



**CONNECTING PIPELINERS**

## **High Consequence Area Definition by the Regulators Can Support Prevention of High Consequence Pipeline Events**



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# Agenda

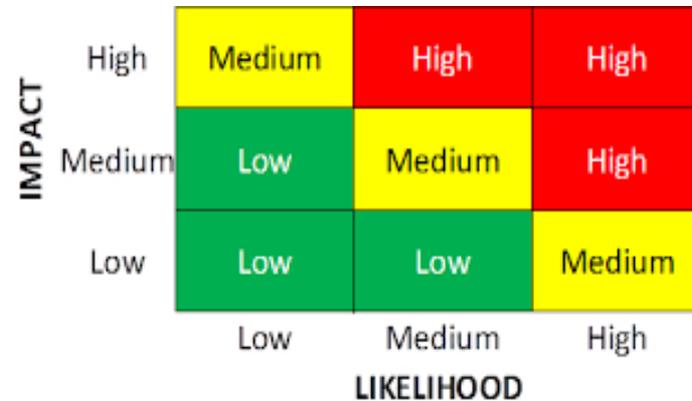
- Why HCA's ?
- What is Risk?
- Who decides what is High Consequence?
- Factors influencing Operators
- Comparison between Jurisdictions
- Water Bodies Classifications
- Benefits of HCA Definition

# Why HCA's

- Prevention of High Consequence Events is Critical
- Prioritizing Resources of Operators is Important
- Focus on Pipeline Integrity is Different When Comparing Upstream to Transmission and Distribution (i.e. Operator Maturity and Focus)
- CAPP Best Management Practice –Guide for Designated Pipeline Sections in High Impact Areas July 2015 (CAPP).

# What is Risk?

- Consequence x Probability
- What Drives Probability?  
(Statistics, Process Conditions)
- What Drives Consequence =  
Product Type, Volume x  
Impacted Area
- Business, Safety, Environment



IMPACT	High	Medium	High	High
	Medium	Low	Medium	High
	Low	Low	Low	Medium
		Low	Medium	High
		LIKELIHOOD		

# Performance Metrics

- Leaks/1000 km of Pipelines
- Zero “High Consequence Events” (CAPP)
- Must be Reasonable and Achievable

# Who Decides What is High Consequence?

- Annex N.3.2 “ The operating company shall document the types of consequences they consider to be significant and the rationale for determining the significance of those consequences”
  
- What Does the Public Consider Significant?
  - All Leaks?
  - Is the Rationale Valid?
  
- CAPP BEST MANAGEMENT PRACTICE
  - “Guide for Designated Pipeline Sections in High-impact Areas “
  - A “High-impact Area” (HIA) is a location where a particular pipeline incident, if it occurred, could potentially result in unacceptable or intolerable effects, such as danger to people or infrastructure, adverse effects to a water body and the surrounding environment, or both.

# Factors Influencing Operators

## Transmission

- Very Pipeline Focused
- Major Asset
- Significant Reputation Impact
- Economics Not as Variable, Fixed in Contracts
- Large Connected and Accessible Infrastructure

## Upstream

- Pipeline is Just One of Many Assets
- Economics Highly Variable
- Small Disconnected Infrastructure (avg. 1 km Length, 3 " Diameter)

# PHMSA -High Consequence Area

- PHMSA Defines Consequence Areas and Triggers Requirements.

- High Consequence Area Means:

(1) A commercially navigable waterway, which means a waterway where a substantial likelihood of commercial navigation exists;

(2) A high population area, which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile;

(3) An other populated area, which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area;

(4) An unusually sensitive area, as defined in § 195.6.

# Gaps in CSA Z662

- Canadian Jurisdiction Definitions Required to Reflect What Canadians Value, What is High Consequence to Us?
- CSA Z662 Has Mostly Safety (i.e. Class Locations, HVP Requirements)
- Alberta Pipeline Safety Review - Noted a Gap in Consistent Definition of a Water Body.
- CAPP Provides Guidance But Not Law (Cannot Hinge Other Requirements in CSA Z662 To It)

# Water Bodies

- Waterbody Classification Guideline for Pipeline Water Crossings -May 2016 (published by Group 10)
- Used to Scale Consequence in risk tools
- The Navigation Protection Act lists Navigable Waters. Can be used as a source.
- Aligns with suggestions in CAPP Best Practice

# River & Stream Classifications

## Class vs Water Body Description

- R0 - Water only present seasonally and not classed as per AESRD. Considered seasonal drainage. No risk of hydrodynamic and impact loads should pipe become exposed.
- R1- Full time water flow and does not exceed 2 meters in water width at maximum flow and is AESRD Class D or un-classified. Low risk of hydrodynamic and impact loads should pipe become exposed.
- R2 - Full time water flow and exceeds 2 meters in water width at maximum flow, but is not greater than 8 meters in width, and is AESRD classed B, C, D or unclassified. Moderate risk of hydrodynamic and impact loads should pipe become exposed.
- R3 - Exceeds 8 meters in water width at maximum flow but not greater than 20 meters, or is normally used for recreational/commercial purposes, or is AESRD Class A. High risk of hydrodynamic and impact loads should pipe become exposed.
- R4- Greater than 20 meters in water width at maximum flow and is considered a major tributary or river, or is a source of fresh water for human consumption, irrespective of AESRD classification or width. High risk of hydrodynamic and impact loads should pipe become exposed.

# Benefits of HCA Definition

- Regulatory Requirements Can Be Linked to HCA Such As:
  - Leak Detection
  - Engineering Assessments
  - Degree of Regulatory Oversight
  - Design
  - Inspections
  - In-Line Inspection Programs

# Methods and Alignments

- Aligns with Process Safety, ISO 9001, Operational Excellence
- Define Critical Tasks Through Association With Risk (HCA)
- Apply Bowtie Approach



# Conclusion

- By Jurisdiction, Defining What is High Consequence Allows For Consistent Approach to Assigning Critical Activities in An Effort to **Eliminate** High Consequence Events
- Operators Risk Tolerance is Aligned With That of Canadians