Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Regulating the Nuclear Industry: Post-Fukushima

Michael Binder
President, Canadian Nuclear Safety Commission

OPG Board Meeting
Pickering, Ontario
August 23, 2011

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Fukushima-Daiichi Nuclear Power Plant

March 11, 2011

Earthquake and tsunami struck

- Efforts continue to control situation
- Raised a number of issues

CNSC took action

- Emergency Operations Centre activated
- Coordinated with federal agencies
- Issued order to all major nuclear facilities
  - Review lessons learned
  - Re-examine safety cases
  - Take action and report

A Wake-up Call For The Nuclear Sector

International Response – Over Reaction?

- **IAEA Ministerial Meeting on Nuclear Safety - June 20-24/11**
- **IAEA General Conference in Vienna - Sept 19-23**
- **Meeting between regulators and WANO**
- **UN General Assembly Nuclear Summit in New York - Sept 22-23**
- **Special Meeting of the Convention on Nuclear Safety - Aug 2012**
- **Proposed Lessons Learned Conference in Japan - Later 2012**
- **IAEA Conference in Ottawa, Canada - Spring 2013**
- **Canadian positions:**
  - Strengthen peer reviews
  - Increase cooperation with WANO

Next Step - Development Of Action Plan By The IAEA

IAEA DG Amano's five-point plan

Major elements of plan:

1. Strengthen nuclear safety standards
2. Systematically review safety of all nuclear power plants, including expanding the IAEA's program of expert peer reviews
3. Enhance effectiveness of national nuclear regulatory bodies and ensure their independence
4. Strengthen global emergency preparedness and response system
5. Expand the Agency's role in receiving and disseminating information

CNSC Response

CNSC Internal Task Force

- Industry submissions to 12(2), including OPG's, being reviewed
- Safety Review Criteria (Canadian "stress tests") issued in June 2011
- Report to the Commission Aug 10, 2011
- Recommendations by Sept 2011

IRRS Review Follow-Up Mission

- Includes assessment of Canada's response to Fukushima – Nov 2011

Ongoing CNSC Web updates

Transparent Process

Lessons Learned to Date

Always room for improvements:

Extreme natural hazards - low frequency high impact events

Severe accidents - beyond plant design

Station Blackout - back-up essential

Loss of Heat Sink - Alternative means to cool reactor

Explosive gases - Prevention of hydrogen build-up inside containment

Spent Fuel Pools - Maintaining water inventory during severe accidents

Emergency Planning - Coordination of all parties

Regulatory Framework - Review regulatory requirements

Canadian Nuclear Facilities Are Safe!!!

External Advisory Committee

- External viewpoint – Not nuclear experts
- Mandate:
  - Review the CNSC's processes and response to the Japan nuclear events
- Members:
  - Kenneth Knox (Chair), President of the Innovation Institute of Ontario
  - Dr. Gilles Patry, President of the Canada Foundation for Innovation
  - Henry Wright, former Board member Transportation Safety Board of Canada
- EAC held its first meeting on Aug 6, 2011
- EAC expected to report in March 2012

Third Party Review

2010 Safety Rating

Safety and Control Area	Bruce		Darlington	Pickering		Gentilly-2	Point Lepreau	Industry Average
	A	B		A	B			
Management system	SA	SA	SA	SA	SA	SA	SA	SA
Human performance management	SA	SA	SA	SA	SA	SA	SA	SA
Operating performance	SA	SA	**FS**	SA	SA	SA	SA	SA
Safety analysis	SA	SA	SA	SA	SA	SA	SA	SA
Physical design	SA	SA	SA	SA	SA	SA	SA	SA
Fitness for service	SA	SA	**FS**	SA	SA	SA	SA	SA
Radiation protection	**BE**	SA	**FS**	SA	SA	SA	SA	SA
Conventional heath and safety	**FS**	**FS**	**FS**	SA	SA	SA	SA	SA
Environmental protection	SA	SA	SA	SA	SA	SA	SA	SA
Emergency management and fire protection	SA	SA	SA	SA	SA	SA	**BE**	SA
Integrated Plant Rating	SA	SA	**FS**	SA	SA	SA	SA	SA
Waste management	SA	SA	SA	SA	SA	SA	SA	SA
Security	Prescribed. See CMD 11-M46.A for this rating.							
Safeguards	SA	SA	SA	SA	SA	SA	SA	SA
Packaging and transport	SA	SA	SA	SA	SA	SA	SA	SA

Fully Satisfactory (FS), Satisfactory (SA), Below Expectations (BE), Unacceptable (UA)

Pickering

- Regulatory issues:
  - Sirens have been installed
  - Fish entrainment – moving forward
- A single operating licence for A and B in June 2013
- End of commercial operation in August 2020

Darlington

Darlington New build / Joint Review Panel

- JRP Report expected soon
- Preparation of government response – GIC

Refurbishment scheduled for 2016

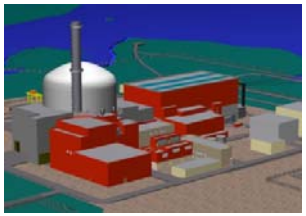
- CNSC PFP for EA screening
- Refurbishment Protocol

Darlington Licence Extension

- Licence expires June 2013
- Preparation of Licence Condition Handbook
- EA and Re-licensing Hearings in October 2012

Vendor Pre-Project Design Reviews

- **EC-6** (AECL – 775 MWe)
  – Phase I complete; Phase II underway (March 2012)
- **ACR-1000** (AECL – 1,100 MWe)
  – Phase III complete
- **AP-1000** (Westinghouse – 1,100 MWe)
  – Phase I complete
- **EPR** (AREVA – 1,400 MWe)
  – Phase I on hold at AREVA's request
- **ATMEA1** (AREVA / Mitsubishi – 1,100 MWe)
  – Phase I started (December 2012)
- **mPower** (Babcock & Wilcox – 125 MWe per module)
  – Phase I to be started this year


EPR

EC-6

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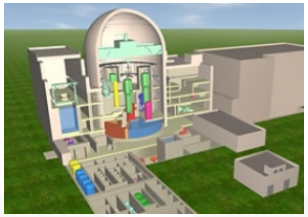
ACR-1000


ATMEA1

mPower

Deep Geologic Repository

- Waiting for appointment of JRP for DGR
- EIS – April 2011
  - Under Review
- Canadian Environmental Assessment Agency Participant Funding Program applies to the JRP

Always opportunity for clarity

Regulatory Documents recently published

- RD-321 Criteria for Physical Protection Systems and Devices at High-Security Sites (December 2010)
- RD/GD-327 Nuclear Criticality Safety (December 2010)
- RD-308 Deterministic Safety Analysis for Small Reactors (June 2011)
- RD-367 Design of Small Reactors (June 2011)
- RD-334 Aging Management for Nuclear Power Plants (June 2011)
- RD/GD-369 Licence Application Guide to Construct a Nuclear Power Plant (July 2011)

Regulatory Documents awaiting Commission decision

- RD/GD-99.1 Reporting Requirements for Operating Nuclear Power Plants: Events (August 2011)
- RD/GD-99.2 Reporting Requirements for Operating Nuclear Power Plants: Compliance and Monitoring (August 2011)
- RD/GD-99.3 Requirements for Public Information and Disclosure (August 2011)

Upcoming Regulatory / Guidance Documents

Consultations in progress:

- RD/GD-360 version 2, Life Management of Nuclear Power Plants (July 15 – September 19, 2011)
- GD-310, Guidance on Safety Analysis of Nuclear Power Plants (June 15 – August 18, 2011)

Upcoming consultations:

- GD-98 Guidance on Reliability Programs for Nuclear Power Plants
- GD-210 Guidance on Maintenance Programs for Nuclear Power Plants
- RD/GD-298 Nuclear Security Response Force
- RD/GD-316 Certification and Re-qualification Tests at Nuclear Power Plants

Draft Effluent Charter – Nov 2011

Modernizing Our Regulatory Framework

CNSC - Other Challenges

- G-2 refurbishment decision – 2012
- Point Lepreau restart – 2012
- Bruce Power Unit 1 and 2 restart - 2011
- Small reactors
- Outreach to public and disclosure
- New mining projects
- Port Hope
- Special Equipment – long-term solution

In context of skeptical post-Fukushima public

The Ottawa Scene

New majority federal government

- Minister of Natural Resources, Honourable Joe Oliver

Jobs and Economic Growth Act

- EA authorities/PFP launched Spring 2011

Federal government initiatives

- Nuclear Liability and Compensation Act?
- Strategic Operating Review/fiscal restraint
- Review of Major Projects Management Office

AECL sale - SNC Lavalin

- Chalk River 5 year licence renewal
- Next steps on National Nuclear Laboratory?

Court cases

- Steam generators
- Environment Canada – hydrazine
- McClean Lake
- Ontario Energy Board

In Looking to the Future, We Must Not Forget the Past!

Please Explore And Provide Feedback!

We Will Never Compromise Safety

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