

Operating Experience at the Chalk River Labs

Kathy Smith
Director
Nuclear Oversight
2009 August



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Agenda

- Brief history of AECL
- Where do we fit in the AECL organization?
- How we share Operating Experience with staff?
- How do we share with our peers in Canada?
- Learning from history
- Where do we do go from here??

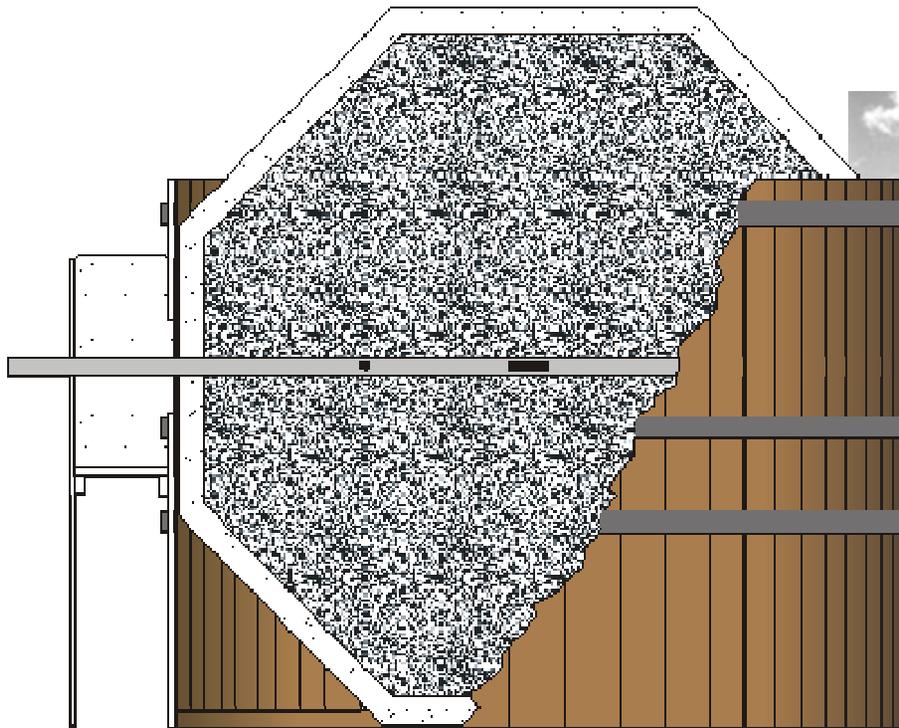
1940-42 ...

George Laurence

(1905 - 1987)

First fission experiments in Canada

(National Research Council)

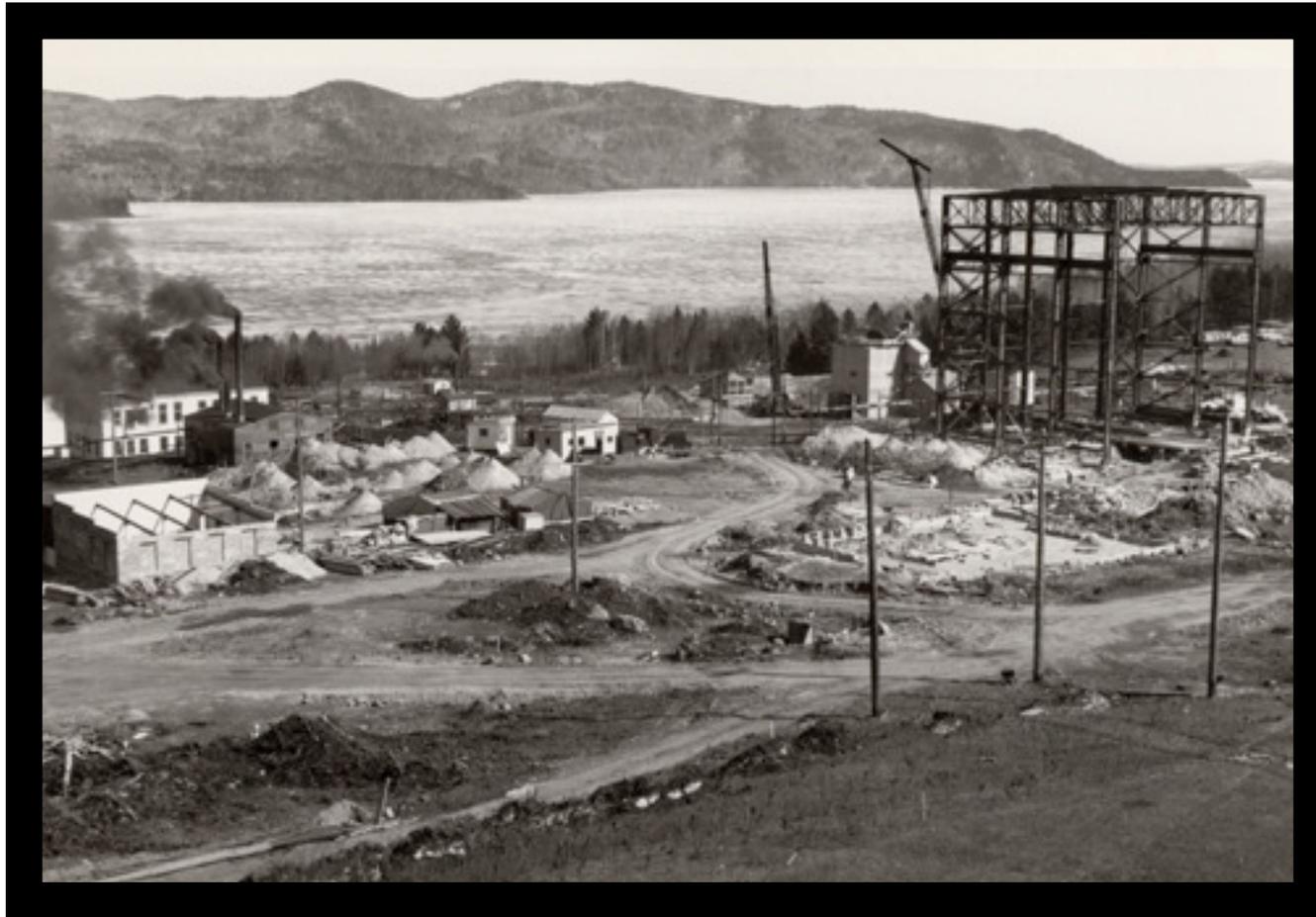


100 Sussex Drive, Ottawa

 AECL EACL

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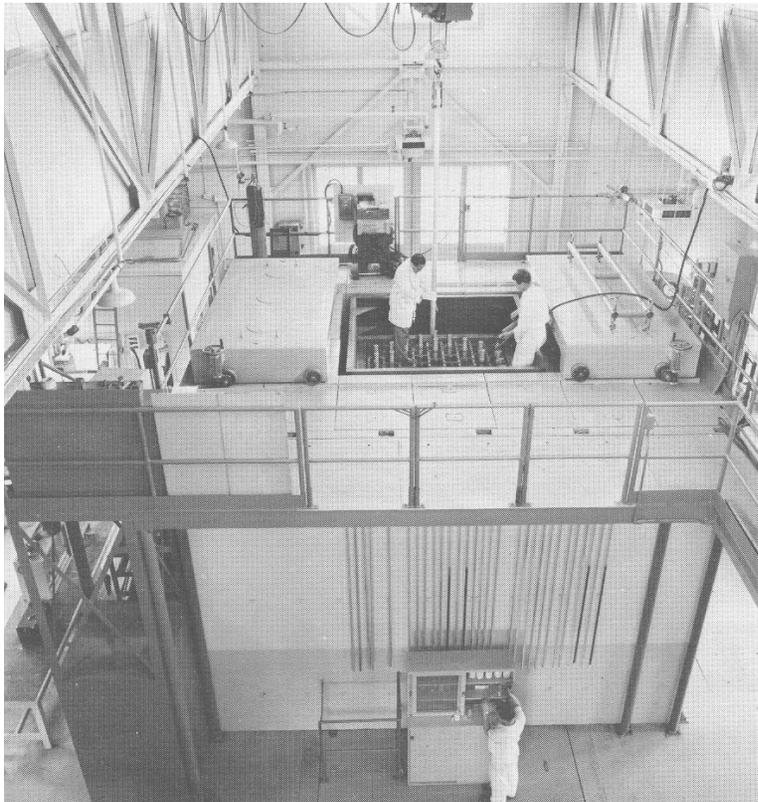
1944 ...



Chalk River Laboratories

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1945 ...



**ZEEP:
First sustained
nuclear reaction
outside
the U.S.A.**

Canada in 1945

- 2nd largest nuclear infrastructure on planet
- Atomic bomb knowledge
- World experts on heavy water reactor
- Uranium supplies
- World's most powerful research reactor (NRX) under construction

... Where do we go from here....?

Canada's Choice: Peaceful Application of Nuclear Energy

NRX 1947



NRU 1957



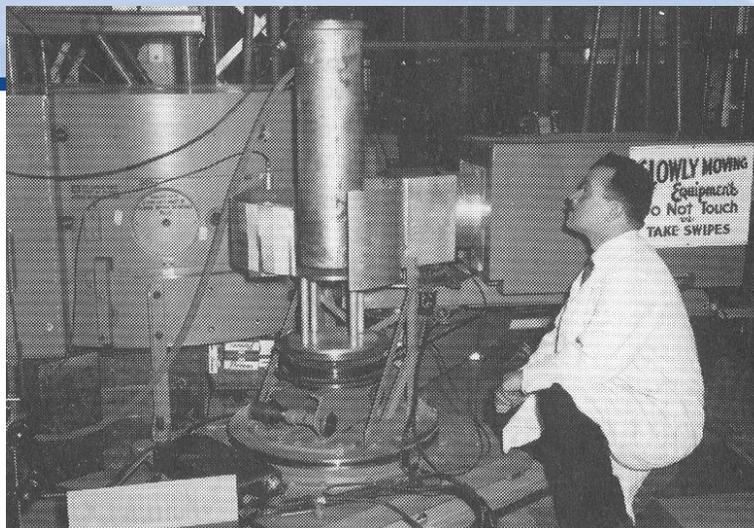
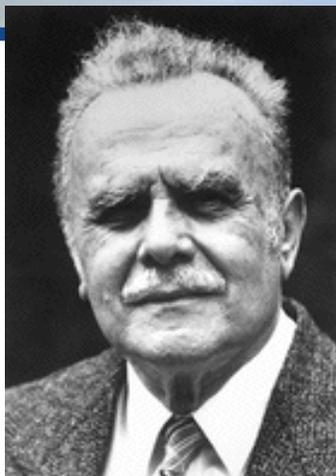
A Mecca for nuclear research

 AECL EACL

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1950's ...

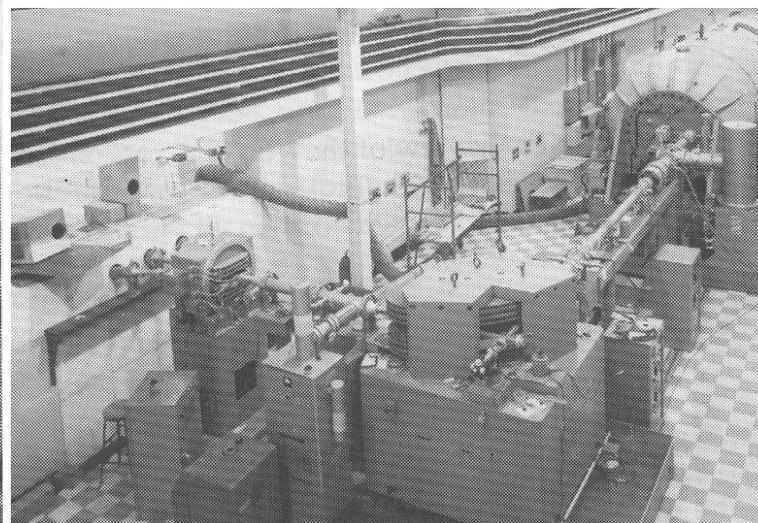
Bertram Brockhouse
- Nobel Prize in
Physics, 1994



Triple Axis Spectrometer, 1958



Ted Litherland, Allan Bromley, Harry Gove



Tandem Accelerator, 1959

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Atomic Energy of Canada Limited

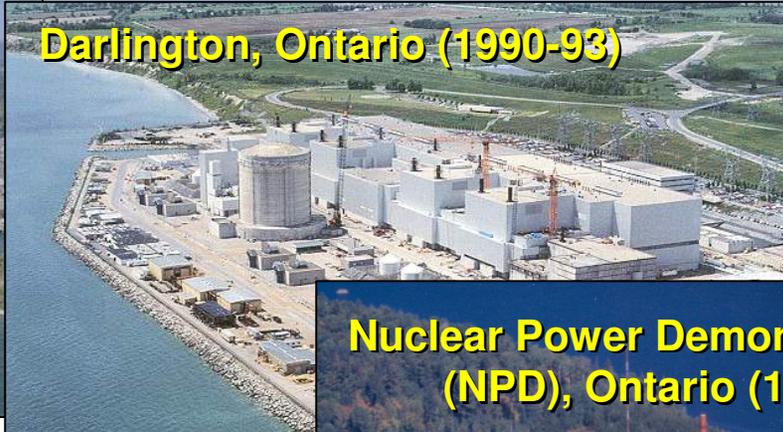


- Established in 1952 to lead the Canadian nuclear industry.
- Over 4,900 employees located across many sites.
- CANDU recognized as one of the top 10 major engineering achievements of the past century in Canada.

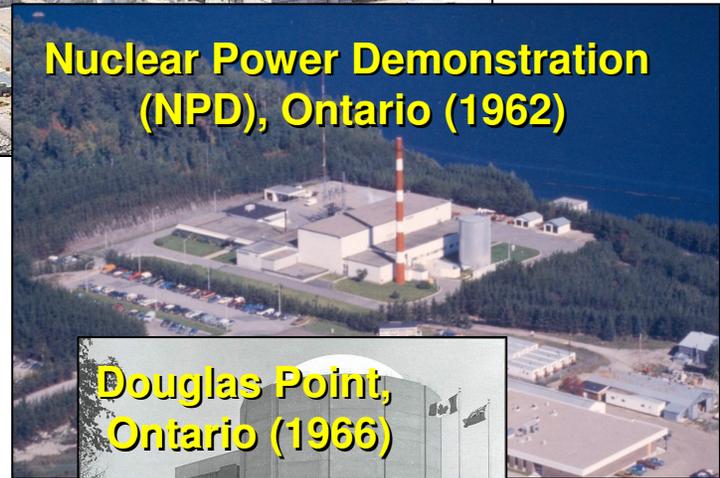
**Pickering, Ontario
(1971-73, 1983-86)**



Darlington, Ontario (1990-93)



**Nuclear Power Demonstration
(NPD), Ontario (1962)**



**Douglas Point,
Ontario (1966)**

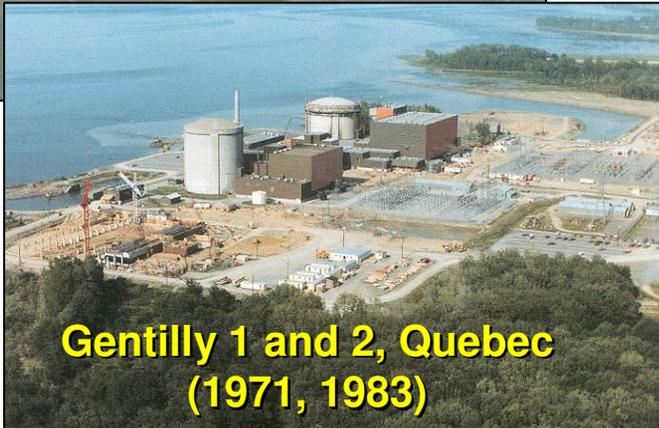


**CANDU
in
Canada**

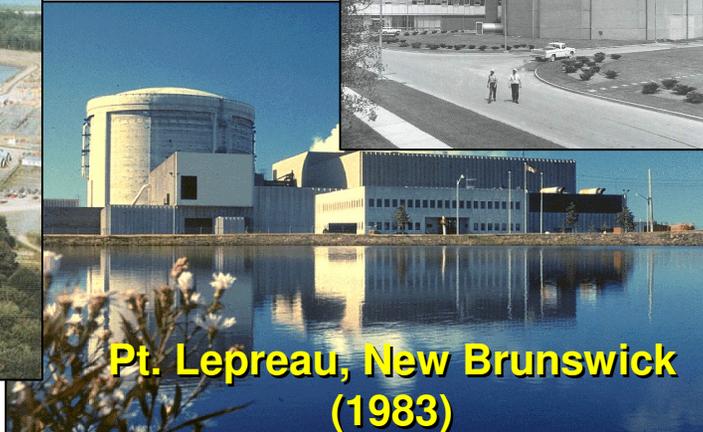
**Bruce, Ontario
(1977-79, 1985-87)**



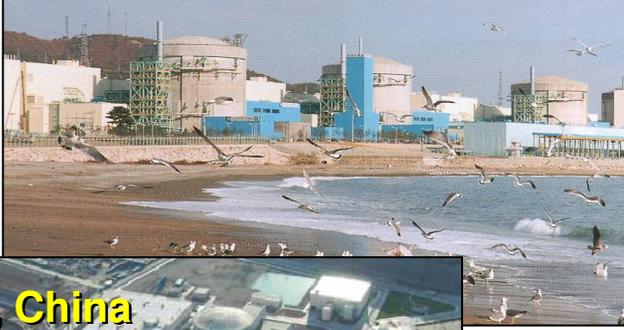
**Gentilly 1 and 2, Quebec
(1971, 1983)**



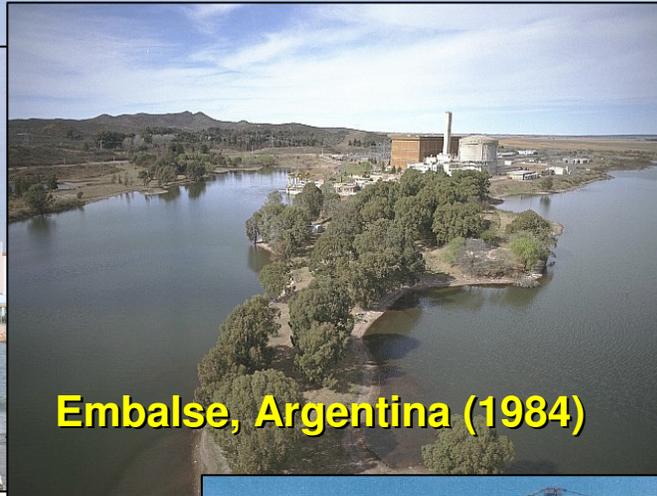
**Pt. Lepreau, New Brunswick
(1983)**



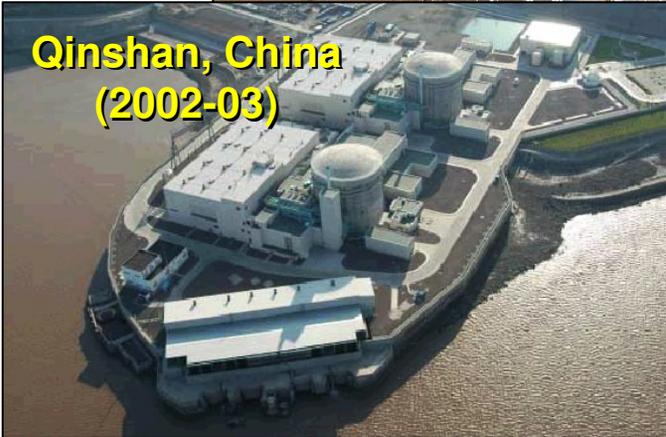
**Wolsong, South Korea
(1982, 1997-99)**



Embalse, Argentina (1984)



**Qinshan, China
(2002-03)**

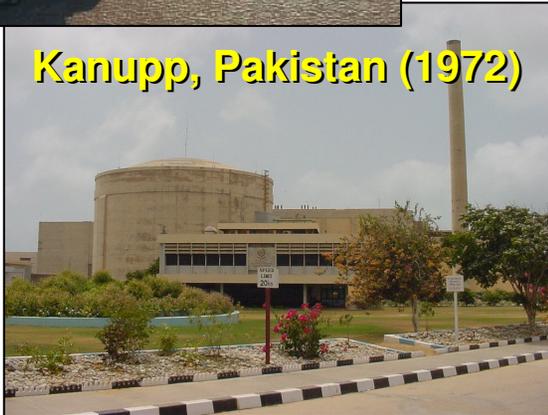


**CANDU
around
the world**

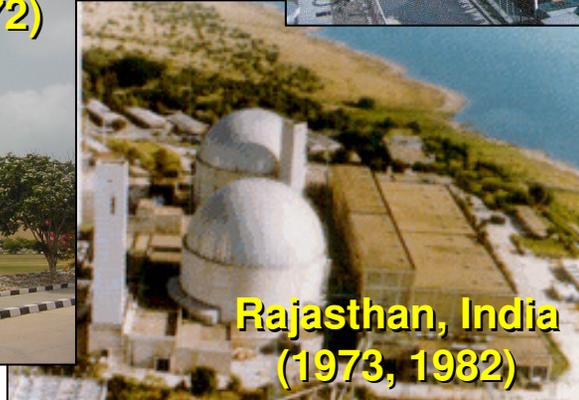
**Cernavoda, Romania
(1996, 2007, ...?)**



Kanupp, Pakistan (1972)



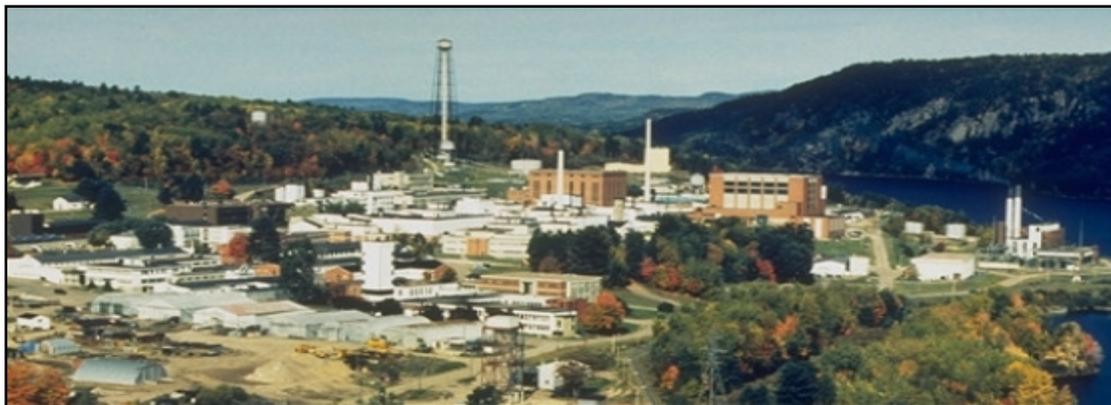
**Rajasthan, India
(1973, 1982)**



AECL: Major Sites



Head Office, Sheridan Park, Mississauga: Executive offices; CANDU projects; product design & development; commercial operations; nuclear services; business development.



Chalk River Laboratories: Nuclear safety, health & environment R&D; nuclear platform infrastructure; radioisotope production; legacy waste management.

Whiteshell Laboratories



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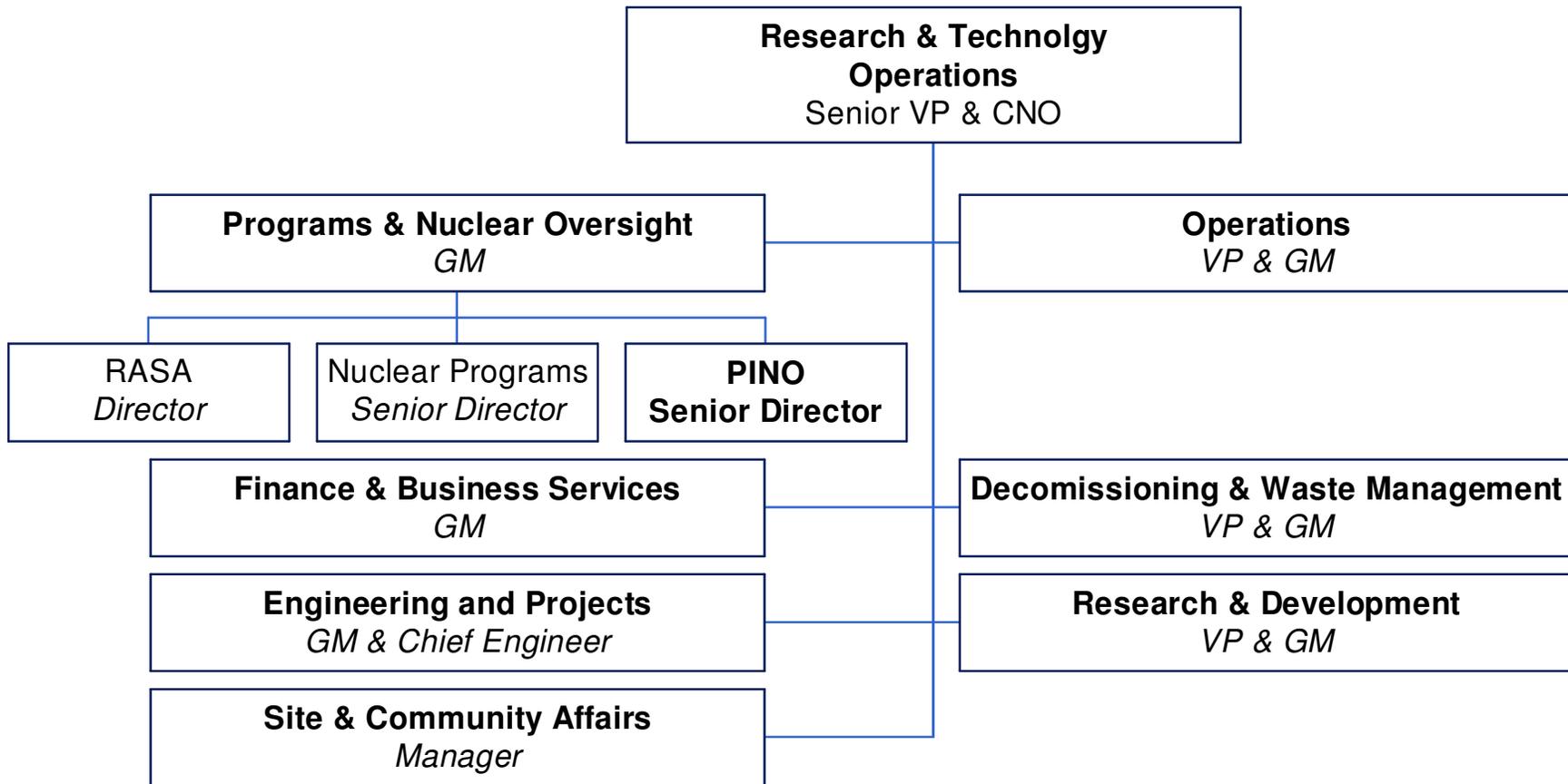
Key Chalk River Activities

1. Reactor Development
2. CRL Nuclear Operations
3. Research & Development
4. Isotope Production
5. Waste Management & Decommissioning

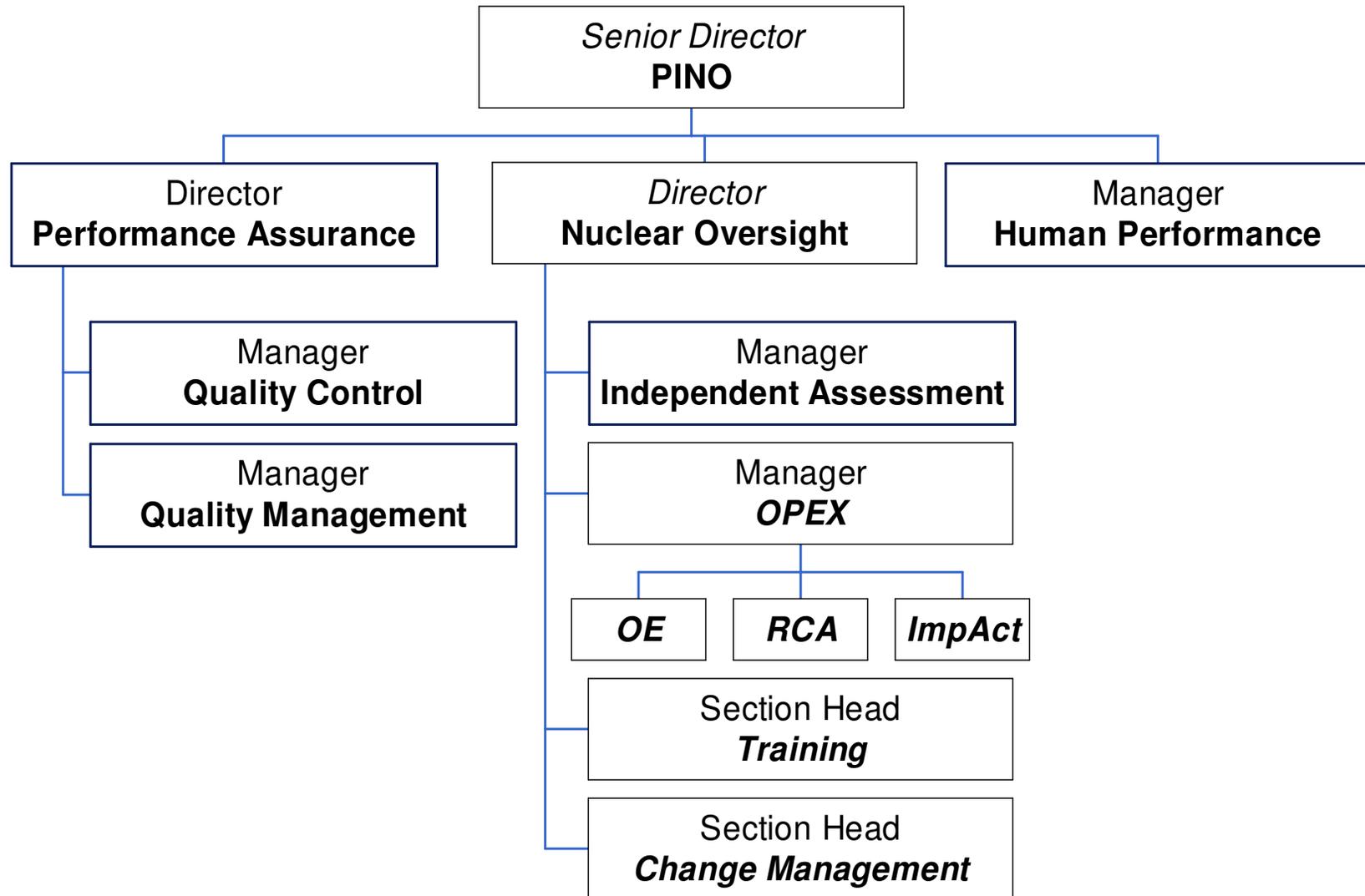


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Research & Technology Operations



PINO - 2009



PINO - 2006

Performance Improvement & Nuclear Oversight (PINO)
(formed in 2006)

VISION

**Assist RTO to drive performance towards
operational excellence:**

-safe, efficient and effective performance of work

Highlights

- Reporting Culture – what gets measured gets fixed!
 - ImpAct process (documenting, dispositioning and trending non-conformances:
 - Exponential increase in Reporting:
 - 2008 there were 10846 reports done by RTO Employees
 - 2009 currently at ~7500
 - Process of moving to next generation Industry CAP Software
 - DevonWay Software purchased (Go live date 2009 Nov 01)
 - Event Reporting, Action Tracking, O&C tracking

2 year trial membership in WANO (World Association of Nuclear Operators)



How do we share our Lessons Learned and OPEX with our staff?

OPEX Alert

Issued: 2009-May-21 AECL OFFICIAL USE ONLY



OPEX ALERT



IB-09-35 Internal
 External



Safety Recall Notice – Fluke Digital Clamp Meters

ImpAct: N/A
 Location: Fluke Corp.
 Event Date: May 15, 2009
 Equipment: Fluke Digital Clamp Meters

Event Summary:

- The US Consumer Product Safety Commission, Health Canada and Fluke Corp. have announced a voluntary recall of some Model 333, 334, 335, 336 and 337 digital clamp meters manufactured between January 29, 2008 and February 27, 2009. The meters can short circuit leading to inaccurate or no voltage reading on energized circuits.
- This finding could create a hazardous situation if the user were to contact live voltage based on an erroneous instrument reading.
- See the attached Safety Recall Notice for details on affected models and series. The manufacturer's notification reported three instances of clamp meters displaying an incorrect voltage reading.

Recommended Actions:

- Stop using clamp meters affected by the recall immediately.
- Contact Fluke for instructions on replacing identified units.
- In Canada, call 1-800-363-5853.
- Fluke Canada web page: [Fluke Canada](#).

Additional Information:

Model Family	Starting Serial No.	Ending Serial No.
Fluke-337 (All models including 337A)	96070000	98890607
Fluke-336 (All models including 336A)	96220000	98900400
Fluke-335 (All models including 335A)	97010000	98860104
Fluke-334 (All models including 334A)	97010000	98870101
Fluke-333 (All models including 333A)	97010000	98880240

Please note:

Serial numbers with the suffix "R" or the prefix "S" are NOT included in this recall.



Send feedback on this bulletin to >OPEX Feedback

Internal and External OPEX Lessons Learned

Issued: AECL OFFICIAL USE ONLY

	OPEX Lessons Learned	
IB-XX-XX	Title	<input checked="" type="checkbox"/> Internal <input type="checkbox"/> External
Imp Act: <input type="text"/> Event Date: <input type="text"/> Location: <input type="text"/> Equipment: <input type="text"/>		
Event: •		
Consequences: •		
Corrective Actions Taken: •		
Lessons Learned: •		
Questions to Consider: •		
Additional Information: •		
Send feedback on this bulletin to >OPEX Feedback		

Internal OPEX Lessons Learned

Issued: 2009-Aug-06	AECL OFFICIAL USE ONLY	
	OPEX Lessons Learned	
IB-09-43	<input checked="" type="checkbox"/> Internal <input type="checkbox"/> External	
Electrical Arc Causes Fire		
ImpAct: R_D-08-07968 ACA/RCA Report: ACA-R_D-08-07968 Event Date: 2008-Oct-31 Location: AECL-CRL, Thermal Hydraulics Lab Equipment: Test Loop Electrical Wiring		
Event: <ul style="list-style-type: none">While conducting an electrically powered Test in MR-10, Personnel smelled smoke in the area around the test station.Upon investigation, the source of smoke was identified as some burnt paper towel underneath another test loop.The source of ignition was determined to be a negative lead coming into contact with a portion of the grounded loop section, and resulting in molten aluminum dropping through the unused test section and igniting the paper towel below.Ensured the burnt paper towel was fully extinguished.		
Apparent Cause(s): <ul style="list-style-type: none"><u>Verbal Communications:</u> All negative ground cables were not secured away from the MR-3 vertical section piping (grounding source) to prevent electrical arcing. The verbal communication from the senior staff to the junior staff was not completed. There was no procedure for verification that the ground cables were secured away from the vertical section piping. The cushion also hid the rogue cable lug from sight.<u>Work Practice:</u> The use of combustible Kim Wipes to catch falling debris. There was no verification done that combustibles were absent from the area.<u>Interface Design or Equipment Condition:</u> There is no electrical isolation switch for all negative junction boxes.		
Corrective Actions Taken: <ul style="list-style-type: none">Post incident meeting held by all personnel involved recording pertinent information.Contacted Fire Department the next day working day.Discontinuing the use of Paper towel in the pit area of the test loops, and start using a metal drip tray instead.Procedure update to include verification that negative cables are tied and properly secured away from a grounding path to prevent arcing.		

- Initiated ECC process to install isolation switch for all negative leads (same as there is on the positive leads).
- Entire Branch staff shall attend EFT refresher training.

Lessons Learned:

- The importance of reducing the fire load by removing combustible material from the laboratory and test areas.
- The need for a proper bracket to secure leads ensuring that electrical arcing cannot take place.

Questions to Consider:

- Do you have combustible material in your lab that puts you at risk of having a fire?
- Are there situations in your laboratory that have the potential for electrical arcing?
- Should you perform a walk down with a peer group to look for hazard potentials?

Send feedback on this bulletin to [>OPEX Feedback](#)

Sources of Internal OPEX:

- Root Cause Analysis
- Apparent Cause Analysis
- Performance based audits
- Good practices
- Project close out reviews

External COG Bulletin



2009-08-12

OPEX
CANDU Owners Group

EB-09-381



AECL OFFICIAL USE ONLY

The following event was recently discussed during the COG Weekly Screening Meeting and may be of relevance to your daily activities.

(Please complete the survey after the event description.)

Valve Misoperation Results in Equipment Damage

Date: 2009-08-03 **Document No:** INPO OED 2009-05
Plant: N/A **Event Significance:**
Unit: **Investigation Type:**
Reportable: No **Evaluating Org:**
SI: **Investigation Status:** Completed

News groups: Human Performance; Maintenance; Operations; Training

Event / Document Abstract:

Three recent valve manipulations resulted in equipment damage when operators encountered unfamiliar situations. An insufficient questioning attitude and a knowledge weakness were contributors. Seeking advice from knowledgeable personnel could have prevented the events. The increased use of other human error reduction tools could have also prevented the errors.

ANO Unit 1 – An operator preparing to add hydrogen to the main generator had difficulty determining whether a one-inch hydrogen isolation valve was open or closed. The operator incorrectly assumed the valve was stuck on its closed seat and used a pipe wrench to reposition the valve, causing valve failure and a hydrogen fire. (OE28790, OPEX #44144)

Crystal River – In January 2009, two operators used excessive force to manually open a motor-operated feedwater isolation valve and bent the yoke, which resulted in a plant startup being delayed several days. (OE28496, OPEX #44260)

Point Beach Unit 1 - Insufficient communication during shift turnover resulted in two auxiliary operators attempting to open a fuel transfer tube isolation gate valve that was already open with a valve wrench, damaging the valve. (OE27775)

Self-Review Questions Related to Manual Valve Operation

1. What are the expectations when a manual valve becomes difficult to operate?
2. What methods are used to verify that valves have been positioned correctly, either locally or remotely? What positive means are used to determine expected valve position? Is the number of turns of a valve from the closed position to the open position known?
3. How is operating experience communicated to operators who are performing the evolution/test for the first time?

Sources of External OPEX:

- Events at other sites
- Vendor notifications
- INPO web site
- WANO web site
- Chemical Safety Board.....

Number of Bulletins Issued

Number of Bulletins Shared RTO Wide		
Year	Internal Lessons Learned	External Lessons Learned
2006	22	96
2007	57	347
2008	63	439
2009*	56	391

* Bulletins Shared As of 2009 August 19.



How do we share with our Peers in Canada?

CANDU Owner's Group (COG) Members



Atomic Energy of Canada Limited



Bruce Power



Hydro Québec



Énergie NB Power

New Brunswick Power Nuclear Corporation



Ontario Power Generation



Korea Hydro & Nuclear Power Company Ltd.



Nuclear Power Corporation of India Ltd.



NA-SA

Nucleoelectrica Argentina



Pakistan Atomic Energy Commission



NUCLEARELECTRICA

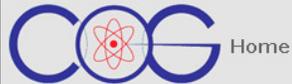
Societatea Nationala Nuclearelectrica



Third Qinshan Nuclear Power Company Ltd.



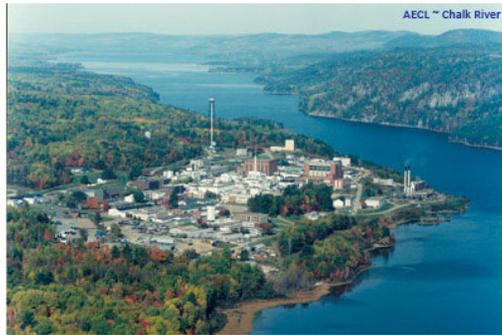
COG Home Page



Welcome AECL Generic |

All Sites

Home | About COG | Operating Experience | Publications | Services | Programs and Projects | Groups & Committees | Events | Executive Corner | Contact Us



AECL - Chalk River

The CANDU Owners Group Inc. (COG) is an affiliation of CANDU Nuclear Power Plant Operators and the original CANDU designer AECL, that provides a framework for co-operation, mutual assistance and exchange of information for the successful support, development, operation, maintenance and economics of CANDU technology. Membership is restricted to organizations owning or operating a CANDU nuclear reactor. Supplier and engineering organizations involved in the design, construction and operation of CANDU reactors are eligible for participation in specific programs.



PAEC - KANUPP

I Need To...

Choose task

Upcoming Events

Item Title	Location	Start Date
Outage Managers Working Group Meeting	The Advocates' Society, COG Office Building	8/26/2009 8:30 AM
COG Maintenance Managers Working Group Meeting	COG Conference Room	8/27/2009 8:00 AM
2009 COG Radiation Protection Conference & Workshop	COG Office Building, The Advocates' Society	8/31/2009 8:30 AM
Performance Engineering Managers Working Group Meeting	Pickering Meeting Room	9/1/2009 8:30 AM
Environmental Qualification Working Group (EQWG) Meeting	Bruce Power LP	9/8/2009 8:00 PM
CNS CANDU Reactor Safety Course	Toronto Marriott Airport Hotel	9/14/2009 9:00 AM

Industry News

Type	Item Title	Source	Publishing Date
	Strong Production Performance in Second Quarter	Bruce Power	8/17/2009
	Bruce B Unit 8 Offline	Bruce Power	8/16/2009
	Presentation by CNSC President Michael Binder to Atomic Energy Canada Limited (AECL) Board Members	AECL	8/14/2009
	AECL Provides Updated Guidance on NRU Return to Service	AECL	8/12/2009
	CNSC Will Hold a Hearing in August 2009 to Consider the Approval of an Environmental Assessment (EA) Screening Report for AECL	CNSC	8/11/2009

Heads Up

Type	Item Title	Station	Publishing Date
	OPG Safety Flash Report - Safety Recall		5/15/2009

Announcements

Ontario Civic Holiday by Mersedeh Safa COG office will be closed on August 3rd for Ontario Civic Holiday.	7/30/2009 6:04 PM
July-August Issue of COGnizant by Mersedeh Safa The July-August Issue of COGnizant is now available on COGonline.	7/22/2009 1:46 PM
R&D Recent Publications by Mersedeh Safa Following our users suggestion, the list of recent R&D Publications is now available under Publications > Research & Development. COG appreciates your feedback.	7/8/2009 12:22 PM
Successful Launch of new COG Web Site by John Froats If you are reading this you will know that COGonline has a new website. The new site, launched at approximately 16:30 on 30 June, has improved layout, greatly enhanced search capability and sets the stage for collaborative workspaces. It is	7/3/2009 8:23 AM

COG Weekly Screening Meeting (WSM)

- **~60-70 OPEX items submitted & screened weekly**
- **Each member site presents OPEX about recent events at their location, which they believe may be of relevance to the other sites.**
- **COG presents nuclear industry reports, which it screens from sources such as WANO, IAEA and NRC.**
- **The committee identifies generic issues and recommends action or information dissemination at other sites, as required.**
- **The committee determines which events need to be reported to the nuclear industry via COG and WANO Event Newsgroups.**
- **All events reviewed are posted to Newsgroups by topic and can be retrieved from the OPEX Database, which also contains copies of the full reports for recent events.**

COG WSM



COG/OPEX Weekly Screening Meeting Minutes 19 August 2009

Part 1 – Site Updates and Heads-Up

Teleconference Attendees:

Moderator: Bill Andersen, COG 416-595-1888 x106

Billy Justason, Point Lepreau	Mahesh Jethava, OPG Pickering	Alex Yeung, AECL-SP
Mike Donovan, Point Lepreau	Tony Kim, OPG Nuclear	David Zekveld, NSS
Madalin Cristea, Cernavoda	Andre Friedmann, OPG Nuc Waste	Kimm Barker, CAMECO
Sergio Battiato, Embalse	Lina Sagherian, OPG Training	Bob Ciminel, WANO-AC
Mohammad Najamuddin, KANUPP	Dan Gleeson, OPG Training	Dave Turner, COG
Abdul Hameed Qureshi, KANUPP	Jon Ward, AECL-CR	Ken Keown, COG
Larry Romanowich, Bruce Power	Alka Garg, AECL-SP	Bob Blackburn, COG
Stephen Prigge, OPG Darlington	Andy Banerji, AECL-SP	

Point Lepreau	<ul style="list-style-type: none">Unit shutdown for 18 month refurbishment outage on 28 Mar 08Calandria inspection and feeder nozzle installation in progress
Cernavoda	<ul style="list-style-type: none">Unit 1 & 2 at high power, no problems
Qinshan	<ul style="list-style-type: none">Units 1 & 2 at high power, no problems
Embalse	<ul style="list-style-type: none">Unit at high power, no problems
KANUPP	<ul style="list-style-type: none">Unit at high power, no problems
Bruce Power	<ul style="list-style-type: none">Units 3, 4, 5, 6, & 8 at high power, no problemsUnit 7 shutdown Jul 30, due to low grid demand, restart in progressUnit 8 forced outage Aug 16-18 – Liquid Zone Control CV problem
OPG – Darlington	<ul style="list-style-type: none">Units 1, 2, 3 & 4 at high power, no problems
OPG – Pickering	<ul style="list-style-type: none">Units 1, 4, 5, 6, 7 & 8 at high power, no problems
AECL-CR	<ul style="list-style-type: none">NRU shutdown May 14, repairing calandria D2O leak, S/D until late 2009Inspection of vessel complete, preparation of tooling for repair
AECL-SP	<ul style="list-style-type: none">No news
WANO-AC	<ul style="list-style-type: none">Beznau – Dose limits exceeded – 3 Aug 09 – INPO Significant Event
COG / Industry	<ul style="list-style-type: none">Utility Services Alliance OE Conference in Atlanta – 15-17 Sep 09COG OPEX and Corrective Action Meetings 17-20 Nov 09

COG Newsgroups

Chemistry	Fuel & Physics	Records Management
Contractors	Fuel Handling	Refurbishment
D2O Management	Grid/Switchyard	Risk & Reliability
Emergency Power	Human Performance	Safety & Licensing
Emergency Preparedness	Industrial Safety	Security
Engineering	Industry News	Self Assessment
Environment (Impact on)	Inspection	Supply & Materials Management
EQ & Seismic	Lifting & Rigging	System – Common Services
Equipment Performance – Heat Exchangers/Steam Generators	Maintenance	System – Condensate/Feedwater/Steam
Equipment Performance – Computers	Nuclear Asset Management & Life Cycle Management	System – Containment
Equipment Performance – Electrical	Operating Experience	System – Electrical
Equipment Performance – Instrumentation & Control	Operations	System – Emergency Core Cooling
Equipment Performance – Other	Outage	System – Heat Transport
Equipment Performance – Pumps	Performance Indicators	System – Moderator
Equipment Performance – Structures	Planning & Scheduling	System – Other
Equipment Performance – Turbine/Generator	Quality Assurance	System – Reactor Auxiliaries
Equipment Performance – Valves	Questions & Answers Forum	System – Reactor Control/Shutdown
External Influences	Radiation Protection	System – Turbine/Generator
Fire Protection	Radioactive Waste	Training
Foreign Material Exclusion (FME)	Reactivity Management	

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COG Action Item

Item #1 - Presenter: Bill Andersen

Title: Update - Fatality during Dismantling Work at Turbine Pedestrian Bearing Fundamental Bolt

Date: 2009-03-13

Document No: WANO EAR PAR 09-050

Plant: Oskarshamn

Event Significance:

Unit: 3

Investigation Type:

Reportable: No

Evaluating Org:

SI:

Investigation Status: Completed

Newsgroups: Contractors; Human Performance; Industrial Safety; Maintenance; Refurbishment; Training

Event / Document Abstract:

Early on the 13th of March 2009, Sunday morning at 5.15 am, a contract worker died following a workplace accident. The afflicted person was a 61-year-old man who was hit in the chest probably by hydraulic oil with high pressure.

An ambulance was called to the site and the unconscious man was taken to Oskarshamn city hospital. However, he was later declared dead as a result of his injuries.

The police have launched an investigation into the man's death and the cause of the event has not yet been established.

Oskarshamn 3 was not in operation at the time of the accident. The unit had been taken offline on 1 March for an extended outage and a project called PULS. All maintenance/dismantling work at the turbine plant was immediately suspended.

What most probably happened is the following:

- 10 persons are in one shift who conducts dismantling work in the turbine hall the actual night between Saturday and Sunday the 15th of March 2009. The shift is supervised by a shift leader.
- Three persons are working as a team to conduct work to loose bolts M125 at pedestal bearing between HP and LP turbine.
- The team pressurized the hydraulic jack to loosen one nut on the fundamental bolts. When pressurized, suddenly a gasket broke and an oil beam hits one person in the chest.

COG Working Groups

- **Corrective Action Working Group**
- **Engineering Managers Working Group**
- **Equipment Reliability Working Group**
- **Fire Protection Working Group**
- **Fuel Handling Working Group**
- **Human Performance Working Group**
- **Liquid Zone Working Team**
- **Operations Managers Working Group**
- **Operations Procedures Managers Working Group**
- **Outage Managers Working Group**
- **Pressure Boundary Working Group**
- **Radiation Protection Managers Working Group**
- **Reactivity Management Working Team**
- **Training Managers Working Group**
- **Turbine Generator Working Group**
- **Valve Managers Working Group**
- **WANO AFI Working Group**
- **Work Control Managers Working Group**



Weekly History Lesson – Learning from past events

Internal OPEX Bulletins Shared RTO Wide:	
1. OPEX ALERT: Employee Observed Consuming Wild Berries Growing Within CA-2	
AECL ImpActs Shared With COG at 09/08/012 WSM	
1. NUC_PROGS-09-01195, Accidental foam release in B420A.	
2. NRU-09-05102, Un-authorized person turned on hand and foot monitor.	
3. NRU-09-06447, Contamination occurred during decontamination of reactor tools.	
4. D_WM-09-01766, Unsafe oxy/acetylene practices.	
5. NRU-09-06387, NRU Sump #1 overflowed into room #114.	
COG and US DOE OPEX shared within RTO:	
1. Catastrophic Failure of a Coupling Capacitor Potential Device in the Switchyard (Davis-Besse).	INPO
2. Improper Testing of Fire Fighting Bunker Gear Can Result in Potential Injury to Fire Fighters.	INPO
3. Sodium Hypochlorite Exposure Near Miss (Cook Plant).	INPO
4. Cloth FME Covers Drawn into CIRC Water Box Vents (Millstone 2).	INPO
5. Transfer of Severed Fuel Rod - Palo Verde Nuclear Generating Station- Unit .1	INPO
6. Confined Space Program Compliance (Dresden).	INPO
7. Engineering Program Guide - Welding Program.	COG
8. Loss of Primary Shutdown Cooling Due to an Electrical Short While Installing a Jumper.	COG
9. Adverse Trend on Unposted Radiation Hazards.	COG
10. Early Release of Fuel Element from Long Handling Tool.	COG
11. Deteriorating Terminal Blocks in the U-2 Central Equipment Room.	COG
12. CANDU Quarterly OPEX Events Trend Report – Q1 2009 Events.	COG
13. Building Collapse in Shanghai.	DOE
Event Free Day Resets: 2009/10 Target < 19 Q2 Target < 5 09/10 Actual: 6 Q2 Actual: 2	

Lessons from TMI

Excerpts from an [August 13, 2009 presentation](#) by NRC Commissioner Dale E. Klein to the U.S. Federal Aviation Administration:

“The most important lesson from TMI (Three Mile Island) was that success breeds complacency, and complacency is the primary enemy of an effective regulatory program... Both the regulator and the regulated industry had become overconfident in the technology itself, and in technology’s ability to provide safety automatically... (and) that the mere existence of industry training programs ensured that plant operators had all the necessary information to operate the plant successfully. TMI would show that all of these assumptions were unfounded.

The nuclear industry... responded effectively to the TMI accident... Ever since 1979... the industry has achieved steady improvement in plant performance. One important measure of the industry’s desire to improve was the creation of an organization called the Institute of Nuclear Power Operation, or INPO... INPO is, in effect, an instrument for industry self-regulation that relies on peer pressure as its most compelling regulatory tool. I attribute much of the industry’s improvement to INPO’s efforts”

OPEX LTBL questions to consider on self regulation:

- 1) Do you habitually read WANO/INPO information bulletins even if you feel they don't apply to you?
- 2) Have you observed any indications that complacency is creeping into your day-to-day operations?
- 3) Have self-assessments revealed clues to the existence of this “primary enemy”?
- 4) Have audits or other investigations identified precursors that are lying in wait to bite?

If you answered yes to any of the above, what compensatory actions are you putting in place to mitigate the risks?
If you answered no, **BEWARE!!!!**

Weekly OPEX Report to the RTD Daily Conference Call

WSM	Jan 28 2009		
AECL items shared with COG:			
<ol style="list-style-type: none"> 1. R-D-08-01166, Removal of Enriched Uranium from Zone "C" without NWSM documentation. 2. MP08-08446, Skin Contamination Exceeding Action Level. 3. PINO-08-08446, Late completion of Root Cause Analysis NUC_PROGS-08-05477. 			
COG and US DOE items shared with AECL:			
<ol style="list-style-type: none"> 1. Transformer Shipping Bars Not Removed-Leads to Electrical Arcing 2. Deviations from Pre-Job Briefing Results in a Forklift Accident 3. Inadequate Lock Out-Tag Out 4. Contaminated Waste Container Inadvertently Released 5. Risk of Containment Sump Screen Blockage 6. Boiler Level Low Transient 7. Experience Feedback On Hydrogen Hazards IN 900 MWE PWRS 8. Domestic Water Concerns 9. Acid Burn to Foot due to a Breach in Protective Clothing 10. Electrical Flash in 480-Volt Breaker 11. Unplanned Internal Tritium Contamination of a Decontamination Centre Worker 12. Crystallised Boron Plugs Two Cold Leg HP Safety Injection Lines 13. US West Shift Cleanup, Power track not Protected or Inspected Post Clean Up 14. Instrument Air Tested to the CSA Standard for Breathing Air 15. Incorrect Reassembly of Boiler Blowdown Valve 16. Impeller and suction head damage due to foreign material entering ECC pump 	<p>DOE DOE DOE DOE COG COG COG COG COG COG COG COG COG COG COG</p>		
Event Free Day Resets: 08/09 Target- ≤ 27	Q4 Target- ≤ 7	08/09 Actual- 19	Q4 Actual- 1

From Miracle to Tragedy – The Importance of Training

The miracle: On January 15, 2009, Chesley B. "Sully" Sullenberger put his US Airways jetliner down on the Hudson river minutes after both engines failed. Sullenberger said: "...I know I can speak for the entire crew when I tell you we were simply doing the jobs we were trained to do." Survivors of the crash described their experience as a miracle.

The tragedy: The Beech Bonanza was well equipped for its time as it took off from Mason City airport in the early hours of February 3, 1959. The 21 year old pilot had approximately 711 hours of total flying time, 128 in the Bonanza. He had 52 hours of dual instrument training and had passed the written examination, but had failed an instrument flight check nine months earlier. His instrument training had been in several aircraft all equipped with conventional artificial horizon, but he had no experience with the Sperry attitude gyro that was in the Bonanza. These two instruments differ greatly in their pictorial display. It was believed that the pilot had difficulty interpreting the completely different display that likely caused spatial disorientation.

Although two flash advisories issued by the Weather Bureau indicated the virtual certainty that conditions would force an instrument only flight, the pilot was not advised of the weather he would be flying into. The Bonanza was airborne by 12:55 a.m. and observed to make 180-degree turn and climb to approximately 800 feet. About five miles from the airport, the aircraft's taillight was seen to gradually descend and disappear. It was approximately 1:00 a.m. The wreckage was found in an open field covered with about four inches of snow at 9:35 am later that morning. The aircraft was demolished, all four occupants had been killed. The landing gear was retracted and the engine was producing cruise power at the time of impact. The attitude indicator showed a 90-degree right bank, nose down attitude. The vertical speed indicator was pegged at 3,000 feet-per-minute descent. The accident happened fifty years ago tonight and was written about as: "The day the music died" in that it caused the death of 22 year old Charles Hardin Holley a.k.a. Buddy Holly. Also killed were performers Ritchie Valens, J.P Richardson (the big Bopper) and the pilot.

The accident investigation board determined: "... that the probable cause of the accident was the pilot's unwise decision to embark on a flight which would necessitate flying solely by instruments he was not properly certificated or qualified to do so...(and) the pilot's unfamiliarity with the instrument which determines the attitude of the aircraft."

EFT's that prevented the '09 event becoming a tragedy and could have prevented the '59 event:

Safe Practices:

<p>A Rigorous and Prudent Approach-</p> <ul style="list-style-type: none"> • All procedures are known and adhered to. • Expected responses to unanticipated occurrences are identified, known and available. 	<p>A Questioning Attitude-</p> <ul style="list-style-type: none"> • Are you adequately trained to perform the task? • If you have serious misgivings on a course of action, listen to the inner voice – it's usually right!
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Quote of quotes: "There is no substitute for the alert, well trained operator controlling equipment and processes within specified parameter bands in accordance with approved procedures."

Admiral Hyman Rickover, Founder of the U.S Naval Nuclear Propulsion Program



Where do we go from here?

- Build a network of OPEX Single Points of Contact (SPOCS) across the business lines to help communicate relevant Lessons Learned
- Continue to monitor our effectiveness through focused self assessments and audits
- Monitor the corrective actions taken to address Lessons Learned/OPEX from other organizations
- Build stronger links with our National Lab peers



Thank you.....Questions?