4 IMPLEMENTATION GUIDANCE

Licensees may determine applicability and screen activities to determine if 10 CFR 50.59 evaluations are required as described in Sections 4.1 and 4.2, or equivalent manner.

4.1 APPLICABILITY

As stated in Section (b) of 10 CFR 50.59, the rule applies to each holder of a license authorizing operation of a production or utilization facility, including ~~the holder of a license authorizing operation of a nuclear power reactor that has submitted a certification of permanent cessation of operations required under 10 CFR 50.82(a)(1) or~~ a non-power production or utilization facility that has permanently ceased operations ~~a reactor licensee whose license has been amended to allow possession but not operation of the facility~~.

4.1.1 Applicability to Licensee Activities

10 CFR 50.59 is applicable to tests or experiments not described in the ~~U~~FSAR (as updated)[1] and to changes to the facility or procedures as described in the ~~U~~FSAR (as updated), including changes made in response to new requirements or generic communications, except as noted below:

Per 10 CFR 50.59(c)(1)(i), proposed activities that require a change to the technical specifications must be made via the license amendment process, 10 CFR 50.90. Aspects of proposed activities that are not directly related to the required technical specification change are subject to 10 CFR 50.59.[2]

To reduce duplication of effort, 10 CFR 50.59(c)(4) specifically excludes from the scope of 10 CFR 50.59 changes to the facility or procedures that are controlled by other more specific requirements and criteria established by regulation. For example, 10 CFR 50.54, which was promulgated after 10 CFR 50.59, specifies criteria and reporting requirements for changing ~~quality assurance,~~ physical security and emergency plans.

[1] The primary purpose of preparing the updated FSAR and subsequent FSAR updates is to ensure that the FSAR contains a description and analysis of the NPUF that reflect the current licensing basis. Under 10 CFR 50.71(e), the NRC requires the licensee to submit an updated FSAR and subsequent FSAR updates at intervals not to exceed 5 years to provide a common reference for the licensee and the NRC. In contrast, the FSAR (as updated) defined in 10 CFR 50.59(a)(4) serves as an up-to-date reference for the NPUF licensee to use in its activities between submittals required by 10 CFR 50.71(e) or by NRC inspectors and reactor operator licensing examiners when they are on site. In the case of changes made under 10 CFR 50.59 and 10 CFR 50.90, use of the FSAR (as updated) may be required to take into account changes since the last submission of the FSAR under 10 CFR 50.71(e).

[2] For every licensee, legally binding obligations are explicitly stated in the license which includes specific parts of 10 CFR as well as TS. For example, if the license incorporates TS as an appendix and the NPUF TS includes the Bases, then the license includes the Bases. 10 CFR 50.59(c)(1)(i), allows licensees to make changes without an amendment provided, "(i) A change to the technical specifications incorporated in the license is not required." Therefore, changes to NPUF TS Bases would require prior NRC approval per 10 CFR 50.59(c)(1)(i) since 10 CFR 50.59(c)(1)(i) requires prior NRC approval for changes to the TS Bases IF it involves a "A change to the technical specifications incorporated in the license."

Commented [NC1]: The first step started with the words from NEI 96-07 Revision 1 (existing endorsed guidance). Then the words that are not applicable to NPUFs or RTRs were deleted (with track changes turned on). Then NPUF specific examples were added (e.g., adapted from TRTR white paper).

Once this first step is completed, we will then add digital I&C guidance from NEI 01-01 and/or Appendix D.

Commented [HD2]: These are words from NPUF final rule.

Commented [CN3]: Since the changes proposed for 50.71(e) will make the non-power facilities update their FSARs and keep them up to date, the wording in the document – i.e., FSAR (as updated) – is meant to reflect the conditions after the NPUF Rule changes take effect.

In addition to 50.90 and 50.54~~(a),~~ (p) & (q), the following include change control requirements that meet the intent of 50.59(c)(4) and may take precedence over 50.59 for control of specific changes:

- ~~10 CFR 50.65 (Maintenance Rule). See additional discussion in Section 4.1.2.~~
- ~~10 CFR Part 50, Appendix B, (Quality Assurance Criteria). See additional discussion in Section 4.1.4.~~
- ~~Standard FP license condition (if applicable). See additional discussion in Section 4.1.5.~~
- ~~10 CFR 50.55a (Codes and Standards)~~
- ~~10 CFR 50.46, (ECCS Rule)~~
- 10 CFR 50.12, (Specific Exemptions)
- 10 CFR Part 20 (Standards for Radiation Protection).

Activities controlled and implemented under other regulations may require related information in the ~~U~~FSAR (as updated) to be updated. To the extent the ~~U~~FSAR (as updated) changes are directly related to the activity implemented via another regulation, applying 10 CFR 50.59 is not required. ~~U~~FSAR (as updated) changes should be identified to the NRC as part of the required ~~U~~FSAR (as updated) update, per 10 CFR 50.71(e). However, there may be certain activities for which a licensee would need to apply both the requirements of 10 CFR 50.59 and that of another regulation. For example, a modification to a facility involves additional components and substantial piping reconfigurations as well as changes to protection system setpoints. The protection system setpoints are contained in the facility technical specifications. Thus, a license amendment to revise the technical specifications under 10 CFR 50.90 is required to implement the new system setpoints. 10 CFR 50.59 should be applied to the balance of the modification, including impacts on required operator actions.

4.1.2 Maintenance Activities

Maintenance activities are activities that restore SSCs to their as-designed condition, including activities that implement approved design changes. For example, a change to the facility occurs during a maintenance activity in which a valve is disassembled, repaired, and reassembled but the valve returned to its original as-designed condition upon completion of the maintenance activity. Maintenance activities are not subject to 10 CFR 50.59, but are subject to ~~the provisions of 10 CFR 50.65(a)(4) as well as~~ technical specifications. For instance, if one train of a system is rendered inoperable while it removed from service to perform maintenance on a valve in that train, the licensee is required to perform technical specifications actions for SSCs that are not operable.~~.~~

Maintenance activities include troubleshooting, calibration, refurbishment, maintenance-related testing, identical replacements, housekeeping and similar activities that do not permanently alter the design, performance requirements, operation or control of SSCs.

Commented [CN4]: 50.54(a) only applies to NPPs.

Commented [NC5]: The deleted rules do not apply to RTRs or NPUFs.

Commented [HD6]: This reflects the 50.71(e) requirement that is part of NPUF final rule.

Maintenance activities also include temporary alterations to the facility or procedures that directly relate to and are necessary to support the maintenance. Examples of temporary alterations that support maintenance include jumpering terminals, lifting leads, placing temporary ~~lead~~ shielding ~~on pipes and equipment~~, removal of barriers, and use of temporary blocks, bypasses, scaffolding and supports.

~~Licensees should ensure operability in accordance with the technical specifications and should assess and manage the risk impact of maintenance activities per 10 CFR 50.65(a)(4) and NUMARC 93-0 1, Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.~~

~~In addition to assessments required by 10 CFR 50.65(a)(4),~~ 10 CFR 50.59 should ~~also~~ be applied in the following case~~s~~:

~~A temporary alteration in support of the maintenance is expected to be in effect during at-power operations for more than 90 days. In this case, 10 CFR 50.59 would be applied to the temporary alteration prior to implementation in the same manner as a permanent change.~~

- The ~~plant~~ facility is not restored to its original condition upon completion of the maintenance activity (e.g., if SSCs are removed, the design, function or operation is altered, or if temporary alteration in support of the maintenance is not removed). In this case, 10 CFR 50.59 would be applied to the permanent change to the ~~plant~~facility.

Installation and post-modification testing of approved facility changes are indistinguishable, in terms of their risk impact on the facility~~plant~~, from maintenance activities that restore SSCs to their as-designed condition. As such, installation and testing of approved facility changes are maintenance activities. ~~that must be assessed and managed in accordance with 10 CFR 50.65(a)(4). This contrasts with historical practice where 10 CFR 50.59 reviews addressed the design, installation and post-modification testing of proposed facility changes. Going forward,~~10 CFR 50.59 ~~will~~ addresses the effect, following implementation, of proposed facility changes to determine if prior NRC approval is required~~, the risk impact of actually implementing the change will be assessed and managed per 10 CFR 50.65(a)(4)~~.

~~If a temporary alteration necessary to install a facility change is expected to be in effect longer than 90 days at power, the required 50.59 review of the temporary alteration may be performed as part of the 50.59 review for the facility change.~~

10 CFR 50.59 should be applied to temporary changes proposed as compensatory actions for degraded or nonconforming conditions, as discussed in Section 4.4.

Control of Maintenance Procedures

Changes to procedures for performing maintenance are made in accordance with any applicable ~~10 CFR Part 50, Appendix B~~facility quality assurance requirements (e.g., managerial and administrative controls in the technical specifications)~~, criteria~~ and licensee procedures. Licensee processes should ensure that changes to facility~~plant~~ configurations called for by procedures are consistent with the technical specifications. Unless required by technical specifications, 10 CFR 50.59 does not apply to such changes because, like the maintenance activities themselves, changes to procedures for performing maintenance do not permanently alter the design, performance requirements, operation or control of SSCs. For example, technical specifications may explicitly require that 10 CFR 50.59 be applied to written procedures for maintenance of components that have nuclear safety significance and for technical specification required surveillance and testing.

Commented [CN7]: This wording is deleted. The concept of temporary alterations does not apply to NPUFs and the reference is removed.

Commented [BP8]: The term “plant” in 96-07 has been replaced with “facility” throughout this example and the document.

Certain maintenance procedures, including those for technical specification required surveillance and inspection, may contain important information concerning SSC design, performance, operation or control. Examples include acceptance criteria for ~~valve stroke~~ ventilation damper actuation times or other SSC functions, torque values, and types of materials (e.g., gaskets, elastomers, lubricants, etc.). Licensee design and/or configuration control processes should ensure that 10 CFR 50.59 is applied to changes in such information and that maintenance procedure changes do not inadvertently alter the design, performance requirements, operation or control of SSCs.

If a change to a maintenance procedure affects information in the ~~U~~FSAR (as updated) (e.g., a specific test or maintenance frequency), the affected information should be updated in accordance with 10 CFR 50.71(e).

4.1.3 ~~U~~FSAR (as updated) Modifications

~~Per NEI 98-03 (Revision 1, June 1999), as endorsed by Regulatory Guide 1.181 (September 1999), m~~Modifications to the ~~U~~FSAR (as updated) that are not the result of activities performed under 10 CFR 50.59 are not subject to control under 10 CFR 50.59. Such modifications include reformatting and simplification of ~~U~~FSAR (as updated) information and removal of obsolete or redundant information and excessive detail.

Commented [CN9]: RG 1.181 is not applicable to NPUFs.
RG 2.7 is NPUF equivalent to RG 1.181 (LWRs)
Other guidance applicable to NPUFs is found in NUREG-1537, Part 1, which describes the format and content of FSARs.

Similarly, 10 CFR 50.59 need not be applied to the following types of activities:

- Editorial changes to the ~~U~~FSAR (as updated) (including referenced procedures, topical reports, etc.)
- Clarifications to improve reader understanding
- Correction of inconsistencies within the ~~U~~FSAR (as updated) (e.g., between sections)
- Minor corrections to drawings, e.g., correcting mislabeled valves
- Similar changes to ~~U~~FSAR (as updated) information that do not change the meaning or substance of information presented.

4.1.4 Changes to Procedures Governing the Conduct of Operations

Even if described in the ~~U~~FSAR (as updated), changes to managerial and administrative procedures governing the conduct of facility operations are ~~controlled under 10 CFR 50, Appendix B, programs and are~~ not subject to control under 10 CFR 50.59. These include, but are not limited to, procedures in the following areas (provided they are not governed by the technical specifications or the license):

- Operations and work process procedures such as control of equipment status (tag outs)
- Administrative controls for Shift staffing ~~and personnel qualifications~~

- Administrative controls for creating or modifying procedures such as maintenance procedures or operating procedures
- ~~Training programs~~
- ~~On-site/off-site safety review committees~~
- ~~Plant~~ Facility modification process
- ~~Calculation process~~

Example

The individual who is designated as the reactor manager/supervisor is typically responsible for day-to-day facility operations. The designation of the manager/supervisor is an administrative requirement on the conduct of facility operations. Thus, assigning this function to another individual would not be subject to 10 CFR 50.59 but would be done in accordance with managerial and administrative controls in the facility technical specifications and any applicable quality assurance requirements and licensee procedures.

4.1.5 ~~Changes to Approved Fire Protection Programs~~Intentionally left blank

Commented [NC10]: NPUFs are not required to have a fire protection program; therefore, changes to the fire protection programs may not be excluded from 50.59 due to (c)(4) "applicability."

~~Most nuclear power plant licenses contain a section on fire protection (FP). Originally, these fire protection license conditions varied widely in scope and contentThese variations created problems for licensees and for NRC inspectors in identifying the operative and enforceable fire protection requirements at each facility.~~

~~To resolve these problems, the NRC promulgated guidance in Generic Letter 86-10, "Implementation of Fire Protection Requirements," for licensees to:~~

~~Incorporate the fire protection program and major commitments into the FSAR for the facility, and~~

~~Amend the operating license to substitute a standard fire protection license condition for the previous license condition(s) regarding fire protection.~~

~~Under the standard fire protection license condition, licensees may~~

~~Make changes to their approved FP programs without prior NRC approval provided that the changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire, and~~

~~Alter specific features of the approved program provided such changes do not otherwise involve a change to the license or technical specifications, or require an exemption.~~

~~Adoption of the standard fire protection license condition provided a more consistent approach to evaluating changes to the facility, including those associated with the fire protection program. Originally, changes to the FP program under the FP license condition were also subject to 10 CFR 50.59; however, this created confusion as to which regulatory requirement governed FP program changes.~~

~~10 CFR 50.59(c)(4) provides that when applicable regulations establish more specific criteria for controlling certain changes, 10 CFR 50.59 does not also apply. Consistent with this intent, the standard fire protection license condition establishes specific criteria for control of fire protection changes and falls within the scope of 10 CFR 50.59(c)(4). Thus, applying 10 CFR 50.59 to fire protection program changes is not required.~~

~~Changes to the fire protection program should be evaluated for impacts on other design functions, and 10 CFR 50.59 should be applied to the non-fire protection related effects of the change, if any.~~

~~Consistent with current practice, determinations made under the standard fire protection license condition should be based on a written evaluation that remains available for NRC review for the life of the plant. These written evaluations should provide the basis for the licensee's conclusion that changes to the fire protection program do not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. An evaluation performed in accordance with the license condition should include an assessment of the impact of the change on the existing fire hazards analysis for the area, as is current practice. The assessment should address the effects on combustible loading and distribution and should consider whether circuits or components, including associated circuits, for a train of equipment needed for safe shutdown could be affected, or whether a new element could be introduced into the area.~~

~~Under the standard license condition, approved fire protection program documents (e.g., fire hazards analysis) are incorporated in the UJFSAR, and as such, changes to this information are subject to 10 CFR 50.71(e) reporting requirements.~~

4.2 SCREENING

Once it has been determined that 10 CFR 50.59 is applicable to a proposed activity, screening is performed to determine if the activity should be evaluated against the evaluation criteria of 10 CFR 50.59(c)(2).

Engineering, design and other technical information concerning the activity and affected SSCs should be used to assess whether the activity is a test or experiment not described in the ~~U~~FSAR (as updated) or a modification, addition or removal (i.e., change) that affects:

- A design function of an SSC
- A method of performing or controlling the design function, or
- An evaluation for demonstrating that intended design functions will be accomplished.

Sections 4.2.1 and 4.2.2 provide guidance and examples for determining whether an activity is (1) a change to the facility or procedures as described in the ~~U~~FSAR (as updated) or (2) a test or experiment not described in the ~~U~~FSAR (as updated). If an activity is determined to be neither, then it screens out and may be implemented without further evaluation under 10 CFR 50.59. Activities that are screened out from further evaluation under 10 CFR 50.59 should be documented as discussed in Section 4.2.3.

Each element of a proposed activity must be screened except in instances where linking elements of an activity is appropriate, in which case the linked elements can be considered together. A test for linking elements of proposed changes is interdependence.

It is appropriate for discrete elements to be considered together if (1) they are interdependent as in the case where a modification to a system or component necessitates additional changes to other systems or procedures; or (2) they are performed collectively to address a design or operational issue. For example, a pump upgrade modification may also necessitate a change to a support system, such as cooling water.

If concurrent changes are being made that are not linked, each must be screened separately and independently of each other.

Activities that screen out may nonetheless require ~~U~~FSAR (as updated) information to be updated. Licensees should provide updated ~~U~~FSAR (as updated) information to the NRC in accordance with 10 CFR 50.71(e).

Specific guidance for applying 10 CFR 50.59 to temporary changes proposed as compensatory actions for degraded or nonconforming conditions is provided in Section 4.4.

4.2.1 Is the Activity a Change to the Facility or Procedures as Described in the ~~U~~FSAR (as updated)?

To determine whether or not a proposed activity affects a design function, method of performing or controlling a design function or an evaluation that demonstrates that design functions will be accomplished, a thorough understanding of the proposed activity is essential. A given activity may have both direct and indirect effects that the screening review must consider. The following questions illustrate a range of effects that may stem from a proposed activity:

- Does the activity decrease the reliability of an SSC design function, including either functions whose failure would initiate a transient/ accident or functions that are relied upon for mitigation?
- Does the activity reduce existing redundancy, diversity or defense-in-depth?
- Does the activity add or delete an automatic or manual design function of the SSC?
- Does the activity convert a feature that was automatic to manual or vice versa?
- Does the activity introduce an unwanted or previously unreviewed system or materials interaction?
- Does the activity adversely affect the ability or response time to perform required actions, e.g., alter equipment access or add steps necessary for performing tasks?

- Does the activity degrade the seismic or equipment environmental qualification of the SSC?
- Does the activity adversely affect other units at a multiple unit site?
- Does the activity affect a method of evaluation used in establishing the design bases or in the safety analyses?
- For activities affecting SSCs, procedures, or methods of evaluation that are not described in the ~~U~~FSAR (as updated), does the change have an indirect effect on electrical distribution, structural integrity, environmental conditions or other ~~U~~FSAR (as updated)-described design functions?

Per the definition of "change" discussed in Section 3.3, 10 CFR 50.59 is applicable to additions as well as to changes to and removals from the facility or procedures. Additions should be screened for their effects on the existing facility and procedures as described in the ~~U~~FSAR (as updated) and, if required, a 10 CFR 50.59 evaluation should be performed. ~~NEI 98-03~~NRC Regulatory Guide~~RG~~ 2.7 provides guidance for determining whether additions to the facility and procedures should be reflected in the UFSAR per 10 CFR 50.71(e).

C~~onsistent with historical practice, c~~hanges affecting SSCs or functions not described in the ~~U~~FSAR (as updated) must be screened for their effects (so-called "indirect effects") on ~~U~~FSAR (as updated)-described design functions. A 10 CFR 50.59 evaluation is required when such changes adversely affect a ~~U~~FSAR (as updated)-described design function, as described below.

Screening for Adverse Effects

Commented [CG11]: Recommend TRTR include a definition of "adverse" elsewhere in guidance to ensure consistent understanding within TRTR community.

A 10 CFR 50.59 evaluation is required for changes that adversely affect design functions, methods used to perform or control design functions, or evaluations that demonstrate that intended design functions will be accomplished (i.e., "adverse changes"). The plain language definition of "adverse" is preventing success, harmful; or unfavorable. Changes that have none of these effects, or have positive effects, may be screened out because only adverse changes have the potential to increase the likelihood of malfunctions, increase consequences, create new accidents or otherwise meet the 10 CFR 50.59 evaluation criteria[3].

Per the definition of "design function," SSCs may have preventive, as well as mitigative, design functions. Adverse changes to either must be screened in. Thus, a change that decreases the reliability of a function whose failure could initiate an accident would be considered to adversely affect a design function and would screen in. In this regard, changes that would relax the manner in which FSAR (as updated) ~~-~~specified industry consensus standards ~~Code requirements~~ are met for certain SSCs should be screened for adverse effects on design function. Similarly, changes that would introduce a new type of accident or malfunction would screen in. This reflects an overlap between the

[3] Note that as discussed in Section 4.2.1.1, any change that alters a design basis limit for a fission product barrier-positively or negatively-is considered adverse and must be screened in.

technical/engineering (“safety”) review of the change and 10 CFR 50.59. This overlap reflects that these considerations are important to both the safety and regulatory reviews.

If a change has both positive and adverse effects, the change should be screened in. The 10 CFR 50.59 evaluation should focus on the adverse effects.

The screening process is not concerned with the magnitude of adverse effects that are identified. Any change that adversely affects a ~~U~~FSAR (as updated)-described design function, method of performing or controlling design functions, or evaluation that demonstrates that intended design functions will be accomplished is screened in. The magnitude of the adverse effect (e.g., is the minimal increase standard met?) is the focus of the 10 CFR 50.59 evaluation process.

Screening determinations are made based on the engineering/technical information supporting the change. The screening focus on design functions, etc., ensures the essential distinction between (1) 10 CFR 50.59 screenings, and (2) 10 CFR 50.59 evaluations, which focus on whether changes meet any of the eight criteria in 10 CFR 50.59(c)(2). Technical/engineering information, e.g., design evaluations, etc., that demonstrates changes have no adverse effect on ~~U~~FSAR (as updated)-described design functions, methods of performing or controlling design functions, or evaluations that demonstrate that intended design functions will be accomplished may be used as basis for screening out the change. If the effect of a change is such that existing safety analyses would no longer be bounding and therefore ~~U~~FSAR (as updated) safety analyses must be re-run to demonstrate that all required safety functions and design requirements are met, the change is considered to be adverse and must be screened in. The revised safety analyses may be used in support of the required 10 CFR 50.59 evaluation of such changes.

Changes that entail update of safety analyses to reflect improved performance, capacity, timing, etc., resulting from a change (beneficial effects on design functions) are not considered adverse and need not be screened in, even though the change calls for safety analyses to be updated. For example, a change that improves the closure time of ventilation ~~main control room~~ isolation dampers reduces effluents~~the calculated dose to operators~~, and ~~U~~FSAR (as updated) dose consequence analyses are to be updated as a result. In this case, the dose analyses are being revised to reflect the lower dose for the public~~main control room~~, not to demonstrate that ~~GDC~~ applicable limits continue to be met. A change that would more than minimally effect the design function of the dampers (~~post-accident isolation of the main control~~reactor ~~room~~e.g., increase the closure time) and increase the existing calculated dose to the public ~~operators~~ would be considered adverse and would screen in. In this case, the dose analyses must be re-run to ensure that ~~GDC~~ applicable limits continue to be met. The revised analyses would be used in support of the 10 CFR 50.59 evaluation to determine if the increase exceeds the minimal standard and requires prior NRC approval.

To further illustrate the distinction between 10 CFR 50.59 screening and evaluation, consider the example of a change to a damper actuation ~~to the diesel generator starting~~ relay that delays the building ventilation damper closure ~~diesel start~~ time from 10 seconds to 12 seconds. The ~~U~~FSAR-described design function credited in the ~~ECCS~~ analyses is for the building ventilation dampers close ~~diesel to start~~within 12 seconds of detecting abnormal effluent activity such that the activity is not released. This change

would screen out because it is apparent that the change will not adversely affect the building isolation ~~diesel generator~~ design function credited in the ~~ECCS~~ accident analyses remain valid).

However, a change that would delay the building ventilation isolation ~~diesel's start~~ time to 13 seconds would screen in because the change adversely effects the design function (~~diesel to start~~ dampers to close within in 12 seconds). Such a change would screen in even if technical/engineering information supporting the change includes revised safety analyses that demonstrate all required safety functions supported by the ventilation ~~diesel~~dampers, e.g., ~~core heat removal,~~ building isolation, ~~containment cooling, etc., are~~is satisfied and that applicable dose limits continue to be met. While this change may be acceptable with respect to performance of required safety functions and meeting design requirements, the analyses necessary to demonstrate acceptability are beyond the scope/intent of 10 CFR 50.59 screening reviews. Thus a 10 CFR 50.59 evaluation would be required. The revised safety analyses would be used in support of the 10 CFR 50.59 evaluation to determine whether any of the evaluation criteria are met such that prior NRC approval is required for the change. Additional specific guidance for identifying adverse effects due to a procedure or methodology change is provided in subsections 4.2.1.2 and 4.2.1.3, respectively.

4.2.1.1 Screening of Changes to the Facility as Described in the ~~U~~FSAR (as updated)

Screening to determine that a 10 CFR 50.59 evaluation is required is straightforward when a change adversely affects an SSC design function, method of performing or controlling a design function, or evaluation that demonstrates intended design functions will be accomplished as described in the ~~U~~FSAR (as updated).

However, a facility also contains many SSCs not described in the ~~U~~FSAR (as updated). These can be components, subcomponents of larger components or even entire systems. Changes affecting SSCs that are not explicitly described in the ~~U~~FSAR (as updated) can have the potential to adversely affect SSC design functions that are described and thus may require a 10 CFR 50.59 evaluation. In such cases, the approach for determining whether a change involves a change to the facility as described in the FSAR (as updated) is to consider the larger, ~~U~~FSAR (as updated) described SSC of which the SSC being modified is a part. If for the larger SSC, the change adversely affects a ~~U~~FSAR (as updated)-described design function, method of performing or controlling the design function, or an evaluation demonstrating that intended design functions will be accomplished, then a 10 CFR 50.59 evaluation is required.

Another important consideration is that a change to nonsafety-related SSCs not described in the ~~U~~FSAR (as updated) can indirectly affect the capability of SSCs to perform their ~~U~~FSAR (as updated)-described design function(s). For example, increasing the heat load on a nonsafety-related heat exchanger could compromise the cooling system's ability to cool safety-related equipment.

Seismic qualification, missile protection, flooding protection, fire protection, environmental qualification, ~~high energy line break~~ and masonry block walls are some of the areas where changes to nonsafety-related SSCs, whether or not described in the ~~U~~FSAR (as updated), can affect the ~~U~~FSAR (as updated)-described design function of SSCs through indirect or secondary effects.

Equivalent replacement is a type of change to the facility that does not alter the design functions of SSCs. Licensee technical evaluations should determine whether the proposed alternate replacement item is equivalent to the original in its ability to perform its required design functions, ~~equivalence assessments,~~ e.g., consideration of performance/operating characteristics and other factors, may thus form the basis for screening determinations that no 10 CFR 50.59 evaluation is required.

As discussed in Section 4.2.1, only proposed changes to SSCs that would, based on supporting engineering and technical information, have adverse effects on design functions require evaluation under 10 CFR 50.59. Changes that have positive or no effect on design functions may generally be screened out. In addition, any change to a design bases limit for a fission product barrier must be considered adverse and screened in. This is because 10 CFR 50.59(c)(2)(vii) requires prior NRC approval any time a proposed change would "exceed or alter" a design bases limit for a fission product barrier.

The following examples illustrate the 10 CFR 50.59 screening process as applied to proposed facility changes:

Example 1

A licensee proposes to replace ~~a~~ the relays for ~~in~~ the reactor pool level ~~or and low-flow~~ alarm ~~overspeed trip~~ circuits ~~of an emergency diesel generator~~ with a nonequivalent relay. These relays ~~is~~ are not described in the ~~U~~FSAR (as updated), but the design function~~s~~ of the reactor pool level ~~or and low-flow~~ alarm~~s~~ ~~overspeed trip circuit and the emergency diesel generator are~~ is described. Based on engineering/ technical information supporting the change, the licensee determines if replacing the relay would adversely affect the design function of ~~either~~ the reactor pool level ~~or low-flow~~ alarm~~s~~ ~~overspeed trip circuit or EDG~~. If the licensee concludes that the change would not affect the ~~U~~FSAR (as updated)-described design function of the circuit ~~or EDG~~, then this determination would form the basis for screening out the change, and no 10 CFR 50.59 evaluation would be required.

Example 2

A licensee proposes a ~~nonequivalent~~ change to the operator on reactor pool cooling system ~~one of the safety injection accumulator~~ isolation valves. ~~.~~ The ~~U~~FSAR (as updated) describes that these isolation valves are open ~~with their circuit breakers open~~ during normal operation. These are ~~motor~~ solenoid operated, safety-related valves that are ~~and~~ required ~~for pressure boundary integrity and~~ to remain open so that flow to the reactor pool ~~RCS~~ will occur during ~~a LOCA as RCS pressure drops below 600 psi~~ an accident to provide reactor pool ~~. They are remotely closed during a normal shutdown so as to not inject when not required. Technical/engineering work supporting this change ensures that the replacement operator is capable of performing the functions of the existing operator and will not adversely affect the connected Class 1E bus or diesel. This change would screen out because (1) the valve operator does not perform, support or impact the UFSAR-described design function (to ensure pressure boundary integrity and remain open when required) that supports safety injection~~ cooling ~~performance~~ credited in the safety analyses. ~~, and (2) the change does not adversely affect other SSC design functions (e.g., of the Class 1E bus).~~ If the proposed change was to

configure ~~t~~these normally open ~~he~~ valves to be ~~as a~~ normally closed~~d~~ valves that automatically open~~s~~ on high reactor pool temperature~~loss of reactor coolant system pressure~~, 10 CFR 50.59 evaluation would be required because the change would adversely affect the reliability of the cooling ~~safety injection~~ function as credited in the safety analyses.

Example 3

A licensee proposes to replace a globe valve with a ball valve in a vent/drain application to reduce the propensity of this valve to leak. This vent/drain valve has two functions but only one of these functions is a design function. Screening considers whether the change adversely affects the function that is a design function. One vent/drain valve function, which is not a design function, is to provide a flow path when open to drain and refill when the system is out of service to support maintenance. The second vent/drain valve function, which is ~~.~~ ~~T~~the UFSAR-described design function, is ~~is~~ to maintain the integrity of the system boundary when closed. The vent/drain function to drain and refill the system does not relate to design functions credited in the safety analyses, and the licensee has determined that a ball valve is adequate to support the vent/drain function and is superior to the globe valve in terms of its isolation function.

Thus, the proposed change affects the design of the existing vent/drain valve—but not the design function (maintain the system boundary integrity) that supports system performance credited in the safety analyses—and evaluation/reporting under 10 CFR 50.59 is not required. The screening determination should be documented, and the UFSAR should be updated per 10 CFR 50.71(e) to reflect the change.

Example 4

The bolts for retaining a rupture disk are being replaced with bolts of a different material and fewer threads, but equivalent load capacity and strength, such that the rupture disk will still relieve at the same pressure as before the change. Because the replacement bolts are equivalent to the original bolts, the design function of the rupture disk (to relieve at a specified pressure) is unaffected, and this activity may be screened out as an equivalent change.

4.2.1.2 Screening of Changes to Procedures as Described in the ~~U~~FSAR (as updated)

Changes are “screened in” (i.e., require a 10 CFR 50.59 evaluation) if they adversely affect how SSC design functions are performed or controlled (including changes to ~~U~~FSAR (as updated)-described procedures, assumed operator actions and response times). Proposed changes that are determined to have positive or no effect on how SSC design functions are performed or controlled may be screened out.

For purposes of 10 CFR 50.59 screening, changes that fundamentally alter (replace) the existing means of performing or controlling design functions should be conservatively treated as adverse and screened in. Such changes include replacement of automatic action by manual action (or vice versa), changes to the man-machine interface, changing a valve from ‘locked closed” to “administratively closed” and similar changes.

The following examples illustrate the 10 CFR 50.59 screening process as applied to proposed changes affecting how SSC design functions are performed or controlled:

Example 1

~~Emergency o~~Operating procedures include operator actions and response times associated with response to design basis events, which are described in the ~~U~~FSAR (as updated), but may also address operator actions for ~~severe accident~~ scenarios that are outside the design basis and not described in the ~~U~~FSAR (as updated). A change would screen out at this step if the change was to those procedures or parts of procedures dealing with operator actions during ~~severe accidents~~ scenarios that are outside the design basis and not described in the ~~U~~FSAR (as updated).

Example 2

If the ~~U~~FSAR (as updated) description of the reactor start-up procedure contains eight fundamental sequences, the licensee's decision to eliminate one of the sequences would screen in. On the other hand, if the licensee consolidated the eight fundamental sequences and did not affect the method of controlling or performing reactor start-up, the change would screen out.

Example 3

The ~~U~~FSAR (as updated) states that a particular flow path is isolated by a locked closed valve when not in use. A procedure change would remove the lock from this valve such that it becomes a normally closed valve. In this case, the design function is to remain closed, and the method of performing the design function has fundamentally changed from locked closed to administratively closed. Thus, this change would screen in and require a 10 CFR 50.59 evaluation to be performed.

Example 4

Operations proposes to revise its procedures to change from 8-hour shifts to 12-hour shifts. This change results in mid-shift rounds being conducted every 6 hours as opposed to every 4 hours. The ~~U~~FSAR (as updated) describes ~~high energy~~ cooling system line breaks that reduce reactor ~~pool including~~pool level including mitigation criteria. Operator action to detect and terminate the line break is described in the ~~U~~FSAR (as updated), which specifically states that 4 hours is assumed for the pipe break to go undetected before it would be identified during operator mid-shift rounds. The change from 4 to 6 hour rounds is a change to a procedure as described in the UFSAR that adversely affects the timing of operator actions credited in the safety analyses for limiting the effects of cooling system ~~high energy~~ line breaks. Therefore, this change screens in, and a 10 CFR 50.59 evaluation is required.

4.2.1.3 Screening Changes to ~~U~~FSAR (as updated) Methods of Evaluation

As discussed in Section 3.6, methods of evaluation included in the ~~U~~FSAR (as updated) to demonstrate that intended SSC design functions will be accomplished are considered part of the "facility as described in the ~~U~~FSAR (as updated)." Thus, use of new or revised methods of evaluation (as defined in Section 3.10) is considered to be a change that is controlled by 10 CFR 50.59 and needs to be considered as part of this screening step. Adverse changes to elements of a method of evaluation included in the ~~U~~FSAR (as updated), or use of an alternative method, must be evaluated under

10 CFR 50.59(c)(2)(viii) to determine if prior NRC approval is required (see Section 4.3.8). Changes to methods of evaluation (only) do not require evaluation against the first seven criteria.

Changes to methods of evaluation not included in the ~~U~~FSAR (as updated) or to methodologies included in the ~~U~~FSAR (as updated) that are not used in the safety analyses or to establish design bases may be screened out.

Methods of evaluation that may be identified in references listed at the end of ~~U~~FSAR (as updated) sections or chapters are not subject to control under 10 CFR 50.59 unless the ~~U~~FSAR (as updated) states they were used for specific analyses within the scope of 10 CFR 50.59(c)(2)(viii).

NRC approval of a method of evaluation has typically followed one of two paths. Most reactor or fuel vendors and several utilities have prepared and obtained NRC approval of vendor topical reports that describe methodologies for the performance of a given type or class of analysis. Through an NRC safety evaluation report (SER), NRC approved the use of the methodologies for a given class of power plants. The second path is the approval of a specific analysis at a specific facility rather than a more generic methodology. In these cases, the NRC's approval has typically been part of a plant's licensing basis and limited to a given plant design and a given application. Changes to methods of evaluation included in the ~~U~~FSAR (as updated) are considered adverse and require evaluation under 10 CFR 50.59 if the changes are outside the constraints and limitations associated with use of the method, e.g., identified in a topical report and/or SER. If the changes are within constraints and limitations associated with use of the method, the change is not considered adverse and may be screened out.

Proposed use of an alternative method is considered an adverse change that must be evaluated under 10 CFR 50.59(c)(2)(viii).

The following examples illustrate the screening of changes to methods of evaluation:

Example 1

The ~~U~~FSAR (as updated) identifies the name of the computer code used for performing ~~containment~~ reactor fuel performance ~~the thermo-hydraulics or neutronics~~ analyses, with no further discussion of the methods employed within the code for performing those analyses. Terms, conditions and limitations relating to the application of the methodology were documented in the vendor topical report (e.g., submitted by the methodology owner), and the NRC safety evaluation report .. Changes to the computer code may be screened out provided that the changes are within the constraints and limitations identified in the associated vendor topical report and SER. A change that goes beyond restrictions on the use of the method would be considered adverse and evaluated under 10 CFR 50.59(c)(2)(viii) to determine if prior NRC approval is required.

Commented [HD12]:

Commented [BD13R12]: The NEI 96-07r1 example used "containment performance analysis" because it clearly fell within criterion viii Criterion (viii) states, "Result in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses." NPUFs have a reactor fuel analysis.

Commented [BP14]: RTRs do not have code TRs.

Example 2

The ~~U~~FSAR (as updated) describes the methods used for reactor fuel ~~atmospheric~~ heat transfer ~~and containment pressure response~~ calculations contained within the CONTEMPT computer code. Although this computer ~~The~~ code is also used for developing long-term temperature profiles following a loss-of-coolant accident by

modeling the reactor pool cooling water system, ~~(post-recirculation phase of LOCA) for environmental qualification through modeling of the residual heat removal system.~~ ~~N~~neither this application of the computer code nor the analysis method is discussed in the ~~U~~FSAR (as updated). A revision to CONTEMPT computer code to incorporate more dynamic modeling of the reactor pool cooling water ~~residual heat removal~~ system to transfer ~~of~~ heat ~~to the ultimate heat sink~~ would screen out because this application of the CONTEMPT computer code is not described in the ~~U~~FSAR (as updated) as being used in the safety analyses or to establish design bases. Changes to CONTEMPT computer code that affect the reactor fuel ~~atmospheric~~ heat transfer ~~or containment pressure predictions~~ may not screen out (because the ~~U~~FSAR (as updated) describes this application in the safety analyses), and may require a 10 CFR 50.59 evaluation.

Example 3

The ~~steamline break mass and energy release~~reactor pool heatup rate calculations were originally performed at a power level of 105% of the nominal power ~~(plus uncertainties)~~ in order to allow margin for future reactor fuel additions. ~~a future power up-rate~~. The utility later decided that it would not pursue the ~~power up-rate~~ fuel additions and wished to use the margin to address other equipment qualification issues. The ~~steamline break mass and energy release~~reactor pool heatup rate calculations were reanalyzed, using the same methodology, at 100% power. ~~(plus uncertainties).~~ This change would screen out as a methodology change because the proposed activity involved a change to an input parameter (% power), which as described in the Section 3.8 definition of "input parameter," is ~~and~~ not a methodology change. This change should be screened per Section 4.2.1.1 to determine if it constitutes a change to the facility as described in the ~~U~~FSAR (as updated) that requires evaluation under 10 CFR 50.59(c)(2)(i-vii).

Example 4

The ~~LOCA mass and energy release~~ reactor pool heatup rate calculations were originally performed at a power level of 105% of the nominal power. ~~plus uncertainties.~~ Some of the assumptions in the analysis were identified as nonconservative, but the NRC concluded in the associated NRC safety evaluation report ~~SER~~ that the overall analysis was conservative because of the use of the higher initial power. The utility later decided that it would not pursue the reactor fuel additions ~~power up-rate~~ and wished to use the margin to address other equipment qualification issues. The reactor pool heatup rate ~~LOCA break mass and energy release~~ calculations were reanalyzed, using the same methodology, at 100% power. ~~(plus uncertainties).~~ As described in the Section 3.8 definition of "input parameter," if certain elements of a methodology or model were approved by the NRC on the basis of the conservatism of a selected input value, then that input value is considered an element of the methodology. This change would not screen out as a methodology change because the proposed activity involved a change to an input parameter that was integral to the NRC approval of the methodology that requires evaluation under 10 CFR 50.59(c)(2)(viii). Changes to methods of evaluation (only) do not require evaluation against the first seven criteria.

Example 5

Due to reactor fuel ~~management~~ changes, the calculated core physics parameters changed. ~~for a particular reload cycle.~~ The FSAR (as updated)-described method of evaluation ~~topical report~~ and associated NRC safety evaluation report ~~SER~~ that

describe how the core physics parameters are to be calculated explicitly allow use of either 2-D or 3-D modeling for the analysis. A change to recalculate the core physics parameters ~~to add or remove discretionary conservatism via use of~~using 3-D methods instead of 2-D methods or vice-versa would screen out because the change is within the terms and conditions of the NRC safety evaluation report. ~~SER.~~

4.2.2 Is the Activity a Test or Experiment Not Described in the ~~U~~FSAR (as updated)?

Research and test reactors are designed to support experiments. The details of the experiment are not typically in the FSAR, but the limits on the experiments are included in the TSs. Deviation from these TS limits (e.g., reactivity worth) requires a license amendment.

As discussed in Section 3.14, tests or experiments not described in the ~~U~~FSAR (as updated) ~~are~~ also include activities where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or inconsistent with analyses or description in the ~~U~~FSAR (as updated).

Commented [CN15]: This paragraph and the following should be kept because, using equipment in a way not intended is considered a "test and experiment" under 50.59.

~~As discussed in Section 4.1.2, testing associated with maintenance is assessed and managed under 10 CFR 50.65(a)(4) and is not subject to 10 CFR 50.59.~~

Tests and experiments that are described in the ~~U~~FSAR (as updated) may be screened out at this step. Tests and experiments that are not described in the ~~U~~FSAR (as updated) may be screened out provided the test or experiment is bounded by tests and experiments that are described. Similarly, tests and experiments not described in the ~~U~~FSAR (as updated) may be screened out provided that affected SSCs will be appropriately isolated from the facility.

Examples of tests that would "screen in" at this step (assuming they were not associated with maintenance or described in the ~~U~~FSAR (as updated)) would be:

~~For BWRs, hydrogen injection into the reactor coolant system to minimize stress corrosion cracking~~

~~For BWRs, zinc injection into the reactor coolant system to reduce activation~~

~~For PWRs, ECCS flow tests that affect the ability to remove decay heat~~

- Performance of thermal calibration with different equipment or methodology.
- Operation with ~~a~~rearranged fuel elements (new loading pattern) to accommodate an in-core experiment. ~~other than specified in the TSs~~ demonstration ~~assemblies~~.

Commented [BP16]: Fueled experiments are allowed by some TSs. Operation with a fuel element other than specified in the TSs would require a license amendment.

Examples of tests that would "screen out" would be:

~~Steam generator moisture carryover tests (provided such testing is described in the UFSAR)~~

~~Balance-of-plant heat balance test~~

- Information gathering that is nonintrusive to the operation or design function of the associated SSC.

4.2.3 Screening Documentation

The 10 CFR 50.59 record-keeping requirements apply to 10 CFR 50.59 evaluations performed for activities that screened in, not to screening records for activities that screened out. However, documentation should be maintained in accordance with facility~~plant~~ procedures of screenings that conclude a proposed activity may be screened out (i.e., that a 10 CFR 50.59 evaluation was not required). The basis for the conclusion should be documented to a degree commensurate with the safety significance of the change. For changes, the documentation should include the basis for determining that there would be no adverse effect on design functions, etc. Typically, the screening documentation is retained as part of the change package. This documentation does not constitute the record of changes required by 10 CFR 50.59, and thus is not subject to 10 CFR 50.59 documentation and reporting requirements. Screening records need not be retained for activities for which a 10 CFR 50.59 evaluation was performed or for activities that were never implemented.