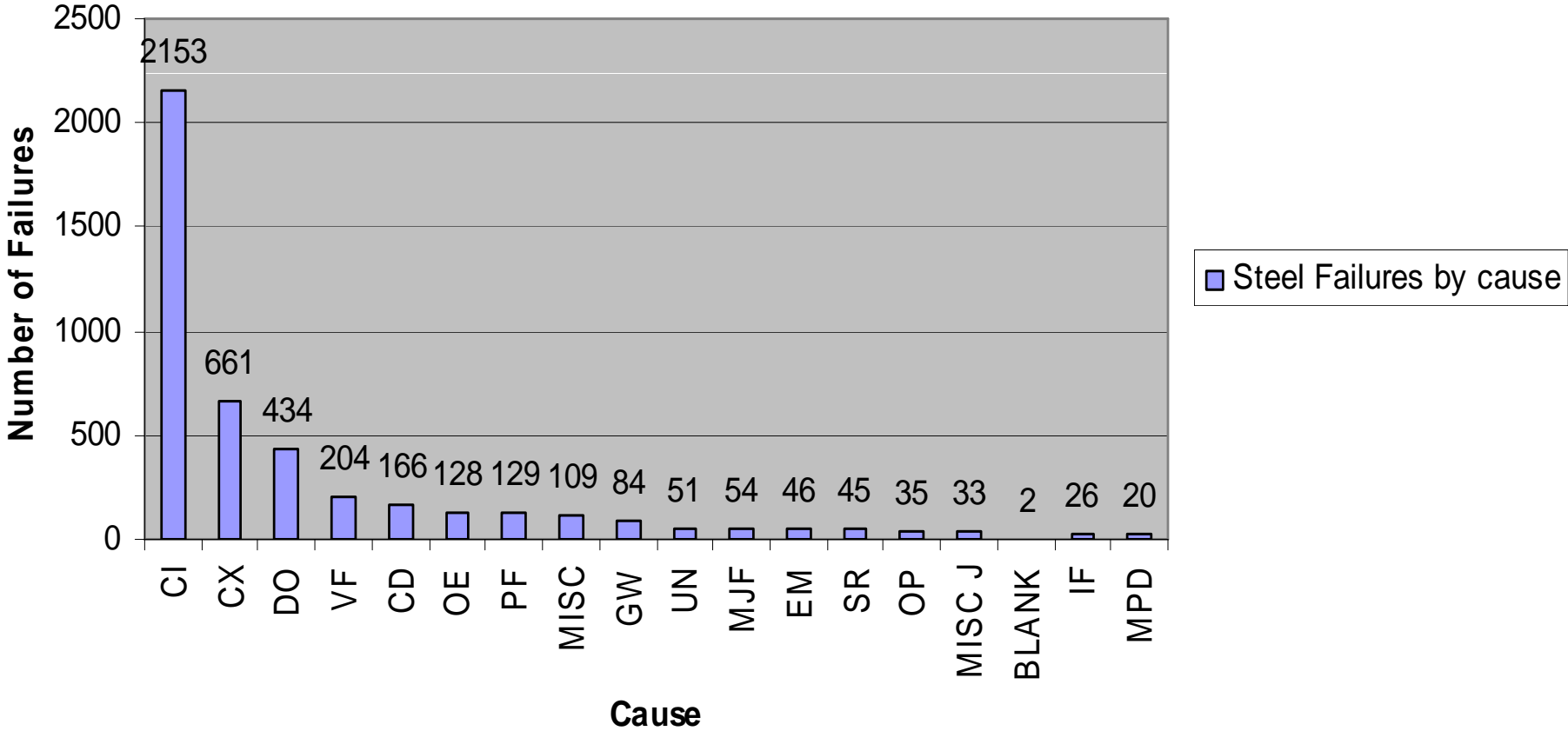
# All pipeline failures by material, Jan 1, 2004-Dec 31, 2009, 5433 Failures

All Failures by material, Jan 1, 2004-Dec 31, 2009, 5433 Failures



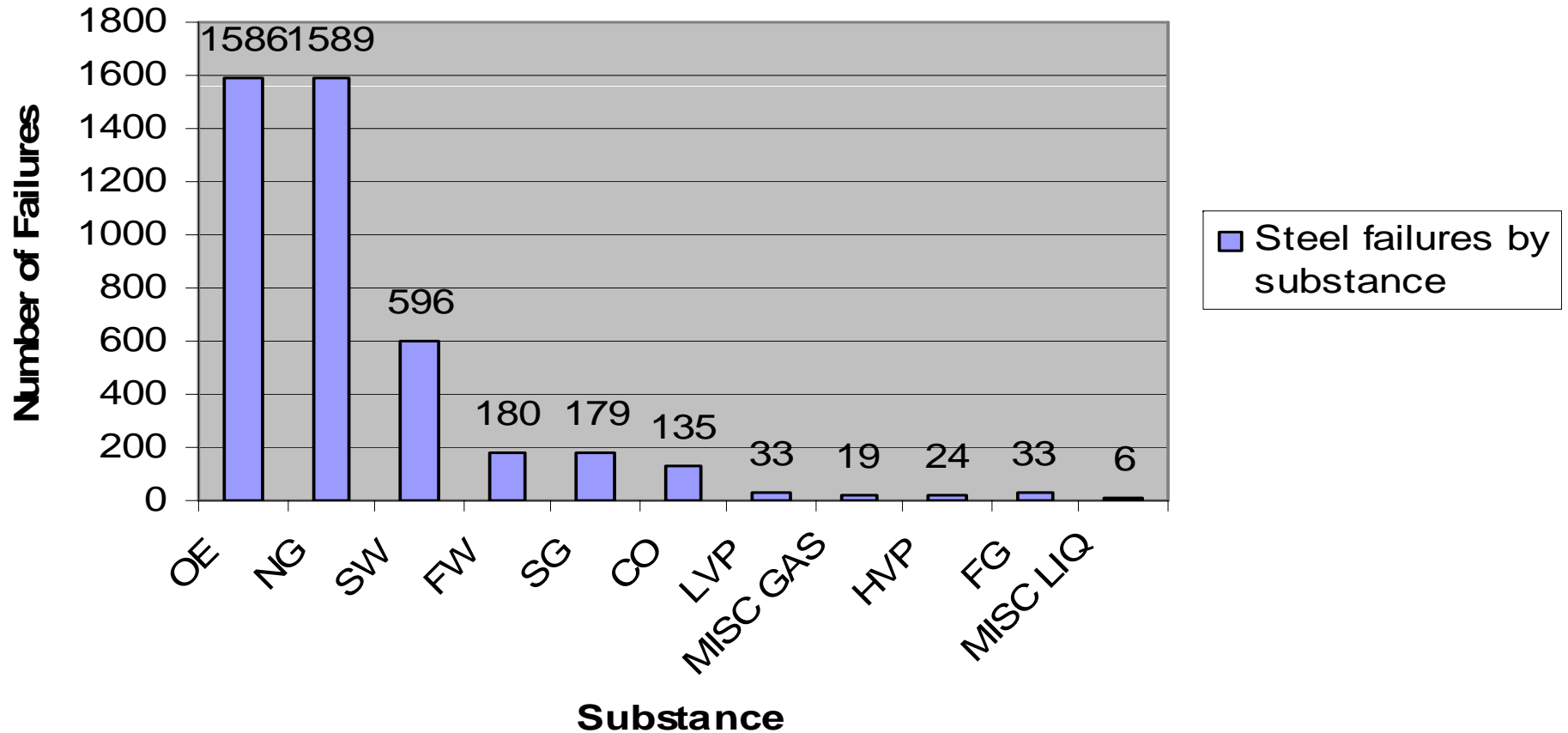
# Steel line failures by cause, Jan 1, 2004-Dec 31, 2009, 4380 Failures

Steel line failures by cause, Jan 1, 2004-Dec 31, 2009  
4380 failures



# Steel line failures by substance, Jan 1, 2004-Dec 31, 2009, 4380 Failures

**Steel line failures by substance, Jan 1, 2004-Dec 31, 2009, 4380 Failures**





# Sour Service Overview

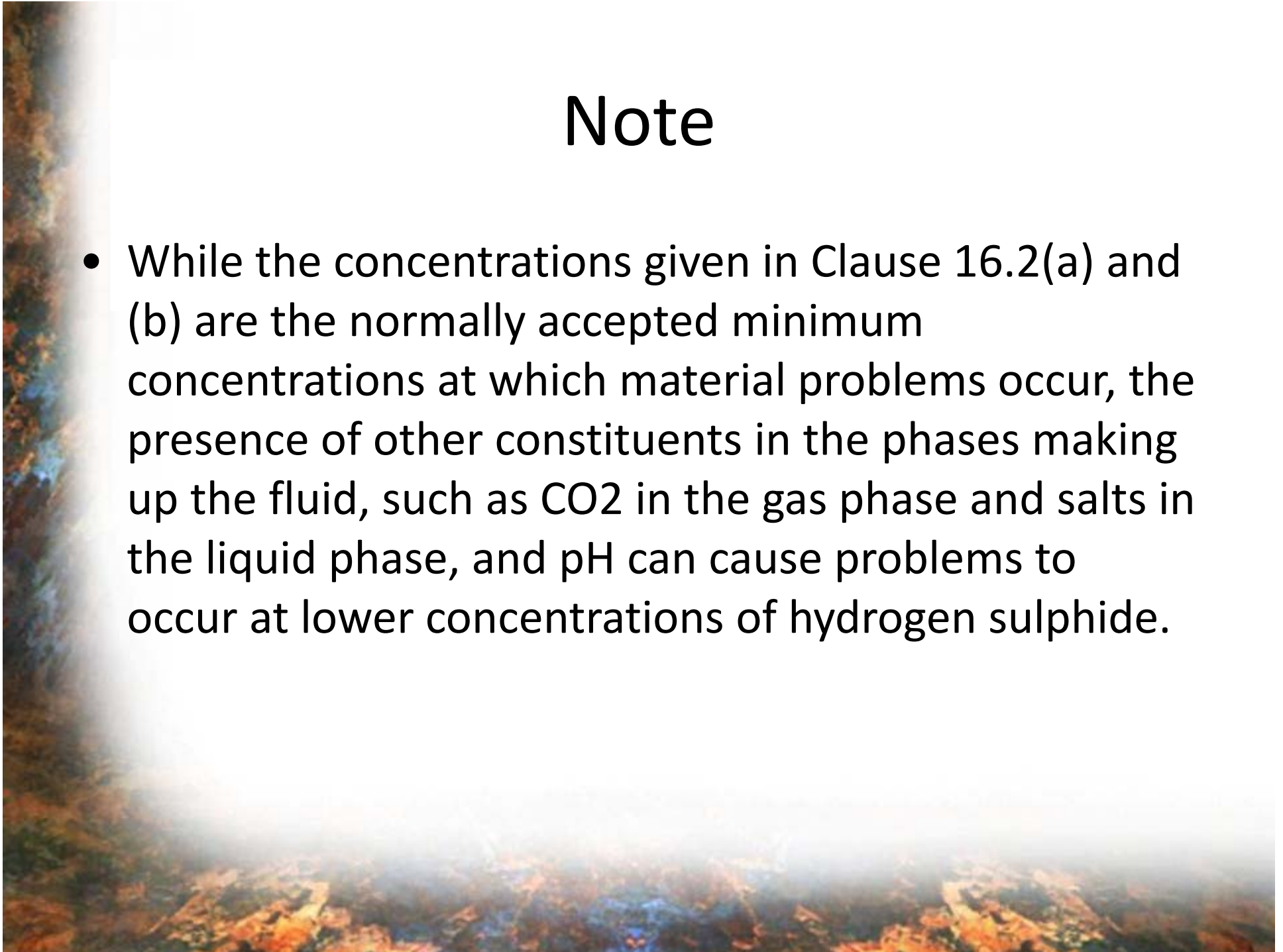
From CSA Z662-07 Clause 16,  
Alberta Pipeline Regulation

## 16.2 Sour service — Specific definition

- “Sour service” means
- (a) for pipeline systems containing gas, service in which the hydrogen sulphide gas partial pressure exceeds 0.30 kPa at the design pressure; and
- (b) for gas-free liquid pipeline systems, service in which the effective hydrogen sulphide partial pressure exceeds 0.30 kPa at the design pressure.

# Note

- While the concentrations given in Clause 16.2(a) and (b) are the normally accepted minimum concentrations at which material problems occur, the presence of other constituents in the phases making up the fluid, such as CO<sub>2</sub> in the gas phase and salts in the liquid phase, and pH can cause problems to occur at lower concentrations of hydrogen sulphide.



## 9.10.1.3

- Unless experience or tests indicate otherwise, any gas that contains hydrogen sulphide or carbon dioxide and has a water dew point that exceeds the minimum pipeline system operating temperature shall be considered to be corrosive.

## 9.10.1.4


- Unless experience or tests indicate otherwise, any gas that contains hydrogen sulphide or carbon dioxide, has a water dew point that is maintained below the minimum pipeline system operating temperature by dehydration, and is suitably inhibited shall be considered to be noncorrosive.

## 16.3.2 Design parameters

- All of the parameters used in the design of the pipeline (e.g., stress calculations, soil support calculations, anchoring or expansion requirements and calculations, riser design, plot plans, bore details, crossing details, piping transitions, material specifications, welding procedures, and backfill procedures) shall be considered design information.
- Drawings, documentation, and procedures for design information shall be approved by the company and shall be kept in the pipeline design file for the life of the pipeline.

## 16.3.4 Design considerations

- Gas pipelines containing H<sub>2</sub>S meeting the sour service definition given in Clause 16.2(a) and multiphase pipelines in which the H<sub>2</sub>S partial pressure (or effective H<sub>2</sub>S partial pressure) exceeds 70 kPa or 5% of design pressure, whichever is lowest, shall be designed to accommodate internal maintenance cleaning and inspection devices.
- To meet these requirements the following must be considered in the design:

- 
- (a) a consistent pipeline internal diameter between the pig barrels;
  - (b) capability for maintenance pigging;
  - (c) capability for in-line inspection tools;
  - (d) location and sizing of pig barrels;
  - (e) use of round port, full-bore valves;
  - (f) size of bend radii; and
  - (g) use of pigging guide bars.

## **16.6.1 Carbon equivalent**

- For all material grades, the maximum carbon equivalent of the base material used in procedure qualification shall be recorded in the procedure qualification records.

## 16.7.2 Mitigation and monitoring program

- Before admission of sour fluids to the pipeline, the operating company shall develop a program to mitigate internal corrosion and shall monitor the effectiveness of its internal corrosion-control program.
- **Note:** *CAPP 2003-0023 provides information on mitigation of internal corrosion in sour service gas gathering pipelines.*

## 16.7.3 Start-up corrosion mitigation

- New sour service gas pipelines, and sour service gas pipelines that are being restored to service after repair or a period of non-use, shall be batch treated with a corrosion inhibitor before line start-up.
- **Note:** *In-line inspection tools can damage protective scales and inhibitor films and thereby provide initiation sites for corrosion damage. To help mitigate this damage, consideration should be given to batch-inhibiting the pipeline immediately after the running of an in-line inspection.*



## **16.8 Operation and maintenance**

- **16.8.1 Procedures**

- In addition to meeting the provisions of Clause 10.3.1.2, operating and maintenance procedures shall be based on the limits specified in the design information specified in Clause 16.3.2.

- **16.8.2 Records**

- In addition to meeting the provisions of Clause 10.4.2, all records related to pipeline design, construction, modification, operations, and maintenance shall be maintained for the life of the pipeline.



## 16.8.8 Pipeline integrity management program

### Annex N

- Licensees of pipelines must develop and implement an integrity management program in accordance with CSA Z662-07, Annex N. As licensees may require time to meet this requirement, licensees must
  - • by **January 1, 2007**, develop an integrity management program (Clauses N.1 to N.9), and
  - • by **July 1, 2007**, develop hazard identification and controls, risk assessments, and program planning (Clauses N.10 to N.17).

# Directive 41 Noncompliance

- After the specified dates, noncompliance with the requirements of Annex N could result in the licensee receiving enforcement action in accordance with the processes described in *Directive 019: EUB Compliance Assurance—Enforcement*.
- Questions regarding Annex N may be addressed to the ERCB Pipeline Technical Operations at (403) 297-8967.



# Alberta Pipeline Regulation



## Annual evaluation for internal corrosion mitigation

- **54(1)** Unless otherwise authorized by the Board, a licensee shall conduct and document an evaluation of any operating or discontinued metallic pipelines in a pipeline system to determine the necessity for, and the suitability of, internal corrosion mitigation procedures
  - (a) annually,
  - (b) prior to the commencement of operation of a new pipeline, and
  - (c) prior to the resumption of operation of a discontinued or abandoned pipeline.

## Section 54 Continued

- **(2)** The evaluation for internal corrosion mitigation shall include, as necessary, an evaluation of production records, operating experience, monitoring data and inspection data.

## Exemption for lined metallic pipelines

- **55(1)** The evaluation for internal corrosion mitigation referred to in section 54 is not required for metallic pipelines containing a full contact polymeric liner unless there is reason to believe that corrosive fluids have entered the annular space between the liner and the pipe.

## Section 55 continued

- **(2)** If there is reason to believe that corrosive fluids have entered the annular space between the liner and the pipe of a metallic pipeline referred to in subsection (1), the evaluation set out in section 54 must be performed to confirm whether the existing condition of the pipeline is acceptable and determine the necessity for internal corrosion mitigation procedures.

## Notice of maintenance activity

- **57(1)** The licensee of a pipeline conveying HVP product or natural gas containing more than 10 moles of hydrogen sulphide gas per kilomole of natural gas shall notify the Board at least 48 hours prior to commencing
  - (a) the replacement of short portions of pipeline allowed by section 3(3)(a),
  - (b) instrumented internal inspections of the pipeline, and
  - (c) any activity that may result in welding on an in-service pipeline.



**QUESTIONS???**