



Tool: Considerations for information categorization

(Step 5. Categorize information)

Introduction to the tool

This tool (*Considerations for Information Categorization*) is intended to support implementation of Step 5 of the process introduced in the IAEA TECDOC-2098, *Collaborative Reviews and Effective Leveraging* [1].

The tool provides a process and a categorization approach for the Recipient Regulator (Regulator B in Ref. [1]) seeking to leverage a regulatory review performed by the Source Regulator (Regulator A in Ref. [1]).

Process for categorization

The suggested categorization process is as follows:

- Sub-divide the information being leveraged using the same organizational structure as the one applied in Step 3 — Assess the Impact of Divergence on Leveraging Information. This structure could be based on IAEA SSG-61 [2], U.S. NRC Standard Review Plan NUREG-0800 [3], or the Recipient Regulator’s requirements for application format and content.
- Form teams within the Recipient Regulator to assess and categorize the information in each sub-division. Teams could be assigned based on the technical disciplines required to perform the analysis for each sub-division.
- Use the Categorization Tool below to divide information into two categories:
 - Type 1: Information will need additional work to be leveraged;
 - Type 2: Information can be leveraged with minimal to no additional assessment.
- Perform analysis, as needed, to leverage information. Ultimately, to leverage information from another regulatory body, the Recipient Regulator needs to conclude that the information meets their regulatory requirements.

Categorization checklist

If the answer to any of the following questions is ‘yes’, consider if that information is to be classified as ‘Type 1’, that is, information that will need additional work to be leveraged:

- Is the information site-specific?
- Does the information relate to matters that contribute significantly to facility risk?
- Did Step 3 identify significant differences in regulatory requirements?
 - a. If so, does the Recipient Regulator need to make findings beyond those required by the Source Regulator?
- Did Step 4 identify any information quality concerns with the Source Regulator’s evaluation?
- Is there a significant technical difference in industry codes and standards?
 - a. Assuming there is a difference, will effort be required to accommodate other codes and standards? (This may not be the case if, for example, the Recipient Regulator’s framework is flexible enough.)
- Have there been any changes (including design changes) to this information since it was analysed by the Source Regulator?
- Has there been any adverse operating experience related to this information?
- Does the Recipient Regulator have experience in this area that would warrant a more detailed review?
- Could the following considerations have a negative impact on structures, systems, and components (SSCs) important to safety?
 - a. Are the safety arguments insufficient in some way?
 - b. Have new findings — arising from operating experience, research, or development — emerged since the Source Regulator’s review, with significant implications for nuclear safety?
 - c. Are there differing conditions (e.g. reactor operation mode, environmental factors, external hazards, AC voltage frequency) specific to the Recipient Regulator that were not adequately considered by the Source Regulator?
 - d. Is significant effort needed to understand the Recipient Regulator’s requirements and how the information was used in the context of those requirements, including performance of in-depth and/or independent reviews where necessary?
 - e. Is there a perceived gap that needs additional verification by the Recipient Regulator to raise confidence?

Categories and required actions

Information type	Action required
Type 1: Information will need additional work to be leveraged	In-depth, independent assessment of how SSCs important to safety meet the Recipient Regulator’s requirements, codes and standards, or of the justification for design changes. This could include Requests for Additional Information (RAIs).
Type 2: Information can be leveraged with minimal to no additional assessment	Information could be leveraged as is, or with minimal additional assessment. This minimal additional assessment could include: • Consideration of how the Source Regulator found the SSCs important to safety acceptable; • Consideration of sufficiency of documentation and supporting technical basis; • Confirmation of absence of design changes; • Limited RAIs.

Appendix I.

Example of implementation of the categorization checklist

Case study: Leveraging United States Nuclear Regulatory Commission (U.S. NRC) reviews for the Canadian Nuclear Safety Commission (CNSC) assessment of GNF2 fuel for the BWRX-300

Checklist implementation	Example
Background	As part of the Licence to Construct for the Darlington New Nuclear Project (DNNP) in Canada, Ontario Power Generation (OPG) identified GE Hitachi’s Global Nuclear Fuel Mark II (GNF2) as the reference fuel design for the BWRX-300 reactor. This fuel is currently used in the U.S. boiling water reactors (BWRs) but had not been used or previously evaluated in Canada. As part of its licence application for the DNNP, OPG submitted multiple documents to demonstrate fuel qualification to the CNSC. Given that extensive evaluations had already been performed by the U.S. NRC, the CNSC aimed to leverage this information.
Information that served the bases to the categorization	The information submitted as part of the DNNP Licence to Construct included: Fuel licensing basis • The GESTAR II fuel licensing framework, developed by GNF2 supplier and accepted by the U.S. NRC, defines fuel licensing criteria, analytical methods and reactor-independent limits. In OPG’s DNNP application, GESTAR II is cited as providing assurance that Canadian regulatory requirements for fuel design are met. Thermo-mechanical and design analyses • The <i>BWRX-300 Darlington New Nuclear Project (DNNP) GNF2 Fuel Assembly Mechanical Design Report</i> [4] addresses design requirements for normal operation, specified in subsection 8.1.1, <i>Fuel Elements, Assemblies and Design</i>, of REGDOC-2.5.2 [5]; • The <i>BWRX-300 Darlington New Nuclear Project (DNNP) GNF2 Fuel Assembly Thermal-Mechanical Design Report</i> [6] provides the outcome of evaluations performed by the fuel performance modelling code, intended to support safety analyses of accident scenarios. Validation of fuel performance computer code • Safety Evaluation Report (SER) prepared by the U.S. NRC; • Independent technical assessment conducted by the U.S. Pacific Northwest Nuclear Laboratory (PNNL); • Three technical reports submitted by OPG validating the fuel performance computer code. CNSC staff noted that these reports addressed technical requirements identified in Clause 10, <i>Validation</i> , of CSA N286.7, <i>Quality Assurance of Analytical, Scientific, and Design Computer Programs</i> [7]. Compliance evidence OPG submitted a REGDOC-2.5.2 compliance matrix demonstrating that OPG’s submissions contain adequate information to comply with CNSC expectations for fuel systems. CNSC staff determined the matrix demonstrated compliance for the fuel system.
Checklist application: 1. Site-specific	The GNF2 fuel design itself is not site-specific. Categorization: Type 2.
Checklist application: 2. Contribution to facility risk	Fuel is safety-significant; however, extensive U.S. operating history reduces uncertainty. Categorization: Potential Type 1 mitigated → remains Type 2 with focused checks.
Checklist application: 3. Regulatory divergences	Differences exist between the U.S. NRC and the CNSC frameworks, but the Canadian framework is flexible enough to accept the U.S. codes and standards where justified. Validation requirements in the U.S. closely resemble those of CSA N286.7. Categorization: Type 2.
Checklist application: 4. Information quality	Information derived from established U.S. NRC reviews and national laboratories shows no quality concerns. Categorization: Type 2.
Checklist application: 5. Differences in codes and standards	While differences exist, it was generally noted that the information submitted was adequate to demonstrate Canadian compliance. Categorization: Type 2.
Checklist application: 6. Design changes / new findings	No design changes have occurred since the U.S. NRC evaluation, and no adverse operating experience has been identified. Categorization: Type 2.
Checklist application: 7. Recipient experience	CNSC has limited direct operating experience with BWR fuel, but the breadth of the U.S. data mitigated the need for an in-depth independent reassessment. Categorization: Type 2 with selective verifications.
Checklist application: 8. Environmental / operational conditions	Canadian site conditions (e.g. hazards, frequencies) did not introduce major deviations affecting fuel performance for leveraging purposes. Categorization: Type 2.
Checklist application: 9. Need for independent verification	Targeted verification was performed (e.g. selective confirmation of analysis assumptions and limits), but it was not extensive. Categorization: Minimal additional work → Type 2.
Categorization outcome	Overall, information related to GNF2 fuel was categorized mostly as Type 2 (leveraged with minimal additional assessment). Supporting reasons include: • Established U.S. operating history; • Completed U.S. NRC evaluations (GESTAR II, SER, PNNL); • Direct CNSC–U.S. NRC technical interactions; • Robust code validation and design documentation; • REGDOC-2.5.2 compliance matrix confirming alignment with CNSC expectations; • Selective Type 1-like elements (focused checks) performed without requiring full independent reassessment.
Efficiency gains from leveraging	• U.S. qualification data and operating experience significantly reduced CNSC review timelines. • CNSC–U.S. NRC collaboration provided timely clarifications and avoided duplicate analyses. • Leveraging allowed CNSC to concentrate on Canadian-specific considerations only.
Key source documents (as referenced in the case)	• OPG DNNP Application referencing GESTAR II (link provided in submission); • OPG NK054-REP-01210-00160, <i>GNF2 Fuel Assembly Mechanical Design Report</i> (rev. 0); • OPG NK054-REP-01210-00161, <i>GNF2 Fuel Assembly Thermal-Mechanical Design Report</i> (rev. 0); • U.S. NRC Safety Evaluation Report; • PNNL technical report on code validation; • REGDOC-2.5.2 compliance matrix demonstrating that OPG’s submissions contain adequate information to comply with the relevant sections of REGDOC-2.5.2.

References

- INTERNATIONAL ATOMIC ENERGY AGENCY, *Collaborative Reviews and Effective Leveraging* — The IAEA’s Nuclear Harmonization and Standardization Initiative, IAEA-TECDOC-2098, IAEA, Vienna (2025), <https://doi.org/10.61092/iaea.psrj-fkjj>
- INTERNATIONAL ATOMIC ENERGY AGENCY, *Format and Content of the Safety Analysis Report for Nuclear Power Plants*, IAEA Safety Standards Series No. SSG-61, IAEA, Vienna (2021).
- UNITED STATES NUCLEAR REGULATORY COMMISSION, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition*, NUREG-0800, U.S. NRC, Washington, D.C. (2023).
- ONTARIO POWER GENERATION, *BWRX-300 Darlington New Nuclear Project (DNNP) GNF2 Fuel Assembly Mechanical Design Report*, NK054-REP-01210-00160 (Rev. 0), OPG, Toronto (confidential).
- ONTARIAN NUCLEAR SAFETY COMMISSION, *Design of Reactor Facilities*, REGDOC-2.5.2 (Version 1), CNSC, Ottawa (2014).
- ONTARIO POWER GENERATION, *BWRX-300 Darlington New Nuclear Project (DNNP) GNF2 Fuel Assembly Thermal-Mechanical Design Report*, NK054-REP-01210-00161 (Rev. 0), OPG, Toronto (confidential).
- CANADIAN STANDARDS ASSOCIATION, *Quality Assurance of Analytical, Scientific, and Design Computer Programs*, CSA N286.7, CSA Group, Toronto (2016).