

**HASKAYNE**

**CCS**

Centre for Corporate Sustainability

# Safety in Operations: There are always lessons to be learned

A Case Study of the Co-op Refinery Complex (Regina)

Enbridge Research In Action Seminar

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5 April 2017



**UNIVERSITY OF CALGARY**  
HASKAYNE SCHOOL OF BUSINESS

University  
of Regina

# Acknowledgements

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Thank you to the Faculty of Business Administration for providing a Deans Research Grant to support this research.

# Pipeline Safety in the News

A search of major Canadian newspapers found that since 2008...

"Pipeline," "oil," and "safety" are mentioned  
**3,874 times**

"Pipeline," "oil," and "leak" are mentioned  
**1,869 times**

# Refinery Safety in the News

A search of major Canadian newspapers found that since 2008...

"Refinery," "oil," and "safety" are mentioned  
**486 times**

"Refinery," "oil," and "leak" are mentioned  
**140 times**

"Refinery," "oil," and "explosion" are mentioned  
**320 times**

# Oil Refining and Risk

**“We all know the oil refinery business is dangerous. You’re boiling oil, you’re not boiling milk.”**

“You want to keep all your product and your fuel inside the piping, not outside. If you get vapours outside, vapour clouds and a source of ignition, you know what you’ve got, Kaboom.”

**Corrosion under 30+ year old piping insulation is a growing problem. Preventative maintenance is key to safety.**

- Perry Feltham, USW (9316), North Atlantic Refinery, NL

# Major Incidents:

## Texas City Refinery Explosion (BP) (2005)



**15 workers killed, 170 injured**

U.S. Chemical Safety and Hazard Investigation Board report cited:  
Cost cutting, lack of training, poor inspections

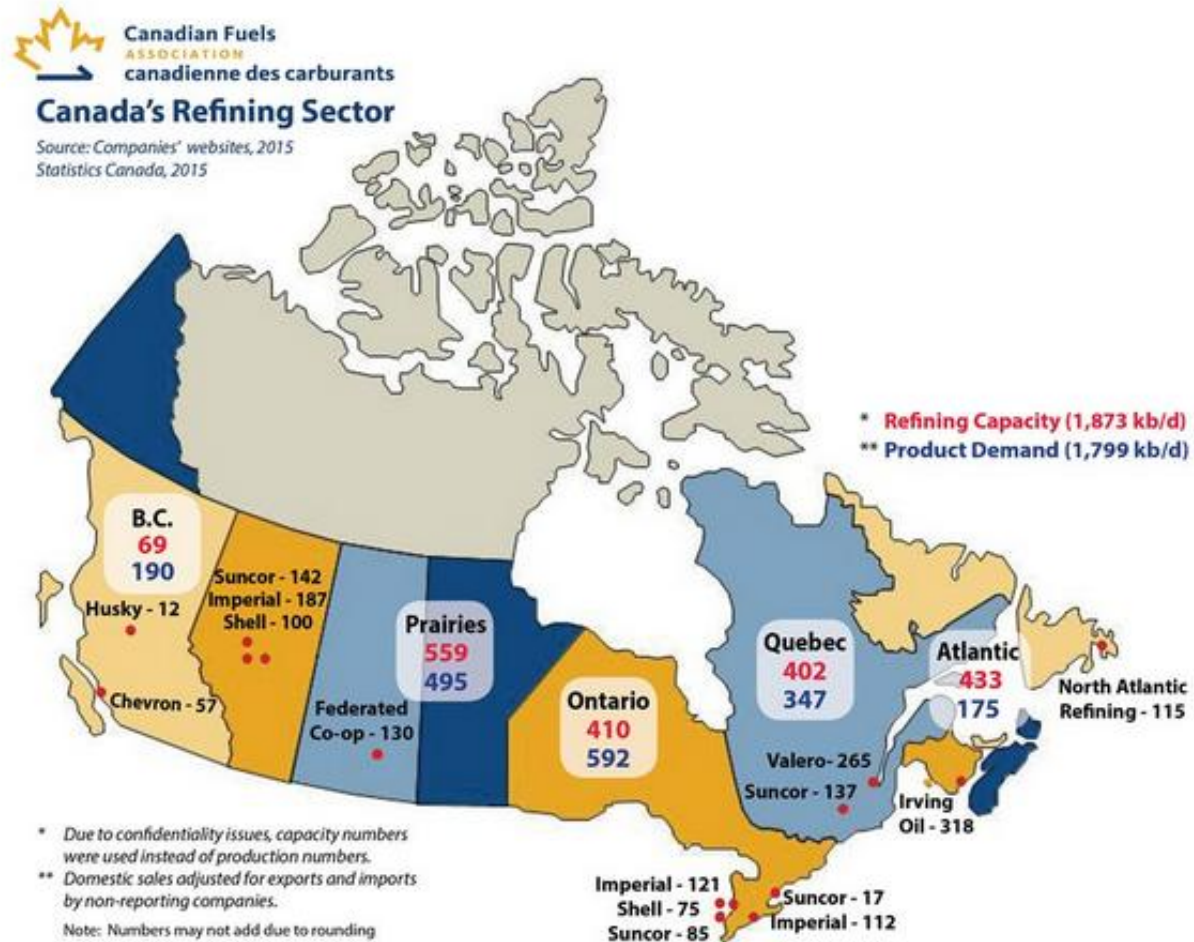
# Major Incidents (2010): Tesoro Anacortes Refinery, Washington State



## 7 workers killed

U.S. Chemical Safety and Hazard Investigation Board report cited:  
Inadequate inspections, aging equipment, poor safety culture

# Refineries in Canada (2015)





# Safety in the Canadian Refining Sector

"Safety is never compromised. If it can't be done safely our members won't do it. We take safety seriously and have the excellent track record to prove it. No one should get hurt on or off the site!"

"We are national leaders in industrial safety management, and **our members have among the best safety records of any manufacturing industry in Canada.** But it doesn't stop there - we are constantly working towards ever-improving safety."

- Peter Boag, President, Canadian Fuels Association



Canadian Fuels  
ASSOCIATION

# Explosions at Refineries and Upgraders (2008-2017)

Refinery (location)	Capacity	Year of Explosion, 2008-2017
Nexen Long Lake (AB)	72	2016 (2 fatalities)
North Atlantic (NL)*	115	2016 (0)*
Syncrude Upgrader (Suncor/Imperial) (AB)**	350	2015 (0)
<b>Co-op (SK)</b>	<b>130</b>	<b>2011 (52 injuries), 2013 (0)</b>
Irving Oil (NB)	320	2012 (1 injury)
Shell (PQ)	Closed	2010 (2 injuries)

Source: Based on search of Google News and "Proquest – Canadian newsstand"

\* Investigation determined that incident was caused by "malicious activity"

\*\* Excludes March 2017 fire

# History of the Co-op Refinery Complex (CRC) 500 (1935) to 130,000 (2017) Barrels-per-Day



**The Co-op Upgrader**  
Securing Saskatchewan's Future Today

Grant Deane  
Premier

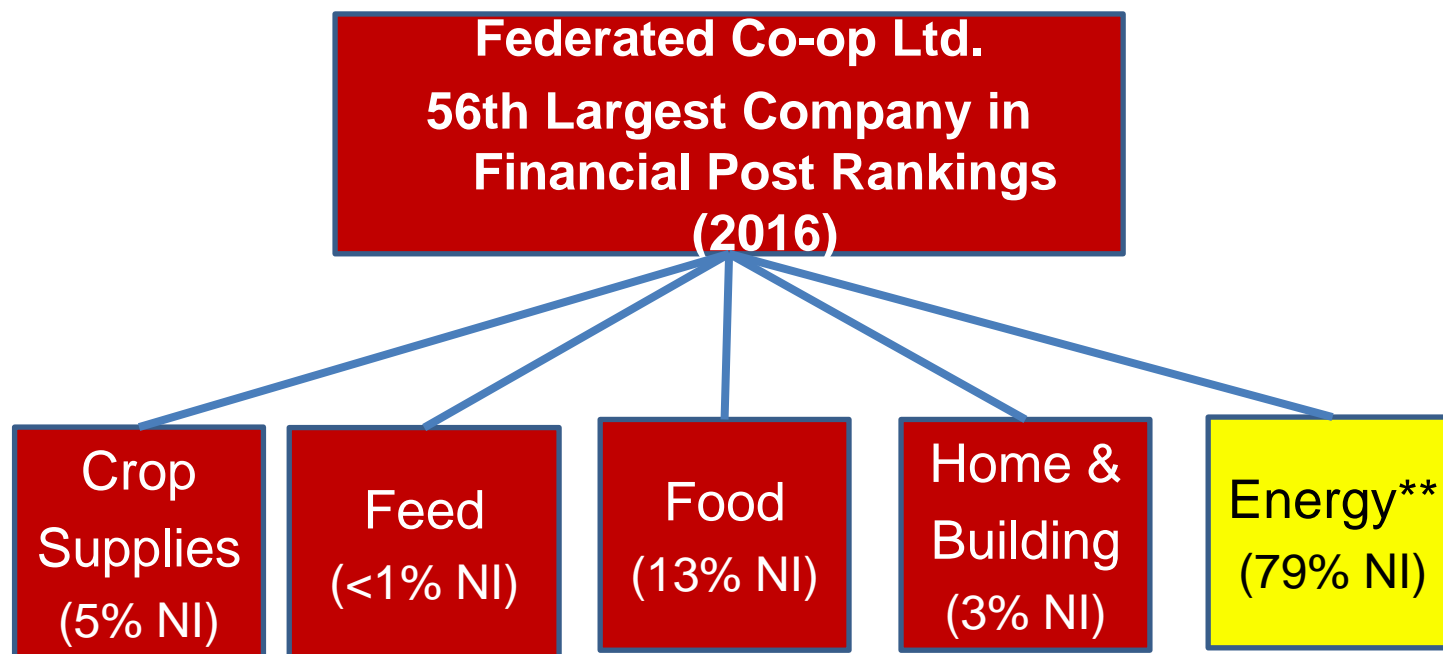
Paul Hochheimer  
Minister Energy & Mines

The Co-op Upgrader is a result of long term negotiations and co-operation between the Government of Saskatchewan, the Federated Co-operatives and the Federal Government. Construction will begin this fall on the 50,000 barrel a day heavy oil upgrader. That's good news for Saskatchewan's economy. The upgrader will increase Saskatchewan crude source purchases some \$480 million per year. Engineering, construction and related work will create more than 4,000 jobs over the next three years. The long term benefits of the upgrader will be felt by businesses throughout the province. Broadening the market for heavy oil is critical to Saskatchewan's economy. The upgrader will ensure our success in the oil industry for years to come.

**In Saskatchewan — We have the energy**

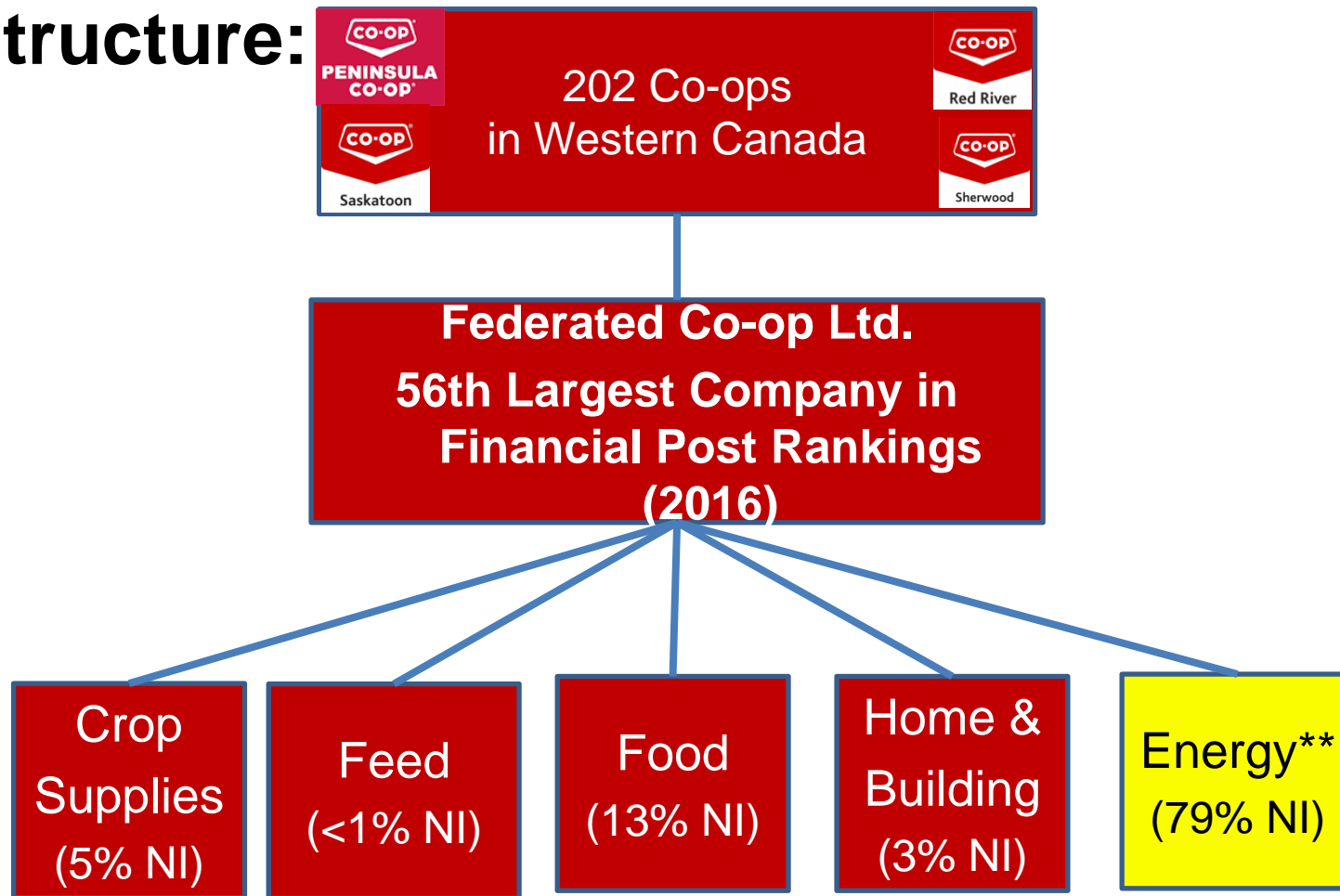
# Federated Co-operatives Ltd (FCL)

## Owner Structure:



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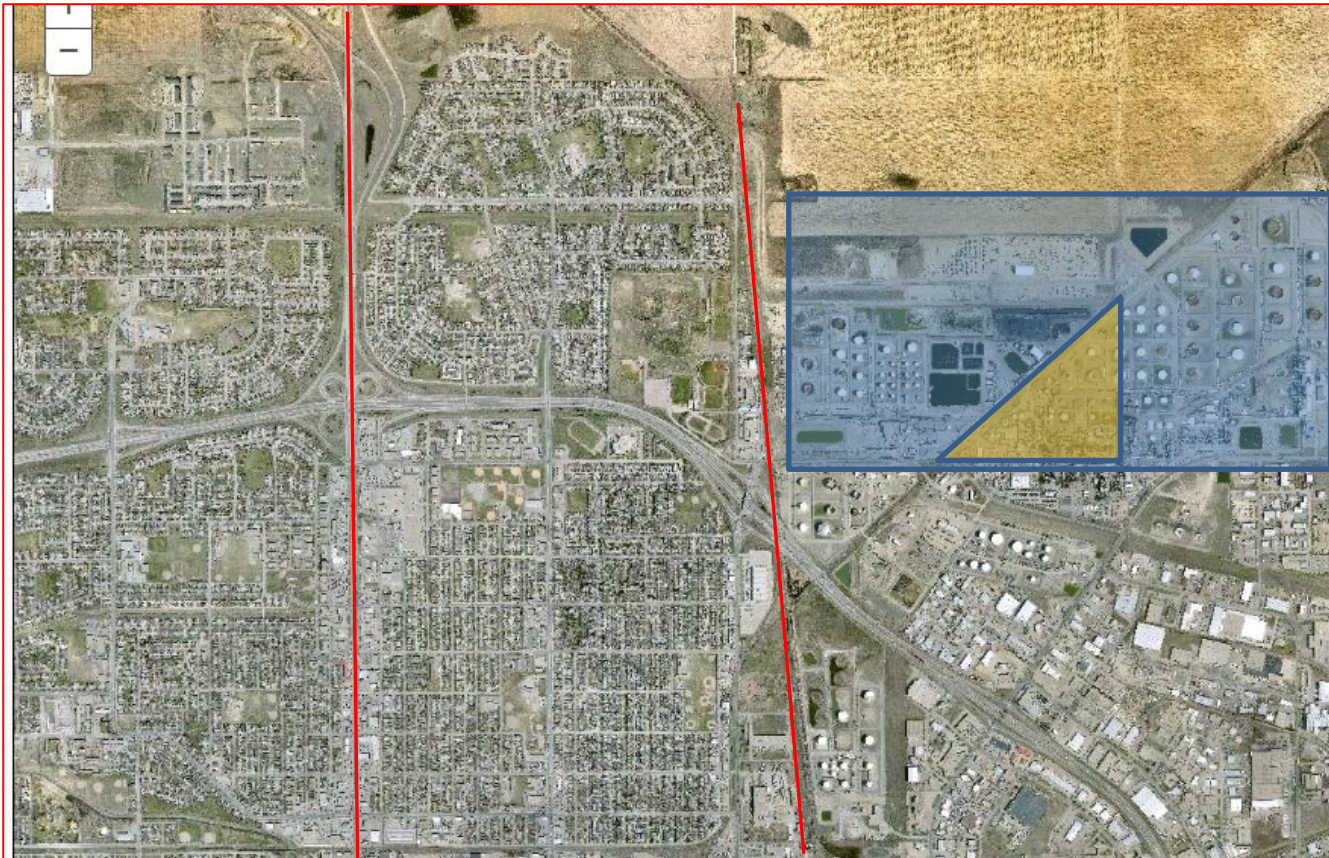




# CRC Site and Residential Neighbourhoods (1950)



# CRC Site and Residential Neighbourhoods (2014)

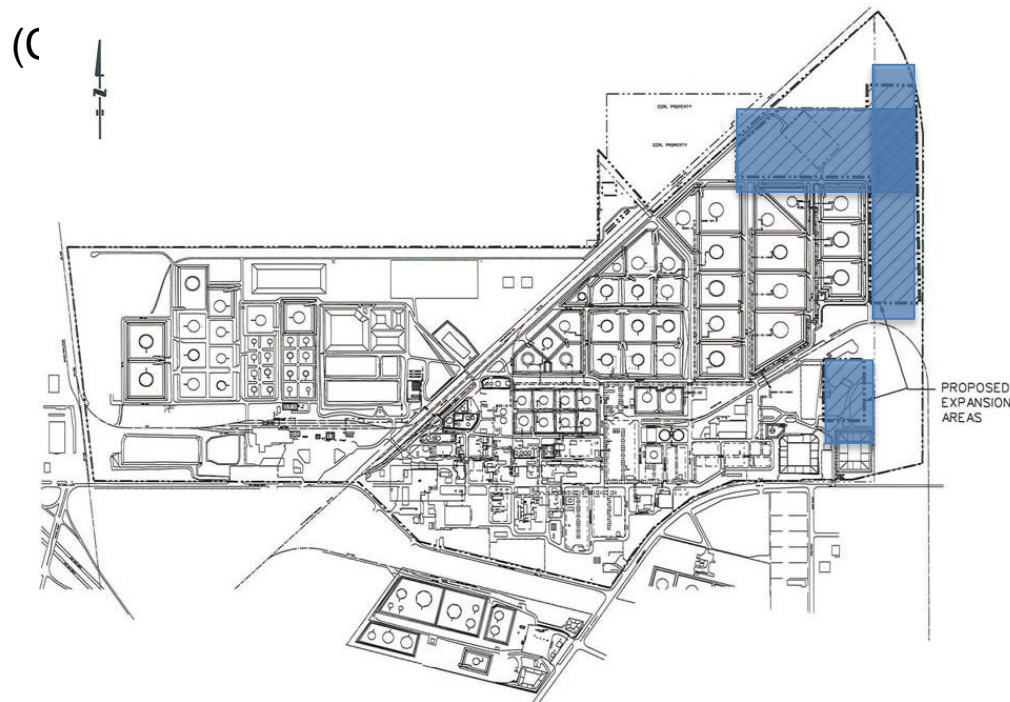




# Increasing CRC's Capacity

## Section 5 Expansion (2010-2012)

- Original estimated cost = \$1.5 billion (2007); final cost = ~\$2.7 billion (2012). **\$1.2 billion or 80% over original estimate**



# Safety as an Espoused Top Priority at the CRC

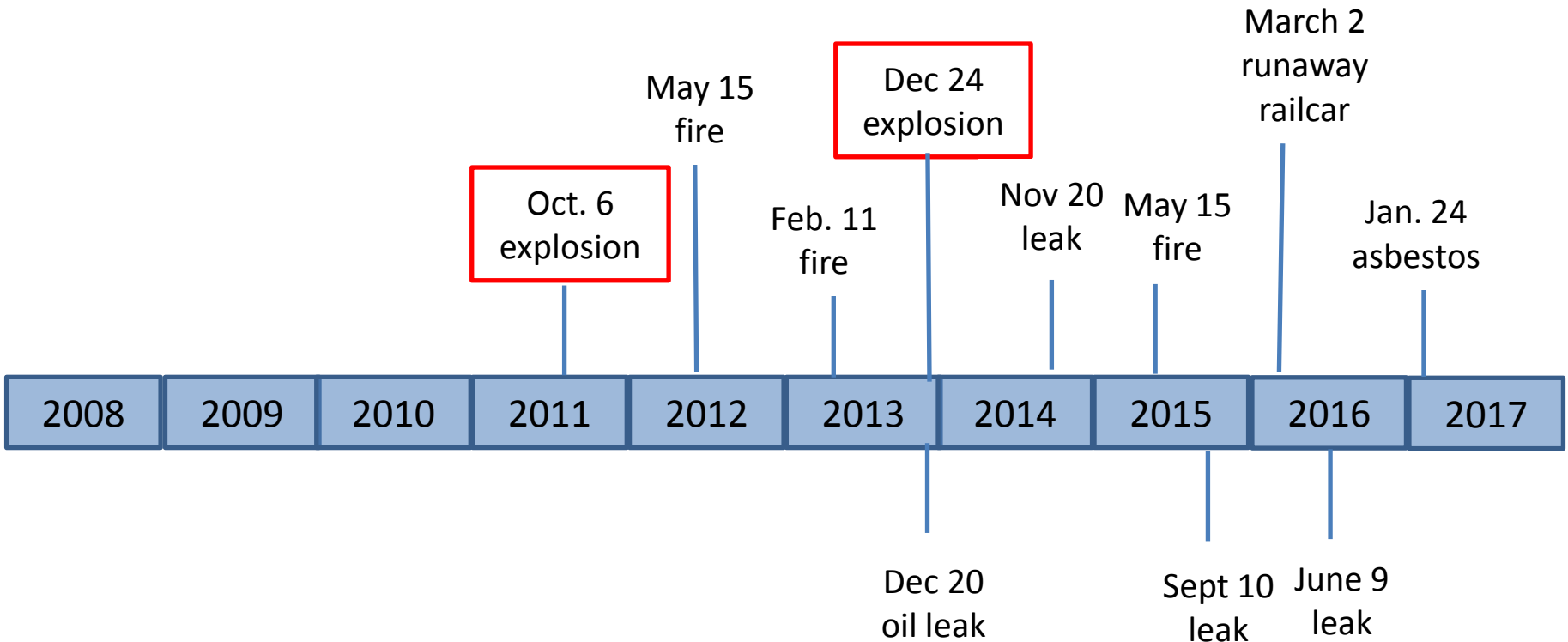
**“Those core principles [safety; equipment integrity; environmental stewardship; and, quality in all products and services] take priority over everything” [...] “We don't compromise those principles.”** (LP, May 27, 2010)

- Bud Van Iderstine, VP Operations CRC

“Our culture of safety is top-notch and we work to improve it all the time.” [...] **“We have an 80 year history in this city and over those 80 years I would put our record up against anyone's in the industry.”** (Global News, May 13, 2015)

- Scott Banda, CEO, FCL

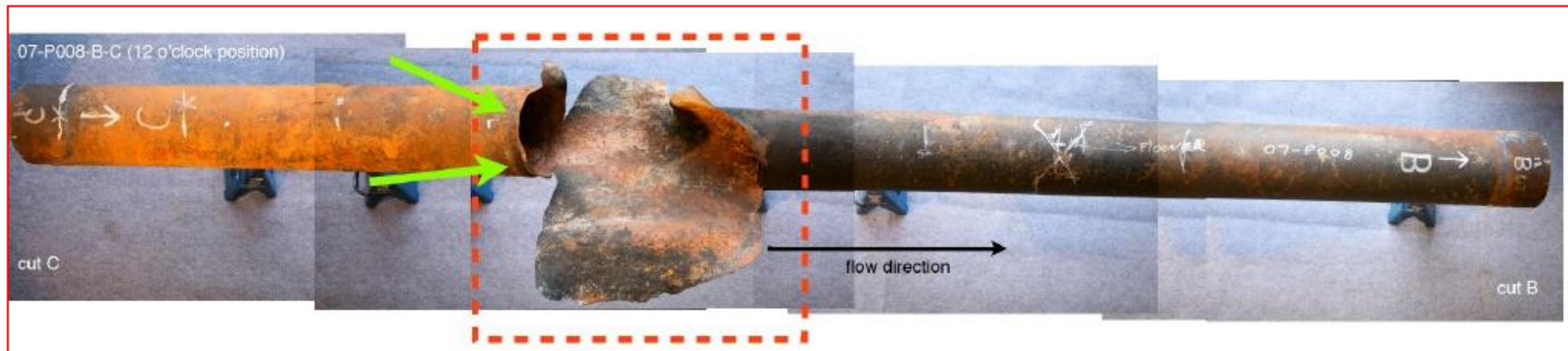
# Safety Incidents at the CRC (2008-2017)



# October 6, 2011 Explosion

52 workers injured. 6 seriously injured

Most injured workers were employees of Sky High Canada



REFINERS ■ WHOLESALERS ■ MANUFACTURERS

October 12, 2011

Dear Irene,

I wish to express personally, and on behalf of everyone at Federated Co-operatives Limited and Consumers' Co-operative Refineries Limited, my deepest regret for your injuries. We are all profoundly sorry that the explosion and fire occurred and that you have been so seriously hurt. I can only try to imagine what you and your family are going through.

We, along with independent provincial and civic authorities, are working hard to determine what went so terribly wrong. I appreciate that this may be small consolation to you at this point, but we do place the safety of our workers and the public ahead of everything we do at the refinery. When despite our best efforts people are injured, we will use every effort to find out what happened and take whatever steps we can to ensure nothing like it happens again.

Again, I am deeply sorry for your injuries and wish you well in what I appreciate will be a long and difficult recovery process. If there is anything I can do to assist you and your family, please let me know.

Sincerely,  
M. Scott Boda  
Chief Executive Officer  
Federated Co-operatives Limited

Member Owned - Truly Canadian

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“We do place the safety of our workers and the public ahead of everything we do at the refinery. When despite our best efforts people are injured, we will use every effort to find out what happened and take whatever steps we can to ensure nothing like it happens again.”

# October 6, 2011 Explosion

## FCL/CRC response:

“Since the incident, the refinery has been conducting a comprehensive safety review with an external consulting firm” [...]

**"We're looking at all aspects of our process and maintenance - as we do all the time, but this is a very deep dive for us."**

(LP, October 15, 2011)

- Vic Huard, VP FCL

19 actions taken in response to the event

- Written procedures that outline how pipe wall thickness monitoring locations are determined
- Additional inspection if high corrosion rates are detected
- 80% of piping in the diesel processing area replaced

(CDN OHS News, August 2012)

# October 6, 2011 Explosion:

**Total cost of explosion \$100 million  
in damages and lost production**

## **Legal repercussions since 2011:**

1. \$200,000 fine (maximum \$300,000) plus \$80,000 victim surcharge (Sentencing May 2015).
2. Regina Police Service Major Crimes Unit investigation (~July 2015 to ?)
3. Court of Queen's Bench civil lawsuit: Skyhigh Canada v. CRC, \$3 million (July 31, 2013 to present)
4. Lawsuit brought on by 6 injured workers (present)

## May 15, 2012 Fire

- Fire in pump house
- Cost = \$5 million





## February 11, 2013 Fire

- Fire in a coker unit pump house (12:20AM)
- Flames about 20m in the air
- Extinguished by 1:00AM
- Cost = \$2.5 million

**“[Huard] concedes that their safety record used to be among the best in the industry but he admits he “can’t say that now.”** (CJME, Feb. 11, 2013)

## December 20, 2013 Leak



- Plume of oil from leaking valve falls on cars up to 700m away from refinery
- Cost = \$50 to \$300 cleaning per vehicle

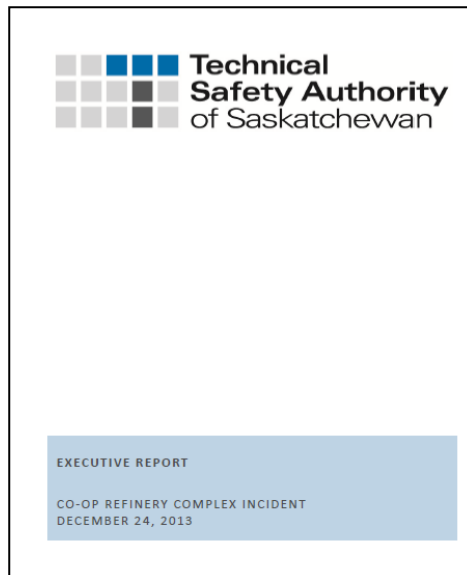
## December 24, 2013 Explosion

- Explosion in Polymerization Unit 27 at 3:25PM
- Fire extinguished at 9PM
- Four explosions and one “massive fireball” and plumes of thick black smoke
- Blast heard 20km outside of Regina
- Cost = \$77 million



# December 24, 2013 Explosion

“Procedures for incident investigation should be revised to ensure that corrections are implemented so that incidents do not repeat. **A similar pipe rupture due to freezing occurred in December, 2008, where the resulting vapour cloud did not ignite. Effective corrective actions were not implemented.”**



## November 20, 2014 Leak

- Leak at flange connector in a processing unit (1:45PM)
- Partial evacuation
- Cost = Not reported

## May 15, 2015 Fire

- Small fire at 2:40 PM is quickly extinguished
- Cost = Not reported

## September 10, 2015 Leak

- Leak detected at 11AM
- 1,181 workers evacuated (return to work at 1PM)
- Cost = No reported
- **“When asked about the refinery's track record, DeLorey repeated a line he delivered in November [2014], when the facility experienced another minor leak. “Obviously, the refinery is a complex facility and with complexity comes challenges,” he said. “We are confident that we have the necessary procedures in place to detect these leaks and isolate the areas, because the no. 1 priority is safety of our people and our neighbours.”**

## June 9, 2016 Leak

- Hot diesel escapes from a gauge
- Worker treated in hospital for burn



## March 2, 2016 Runaway Railcar

- Cando Rail Service railcar with asphalt travels 4.3 km
- Investigation finds that brakes were not applied and inadequate supervision by Cando



# January 24 to January 26, 2017

## Asbestos Exposure

- The results of two tests for asbestos - one positive and one negative sample - are mixed up
- 14 refinery workers and some contractor employees were likely exposed to asbestos during the removal of insulation from a tower that contained asbestos but was thought to be free of asbestos

# Transparency and Public Safety

- Major Hazards Risk Assessment Report (2012)
- Highlights "worst-case scenario" of an incident
- Journalist files access to information request .  
CRC opposes public release of the report

**"Disclosure is in the public interest as it relates to public safety and protection of the environment"**

(Information and Privacy Commissioner, Kruzeniski, July 2015)



# Transparency and Public Safety

- Court orders partial release of report to CBC journalist. 48 pages remain sealed (October 2016)
- Report conclusion: “although the effects from fire, explosion and toxic gas releases can leave the CRC site, the probability to do so is low enough for these large events that the risk is acceptable according to accepted guidelines.” (MHRA Report)



# Union Perspective on Safety

- **The Refinery Leadership Team (RLT) has made it clear that they are not accepting anything less than 100% compliance to all safety rules and regulations. [...] When the majority of us employees were hired we were told by our supervisors that safety is the number one priority. It did not take much on the job experience to realize that statement wasn't completely accurate. As a Process Department we have seen production trump safety time and time again. Start ups and shutdowns, planned or not, are notorious examples where the expectations don't line up with the rhetoric."**

- Union Newsletter, December 2015



**UNIFOR**  
Local594 | Canada

# Safety and Labour Relations (2017)

“[...] attempting to run a large-scale refinery with a skeleton replacement crew with questionable qualifications is a public safety risk.”

- Kevin Bittman, President, Unifor 594, March 2017

"[The union] will say that FCL is putting profits before people, and that the CRC cannot be operated safely in the event of a labour disruption. Nothing could be further from the truth — on both points."

- Scott Banda, CEO, FCL, March 2017



# Summary of CRC Safety Record, 2008-2017

- 2 explosions (2011, 2013)
- 52 injured workers (2011)
- 3 fires
- 4+ leaks
- Total reported cost of incidents = \$184 million + ?
- 3 legal cases = \$280,000 (settled) + \$3 million SkyHigh Canada + injured workers lawsuit + Regina Police Service investigation = Total cost ?
- Cost of increase to plant insurance?
- Cost of safety-related labour relations conflict?
- Incidents involving on-site contractors
- Cost of damage to corporate reputation?

# Enhancing the CRC Brand and Social License

“[FCL] brand-specific research included [...] **monitoring public opinion and support of the Co-op Refinery Complex as it operates in alignment with both FCL’s values and values important to the public.**”

(FCL Annual Report, 2013)

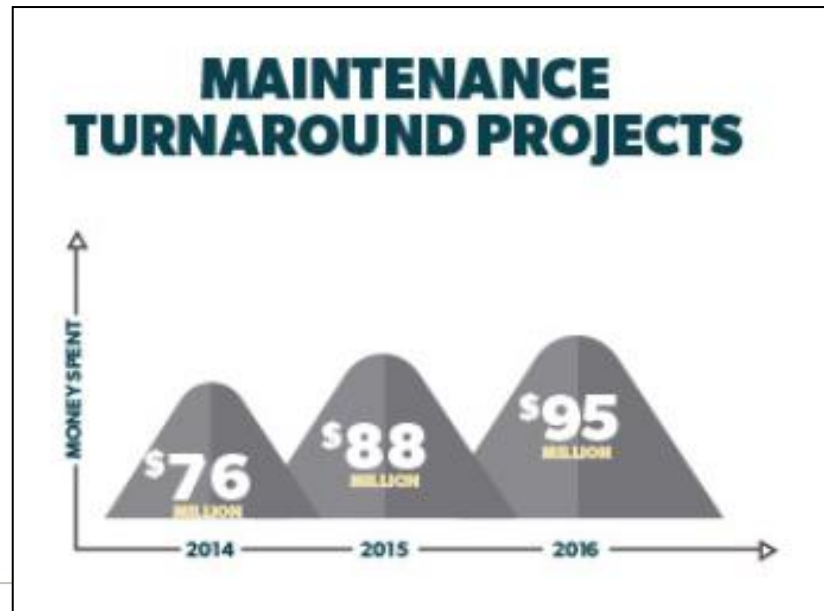




# The CRC Rebranded

“Over the last few years, we have put a lot of money into steel. Now it’s time for us to increase our investment in our people and the systems that support those people.”

- Gil LeDressay, VP Operations, CRC (FCL website, June 24, 2015)



# The CRC Rebranded - A New Vision

**“At the Co-op Refinery Complex our Vision is to be a recognized leader in safety, reliability and sustainability within the petroleum refining industry. We believe our values of integrity, responsibility and excellence will guide us in realizing our vision and ultimately fuel our business in accomplishing our Mission of Fueling Western Canada.”**



# The CRC Rebranded

- Begin implementing new process safety management system (2013)
- New leadership at the CRC (2013)
- New website and logo (2015)
- Significant community advertising (2015)
- New mission (2015)
- Public commitment to purchase leak detection and repair system (2015)
- New \$200 million on-site waste water treatment plant (2016)
- Funding emergency alert system for City of Regina (2016)
- FCL partners with Safe Saskatchewan (2016)
- Claim that \$2 billion has been invested in health and safety (2017)
- "Director, Communications and Public Affairs" becomes "Director, Communications and Public Safety" (March 2017)



# Lessons Learned Summary:

- 1. Pushing systems to the edge carries with it wide ranging human, environmental, reputational, and financial risks**
- 2. Transparency and public safety**
  - CRC
  - Canadian Fuels Association
  - Regulation
- 3. Safety culture**
  - Top management 'walking the talk' and credibility
  - Workers feel safe reporting hazards
  - Contractor safety
- 4. Commitment to process safety**
  - Comprehensive inspections
  - Proactive corrective action
  - Ongoing investment

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