11 GLOSSARY

The U.S. Nuclear Regulatory Commission (NRC) staff has defined the terms provided in this section for the purposes of this standard review plan (SRP). Many of the terms are taken from Title 10 of *Code of Federal Regulations* (10 CFR) 20.1004, "Units of Radiation Dose," 10 CFR 71.4, "Definitions," or 49 CFR 173.403, "Definitions." Standards are expressed in the International System of Units (SI). The U.S. standard or customary unit equivalents presented in parentheses are for reader convenience.

A_1. See 10 CFR 71.4.

A_2. See 10 CFR 71.4.

Assembly defect. Any change in the physical as-built condition of the spent fuel assembly except for normal in-reactor changes such as elongation from irradiation growth or assembly bow. Examples of assembly defects include: (a) missing rods, (b) broken or missing grids or grid straps (spacers), and (c) missing or broken grid springs.

Benchmarking. Establishing a predictable relationship between calculated results and reality. The main goal of benchmarking is a quantitative understanding of the difference, or "bias," between calculated and expected results and the uncertainty in this difference (bias uncertainty). Also known as code or method "validation."

Breached spent fuel rod. A spent fuel rod with cladding defects that permit the release of gases or solid fuel particulates from the interior of the fuel rod. SNF rod breaches include pinhole leaks, hairline cracks, or gross ruptures.

Burnup. The measure of the thermal power produced in a specific amount of nuclear fuel through fission, usually expressed in units of gigawatt days per metric ton uranium (GWd/MTU). For the purpose of assessing the allowable contents, the maximum burnup(s) of the fuel should be specified in terms of the average burnup of the entire fuel assembly (i.e., assembly average). Additionally, for SNF criticality analyses that rely on burnup credit, a minimum required assembly-average burnup will be specified. For the purpose of assessing fuel-cladding integrity in the materials review, the rod with the highest burnup within the fuel assembly should be specified in terms of peak rod average burnup. For assemblies with mixed oxide (MOX) or thoria rods, the units will usually be megawatt days per metric ton heavy metal (MWd/MTHM).

Can for damaged fuel. A metal enclosure that is sized to confine damaged spent fuel contents. A can for damaged fuel must satisfy fuel-specific and system-related functions for undamaged SNF required by the applicable regulations.

Carrier. See 10 CFR 71.4.

Certificate holder. See 10 CFR 71.4.

Certificate of compliance. See 10 CFR 71.4.

Close reflection by water. See 10 CFR 71.4.

Closed transport vehicle. A transport vehicle or conveyance equipped with a securely attached exterior enclosure that during normal transportation restricts the access of unauthorized persons to

the cargo space containing the Class 7 (radioactive) materials. The enclosure may be either temporary or permanent, and in the case of packaged materials may be of the "see-through" type, and must limit access from the top, sides, and bottom. (49 CFR 173.403)

Confirmatory calculations. The NRC reviewer performed independent calculations to confirm the adequacy of the applicant's analyses. These calculations do not replace, nor do they endorse, the applicant's design calculations.

Consignment. See 10 CFR 71.4.

Containment system. See 10 CFR 71.4.

Contamination. See 10 CFR 71.4.

Conveyance. See 10 CFR 71.4.

Criticality Safety Index (CSI). See 10 CFR 71.4

Curie (Ci). A unit of radioactive decay. A curie is equal to 37 billion (3.7×10^{10}) disintegrations per second. The SI unit Becquerel (Bq) is equal to 1 disintegration per second.

Damaged spent nuclear fuel. Any spent fuel rod or spent fuel assembly that cannot meet the pertinent fuel-specific or system-related functions.

Exclusive use. See 10 CFR 71.4.

Fissile material. See 10 CFR 71.4.

Fissile material package. Fissile material packaging, together with its fissile material contents.

Gross Breach. A breach in the spent fuel cladding that is larger than either a pinhole leak or a hairline crack and allows the release of particulate matter from the spent fuel rod.

High Burnup Fuel. SNF with assembly-average burnup (see "Burnup") exceeding 45 GWd/MTU.

Intact spent nuclear fuel. Any fuel that can fulfill all fuel-specific and system-related functions, and that is not breached. Note that all intact SNF is undamaged, but not all undamaged fuel is intact, since under most situations, breached spent fuel rods that are not grossly breached will be considered undamaged.

k_{eff} "k-effective". Effective neutron multiplication factor including all biases and uncertainties at a 95-percent confidence level for indicating the level of subcriticality relative to the critical state. At the critical state, $k_{eff} = 1.0$. This has also been used to represent effective thermal conductivity.

Low Burnup Fuel. SNF with an assembly-average burnup (see "Burnup") less than 45 GWd/MTU.

Low specific activity material. See 10 CFR 71.4.

Low toxicity alpha emitters. See 10 CFR 71.4.

Maximum normal operating pressure (MNOP). See 10 CFR 71.4.

Natural thorium. See 10 CFR 71.4.

Natural uranium. Uranium with the naturally occurring distribution of uranium isotopes (approximately 0.711 weight percent uranium-235, and the remainder by weight essentially uranium-238).

Normal form radioactive material. See 10 CFR 71.4.

Optimum interspersed hydrogenous moderation. See 10 CFR 71.4.

Package. See 10 CFR 71.4.

Package Application (Safety Analysis Report). In the context of Part 71, the Safety Analysis Report (SAR) is sometimes called the package application. Information provided in the package application report that is not incorporated into the certificate of compliance is not typically considered a condition of the approval. The package application simply provides the information that demonstrates that the design meets the performance standards in the regulations. The package application is typically listed as a "reference" at the end of the certificate, not as a condition. To use a package under the General License in Subpart C of 10 CFR Part 71, the licensee is required to have a copy of the packaging drawings and other documents, referenced in the Certificate, that relate to the use and maintenance of the package, and actions to be taken before shipment. The licensee must follow the terms and conditions in the certificate (i.e., the shipment must conform, in all respects, to the certificate and any documents specifically cited as a condition of the approval). The licensee does not need to have a copy of the complete package application.

Packaging. See 10 CFR 71.4.

Pinhole leaks (or hairline cracks). A minor cladding defect that will not permit significant release of particulate matter from the spent fuel rod and therefore presents a minimal as low-as-is-reasonably-achievable concern for loading and unloading operations.

Radiation level. The radiation dose-equivalent rate expressed in millisievert(s) per hour (mSv/h) or millirem(s) per hour (mrem/h). Neutron flux densities may be converted into radiation levels according to Table 1, 49 CFR 173.403.

Radioactive contents. A Class 7 (radioactive) material, together with any contaminated liquids or gases within the package. (49 CFR 173.403)

Radioactive material. Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in the table in 49 CFR 173.436 or values derived according to the instructions in 49 CFR 173.433 (49 CFR 173.403).

Safety Evaluation Report (SER). In the context of this SRP, the report NRC staff prepared by to document the acceptability of the applicant's application and other submissions. The SER also identifies the NRC staff's conclusions and the conditions of approval that are included in the NRC approval (certificate of compliance or letter authorization) that the SER accompanies.

Special form radioactive material. See 10 CFR 71.4

Specific activity of a radionuclide. See 10 CFR 71.4

Spent nuclear fuel or spent fuel (SNF). See 10 CFR 71.4

Surface contaminated object (SCO). See 10 CFR 71.4.

Transport index. See 10 CFR 71.4.

Type A quantity. See 10 CFR 71.4.

Type B quantity. See 10 CFR 71.4.

Undamaged spent nuclear fuel. Any fuel rod or fuel assembly that can meet the pertinent fuel-specific or package-related functions necessary to meet 10 CFR Part 71. Undamaged SNF rods may contain pinholes or hairline cracks, but may not contain gross breaches. Undamaged SNF assemblies may have assembly defects if able to meet the pertinent fuel-specific or package-related functions.