



REGDOC-2.4.5, *Nuclear Fuel Safety and Qualification*

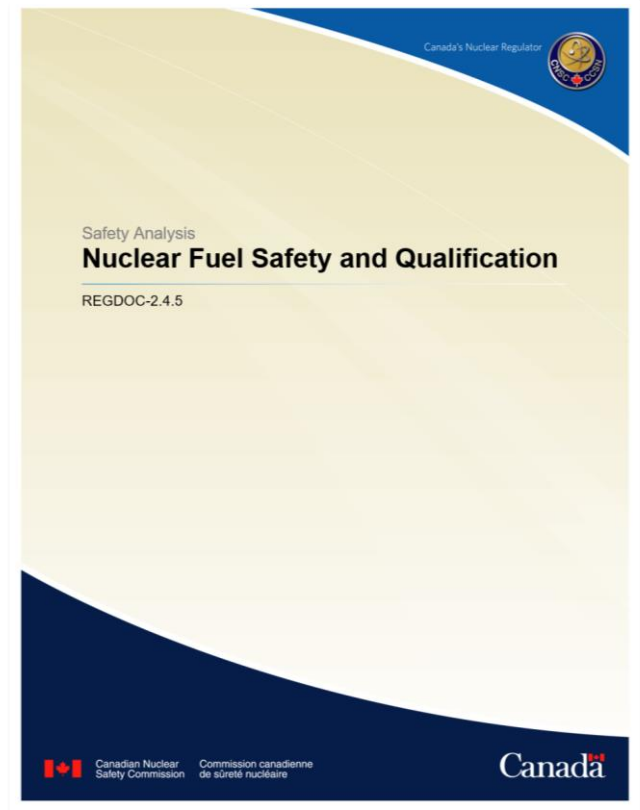
Commission Meeting
February 21, 2024



Request acceptance of:

REGDOC-2.4.5

Nuclear Fuel Safety and Qualification



- ➔ REGDOC-2.4.5 Overview
- ➔ Background
- ➔ Objectives of REGDOC-2.4.5
- ➔ Development – Test Scenarios
- ➔ Results of public consultation
- ➔ Conclusion and recommendation



Objective:

Clarifies requirements and provides guidance for the design, operation, monitoring, qualification and performance assessments of fuel for operating reactor facilities.

Purpose:

Consolidates existing requirements and guidance into a single document.

Scope:

Class IA facilities.

Regulatory requirements and guidance related to fuel are not well documented.

- CANDU reactors must comply with modern standards or regulatory documents for all barriers to the release of radioactivity
- Currently, CNSC letters and licence conditions handbooks (LCH) set the basis for fuel regulation
- Other requirements are found throughout several REGDOCs and standards

Consolidating the requirements and guidance into a new regulatory document would capture existing knowledge and best practices.



Consolidate
existing
requirements

- Technology neutral, but CANDU-centric
- No new requirements for existing licensees



Promote best
Practices

- Capture existing knowledge



Provide clarity
and regulatory
certainty

- Support new nuclear licensing
- Provide a framework and guidance for new applicants

Test scenarios (hypothetical situations)

1. Innovative fuel designs
2. Foreign design and manufacture of fuel

Tested by staff with varying backgrounds to determine if the REGDOC was usable, comprehensive and that users came to consistent conclusions.

The test scenarios confirmed the REGDOC was able to handle a wide variety of situations.

Posted for public consultation from:

September 26, 2022, to January 28, 2023.

Type	Number of Commenters	Number of comments
CANDU industry	5	78
SMR industry	4	99
Individuals	2	11
Total	11	188

Workshop with commenters held on July 19, 2023.

1

Placement in *Safety Analysis SCA*

2

Focus of document

3

Duplication of requirements

4

Third party fuel designers and qualification

5

Technology neutrality

6

Guidance on qualification

All commenters received a copy of the final CNSC staff responses

1

Placement in *Safety Analysis SCA*

What we heard	How we addressed it
<ul style="list-style-type: none">The document does not fit neatly into a single SCA.	<ul style="list-style-type: none">Document name changed to better reflect contents.No other change made. SCAs organize the regulatory framework and are not always a perfect fit for every document.

2

Focus of document

What we heard	How we addressed it
<ul style="list-style-type: none"> • Some participants felt the document should focus on advanced fuels. • Other participants thought it should only focus on CANDU fuels. 	<ul style="list-style-type: none"> • While no change made, CNSC staff outlined the process for addressing advanced fuels. • Additionally, staff discussed the need to provide clarity for proponents of non-CANDU fuels.
<ul style="list-style-type: none"> • A third option presented was drafting two separate documents. 	<ul style="list-style-type: none"> • No change made. Two documents provide little benefit and create challenges in consistency and clarity.

3

Duplication of requirements

What we heard	How we addressed it
<ul style="list-style-type: none">• Participants were concerned the document duplicated existing requirements	<ul style="list-style-type: none">• Document reviewed by writing team to ensure requirements point to existing standards, etc. where applicable.
<ul style="list-style-type: none">• Participants were concerned the document might introduce new requirements.	<ul style="list-style-type: none">• Document reviewed by writing team to ensure no new requirements were introduced.

4

Third party fuel designers and qualification

What we heard	How we addressed it
<ul style="list-style-type: none">Participants expressed concern about the ability to use international fuel suppliers.	<ul style="list-style-type: none">CNSC staff explained how REGDOC allows the use of international suppliers provided they demonstrate regulatory equivalency.

5

Technology neutrality

What we heard	How we addressed it
<ul style="list-style-type: none">Some participants expressed concern about the CANDU-centric nature of the document.	<ul style="list-style-type: none">Writing team reviewed document to ensure CANDU-specific text is noted.
<ul style="list-style-type: none">Participants asked how the document will evolve for non-CANDU fuel.	<ul style="list-style-type: none">Staff outlined the periodic review process for REGDOCs and noted these documents can be reopened at any time if required.

6

Guidance on qualification

What we heard	How we addressed it
<ul style="list-style-type: none">• Participants wanted more guidelines on the qualification stage.	<ul style="list-style-type: none">• CNSC staff noted the reference to NUREG-2246 and that it had been successfully used in the CNSC-USNRC joint review of TRISO fuel qualification.
<ul style="list-style-type: none">• Participants noted that first-of-a-kind builds have less operational experience.	<ul style="list-style-type: none">• CNSC staff noted areas for additional guidance.• Additionally, staff noted first-of-a-kind scenarios are better handled in individual licensing bases.

REGDOC-2.4.5

- Improves management and retention of knowledge
- Consolidates CNSC staff expectations and licensee commitments
- Simplifies CNSC staff's work to verify compliance with requirements
- Clarifies regulatory requirements

CNSC staff recommend:

The Commission accepts

REGDOC-2.4.5, Nuclear Fuel Safety and Qualification
for publication and use.



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Thank You! Questions?



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