Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2017

Commission Meeting
December 13, 2018
CMD 18-M47.A

CNSC Staff Presentation

Errata in CMD 18-M47

- CMD pg. 27, number of inspection action items for the Blind River Refinery should be 7 instead of 10
- CMD pg. 117, number of inspection action items for BTL should be 12 instead of 14
- CMD pg. 158, Table F-15, Table title should say “Uranium in soil monitoring results, residential locations, 2013-2017”

Presentation Outline

- **Overview of CNSC Regulatory Oversight**
  - Safety and control area performance ratings
  - Regulatory limits and action levels
  - Public information and community engagement
  - Independent Environmental Monitoring Program
- **Safety Performance of Uranium Processing Facilities**
- **Safety Performance of Nuclear Substance Processing Facilities**
- **Participant Funding and Interventions**

Uranium Processing Facilities
Cameco Blind River Refinery
Cameco Port Hope Conversion Facility
Cameco Fuel Manufacturing Inc.
BWXT Nuclear Energy Canada Inc.

Nuclear Substance Processing Facilities
SRB Technologies (Canada) Inc.
Nordion (Canada) Inc.
Best Theratronics Ltd.

CNSC Regulatory Oversight Reports, 2017

Regulatory Oversight Reports	Dates
Research reactors and Class IB accelerators	August 23, 2018
Use of nuclear substances in Canada	October 3, 2018
Canadian nuclear power generating sites	November 8, 2018
Uranium mines, mills, historic and decommissioned sites in Canada	December 12, 2018
Uranium and nuclear substance processing facilities in Canada	**December 13, 2018**

Summary and highlights of licensee safety performance for 2017

Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2017

Highlights:

- CNSC's regulatory efforts
- Licensees rating for the 14 safety and control areas (SCAs) with a focus on:
  - radiation protection
  - environmental protection
  - conventional health and safety
- Licensing activities, significant events and changes in performance ratings at uranium and nuclear substance processing facilities

Commission Meeting, December 13, 2018
CMD 18-M47.A

CNSC REGULATORY OVERSIGHT

CNSC Regulatory Oversight

- Regulatory oversight includes licensing, compliance and reporting activities
- Compliance is verified through:
  - Inspection/verification activities
  - reviews of operational activities and documentation
  - licensee reporting of performance data, including annual reports and unusual occurrences
- Nature of the oversight activities are commensurate with risk associated with the site

Risk-informed and performance-based approach

CNSC inspector taking notes during an onsite inspection at Cameco Fuel Manufacturing Inc.

Source: CNSC

CNSC Regulatory Oversight
Ratings and Performance

- Safety and control areas (SCAs) are used to assess and evaluate licensee performance
- CNSC staff rate performance as:
  - Fully satisfactory (FS)
  - Satisfactory (SA)
  - Below expectations (BE)
  - Unacceptable (UA)
- Ratings are derived from results of regulatory oversight activities

Safety and Control Areas

Management System
Human Performance Management
Operating Performance
Safety Analysis
Physical Design
Fitness for Service
Radiation Protection
Conventional Health and Safety
Environmental Protection
Emergency Management and Fire Protection
Waste Management
Security
Safeguards and Non-Proliferation
Packaging and Transport

CNSC Regulatory Oversight
SCA Performance Rating Methodology

- Each SCA consists of several specific areas and metrics
- CNSC staff use expert judgement and rate licensees' performance based on multiple inputs, including:
  - results of compliance activities and effectiveness of licensees' actions
  - key performance indicators
- Independent environmental monitoring
- Annex 1 includes specific examples of licensee ratings from the 2017 regulatory oversight report

Performance ratings represent an holistic summary of each SCA

Example: Environmental Protection SCA

Specific areas:

- Effluent and emissions control (releases)
- Environmental management system
- Assessment and monitoring
- Protection of the public
- Environmental risk assessment

CNSC Regulatory Oversight

Regulatory Limits and Action Levels

Regulatory dose limits

- Established to ensure safety to workers and members of the public
- Set in regulations
- Significantly below the threshold for health effects

Licence limits

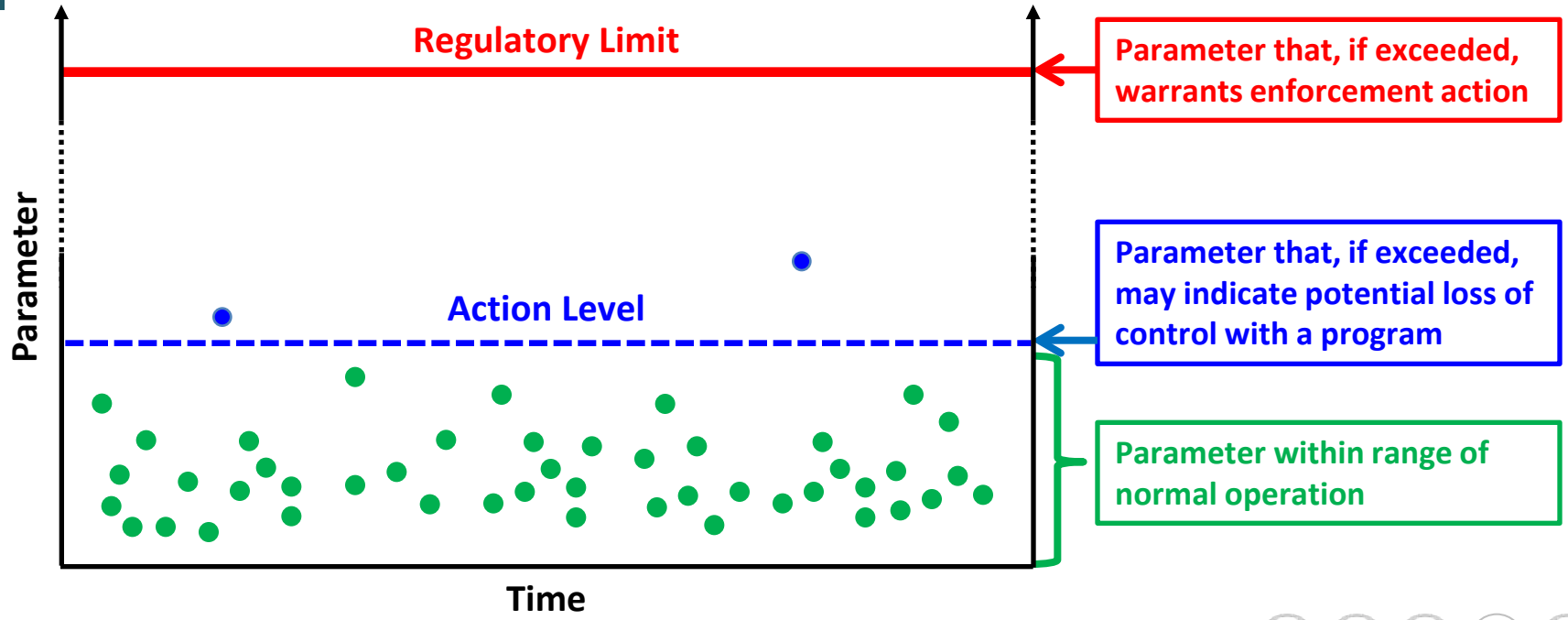
- Established to limit the quantity of nuclear and hazardous substances released into the environment

Action levels

- Threshold at which licensees take action to ensure program performance is maintained
- Established based on operating performance, at a level well below regulatory limits
- Assure intervention by the licensee before licence limits are exceeded

CNSC Regulatory Oversight

Regulatory Limits and Action Levels



Independent Environmental Monitoring Program (IEMP)

- CNSC staff sample air, water, soil, vegetation, and various foods to independently verify that the public and the environment are protected
- In 2017, CNSC staff conducted IEMP sampling at:
  - Cameco Blind River Refinery
  - Cameco Port Hope Conversion Facility
  - Cameco Fuel Manufacturing Inc.

All IEMP results are posted on the CNSC's website

CNSC staff taking water samples near the SRB Technologies facility in Pembroke, Ontario in 2018.

Photo Source: CNSC

Decision on Radionuclide Report in the National Pollutant Release Inventory (NPRI)

- Environment and Climate Change Canada (ECCC) concluded that radionuclides did not meet the criteria for an NPRI reportable substance
- CNSC has monitoring and licensee reporting requirements which exceed those of the NPRI
- Recognition that CNSC public reporting on radionuclides requires improvements with respect to consistency and accessibility
- CNSC and ECCC/NPRI working agreement to assist the CNSC in developing publicly accessible databases for radionuclides

Fulfilling CNSC's mandate to disseminate scientific and regulatory information

Indigenous and Community Engagement

- CNSC staff met with the Mississauga First Nation to include IEMP sample locations on their land
- In 2017, CNSC staff participated in Community Liaison Committee meetings, open houses and meetings between Indigenous communities and licensees

CNSC staff engage with the public and Indigenous groups

CNSC staff collecting air samples at a daycare on Mississauga First Nation land near the Blind River Refinery, 2017

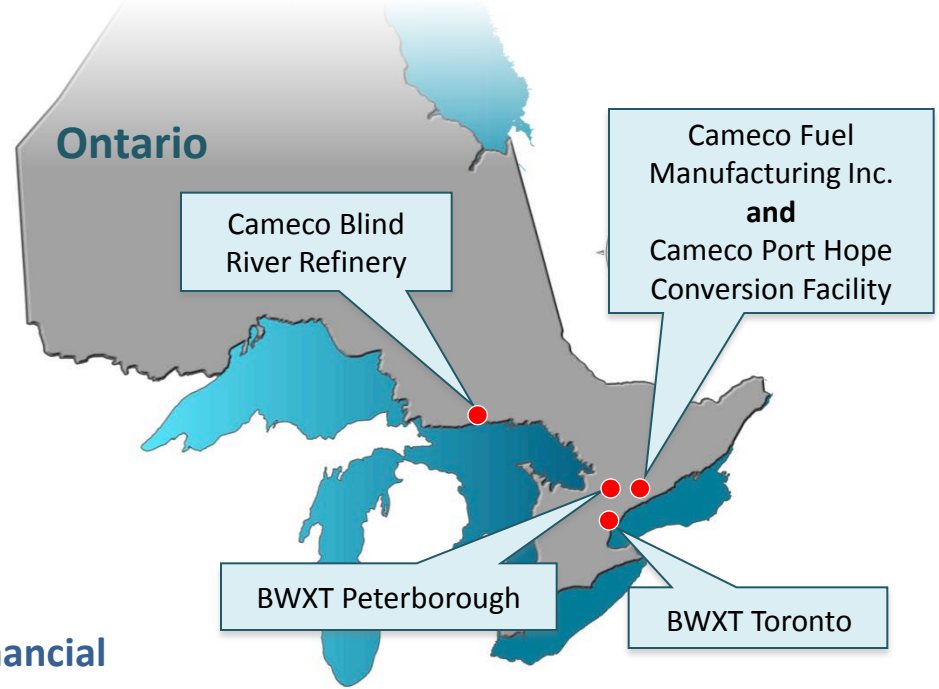
Photo Source: CNSC

Commission Meeting, December 13, 2018
CMD 18-M47.A

URANIUM PROCESSING FACILITIES

Uranium Processing Facilities

Facility	Licence Expiry	Financial Guarantee (approx.)
Cameco Blind River Refinery	February 2022	$48M
Cameco Port Hope Conversion Facility	February 2027	$128.6M
Cameco Fuel Manufacturing Inc.	February 2022	$21M
BWXT Toronto and Peterborough	December 2020	$52.4M



All uranium processing facilities have valid financial guarantees in place for decommissioning

Uranium Processing Facilities
Regulatory Oversight 2017

	Blind River Refinery	Port Hope Conversion Facility	Cameco Fuel Manufacturing	BWXT Toronto and Peterborough	Totals
Person Days for Licensing	16	23	11	78	**128**
Person Days for Compliance	223	301	295	214	**1033**
Number of Inspections	4	5	4	5	**18**
Inspection Action Items	7	22	19	12	**60**
Enforcement Actions	0	1	0	1	**2**
Number of Safeguards Inspections led by IAEA*	3	5	3	5	**16**

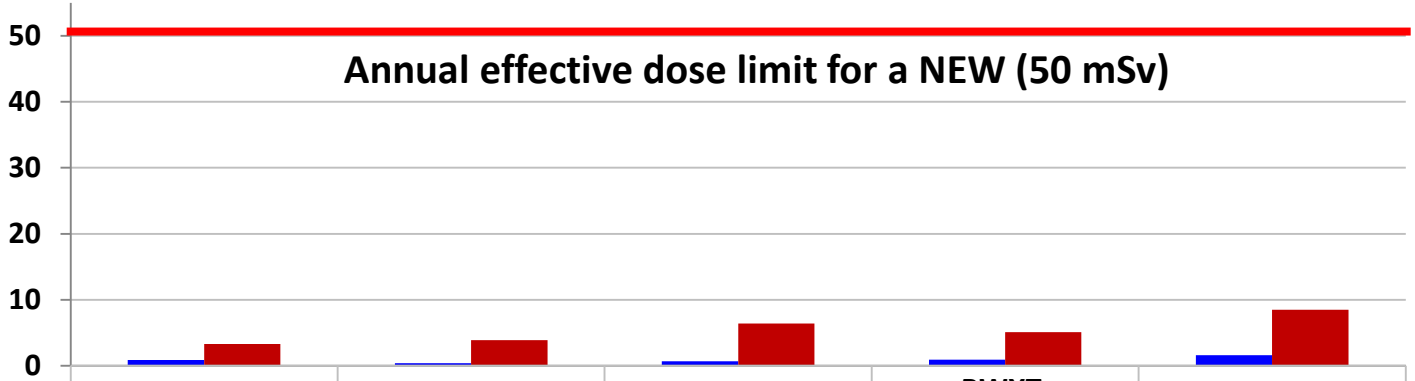
*Note: Canada has met their international obligations on the peaceful use of nuclear energy.

Uranium Processing Facilities
Performance Ratings 2017

Safety and Control Area	Blind River Refinery	Port Hope Conversion Facility	Cameco Fuel Manufacturing	BWXT Toronto and Peterborough
Management System	SA	BE	SA	SA
Human Performance Management	SA	SA	SA	SA
Operating Performance	SA	SA	SA	SA
Safety Analysis	SA	SA	SA	SA
Physical Design	SA	SA	SA	SA
Fitness for Service	SA	SA	SA	SA
Radiation Protection	SA	SA	SA	SA
Conventional Health and Safety	FS	SA	SA	SA
Environmental Protection	SA	SA	SA	SA
Emergency Management and Fire Protection	SA	SA	SA	SA
Waste Management	SA	SA	SA	SA
Security	SA	SA	SA	SA
Safeguards and Non-Proliferation	SA	SA	SA	SA
Packaging and Transport	SA	SA	SA	SA

FS = Fully Satisfactory
SA = Satisfactory
BE = Below Expectations
UA = Unacceptable

Radiation Protection
2017 Average and Maximum Effective Doses to Nuclear Energy Workers (NEWs)



	Cameco BRR	Cameco PHCF	CFM	BWXT Peterborough	BWXT Toronto
Average effective dose (mSv)	0.9	0.4	0.7	1.0	1.6
Maximum effective dose (mSv)	3.3	3.9	6.4	5.1	8.5

Note: In addition to the annual effective dose limit of 50 mSv in any one year, a regulatory dose limit of 100 mSv over a defined five-year dosimetry period is applied for a NEW

Uranium Processing Facilities

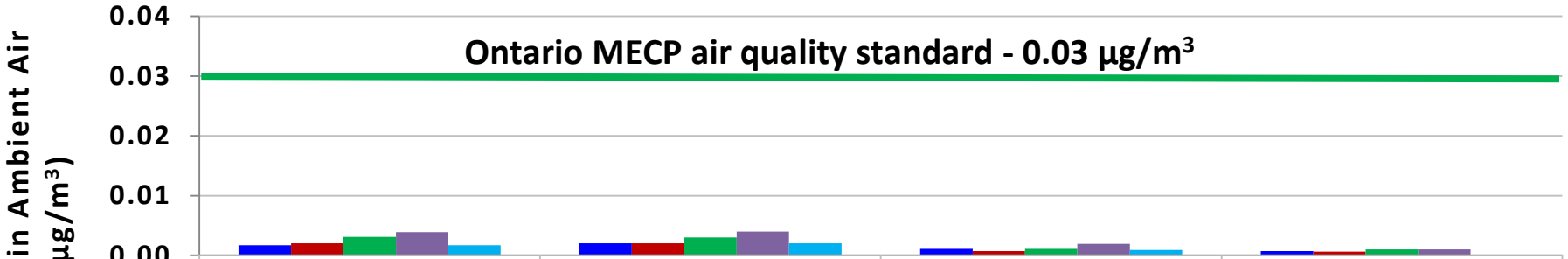
Dose to Public (mSv) 2013-2017 – 5 Year Trend

Facility	Year					Regulatory Limit
	2013	2014	2015	2016	2017	
Cameco Blind River Refinery	0.012	0.005	0.005	0.005	0.005	1 mSv/year
Cameco Port Hope Conversion Facility	0.021	0.012	0.006	0.020	0.153*	
Cameco Fuel Manufacturing	0.013	0.018	0.025	0.023	0.022	
BWXT Toronto	0.0006	0.0055	0.010	0.0007	0.0175	
BWXT Peterborough	<0.001	<0.001	<0.001	<0.001	<0.001	

*For 2017, Cameco PHCF's increased dose to the public is due to an update to their public dose calculations which include a more conservative dose estimate compared to previous years. There has been no increase in environmental releases or gamma dose from the PHCF and as a result, there is no increased risk to the public.

Environmental Protection

Uranium in Ambient Air 2013-2017 – 5 Year Trend

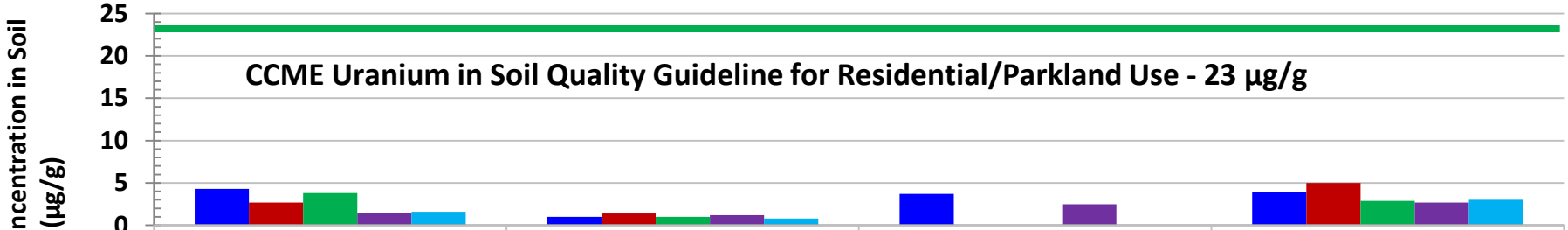


	Cameco BRR	Cameco PHCF	CFM	BWXT Toronto
2013	0.0017	0.0020	0.0011	0.0007
2014	0.0020	0.0020	0.0007	0.0006
2015	0.0031	0.0030	0.0011	0.0010
2016	0.0039	0.0040	0.0019	0.0010
2017	0.0017	0.0020	0.0009	<0.0001

Note: BWXT Peterborough does not conduct ambient air monitoring as emissions at the point of release are already below the Ontario Ministry of the Environment, Conservation and Parks (MECP) air quality standard for uranium.

Environmental Protection

Uranium Concentrations in Soil 2013-2017 – 5 Year Trend



	Cameco BRR	Cameco PHCF	CFM*	BWXT Toronto
2013	4.3	1.0	3.7	3.9
2014	2.7	1.4	N/A	5.0
2015	3.8	1.0	N/A	2.9
2016	1.5	1.2	2.5	2.7
2017	1.6	0.8	N/A	3.0

*Cameco Fuel Manufacturing (CFM) samples soil on a 3-year frequency
Note: BWXT Peterborough does not conduct soil monitoring due to extremely low stack emissions.
CCME = Canadian Council of Ministers of the Environment

Conventional Health and Safety

Lost-Time Injuries 2013-2017 – 5 Year Trend

Facility	2013	2014	2015	2016	2017
Cameco Blind River Refinery	0	0	0	0	0
Cameco Port Hope Conversion Facility	0	1	2	3	1
Cameco Fuel Manufacturing Inc.	0	0	1	0	0
BWXT Toronto and Peterborough	0	1	0	0	0

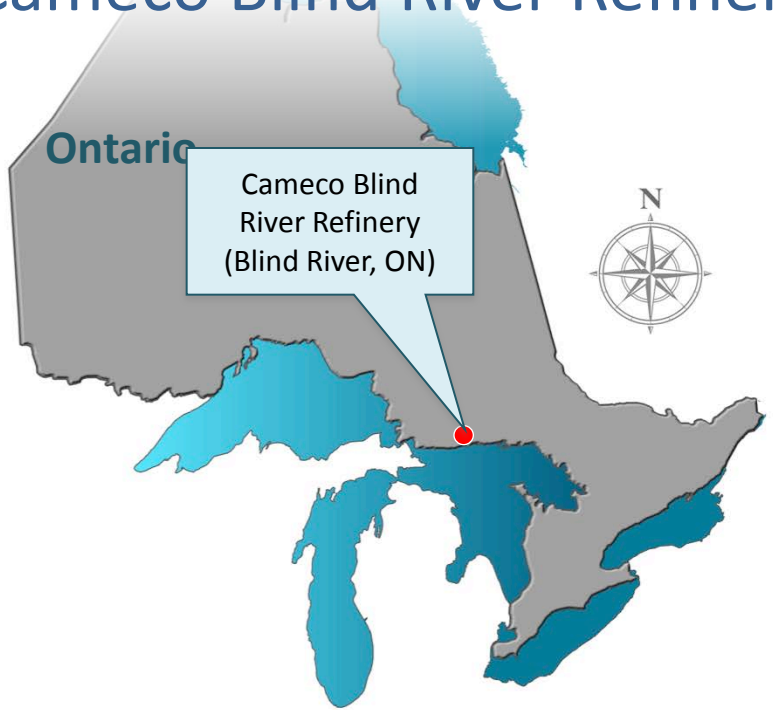
CNSC staff reviewed and confirmed corrective actions taken by licensees

Commission Meeting, December 13, 2018
CMD 18-M47.A

BLIND RIVER REFINERY

Uranium Processing Facilities

Cameco Blind River Refinery (BRR)



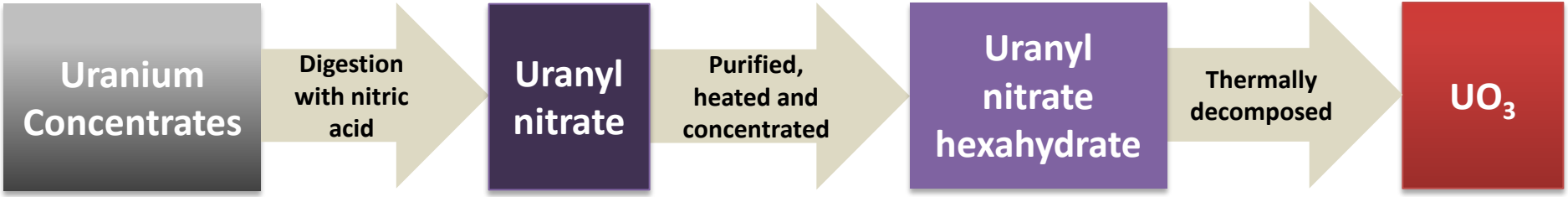
The Blind River Refinery facility is located about 5 kilometers to the west of Blind River, Ontario on Lake Huron.

Photo source: Cameco

Operational Activities

Cameco Blind River Refinery

- Refines uranium concentrates (yellowcake) received from uranium mines worldwide to produce uranium trioxide (UO_3)



Facility Highlights

Cameco Blind River Refinery

- No changes to facility operations in 2017
- No changes to the licence conditions handbook in 2017
- UO_3 plant had scheduled shutdowns for planned maintenance
- Facility was maintained according to its licensing basis

UO_3 tote bin loading and handling station at the Blind River Refinery.

Photo source: Cameco

Safety Performance Summary
Cameco Blind River Refinery

- No regulatory limits exceeded
- Action levels
  - one radiation protection action level exceeded
  - no environmental action levels exceeded
- No lost-time injuries
  - none in the past 11 years

Safety Performance Highlights

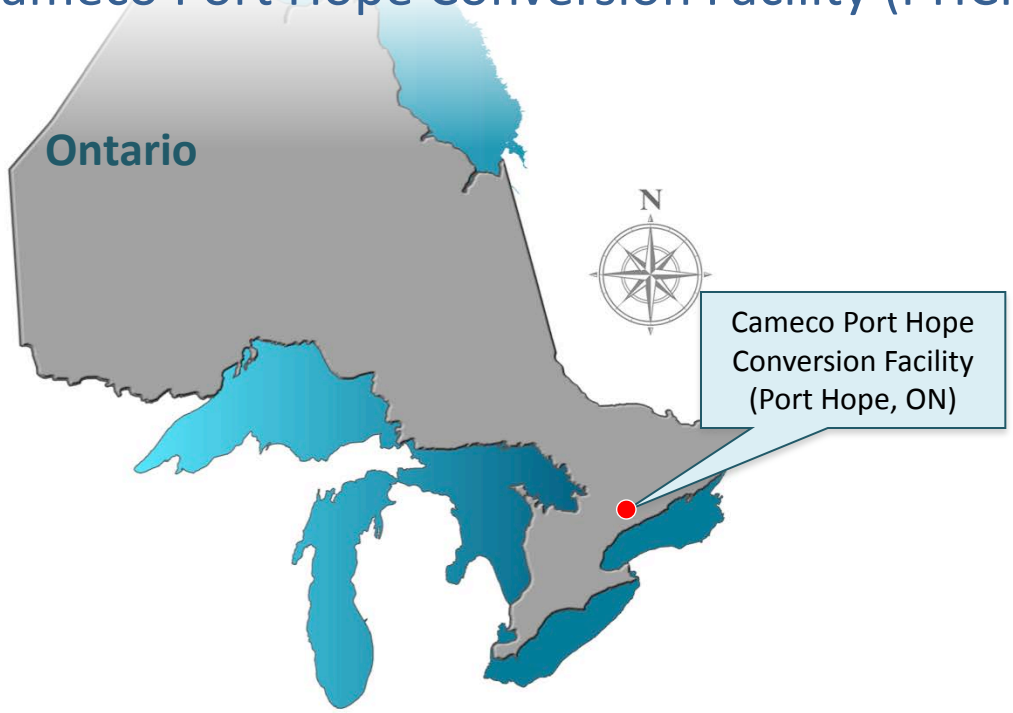
Cameco Blind River Refinery

- One radiation protection action level exceeded for whole-body dose of an employee
- Cameco conducted an investigation and concluded that the reported exposure was not attributed to the employee
- Cameco pursued a change to the employee's official dose record in the National Dose Registry
- The dose change request was reviewed by CNSC staff and approved in December 2017

Commission Meeting, December 13, 2018
CMD 18-M47.A

PORT HOPE CONVERSION FACILITY

Uranium Processing Facilities
Cameco Port Hope Conversion Facility (PHCF)



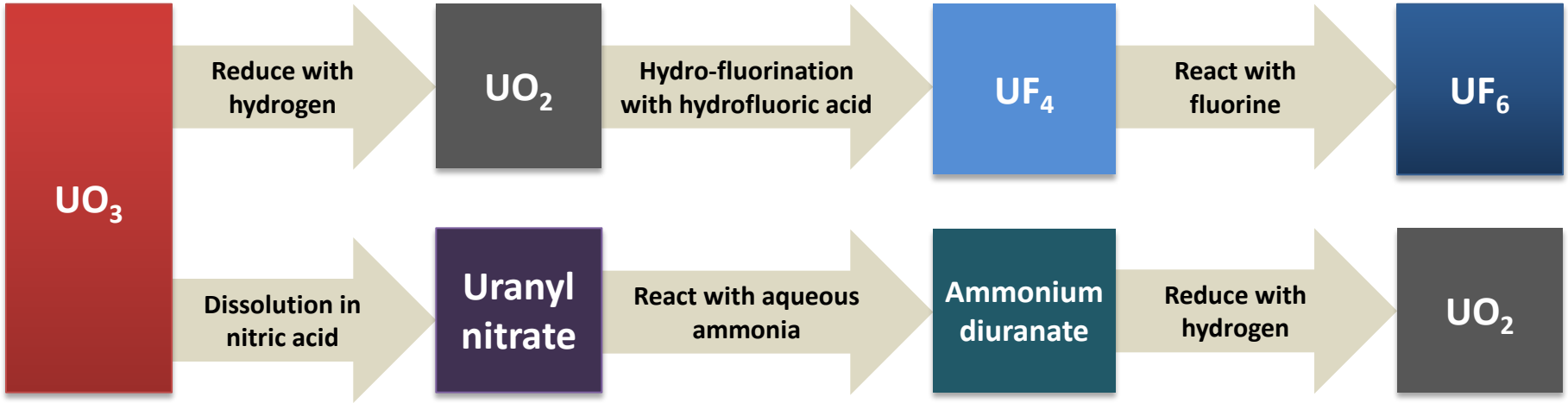
Port Hope Conversion Facility is situated on the north shore of Lake Ontario, approximately 100 kilometers east of Toronto.

Photo source: Cameco

Operational Activities

Cameco Port Hope Conversion Facility

- Converts UO_3 powder produced by Cameco's Blind River Refinery into uranium dioxide (UO_2) and uranium hexafluoride (UF_6)



Facility Highlights
Cameco Port Hope Conversion Facility

- Vision in Motion (VIM) project oversight
  - repackaging of stored wastes in preparation for transfer to Canadian Nuclear Laboratories' Long-Term Waste Management Facility (LTWMF)
  - asbestos abatement and electrical upgrades in the former UF_6 plant to prepare for future equipment removal and demolition
- Cameco is working closely with Canadian Nuclear Laboratories on remediation activities

Demolition of building 42 on the Centre Pier in Port Hope.

Photo source: Cameco

Safety Performance Summary

Cameco Port Hope Conversion Facility

- No regulatory limits exceeded
- Action levels
  - No radiation protection action level exceedances
  - 19 instances of one environmental action level exceedance
- One lost-time injury
  - injured arm muscle when attempting to lift a drum

CNSC staff reviewed and confirmed corrective actions taken by Cameco

Safety Performance Highlights

Cameco Port Hope Conversion Facility

- 19 action level exceedances for uranium discharges from the sanitary sewer
- Cameco's investigation attributed this to heavy rainfall leading to groundwater infiltration into sanitary sewer piping
- Releases were below licence limit with no impact on the environment
- Cameco committed to corrective actions such as sealing the identified infiltration sources and upgrading the sanitary sewer system as part of VIM
- CNSC staff reviewed Cameco's investigation and corrective actions, and found them acceptable

Facility Highlights
Cameco Port Hope Conversion Facility

- No changes to facility operations in 2017
- No changes to the licence conditions handbook in 2017
- The UO_2 and UF_6 plants had scheduled shutdowns for planned maintenance
- Facility was maintained according to the licensing basis

Port Hope Conversion Facility worker performing visual check on UO_2 inside rotary kiln.

Photo source: Cameco

Enforcement Action Summary (1/2)

Cameco Port Hope Conversion Facility

- In May 2017, Cameco reported a release of hydrogen fluoride gas at its UF_6 plant during maintenance work
- Worker was not injured and there were no environmental impacts as a result of this event reported to the CNSC
- CNSC staff conducted a reactive inspection, assessed the event and Cameco's past compliance history
- Cameco failed to verify whether work was being performed correctly and according to its approved management system

Enforcement Action Summary (2/2)

Cameco Port Hope Conversion Facility

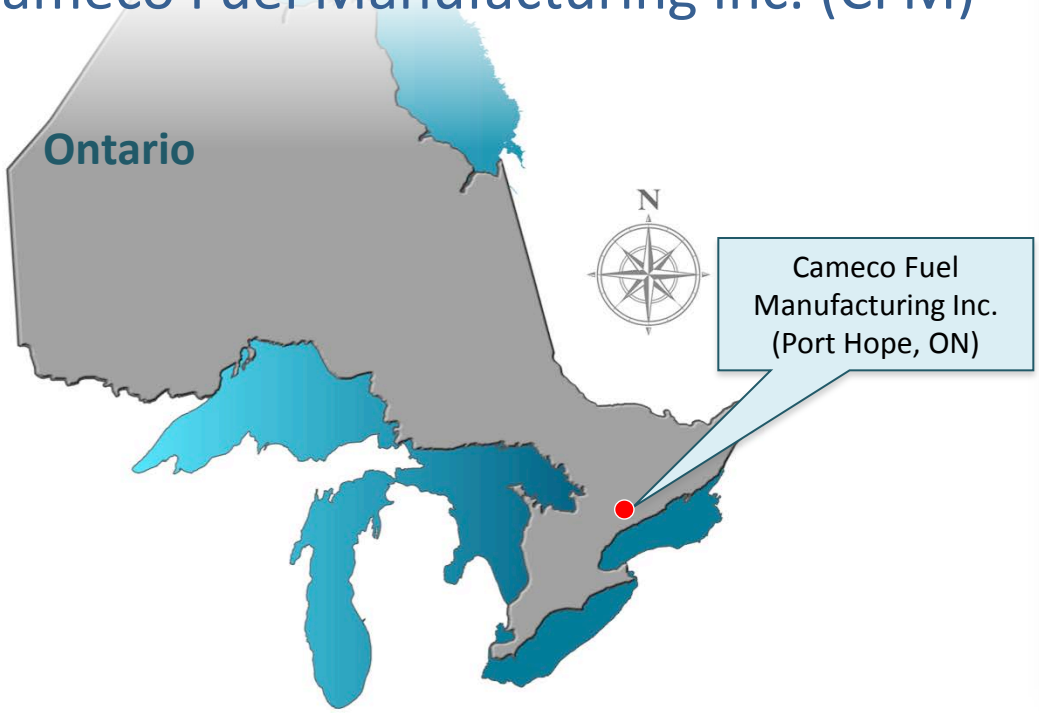
- In September 2018, AMP issued to Cameco for non-compliance with its management system
- Cameco challenged AMP and requested review by the Commission
- In May 2018, Commission determined that Cameco committed the violation
- With Cameco's payment of the full amount in June 2018, CNSC closed the AMP

Corrective actions in response to the event are closed

Commission Meeting, December 13, 2018
CMD 18-M47.A

CAMECO FUEL MANUFACTURING INC.

Uranium Processing Facilities
Cameco Fuel Manufacturing Inc. (CFM)



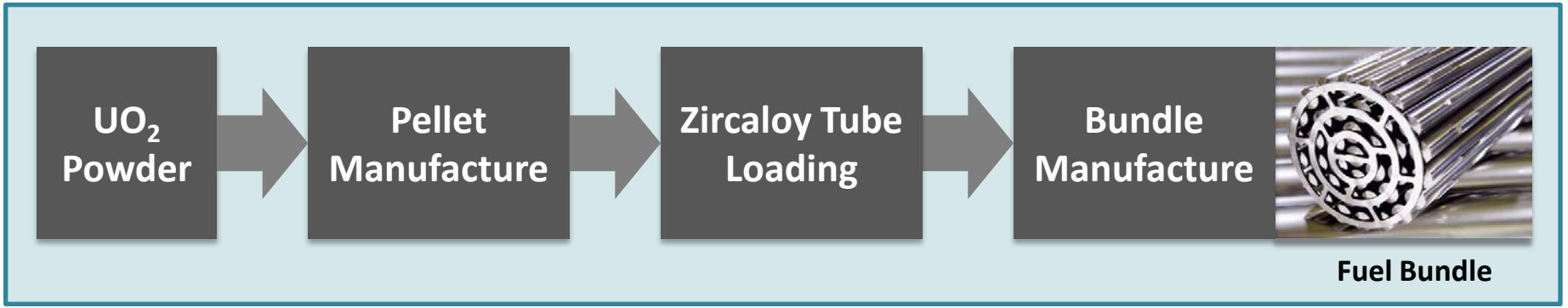
Cameco Fuel Manufacturing facility is located in Port Hope, Ontario.

Photo source: Cameco

Operational Activities

Cameco Fuel Manufacturing Inc.

- Manufactures nuclear reactor fuel bundles from uranium dioxide (UO_2) and zirconium alloy (zircaloy) tubes



Facility Highlights

Cameco Fuel Manufacturing Inc.

- No changes to facility operations in 2017
- No changes to the licence conditions handbook in 2017
- CFM had scheduled shutdowns for planned maintenance
- Facility was maintained according to the licensing basis

A CFM worker performing a final inspection on a fuel bundle prior to packaging.

Photo source: Cameco

Safety Performance Summary

Cameco Fuel Manufacturing Inc.

- No regulatory limits exceeded
- Action levels
  - one radiation protection action level exceeded
  - one environmental action level exceeded
- No lost-time injuries

Safety Performance Highlights
Cameco Fuel Manufacturing

- One radiation protection action level exceeded
  - in Q2, 2017, worker whole-body dose measurement of 1.4 mSv exceeded action level of 1.0 mSv
- One environmental action level exceeded
  - in Q3, 2017, fenceline gamma measurements of 1.1 µSv/h exceeded action level of 1.0 µSv/h

CNSC staff reviewed and confirmed corrective actions taken by Cameco

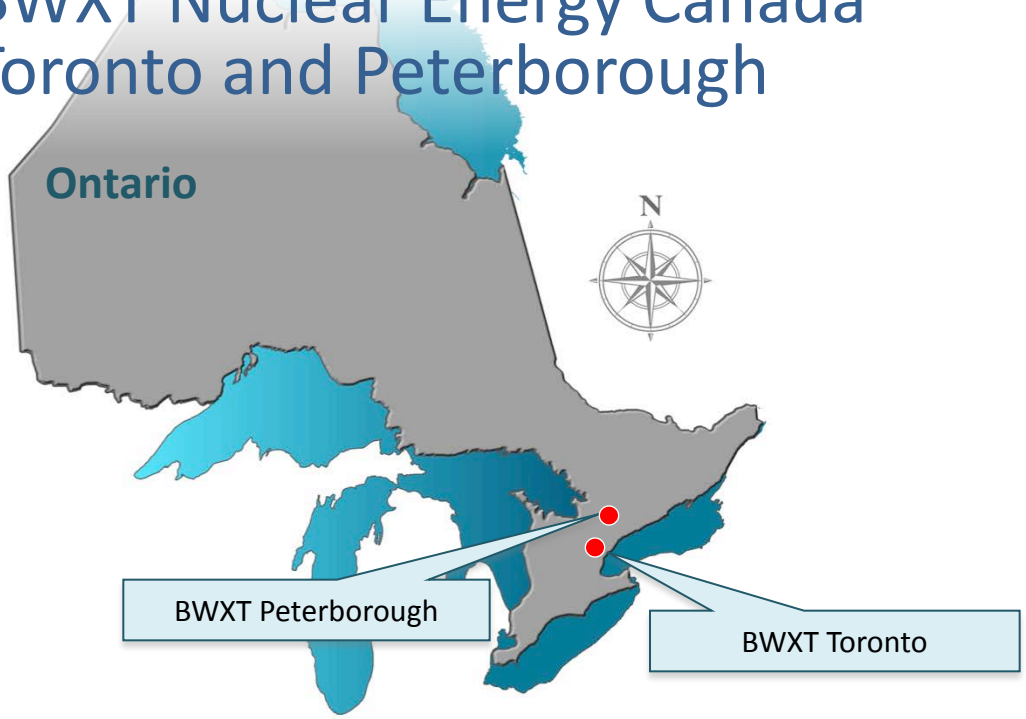
Commission Meeting, December 13, 2018
CMD 18-M47.A

BWXT NUCLEAR ENERGY CANADA

Commission Meeting, December 13, 2018
CMD 18-M47.A

Uranium Processing Facilities

BWXT Nuclear Energy Canada Toronto and Peterborough



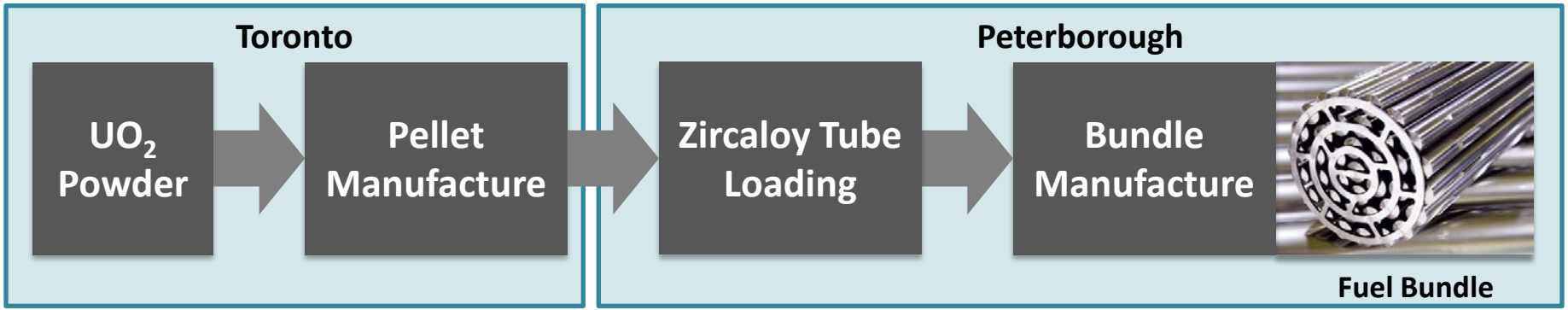
BWXT has two sites in Ontario, one in Toronto (top photo) and one in Peterborough (bottom photo).

Photo source: BWXT, Google

Operational Activities

BWXT Toronto and Peterborough

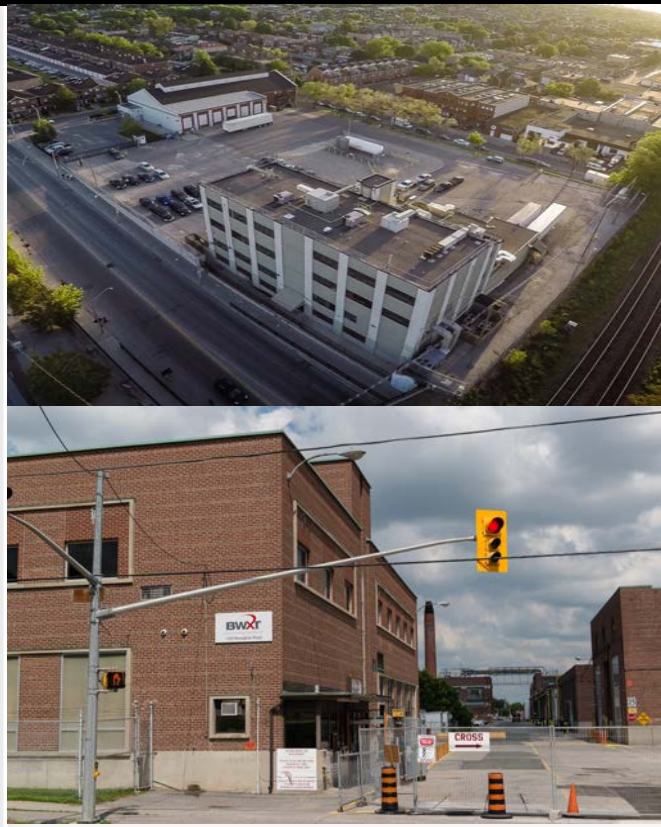
- Toronto facility produces natural and UO_2 pellets for nuclear fuel bundles
- Peterborough facility produces and tests nuclear fuel bundles



Facility Highlights

BWXT Toronto and Peterborough

- Commission approved the transfer of GE-Hitachi Nuclear Energy Canada Inc.'s (GEH-C) operating licence to BWXT in December 2016
- Licence conditions handbook was revised accordingly to reflect changes
- No changes to facility operations in 2017
- Facilities were maintained according to the licensing basis



BWXT sites in Toronto (top) and Peterborough (bottom).

Photo source: BWXT

Safety Performance Summary
BWXT Toronto and Peterborough

- One regulatory limit exceeded
  - occupational exposure of beryllium for two workers
  - no radiation or environmental protection regulatory limits exceeded
- No action levels exceeded
- No lost-time injuries

Enforcement Action Summary

BWXT Peterborough

- In August 2017, BWXT reported that incorrect respirator cartridges/filters were used during non-routine maintenance activities
- CNSC issued a request under the GNSR section 12(2) to BWXT requiring to conduct additional analyses and report on results
- CNSC staff conducted a reactive inspection in October 2017 and found that BWXT addressed all of CNSC's actions

CNSC staff reviewed BWXT's investigation and confirmed corrective actions

Safety Performance Conclusions

Uranium Processing Facilities

- CNSC staff are satisfied that in 2017, licensees operating uranium processing facilities in Canada:
  - adequately controlled radiation exposures to keep doses ALARA and environmental releases to protect the environment
  - continued to protect workers with an effective conventional health and safety program
  - continued to effectively implement programs in support of all SCAs
- Cameco is making appropriate improvement to its management system at PHCF and continues to ensure protection of workers and the environment

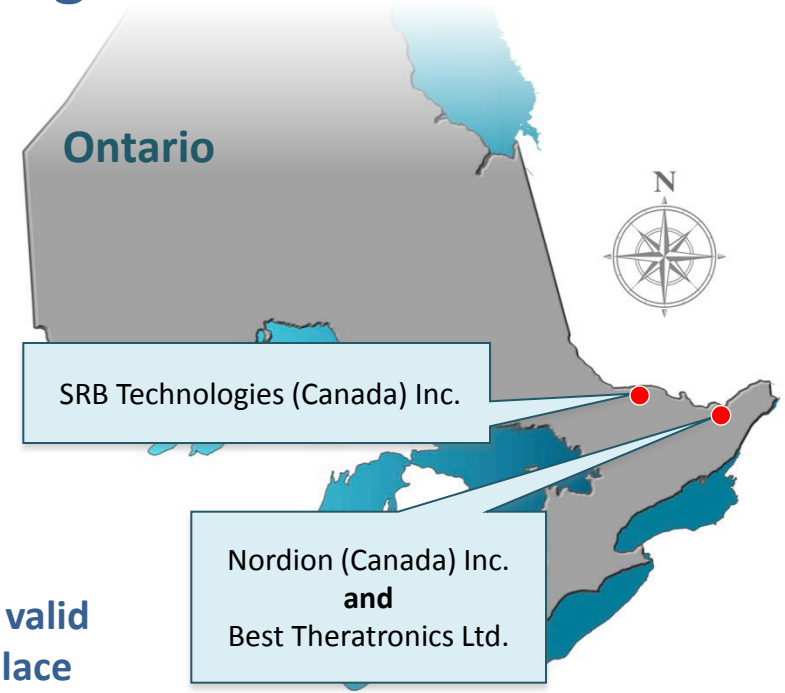
CNSC staff are satisfied that licensees continue to protect the health and safety of workers, public and the environment

Commission Meeting, December 13, 2018
CMD 18-M47.A

NUCLEAR SUBSTANCE PROCESSING FACILITIES

Nuclear Substance Processing Facilities

Facility	Licence Expiry	Financial Guarantee (approx.)
SRB Technologies (Canada) Inc.	June 2022	$0.68M
Nordion (Canada) Inc.	October 2025	$45.1M
Best Theratronics Ltd.	June 2019	$1.8M



All nuclear substance processing facilities have valid financial guarantees for decommissioning in place

Nuclear Substance Processing Facilities

Regulatory Oversight in 2017

	SRB Technologies (Canada) Inc.	Nordion (Canada) Inc.	Best Theratronics Ltd.	Totals
Person Days for Licensing	13	5	5	**23**
Person Days for Compliance	105	198	106	**409**
Number of Inspections	2	5	4	**11**
Inspection Action Items	3	8	12	**23**
Enforcement Actions	0	0	0	**0**
Number of Safeguards Inspections led by IAEA*	0	1	0	**1**

*Note: Canada has met their international obligations on the peaceful use of nuclear energy.

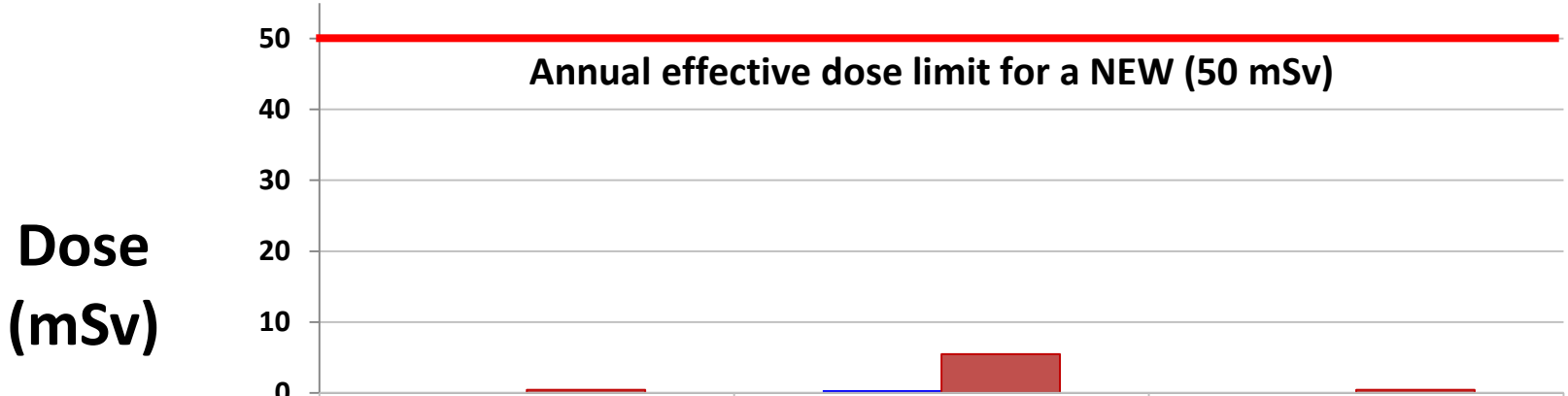
Nuclear Substance Processing Facilities

Performance Ratings 2017

Safety and Control Area	SRB Technologies (Canada) Inc.	Nordion (Canada) Inc.	Best Theratronics Ltd.
Management System	SA	SA	SA
Human Performance Management	SA	SA	SA
Operating Performance	SA	SA	SA
Safety Analysis	SA	SA	SA
Physical Design	SA	SA	SA
Fitness for Service	FS	SA	SA
Radiation Protection	SA	SA	SA
Conventional Health and Safety	SA	SA	SA
Environmental Protection	SA	FS	SA
Emergency Management and Fire Protection	SA	SA	SA
Waste Management	SA	SA	SA
Security	SA	FS	SA
Safeguards and Non-Proliferation	N/A	SA	SA
Packaging and Transport	SA	SA	SA

FS = Fully Satisfactory
SA = Satisfactory
BE = Below Expectations
UA = Unacceptable
N/A = Not Applicable

Radiation Protection
2017 Average and Maximum Effective Doses to Nuclear Energy Workers (NEWs)



	SRBT	Nordion	BTL
Average effective dose (mSv)	0.05	0.42	0.02
Maximum effective dose (mSv)	0.46	5.49	0.47

Note: In addition to the annual effective dose limit of 50 mSv in any one year, a regulatory dose limit of 100 mSv over a defined five-year dosimetry period is applied for a NEW

Nuclear Substance Processing Facilities

Dose to Public 2013-2017 (mSv) – 5 Year Trend

Facility	Year					Regulatory limit
	2013	2014	2015	2016	2017	
SRB Technologies	0.0068	0.0067	0.0068	0.0046	0.0033	1 mSv/year
Nordion	0.022	0.010	0.0056	0.0021	0.0001	
Best Theratronics	N/A	N/A	N/A	N/A	N/A	

N/A = Not applicable

Public dose estimates are not provided for Best Theratronics Ltd. because its licensed activities involve sealed sources and there are no discharges to the environment.

Conventional Health and Safety

Lost-Time Injuries (LTIs) 2013-2017 – 5 Year Trend

Facility	2013	2014	2015	2016	2017
SRB Technologies	0	0	0	0	3
Nordion	1	3	0	3	0
Best Theratronics	N/A	1	1	3	1

N/A = Not Applicable
Best Theratronics was not required to report LTI statistics prior to 2014 under its previous licence.

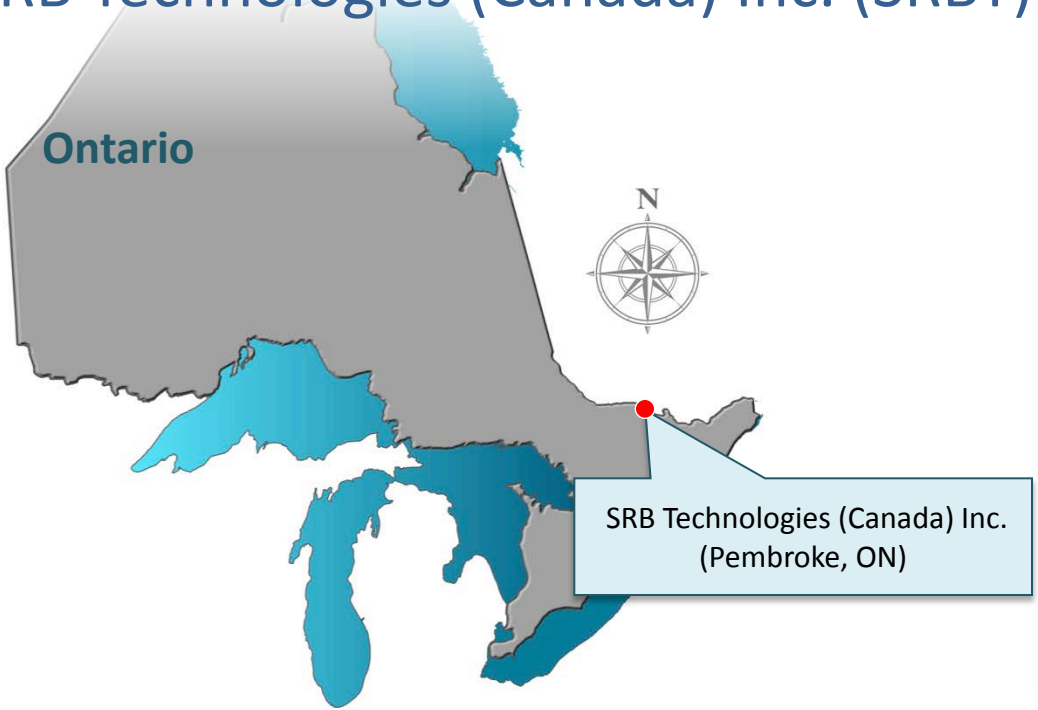
CNSC staff reviewed and confirmed corrective actions taken by licensees

Commission Meeting, December 13, 2018
CMD 18-M47.A

SRB TECHNOLOGIES (CANADA) INC.

Nuclear Substance Processing Facilities

SRB Technologies (Canada) Inc. (SRBT)



Aerial view of SRB Technologies. SRBT is a gaseous tritium light source manufacturing facility located in Pembroke, Ontario.

Photo source: SRB Technologies

Operational Activities

SRB Technologies (Canada) Inc.

- Processes tritium gas to produce gaseous tritium light sources (GTLS)
- Manufactures radiation devices in various shapes, sizes and colours that contain GTLS

Exit Signs

Safety Markers

Raw Light Sources

Safety Signs

Tactical Devices

Photo source: SRB Technologies

Facility Highlights
SRB Technologies (Canada) Inc.

- No changes to facility operations in 2017
- No changes to the licence conditions handbook in 2017
- Facility was maintained according to the licensing basis

SRBT employee performing tritium filling operations

Photo source: SRBT

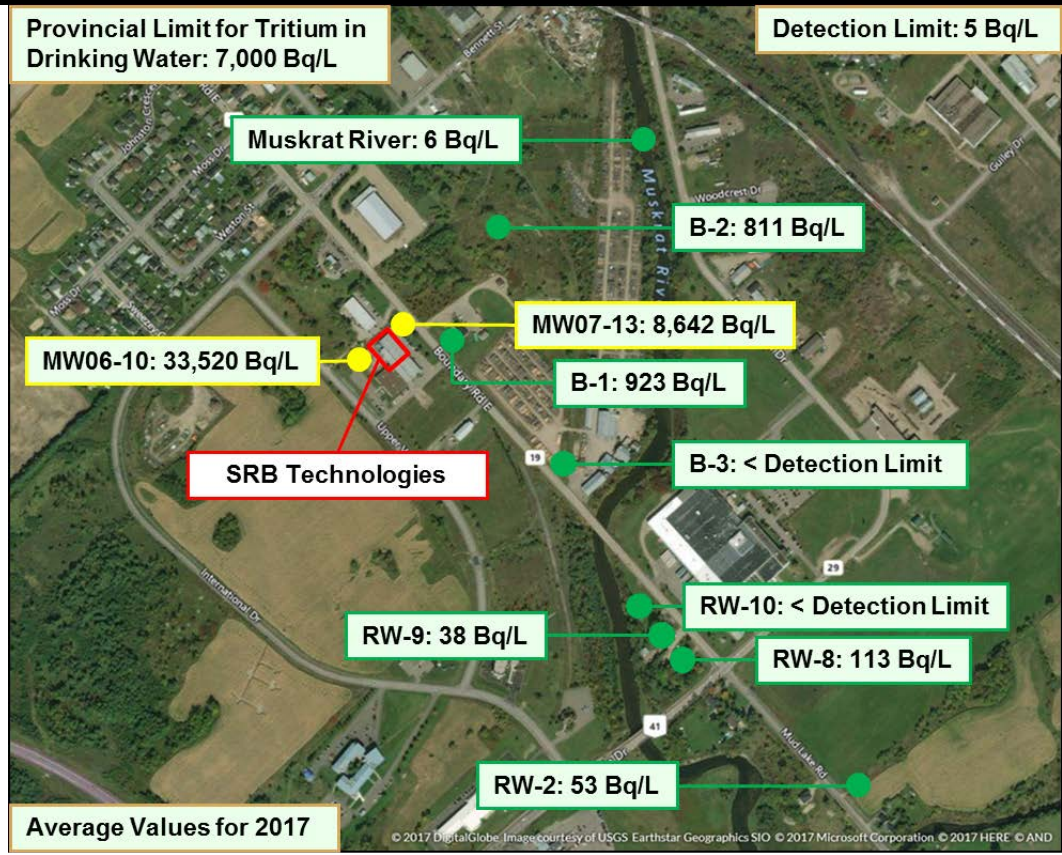
Commission Meeting, December 13, 2018
CMD 18-M47.A

Facility Highlights

Tritium Concentrations In Groundwater (2017)

- Tritium levels surrounding the facility continue to decrease compared to previous years
- Elevated tritium concentrations originated from past operations
- Low values near and in Muskrat River and residential areas

Public and environment around the facility remain protected



Safety Performance Summary
SRB Technologies (Canada) Inc.

- No regulatory limits exceeded
- No action levels exceeded
- Three lost-time injuries
  - lacerated hand
  - injured back
  - sudden shoulder pain

CNSC staff reviewed and confirmed corrective actions taken by SRBT

Commission Meeting, December 13, 2018
CMD 18-M47.A

NORDION (CANADA) INC.

Commission Meeting, December 13, 2018
CMD 18-M47.A

Nuclear Substance Processing Facilities
Nordion (Canada) Inc.

The Nordion (Canada) Inc. facility located in Ottawa, Ontario is highlighted in red.

Photo source: Bing Maps

Operational Activities

Nordion (Canada) Inc.

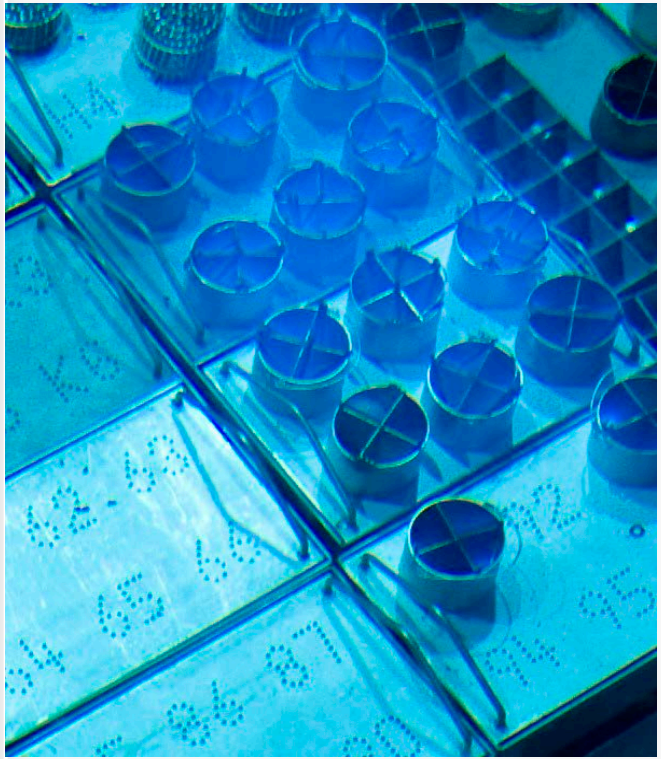
- Manufactures sealed radiation sources (cobalt-60) for medical and industrial applications
- Processes radioisotopes (such as yttrium-90) for health and life sciences applications

Nordion personnel working with a hot cell manipulator.

Photo source: Nordion

Facility Highlights
Nordion (Canada) Inc.

- In 2016, Nordion ceased production and sale of iodine-125, iodine-131 and xenon-133
- In April 2018, BWXT announced the acquisition of Nordion's medical isotope business
- No changes to the licence conditions handbook in 2017
- Facility was maintained according to the licensing basis



Co-60 storage pool at Nordion.

Photo source: Nordion

Safety Performance Summary

Nordion (Canada) Inc.

- No regulatory limits exceeded
- No action levels exceeded
- No lost-time injuries

Commission Meeting, December 13, 2018
CMD 18-M47.A

BEST THERATRONICS LTD.

Commission Meeting, December 13, 2018
CMD 18-M47.A

Nuclear Substance Processing Facilities
Best Theratronics Ltd. (BTL)

The Best Theratronics Ltd. facility located in Ottawa, Ontario is highlighted in red.

Photo source: Bing Maps

Operational Activities

Best Theratronics Ltd.

- Manufactures medical equipment, including cobalt-60 (Co-60) radiation therapy units and cesium-137 (Cs-137) blood irradiators
- No changes to facility operations
- In July 2017, the Commission accepted BTL's financial guarantees and amended the licence
- Licence conditions handbook was revised accordingly to reflect changes
- BTL was non-compliant with its financial guarantee licence condition; its licensing basis was maintained otherwise

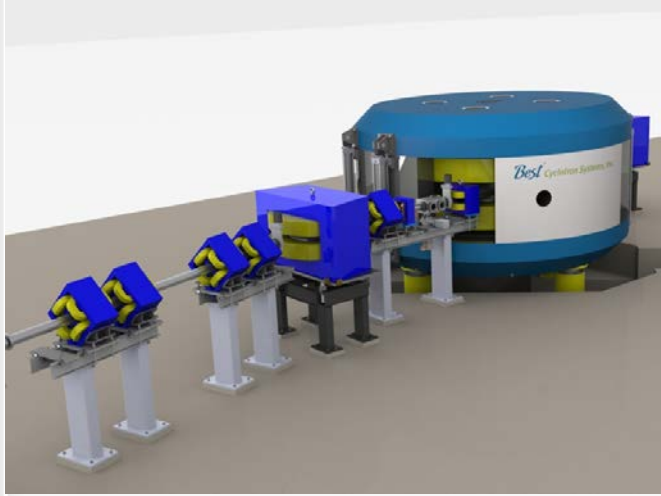


Image of a 70 MeV cyclotron manufactured by BTL.

Photo source: Best Theratronics Ltd

Enforcement Action Summary

Best Theratronics Ltd.

- August 24, 2015: CNSC Designated Officer issued an order to BTL for being non-compliant with the financial guarantee licence condition
- BTL reduced its inventory of nuclear substances, and submitted a revised preliminary decommissioning plan and cost estimate of $1.8 million
- July 14, 2017: the Commission accepted the revised financial guarantee

Best Theratronics is in compliance with its financial guarantee licence condition

Safety Performance Summary
Best Theratronics Ltd.

- No regulatory limits exceeded
- No action levels exceeded
- One lost-time injury
  - thumb laceration

CNSC staff reviewed and confirmed corrective actions taken by BTL

Safety Performance Conclusions

Nuclear Substance Processing Facilities

- CNSC staff have confirmed that in 2017, licensees operating nuclear substance processing facilities in Canada:
  - adequately controlled radiation exposures to keep doses ALARA and environmental releases to protect the environment
  - continued to protect workers with its conventional health and safety program
  - continued to effectively implement programs in support of all SCAs
  - addressed all areas of non-compliance in a timely manner

CNSC staff are satisfied that licensees continue to protect the health and safety of workers, public and the environment

Commission Meeting, December 13, 2018
CMD 18-M47.A

PARTICIPANT FUNDING AND INTERVENTIONS

Participant Funding Program (PFP) and Interventions

- CNSC provided funding of up to $25,000 to the following recipients
  - Canadian Environmental Law Association (CELA)
  - Sagamok Anishnawbek First Nation
- A total of four written interventions received
  - Canadian Nuclear Workers Council
  - Northwatch
  - Both PFP recipients

Key Themes in Interventions

- Public availability of data and disclosure of documents
- Waste management
- Focus of inspections
- Licence limits and actual releases
- Engagement with Indigenous communities

Public availability of data and disclosure of documents

"We recommend that CNSC require the disclosure of licensees' Environmental Protection Programs, Waste Management and Preliminary Disclosure Plans." (CELA)

CNSC staff response:

- As requested, CNSC staff provided copies of licences, licence condition handbooks and redacted ERAs to CELA
- Licensees' annual compliance reports are available on their websites
- Upon implementation of REGDOC-3.2.1, *Public Information and Disclosure*, licensees will be required to post their ERAs
- Environmental protection programs, waste management programs and preliminary decommissioning plans may contain proprietary information

Waste management

"Waste Management should be a mandatory component of RORs, to further the mandate of the Commission per s. 9 of the NSCA to ensure the protection of the environment." (CELA)

CNSC staff response:

- ROR focusses on radiation protection, environmental protection, and conventional health and safety SCAs; other SCAs are addressed as necessary
- CNSC produces a comprehensive report on waste management through the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*
- Licensees' annual compliance reports include details on waste management and are available to the public

Focus of inspections

"The CNSC should detail how it ensures compliance with the licensees' Environmental Protection SCA when annual inspections do not include this SCA in its review." (CELA)

CNSC staff response:

- CNSC staff do not perform onsite inspections that cover all SCAs during a year
- Inspections are based on risk-informed compliance plans for each facility
- Additional inspections may be conducted if warranted by licensee performance
- Compliance verification is also conducted through reviews of reporting submissions

Licence limits and actual releases

"We recommend the Commission lower allowable licence limits, in keeping with the ALARA principle, and to ensure that fluctuations within emission releases are more detectable." (CELA)

CNSC staff response:

- CNSC staff acknowledge that licence limits can be much higher than releases at certain facilities
- Current licence limits are established at levels that protect the health and safety of persons and the environment
- Licensees are required to monitor and report on their releases and any fluctuations as part of their trend analyses in licensees' annual compliance reports

Engagement with Indigenous communities

Request for participation in compliance activities and improve engagement (Sagamok First Nation)

CNSC staff response:

- CNSC staff are committed to strengthening relationships with each Indigenous community with an interest in CNSC regulated facilities
- CNSC staff are working with interested Indigenous communities to develop a mutually agreed upon formalized structure for ongoing and regular engagement
- As an independent regulator, CNSC does not conduct inspections with members of the public or Indigenous groups; licensees are encouraged to provide facility tours

Commission Meeting, December 13, 2018
CMD 18-M47.A

CONCLUSION

Conclusions

CNSC staff's regulatory oversight activities confirmed that:

- Licensees are taking action in a timely manner
- Licensees' programs are implemented effectively
- Priority areas using a risk-informed approach and verification activities are maintained
- Trends across the uranium and nuclear substance processing facilities are safe

CNSC mandate to protect the environment, the health and safety of workers, and the public

Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

Canada

Connect With Us

Join the conversation

nuclearsafety.gc.ca

Commission Meeting, December 13, 2018
CMD 18-M47.A

ANNEX 1 – RATING METHODOLOGY USED IN NUCLEAR FUEL CYCLE AND FACILITIES REGULATORY OVERSIGHT REPORTS

Outline

- Background
- Regulatory Oversight
- Rating Objectives
- Rating Methodology for Nuclear Cycle Facilities Performance Reports
- Conclusion

Background (1/2)

- Regulatory Oversight Reports include performance ratings
- CNSC staff rate licensee performance within each Safety and Control Area
- Internationally Canada is unique in:
  - Rating performance for fuel cycle program licensees
  - Presenting these reports in a public meeting
  - Offering public interventions and participant funding on the reports

Background (2/2)

- Detailed reporting on areas of interest to the public and Commission:
  - Radiation Protection
  - Environmental Protection
  - Conventional Health and Safety

  Key performance indicators directly linked to the CNSC mandate to protect health, safety and the environment

  - Other Areas of Concern or Major Improvements
- Performance ratings reflect our understanding and history with the licensed facility

Regulatory Oversight (1/2)

- Licensee performance is continually assessed by CNSC staff
  - Performance ratings do not replace day to day compliance and enforcement
  - Non-compliances are addressed with enforcement actions at the time they are discovered
- Compliance planning
  - Takes into account the risk associated with the type/complexity of the facilities or activities
  - Is flexible to allow for the broad range of licensee operations
- Compliance results come from various inputs such as inspections, technical assessments of licensee scheduled and unscheduled reporting and enforcement actions

Regulatory Oversight (2/2)

- Subject Matter Experts are organized into Facility Assessment and Compliance (FAC)Teams
  - Licensing, inspection and specialist groups collaborate using a multi-key approach in regulatory oversight in teams organized by licensed facility
  - These teams participate in compliance planning and oversight activities throughout the licence period and reflect a collective knowledge of each facility
- Compliance activities include:
  - Inspections at the licensed locations
  - Technical assessments of licensee submissions such as:
    - scheduled Annual Compliance Reports
    - unscheduled event or occurrence reports

Rating Objectives

- Provides overall picture to the Commission, public and Aboriginal Groups on performance in a transparent manner
- Trending of ratings over time can inform regulatory program
- Indicate to licensees where they need to focus effort and where they need to maintain current performance
- Highlight good performance

Rating Methodology Overview (1/2)

- Expert judgement/qualitative approach in evaluating and rating licensees' performance using performance indicators
- Based on evaluation of licensee's performance:
  - Since the last rating was assigned
  - Over the current licensing period including the significance of any enforcement actions issued and the licensee's response to those actions
- Ratings draw upon the FAC Teams' exposure to rating similar facilities within that Safety and Control Area and ensure knowledge is shared

Rigorous Methodology and Reproducible Ratings

Rating Methodology Overview (2/2)

- Each safety and control area is evaluated individually and every facility has different inputs to the technical topic areas
- For example:
  - a rating may not have an input from onsite inspections in an SCA if none were conducted in that year
  - in these cases the rating input is based on the FAC team's assessment of scheduled and unscheduled reports since the last rating was assigned

Each safety and control area is evaluated individually

Three Step Process Approach

1 Identify Compliance Results

- Inspections
- Technical Assessments
  - Scheduled and
  - Unscheduled Reports
- Enforcement actions
- Trends
- Performance indicators

2 Assess Compliance Results

- Regulatory requirements

3 Rate Performance

- Performance by SCA for each licensee

Identify Compliance Results

1 Identify Compliance Results → 2 → 3

- Compliance results compiled by FAC Team
- The number and types of compliance results is facility specific and based on our risk-informed compliance plans
- Non-compliances are addressed as they are found and the Commission is updated on any significant findings at the time they occur

Identify Compliance Results

1 → **2 Assess Compliance Results** → 3

- Use a qualitative, expert based approach to assess compliance results against regulatory requirements using documented technical assessments
- Safety significance is assigned to non-compliances and enforcement actions
- CNSC Regulatory Information Bank database used to rank, monitor and report on non-compliances and enforcement actions and licensee commitments

Rate Performance (1/2)

1 → 2 → **3 Rate Performance**

- Scheduled and Unscheduled Reporting
- Inspection Results
- Non-compliances and enforcement Actions
  - Low, medium and high safety significance
- Performance Indicators and Trends
  - Lost-time injuries
  - Reportable events
  - Licensee response to events
  - Worker radiation doses
  - Environmental releases
  - Major improvements

FAC Team Considerations in Rating Performance

Rate Performance (2/2)

1 → 2 → **3 Rate Performance**

- Qualitative approach taken due to the number of compliance results considered for these licensees
- Consistency in rating between facilities and activities through FAC Team's shared knowledge, lessons learned and mentoring
- Single reportable event or deficiency in a program area does not result in a licensee getting a BE or prevent a licensee from getting a FS
- Compliance results drive the rating in an SCA

UA	BE	SA	FS
Unacceptable	Below expectations	Satisfactory	Fully Satisfactory

Example 1: PHCF 2016 Management System SCA Rating

1 Identify Compliance Results

Inspections

- Findings related to Management System SCA during Type II inspections

Technical Assessments

- Annual Compliance Report review
- Review of Quality Management Program Manual

2 Assess Compliance Results

- All Enforcement Actions addressed
- Technical assessments confirmed compliance of the Quality Management Program Manual with regulatory requirements

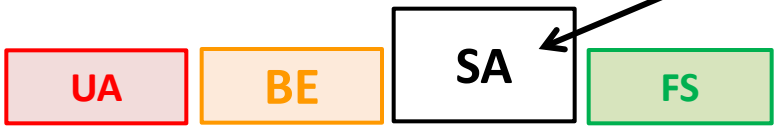
3 Rate Performance

Enforcement Actions

- All enforcement actions closed

Recommendations

- 2 recommendations from review of Cameco's Quality Management Program Manual



Example 2: PHCF 2017 Management System SCA Rating

1 Identify Compliance Results

Inspections

- Type II Reactive Inspection with focus on release event

Technical Assessments

- Annual Compliance Report review

2 Assess Compliance Results

Inconsistent implementation of management system program

- HF release event
- Deficiencies in following work processes and procedures and in verifying work processes
- History of repeated non-compliances

3 Rate Performance

Enforcement Actions

- 1 Administrative Monetary Penalty

Potential for significant safety risk to persons and environment

UA	BE	SA	FS

Example 3: Nordion's Security SCA Rating

1 Identify Compliance Results

- Type II Security SCA inspection
- Technical Assessments
- Annual Compliance Report review

2 Assess Compliance Results

- No non-compliances observed
- Good practices recognized
- Meet or exceed security requirements
- IPPAS mission recommendations addressed quickly and closed

3 Rate Performance

Enforcement Actions

- NONE

Good practices recognized

- IPPAS mission
- relationship with local law enforcement

UA | BE | SA | **FS**

Conclusion

- Performance ratings use a qualitative, expert based approach that takes into consideration the wide variety of licences and relative risk ranking associated with the type of activity and associated hazards
- While the approach is qualitative, it is comprehensive, based on expert opinion and includes operational staff, subject matter experts and management to arrive at performance ratings

Commission Meeting, December 13, 2018
CMD 18-M47.A

ANNEX 2 – DISPOSITION OF INTERVENORS' COMMENTS

Northwatch, CMD 18-M47.2

Comment/Recommendation	CNSC Disposition
Clearly Post ROR – Clearly post the Regulatory Oversight Report on the CNSC website for the public to access (CMD-18-M47.2, pg. 3)	The full report is available on CNSC's website under "Regulatory Oversight Report – Uranium and Nuclear Substance Processing Facilities". CNSC's website also includes a page which links to other RORs presented to the Commission in 2017 (e.g., NPPs, UMMs, nuclear substances, research reactors, etc.). However, CNSC staff is continuously looking for ways to improve its website so that the information can be shared more effectively.
Transportation Events – Additional detail should be provided in the ROR about transportation events (CMD-18-M47.2, pg. 3)	CNSC staff provide a description of each event and corresponding corrective actions (including transportation incidents) in the ROR. Additional Information on events are included in the licensees' annual compliance reports which are available on the licensees' websites. The 2017 ROR focuses on the safety and control areas (SCAs) of Radiation Protection, Environmental Protection and Conventional Health and Safety because these area contain key performance indicators, such as monitoring to demonstrate compliance with regulatory requirements. RORs are high-level reports focusing on the past year's performance. However, the CNSC is committed to fulfilling its mandate to disseminate information to the public and are seeking ways to improve information accessibility and communication to the public and interested organizations. This also includes the reporting on the safety performance of licensees in the RORs.
More Information on Environmental Objectives and IEMP – More information should be provided on environmental objectives for BRR and IEMP data collection plan should be explained (CMD-18-M47.2, pg. 4)	Environmental objectives are part of the EMS which are jointly established between Cameco's site management and specialists to ensure there is a commitment and awareness to environmental protection from BRR's operations. REGDOC-2.9.1 requires that the EMS for BRR establishes and maintains environmental objectives in accordance with ISO 14001:2015 *Environmental Management Systems* - Requirements with guidance for use. The environmental objectives completed at BRR in 2017 were related to action level reviews, reduction of legacy waste, review of storm water lagoon pumping systems and assessing internal recycle of liquid effluent streams. For IEMP sampling near BRR many of the sampling locations in the 2017 and 2018 are different then in 2013 and 2014 due to input from the Mississauga First Nation (MFN). The 2017 and 2018 sampling plans are more representative of a collaborative approach between CNSC and MFN with regards to developing an IEMP sampling plan that included samples collected on MFN land. This has resulted in sampling locations being changed and/or added.

Northwatch, CMD 18-M47.2

Comment/Recommendation	CNSC Disposition
More information on MFN and CNSC meetings – Provide more detailed information in the ROR about follow up actions for MFN and CNSC meetings (CMD-18-M47.2, pg. 4)	The CNSC is committed to regular, structured and formalized engagement with Indigenous groups to discuss activities and issues related to the CNSC regulated facilities. The CNSC strives for continuous improvements to provide data and information of interest to the public and Indigenous groups in a manner that can easily be understood. The MFN's participation with CNSC's IEMP sampling campaigns began in 2015 when CNSC staff met with the MFN to present the IEMP results from the 2013 and 2014 IEMP campaigns. At the meeting, members of the community requested more information as to how the MFN could participate in future IEMP sampling campaigns (2017 and 2018 campaigns). In 2016, CNSC staff met with MFN's environmental technician to discuss CNSC's IEMP sampling locations and review MFN's own sampling program. In 2017 and 2018, CNSC staff communicated via email with the MFN to determine which locations to sample on their land and on which dates. During the 2017 and 2018 sampling campaigns, a MFN staff member accompanied CNSC staff. IEMP results were provided to the MFN for discussion and most recently, CNSC staff met with the MFN in October 2018 while CNSC staff were collecting IEMP samples in the Blind River area. CNSC staff will continue to provide information on its activities with Indigenous groups.
Waste Management and Decommissioning Reporting Gaps – Provide more information on waste management and decommissioning plans (CMD-18-M47.2, pg. 5)	Based on direction from the Commission, the approach to the ROR is to focus on radiation protection, environmental protection and conventional health and safety SCAs; other SCAs are addressed as needed. These three SCAs are indicators for potential problems in the other SCAs. The Waste Management SCA is covered in detail in the licensee Annual Compliance Reports which are available online through the licensee website. CNSC produces a comprehensive report on waste management, including waste classification and volumes, every three years, through Canada's National Report to the *International Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, which is available on CNSC's website.

Northwatch, CMD 18-M47.2

Comment/Recommendation	CNSC Disposition
More detailed reporting of air emissions – More detailed information about air releases should be provided including periods of inoperability and greater frequency averages (CMD-18-M47.2, pg. 6)	The reporting within the main body of the ROR has been simplified in order to summarize overall annual results of performance for a number of facilities. Documenting and discussing more frequent monitoring and reporting (monthly or weekly data) for every facility would add substantially to the ROR. Data is currently being compiled into multi-year databases for radionuclides for web posting in a downloadable format as part of the CNSC and ECCC National Pollutant Release Inventory (NPRI) Joint Task Force. Monitoring is continued during summer shutdown and emission results are reported during that period. The BRR is required to monitor throughout the year and provide their environmental data in their quarterly and annual compliance monitoring reports. The reporting requirements for radiological releases at BRR are specified in their licence. CNSC staff reviews BRR's reported environmental data to ensure there are no release limit exceedances.
Blind River, EMS – Annual safety meeting should be public and provide report on production levels for BRR (CMD-18-M47.2, pg. 6) Annual Report on Production Levels – Provide report on production levels for BRR (CMD-18-M47.2, pg. 6)	The annual safety meeting is not a public meeting. This is an internal meeting at the senior management level. Blind River Refinery has an EMS that aligns with the requirements of REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*. One of the requirements of the regulatory document is to conduct an annual management review of the EMS. Detailed plant production information is considered by Cameco to be "protected proprietary" and is not included in the ROR. Related to production, the BRR has a licensed annual production limit of 18,000 tonnes of uranium as uranium trioxide. This limit was not exceeded in 2017. Related to worker and public dose, CNSC staff ensure that the regulatory limits are not exceeded and that exceedances of action levels are reported and that corrective actions are taken. Cameco BRR complied with these requirements in 2017. CNSC staff encourage licensees to reach out to the public as part of their public information and disclosure programs and discuss areas of interest.

Canadian Environmental Law Association (CELA), CMD 18-M47.3

Recommendation	CNSC Disposition
Recommendation No. 1 - Findings in ROR should be supported by contextual information, to explain basis for conclusion (CMD-18-M47.3, pg. 2)	The 2017 ROR focuses on the safety and control areas (SCAs) of Radiation Protection, Environmental Protection and Conventional Health and Safety. References relevant to the information for those SCAs is provided in those reports which are included in the ROR. Assessment of other SCAs is the result of the assessment of information from a number of sources (such as annual report, inspection and program documents) and are not the focus of the 2017 ROR. RORs are high level reports on the past year's performance. However, the CNSC is committed to fulfilling its mandate to disseminate information to the public and are seeking ways to improve our information accessibility and communication. If CNSC staff have concerns or are not satisfied with other SCAs, CNSC staff will report on the information.
Recommendation No. 2 - Recommend the frequency of emission reporting and reportable units used in the ROR reflect those used in licence (CMD-18-M47.3, pg. 2)	Licensees are required to monitor airborne emissions at the frequency specified in their licence limits. If licensees are reporting their emissions incorrectly, CNSC staff will notify the licensee immediately and review all their environmental data to ensure that no release limits were exceeded. The reporting within the main body of the ROR has been simplified in order to summarize overall annual results of performance for a number of facilities. However, more detailed reporting could be provided within the appendices with comparisons of results to their corresponding frequency and maximum values (highest weekly or daily averages) as required for compliance within the facility's licence.
Recommendation No. 3 - Commission should undertake a review of licence discharge thresholds considering effects on human health and aquatic organisms (CMD-18-M47.3, pg. 2)	This is already completed as a part of the facilities environmental risk assessment (ERA). The ERA contains both a human health risk assessment and an ecological risk assessment. Clarification on release limits and their development will be provided in REGDOC-2.9.2 which is currently undergoing internal review and with planned public review period scheduled for Spring 2019. Note: CNSC assumes that CELA is referencing licence limits when they use the term "licence discharge thresholds".

Canadian Environmental Law Association (CELA), CMD 18-M47.3

Recommendation	CNSC Disposition
Recommendation No. 4 - Recommend Commission to lower allowable licence limits (CMD-18-M47.3, pg. 2)	Monitoring and reporting frequency are the factors which identify fluctuations in emissions not the actual licence limits. As part of annual reporting, licensees are required to monitor and report their trend analyses. Any exceedance of a licence limit would be reported to the CNSC. The current release limits at nuclear facilities are established at levels that are protective of the health and safety of persons and the environment. However, CNSC staff acknowledge that the licence limits can be much higher than the releases at certain facilities. With the implementation of REGDOC-2.9.2 on environmental protection in the near future, this will likely lower licensees allowable licence limits and action levels in keeping with the ALARA principle.
Recommendation No. 5 - Recommend CNSC standardize the units and frequency of measurements among regulated facilities (CMD-18-M47.3, pg. 2)	Licensees are required to monitor airborne emissions and liquid effluent at the frequency specified in their release limits. Depending on the facility and the nature of its releases, monitoring frequency can vary from daily, weekly, monthly or on a batch release frequency. Action levels are implemented to provide a mechanism of control to ensure that release limits are not exceeded. Each facility is site specific, so it's not necessary to standardize the units and frequency of measurements among regulated facilities since each facility is unique in terms of their emissions and liquid effluent discharges.
Recommendation No. 6 - Provide information on how action levels are chosen/set (CMD-18-M47.3, pg. 2)	Licensees are responsible for establishing action levels and CNSC staff review these action levels to ensure they are appropriately set. CNSC staff report any action level exceedances in the ROR. CNSC staff have published regulatory guidance document G-228, *Developing and Using Action* Levels, which licensees and the public can use for information on how action levels are established. The publication of CSA N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities,* provides licensees a standardized approach and methodology for deriving action levels. This standard provides licensees the opportunity to develop site-specific performance based action levels which incorporate the variation and fluctuation within their specific waste streams. The action levels serve as an indicator of a potential loss of control of an element of the licensee's environmental protection program. Although CSA N288.8 is not a licence requirement for all nuclear facilities, the publication and implementation of REGDOC-2.9.2 will require all licensees to review their action levels using CSA N288.8.

Canadian Environmental Law Association (CELA), CMD 18-M47.3

Recommendation	CNSC Disposition
Recommendation No. 7 - CNSC should aim for greater consistency among licensees' IEMP reporting and provide contextual analysis of IEMP data and key findings in ROR (CMD-18-M47.3, pg. 2)	CNSC staff provide the summary of IEMP results in the RORs, more fulsome information is available on the CNSC's website and in the IEMP technical reports, which are available upon request.
Recommendation No. 8 - CNSC should detail how it ensures compliance with the licensees' Environmental protection SCA when annual inspections are not performed (CMD-18-M47.3, pg. 2)	In addition to performing EP inspections, CNSC ensure compliance with licensees' EP programs (EP SCA) by performing desktop reviews. CNSC staff review licensees annual and quarterly compliance reports to ensure no release limits are exceeded and they are in compliance with the requirements established in their licence and Licence Conditions Handbook (LCH). Furthermore, EP related items can be inspected during general inspections if an EP inspection is not performed that year.
Recommendation No. 9 - Waste Management should be a mandatory component of RORs (CMD-18-M47.3, pg. 2)	Based on direction from the Commission, the approach to the ROR is to focus on radiation protection, environmental protection and conventional health and safety SCAs; other SCAs are addressed as needed. These three SCAs are indicators for potential problems in the other SCAs. In the event that CNSC staff identify an issue with licensee compliance related to this area, this issue would be discussed in the ROR. CNSC produces a comprehensive report on waste management, including waste classification and volumes, every three years, through Canada's National Report to *the International Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, which is available on CNSC's website.

Canadian Environmental Law Association (CELA), CMD 18-M47.3

Recommendation	CNSC Disposition
Recommendation No. 10 - Recommend inclusion of a Waste Management chapter to review capacity of onsite facilities to safely store and monitor waste (CMD-18-M47.3, pg. 3)	Refer to CNSC disposition of recommendation no. 9.
Recommendation No. 11 - Discuss measures taken by facilities to phase out asbestos by 2022 in ROR and at meeting (CMD-18-M47.3, pg. 3)	CNSC staff informed the licensees identified in this ROR of Environmental and Climate Change Canada (ECCC) and Health Canada's new Proposed Asbestos Regulation Impact on Nuclear Fuel Cycle Program licensees in March 2018. To determine the extent of the impact on the nuclear sector, CNSC staff requested that licensees provide a list of asbestos containing components in their inventory; and information as to whether each component can be phased out and the time required to phase out the component. In accordance with the CNSC-ECCC MOU, CNSC and ECCC staff will work closely to monitor compliance of nuclear facilities with the recently published Asbestos Regulations and other new instruments.
Recommendation No. 12 - Request an update on the inclusion of radionuclide release in its reports (CMD-18-M47.3, pg. 3)	A work plan has been agreed to and is being implemented in a phased approach (Phase I and II). To date, the CNSC and ECCC National Pollutant Release Inventory (NPRI) Joint Task Force, established in August 2018, has had five technical meetings. Since the formation of the Joint Task Force, updates on commitments and progress have been provided at two NPRI working group meetings both of which were attended by a CELA representative. CNSC staff have included the total annual releases of radionuclides to the environment in Appendix G of the 2017 ROR for Uranium and Nuclear Substance Processing Facilities in Canada.

Canadian Environmental Law Association (CELA), CMD 18-M47.3

Recommendation	CNSC Disposition
Recommendation No. 13 - Include radionuclides in NPRI's substance list (CMD-18-M47.3, pg. 3)	The release data is currently being compiled into multi-year databases for radionuclides for web posting in a downloadable format as part of the CNSC and ECCC National Pollutant Release Inventory (NPRI) Joint Task Force.
Recommendation No. 14 - ROR should review licensing requirements, ensure documents are publicly available, flag ERAs that have changed, and review actions to remedy non-compliance with REGDOC-3.2.1 (CMD-18-M47.3, pg. 3)	CNSC staff assess all 14 SCAs.The approach to the ROR is to focus on radiation protection, environmental protection and conventional health and safety because these are the SCAs that were deemed to have key performance indicators towards the objective of protection workers, public and the environment. This approach to reporting was accepted by the Commission. The ROR's intent is to provide information on licensees' compliance with the legal requirements of the Nuclear Safety and Control Act (NSCA) and its associated Regulations made under the NSCA, each facility's LCH, and any other applicable standards and regulatory documents. Furthermore, the purpose of the ROR is to provide highlights of CNSC staff's activities to ensure compliance. REGDOC-3.2.1, *Public Information and Disclosure,* was published in May 2018 and will require that licensees post their ERA on their websites. Licensees are developing implementation plans which are expected to be submitted by September 2019. However, as per the request by CELA, CNSC provided redacted versions of the current ERAs for Cameco's facilities, BWXT and Nordion.
Recommendation No. 15 - Disclose licensees' environmental protection programs, waste management and decommissioning plans, raw data and all documents before the Commission to the public (CMD-18-M47.3, pg. 3)	CNSC staff review these programs at the time of licensing and when those programs are revised by the licensee. In addition, CNSC staff verify the implementation of these programs through compliance activities. In the event that CNSC staff identify an issue with licensee compliance related to these areas, this issue would be discussed in the ROR. In the case of the EP program, the results of CNSC staff's review and conclusions on the licensee's implementation of the program are discussed in detail in the ROR. Waste Management programs and Preliminary Decommissioning Plans (PDP) may contain proprietary information, such as specific contractual details and detailed cost estimates, that cannot be shared publicly. Some licensees have now voluntarily posted their Preliminary Decommissioning Plans on their websites (e.g. Bruce Power, Ontario Power Generation).

Canadian Environmental Law Association (CELA), CMD 18-M47.3

Recommendation	CNSC Disposition
Recommendation No. 16 - Confirm existence of EP Programs, WM and Disclosure Plans for each facility to ensure requisite compliance plans are in place (CMD-18-M47.3, pg. 3)	In order to obtain a licence, licensees are required to submit Environmental Protection Programs, Waste Management Programs and Preliminary Decommissioning Plans (and other programs), and demonstrate that they meet regulatory requirements. CNSC staff review these programs and verify their implementation through regular compliance activities.

Sagamok Anishnawbek First Nation, CMD 18-M47.4

Recommendation	CNSC Disposition
Recommendation No. 1 – Present CNSC Report to Chief and Council and G'Daa Kiim-Non Committee and relevant follow-up information provided or requested (CMD-18-M47.4, pg. 9)	CNSC staff are committed to strengthening relationships with each Indigenous community/group with interest in CNSC regulated facilities. As part of CNSC's Long Term Indigenous engagement strategy, CNSC staff are actively working with interested Indigenous communities/organizations to develop a mutually agreed upon formalized structure (e.g. terms of reference or protocol agreement) for ongoing and regular engagement and communication particular to the community/organization. Should an Indigenous community/organization wish to request a presentation updating the community's leadership on CNSC's Regulatory Oversight Report this request can be accommodated. In October 2018, CNSC staff met with representatives from Sagamok First Nation; in that meeting preliminary discussions were held regarding developing a formalized structure for ongoing engagement and communication. Another meeting was held on December 12th, 2018 to continue this discussion, prior to this presentation to the Commission.
Recommendation No. 2 – Improve the Indigenous Community engagement and relationship building via formation of Indigenous Citizens Committee (ICC) (CMD-18-M47.4, pg. 9)	CNSC staff are actively working with interested Indigenous communities/organizations to develop a mutually agreed upon formalized structure (e.g. terms of reference or protocol agreement) for ongoing and regular engagement and communication. The CNSC engages with Indigenous organizations in the format requested or suggested by the Indigenous community/organization. If an Indigenous community/organization suggests CNSC engage with them via an Indigenous Citizens Committee, the CNSC will accept this approach.
Recommendation No. 3 – Provide community with up-dated environmental monitoring data (i.e. IEMP) of Cameco Fuel Processing facility, Agnew Lake and Elliot Lake Decommissioned Mine sites (CMD-18-M47.4, pg. 9)	CNSC staff provide their results from the IEMP campaigns on the CNSC website. CNSC staff look forward to working with the Sagamok Chief and Council to provide regular information to the community on the CNSC's oversight of licensees' annual environmental monitoring reporting data, as well as IEMP sampling and results.

Sagamok Anishnawbek First Nation, CMD 18-M47.4

Recommendation	CNSC Disposition
Recommendation No. 4 – Include indigenous representative(s) the opportunity to be directly involved in CNSC inspection visits and participate in compliance verification activities at locations of interest to indigenous communities. (CMD-18-M47.4, pg. 9)	As an independent regulator, the CNSC does not conduct inspections with members of the public or Indigenous groups. Inspectors follow a systematic qualification process and receive training such as radiation protection, occupational health and safety and conducting onsite inspections. In addition, inspectors must have the necessary security clearances to receive access to nuclear facilities and review prescribed information as part of the inspections. However, CNSC staff encourage licensees to offer facility tours to Indigenous groups and interested members of the public.
Recommendation No. 5 – Create annual funding programs and scholarships to provide training opportunities for youth of indigenous communities and programs that provide community members a chance to learn about nuclear industry practices (CMD-18-M47.4, pg. 9)	The CNSC is willing to explore this request with Sagamok to determine how the CNSC could contribute through an appropriate funding mechanism to provide community members a chance to learn about nuclear industry practices. Depending on the desired scope of the program, this type of initiative would be consistent with the CNSC's mandate to disseminate scientific and regulatory information to the public.
Recommendation No. 6 – Invite CNSC staff into community to enhance knowledge, promote transparency and discuss items of importance to Indigenous peoples (CMD-18-M47.4, pg. 9)	CNSC staff are also committed to strengthening relationships with each Indigenous community/group with interest in CNSC regulated facilities. The CNSC is an independent, open and transparent regulator. As part of CNSC's Long Term Indigenous engagement strategy the CNSC welcomes opportunities to visit with Indigenous communities/organizations when opportunities arise and to discuss items of importance.

Sagamok Anishnawbek First Nation, CMD 18-M47.4

Recommendation	CNSC Disposition
Recommendation No. 7 – Incorporate TEK sustainability insights, implementing their customs, traditions and beliefs into environmental assessment and performance evaluations of nuclear licensee holders (CMD-18-M47.4, pg. 9)	The CNSC as an Agent of the Crown respects and values Indigenous Knowledge (IK). When Indigenous groups are willing to share their IK with the CNSC, CNSC staff feel it is important to learn about the knowledge shared and integrate it into the work that they do in an appropriate and respectful manner, while ensuring its protection. Currently, the CNSC works with IK in a number of different areas including its IEMP, in environmental assessments, Commission Member Documents, licensing and licensee program reviews, Environmental Risk Assessments and other regulatory activities and studies as appropriate. Upon consent of the Indigenous community, IK is also shared directly with the Commission in order to help inform Commission members' understanding of the Indigenous groups interests, rights and practices and how it may relate to the matter before them. In addition, through its Participant Funding Program (PFP), CNSC staff are able to offer, upon request, funding support for IK studies related to CNSC regulated facilities and activities. CNSC is currently funding a number of IK studies for Indigenous groups with direct interest in CNSC regulated facilities and would be open to discussing this type of initiative with Sagamok as part of the development of a work plan in relation to our long term engagement relationship. CNSC staff look forward to working with the Sagamok Chief and Council to provide regular information to the community on the CNSC's oversight of licensees' annual environmental monitoring reporting data, as well as IEMP sampling and results.
Recommendation No. 8 – Provide for annual site visits/inspections at the Cameco refinery, Elliot Lake and Agnew Lake decommissioned sites (CMD-18-M47.4, pg. 9)	As an independent regulator, the CNSC does not conduct inspections with members of the public or Indigenous groups. Inspectors follow a systematic qualification process and receive training such as radiation protection, occupational health and safety and conducting onsite inspections. In addition, inspectors must have the necessary security clearances to receive access to nuclear facilities and review prescribed information as part of the inspections. However, CNSC staff encourage licensees to offer facility tours to Indigenous groups and interested members of the public.