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Canadian Nuclear
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Pre-Consultation for RD-308 and RD-367

**April 28, 2010 Public Webinar on
Design and Safety Analysis for
“Small Reactors”:**



**SECTION 1
Introduction and Context,
CNSC Regulatory Approach and
Overview of Siting and Licensing:**

Presenter: M. de Vos

EDOCS 3515962

Overall Purpose



This webinar is designed to explain some high level concepts that are being considered for inclusion in:

- RD-308 "*Deterministic Safety Analysis for Small Reactors*" and
- RD-367 "*Design Requirements for Small Reactors*"

Why?



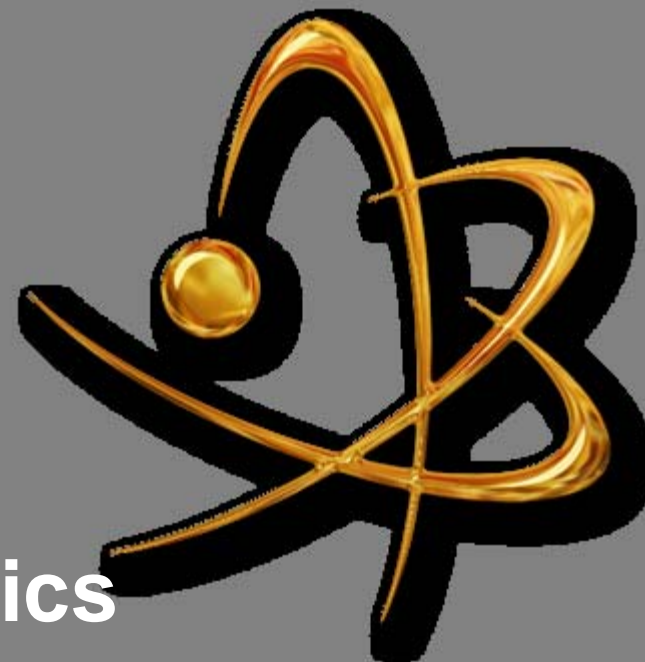
To explain key concepts in the two proposed regulatory documents and hear back from you so that you can prepare to participate in the Regulatory Document Public Consultation Process scheduled to begin later this year.



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Webinar Logistics



How the Webinar will be Conducted

- This webinar is being simultaneously broadcast in French and English.
- We will address questions in both official languages using simultaneous interpretation.

Webinar Agenda



- Section 1: Introduction and Context, CNSC Regulatory Approach and Overview of Siting and Licensing: Two Qs and As sessions
- Section 2: RD-308 and RD-367 Key Concepts: Three Qs and As sessions
- Section 3: Overview of RD-308 and RD-367 and next steps in the regulatory process: Two Qs and As sessions

How the Webinar will be Conducted

- The speakers will present material for their section (s) - about 25 minutes.
- While we are presenting, you can submit questions online.
- At the Question and Answer pause (will be indicated by a slide) speaker will stop for a specific amount of time (5-15 minutes) so that questions accumulated so far can be answered by Staff.

Your participation today



Please:

- Be concise and open in your comments but focus your questions on the material being covered
- Limit the length of the question. (your question (s) will appear in a chat format)
- Ask questions based on the material presented. The intent is to help clarify questions in order to help you participate in the consultation process for RD-308 and RD-367




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The CNSC's Regulatory Philosophy

The Licensee is the cornerstone of safety and is held accountable by their licence

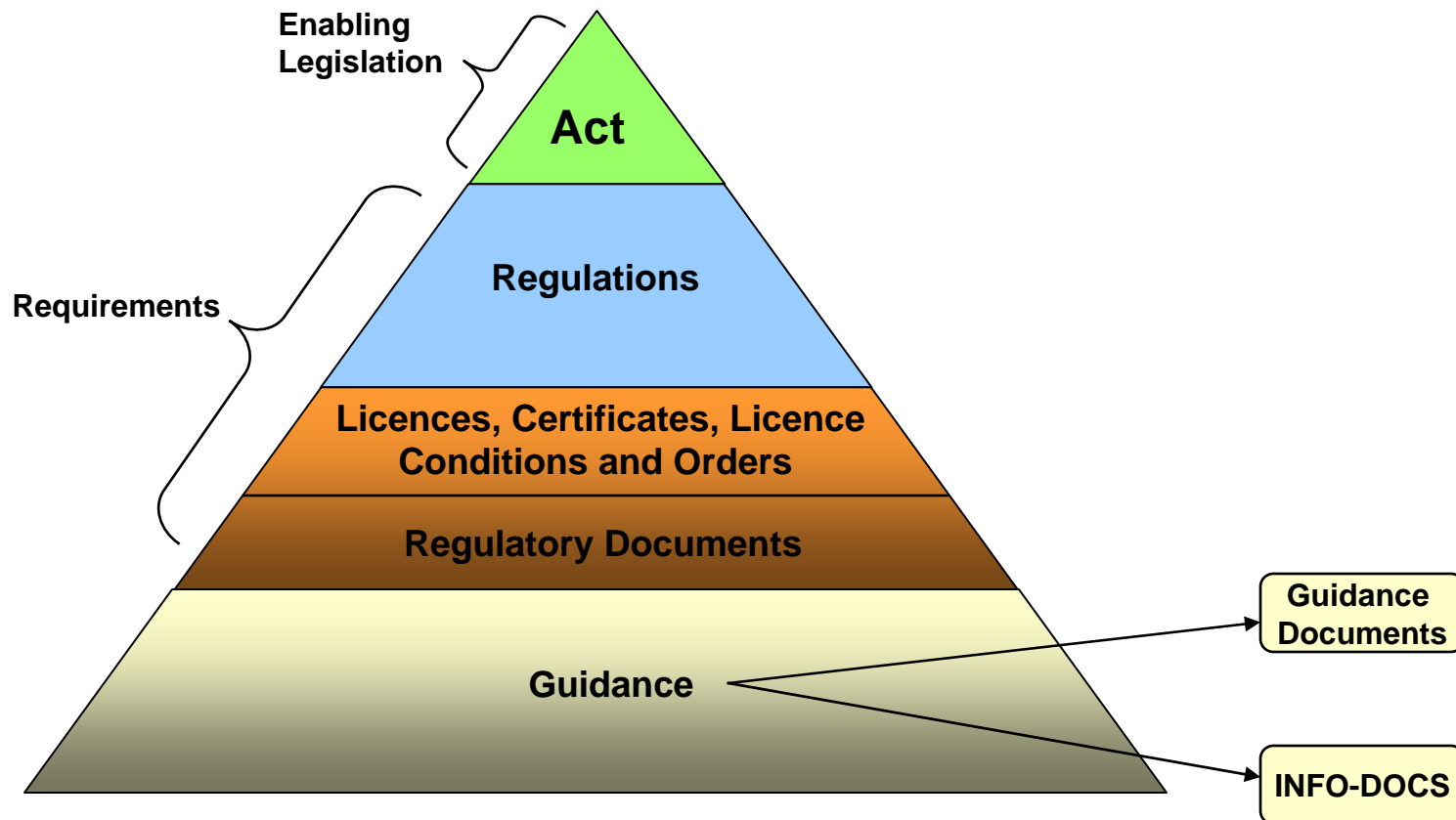


Section 24(4) of the *Nuclear Safety and Control Act* (NSCA)

No licence may be issued, renewed, amended or replaced unless, in the opinion of the Commission, the applicant:

- (a) is qualified to carry on the activity that the licence will authorize the licensee to carry on; and
- (b) will, in carrying on that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed

Regulatory Framework



Regulatory Documents



- Provide detail and clarification of the licensing and other regulatory requirements of the Canadian Nuclear Safety Commission with respect to the *Nuclear Safety and Control Act*, regulations made under the Act, and licence conditions
- Legally enforceable when referenced in a licence

CNSC is a “Balanced” Regulator



The applicant proposes, based on considerations contained in Regulatory Documents and applicable Canadian Codes and Standards how they will meet the requirements of the Regulations under the *Nuclear Safety and Control Act*.

This allows the applicant to be flexible based on their unique licensing case.

Additional review effort will be needed for novel approaches, and when alternative approaches to meet regulatory requirements are proposed.

At a High Level...



- The applicant's proposal is then reviewed by Staff against best industry practices and documents under the CNSC Regulatory Framework.
- The proposal then goes before the Commission (public decision making forum) and if the Commission agrees, a licence is granted.

So What Does this Mean? (1)



- The applicant is expected to demonstrate long-term thinking. (over the expected lifecycle of their project)
- The applicant is expected to be a “smart buyer” .
- The applicant is expected to propose and defend their safety case and how they plan to meet their obligations under the *Nuclear Safety and Control Act*.

So What Does this Mean? (2)



- The applicant is expected to demonstrate they have adequately consulted stakeholders and considered their views. (potentially affected public, aboriginal groups etc)
- The applicant is expected to show they have a Management System that will be capable of demonstrating oversight of all licensed activities.



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Environmental Assessment, the Reactor Licensing Process and the Role of Site Evaluation

What is Site Evaluation?



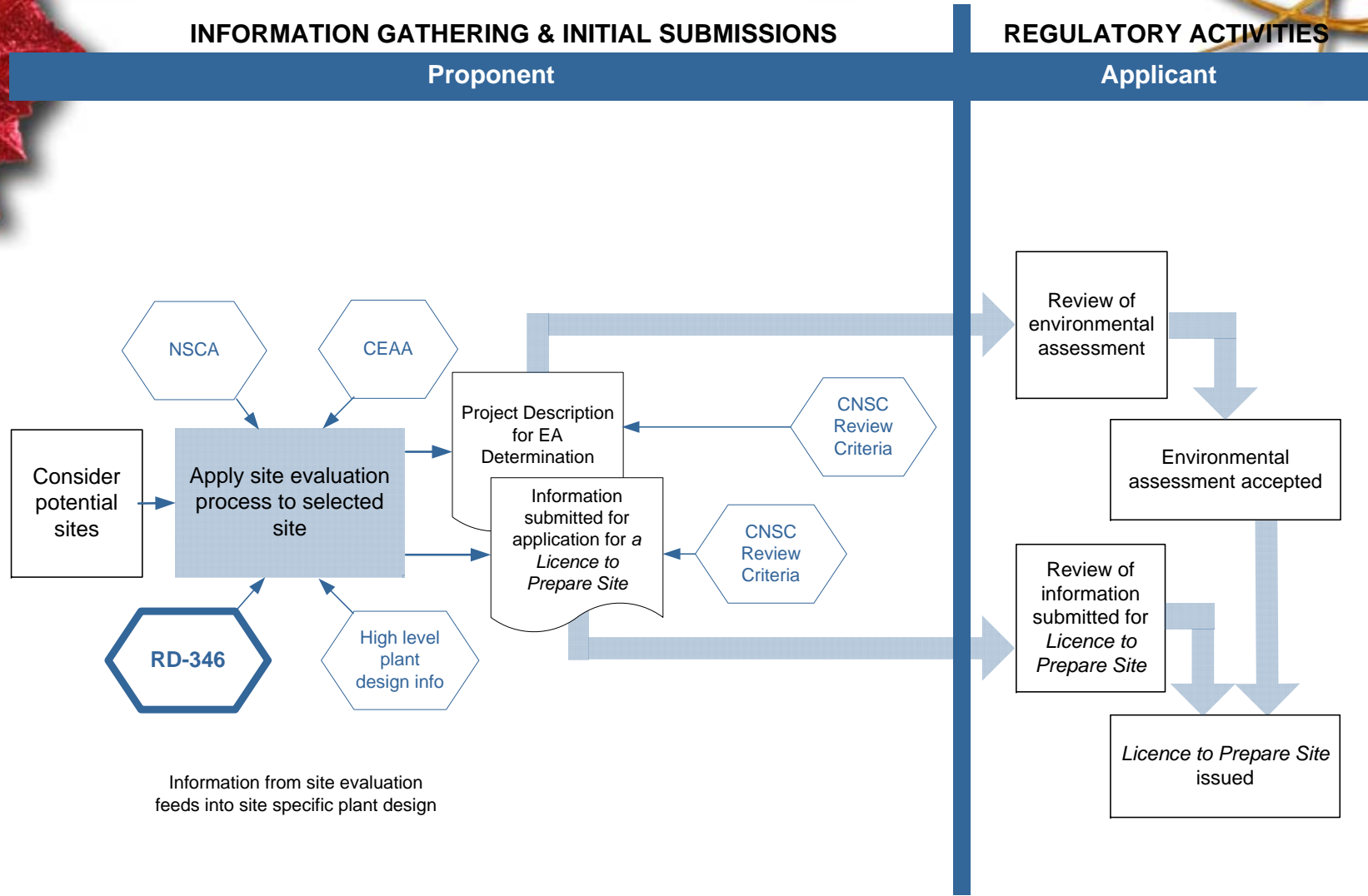
- Done by a proponent prior to submission of an application to the CNSC to confirm one or more sites will be suitable for the full lifecycle of a nuclear facility. (not federally regulated)
- Described in CNSC Regulatory Document **RD-346** - Site Evaluation for New Nuclear Power Plants. (also applies to small reactors)
- Includes a characterisation of each candidate site and includes external effects on the site and the effects of the site on the environment.

What is Site Selection?



- The process by which the final site is chosen.
- Unless the facility will be located on federal Crown Land, the choice of site is a matter between the proponent and the municipalities and provinces / territories involved. (CNSC is not involved)

How Site Evaluation Interfaces with Environmental Assessment (EA) and Site Preparation License Processes



Site is evaluated and chosen... then what?



Using site evaluation information, the proponent builds and submits:

- A ***Project Description*** – Used to trigger which Environmental Assessment (EA) process will be used.

and

- An application for a ***Licence to Prepare Site (LTPS)*** which triggers CNSC involvement in both the licensing and EA processes

Scope of the Reviews



- Environmental Assessment is about the environmental effects over the entire project life-cycle (from Site Preparation through to Abandonment)
- Licence to Prepare Site is:
 - preparing the site, and
 - the evaluation of the proposed site for the construction and operation of the nuclear facility [S 4(a) Class I Regs]

Scope: EA & Licence to Prepare Site

Unique to EA	Common to EIS and LTSPS (leveraged)	Unique to LTSPS
<ul style="list-style-type: none"> • Project Justification: <ul style="list-style-type: none"> – Purpose and Need for the Project – Alternatives to the Project – Alternative Means of Carrying out the Project • Description of the Project: <ul style="list-style-type: none"> – Construction – Operation and Maintenance – Modifications – Decommissioning and Abandonment, – Waste and Used Fuel Management – Environmental Protection Policies and Procedures for project life-cycle • Capacity of Renewable Resources 	<ul style="list-style-type: none"> • General Information about the Applicant and Description of Proposed Facility • Site Evaluation: Is the proposed site appropriate for the proposed construction and operation of the facility, taking site characteristics, emergency preparedness and physical protection of the facility into account? <ul style="list-style-type: none"> ➤ Assessing the impact of the environment on the facility ➤ Assessing the impact of the facility on the environment <ul style="list-style-type: none"> – Population and Emergency Planning Considerations: Exclusion Zone, Protective Zone, Planning Considerations, – Baseline Data – Evaluation of Natural External Events – Evaluation of External, Non-Malevolent, Human-Induced Events – Security – Decommissioning 	<ul style="list-style-type: none"> • Specific information regarding the applicant, per GNSCR, Class I Regs • Programs for the conduct of Site Preparation activities <ul style="list-style-type: none"> – Occupational Health and Safety; – Quality Assurance; – Environmental Protection – Emergency Preparedness – Security – Decommissioning and Financial Guarantees

Particular to Small Reactors

A Note on Licensing...



License to Prepare Site

Licence to Construct

Licence to Operate

Licence to Decommission

Licence to Abandon

- Applications can be submitted in series or in parallel. (business risk)
- Proponent can apply directly for a higher license, but must also satisfy all regulations of previous licensing steps and their information must be sufficient to meet the licence they are applying for.

Where is the Licensing Process Described?



The licensing process will be described in CNSC publication INFO-XXXX ***Licensing Process for New Small Reactors in Canada*** (currently under internal review and expected to be published within next few months)

Hint:

It is very similar to INFO-0756 ***Licensing Process for New Nuclear Power Plants*** in Canada (available from CNSC Website)



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Questions and Answers so far... (5 minutes)

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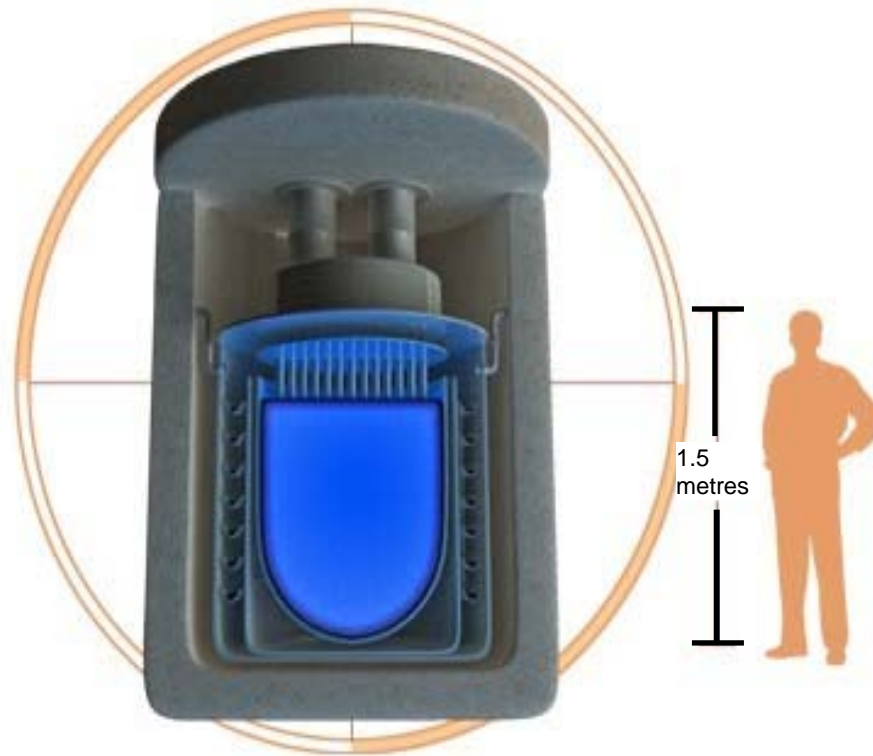
CNSC Staff are Preparing for the Possibility of Receiving Licence Applications for “Small Reactors”



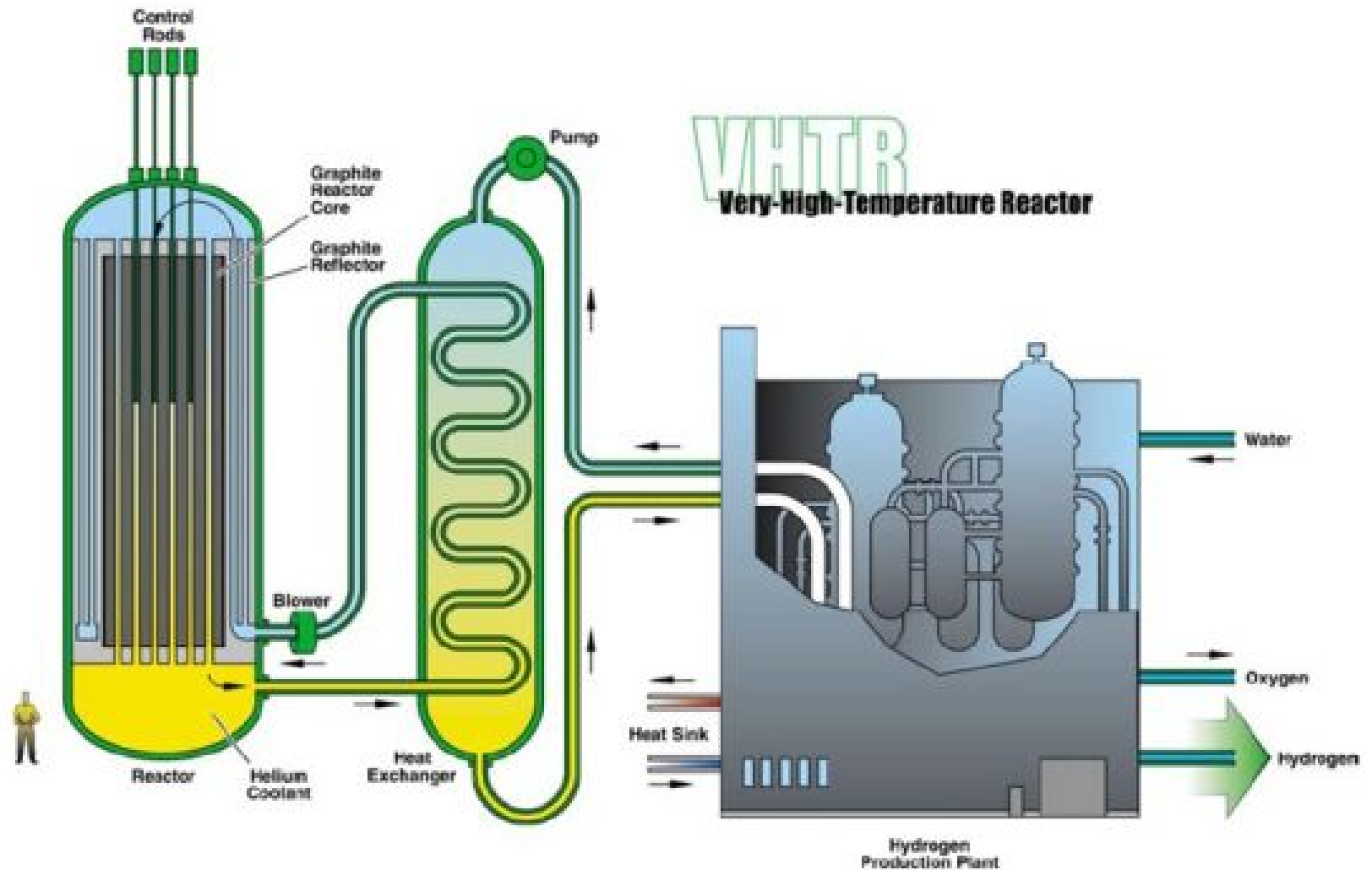
There is a new class of proponent who is looking at ways to either adapt existing low power reactor designs or use new small reactor designs for more than traditional research or isotope production. For example:

- Small scale electrical production in remote areas
- Process steam for industrial use

Approx. 40 MW thermal



Approx. 200 MW thermal



Research Reactors




OPAL Pool-type Research Reactor (20 MW thermal)

In Canada, existing research reactors range from 20 kWt (SLOWPOKE) to 135 MWt (NRU)



- These small reactors would have a wide range of end uses, and therefore a wide range of designs and features.
- Each reactor type needs a regulatory approach that makes sense for the risk it might pose without compromising safety.
- For these types of reactors, we are developing a regulatory framework for application in the immediate and more distant future.



On January 13, 2010, CNSC staff briefed the Commission about the following intent:

- *To divide reactors into two classes by power output and make classes independent of the end use of the reactor.*
- **Nuclear Power Plant:** means a fission reactor with a thermal power greater than or equal to 200 MWt (about 75 MW electrical output)
- **Small Reactor:** means a fission reactor with a thermal power less than 200 MWt

So why 200 MWt?



- The risk to health, safety and the environment posed by a reactor is dominated by the radioactive material in the core and that is closely related to the thermal power of the reactor.
- The threshold value should be set at a power below which CNSC is prepared to use a “graded approach”.
- Staff has agreed that a threshold of 200 MWt is reasonable with the understanding that CNSC is prepared to exercise flexibility for reactors close to the threshold.

New Regulatory Documents Under Development



For this class of reactors, Staff is preparing to go to public consultation during the summer of this year for:

- RD-308 "*Deterministic Safety Analysis for Small Reactors*"
- RD-367 "*Design Requirements for Small Reactors*"

March 1 Workshop with Industry



On March 1 2010, we had a similar workshop with representatives from every type of small reactor in this new class:

- Research Reactors
- Isotope Reactors
- Future Small “Power” Reactors

Summary posted on www.nuclearsafety.gc.ca

What did Industry Say? (1)



- Regulatory criteria should consider the risk associated with a reactor's design and location, and address non-water-cooled reactor technology (for example, high-temperature gas cooled reactors).
- ...would like to understand how the CNSC will consider unique aspects ... such as the possibility of remote operation, the role of operational experience, and the level of research and development needed for licensing first-of-a-kind technologies.

What did Industry Say? (2)



- ...needs clarity on design requirements for beyond design basis accidents
- requires clarification of definitions, particularly the “graded approach,” with elaboration in these areas: scope and depth of probabilistic safety analysis, robustness, and application of codes and standards .

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End of Section 1:
Question and Answers for
next 15 minutes.

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