

NEI PROPOSED REVISIONS
(Document Date: September 14, 2016)

3 SCREEN GUIDANCE

CAUTION

The guidance contained in this appendix is intended to supplement the generic Screen guidance contained in the main body in NEI 96-07, Section 4.2. Namely, the generic Screen guidance provided in the main body of NEI 96-07 and the more-focused Screen guidance in this appendix BOTH apply to digital modifications.

3.1 INTRODUCTION

3.2 PROCESS

3.2.1 SCREENING OF CHANGES TO THE FACILITY AS DESCRIBED IN THE UFSAR

3.2.1.1 SCOPE

The screening of proposed activities involving the *facility as described in the UFSAR* considers the software and hardware portions of the digital modification.

If a coping strategy involves activities that include physical changes to SSCs, those activities would also be addressed as proposed activities involving the facility as described in the UFSAR.

In the determination of potential adverse impacts, the following aspects should be addressed in the response to this Screen consideration:

- (a) Equivalent, Similar and Identical SSCs (Section 3.2.1.2)
- (b) Combination of Components/Functions (Section 3.2.1.3)
- (c) Dependability (Section 3.2.1.4)

3.2.1.2 Equivalent, Similar and Identical SSCs

During the original licensing process, the types of SSCs in the facility (refer to Definition 2.w) may have been a consideration.

The UFSAR may explicitly or implicitly describe the equivalency, similarity and/or identicalness of SSCs through diversity, separation, independence and/or redundancy discussions. With digital modifications, the new equipment has the potential to impact the diversity, separation, independence and/or redundancy of the SSCs described in the UFSAR.

NEI PROPOSED REVISIONS

(Document Date: September 14, 2016)

To assist in determining the impact of a digital modification on the diversity, separation, independence and/or redundancy of the affected components, identify the types of SSCs (i.e., equivalent, similar and/or identical) described in the UFSAR. Compare the proposed types of SSCs (i.e., equivalent, similar and/or identical) with the existing types of SSCs. The impact of any differences in the types of SSCs on diversity, separation, independence and/or redundancy is then determined.

For redundant SSCs, the following guidance applies to the use of equivalent, similar and identical SSCs:

1. The use of identical software in two or more redundant SSCs is ADVERSE because the independence of the SSCs has been reduced.
2. The use of equivalent or similar software in two or more redundant SSCs is NOT ADVERSE because the independence of the SSCs has been maintained.
3. The use of equivalent or similar hardware in two or more redundant SSCs is subject to the same licensing considerations as described in the UFSAR as those for non-digital SSCs and a conclusion of ADVERSE or NOT ADVERSE is determined in the same manner as for non-digital proposed activities.

For duplicate SSCs, the use of equivalent or similar hardware is subject to the same licensing considerations as described in the UFSAR as those for non-digital SSCs and a conclusion of ADVERSE or NOT ADVERSE is determined in the same manner as for non-digital proposed activities.

Examples 3-a through 3-b illustrate the process for determining the impact(s) on design functions for digital modifications due to changes affecting diversity, separation, independence and/or redundancy.

Example 3-a. Replacing Similar and Identical SSCs that Does NOT Cause an Adverse Impact on a UFSAR-Described Design Function

A licensee has two non-safety-related main feedwater pumps (MFWPs), each with 70% capacity. There are two similar and duplicate analog control systems, one for each MFWP.

The licensee proposes to replace the two similar and duplicate analog control systems with two digital control systems. The hardware for each digital control system is similar (i.e., both hardware platforms are Model X) and the software in each digital control system is identical.

The UFSAR descriptions are as follows:

- (1) Two analog control systems exist.
 - (2) Both analog control systems are similar.
-

NEI PROPOSED REVISIONS

(Document Date: September 14, 2016)

(3) The types of MFWP control system malfunctions include (a) failures causing the loss of all feedwater to the steam generators and (b) failures causing an increase in main feedwater flow to the maximum output from both MFWPs (140%).

The use of similar hardware platforms and identical software in both control systems is NOT ADVERSE for the following reasons:

(1) There are no UFSAR descriptions related to the ability of one MFWP and its analog control system to provide a redundant source of main feedwater flow in the event of the loss of one MFWP/control system. Therefore, the MFWPs and control systems are not required to satisfy single failure criteria. The two analog control systems existed for operational convenience only, not to satisfy any General Design Criteria requirements.

(2) There is no impact on diversity since none originally existed or was described in the UFSAR.

(3) There is no impact on the separation of the control systems described in the UFSAR since each of the analog control systems will be replaced with its own digital control system.

(4) Although the analog control systems were independent and similar (but not identical) and the proposed digital control systems contain identical software, no new types of malfunctions are introduced since the loss of BOTH MFWPs and failures causing an increase in main feedwater flow to the maximum output from both MFWPs (140%) are already considered in the licensing basis.

Example 3-b. Replacing Similar and Identical SSCs that DOES Cause an Adverse Impact on a UFSAR-Described Design Function

Using the same basic information from Example 3-a, this example illustrates how variations in the licensing basis (as described in the UFSAR) would result in ADVERSE conclusions.

Alternate Licensing Basis #1: If the UFSAR described the loss of only ONE MFWP, the proposed activity would be ADVERSE because a new type of malfunction would be introduced due to a possible software CCF that could disable BOTH MFWPs.

Alternate Licensing Basis #2: If the UFSAR described the consideration of the maximum output from only ONE MFWP, the proposed activity would be ADVERSE because a new type of malfunction would be introduced due to a possible software CCF that could cause BOTH MFWPs to reach their maximum output.
