

Charles R. Pierce
Regulatory Affairs Director

Southern Nuclear
Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, AL 35201

Tel 205.992.7872
Fax 205.992.7601



February 20, 2014

Docket No.: 50-348

NL-14-0249

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

**Joseph M. Farley Nuclear Plant – Unit 1
Updated Seismic Recommendation 2.3 Walkdown Report**

- Reference: 1. NRC Letter, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Daiichi Accident*, dated March 12, 2012.
2. Electric Power Research Institute (EPRI) Report 1025286, *Seismic Walkdown Guidance: For Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic*, dated June 2012.
3. Joseph M. Farley Nuclear Plant – Unit 1 *Seismic Recommendation 2.3 Walkdown Report* dated November 27, 2012. ML12355A777.

Ladies and Gentlemen:

On March 12, 2012, the U. S. Nuclear Regulatory Commission (NRC) issued Reference 1 to all power reactor licensees and holders of construction permits in active or deferred status. Enclosure 3 of Reference 1 requests licensees to perform seismic walkdowns using an NRC-endorsed walkdown methodology. The NRC requested information for the following purposes:

- to gather information with respect to NTF Recommendation 2.3, as amended by staff requirements memorandum (SRM) associated with SECY-11-0124 and SECY-11-0137.
- to request licensees to develop a methodology and acceptance criteria for seismic walkdowns to be endorsed by the NRC staff.

- to request licensees to perform seismic walkdowns using the NRC-endorsed seismic walkdown methodology.
- to identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program.
- to verify the adequacy of licensee monitoring and maintenance procedures.

Enclosure 3 of Reference 1 required each addressee to submit its walkdown report within 180 days of the NRC's endorsement of Reference 2 of this letter. Reference 3 of this letter provided Southern Nuclear Operating Company's 180 day response to Reference 1 for Joseph M. Farley Nuclear Plant (FNP) Unit 1. Included in Reference 3 was a list of inaccessible areas that would have to be inspected at a later date. A schedule for completion of the walkdown for these inaccessible areas was provided in Enclosure 2 of Reference 3.

The FNP Unit 1 seismic walkdowns and area walk-bys of the inaccessible areas previously mentioned have been completed except for one item which was removed from the Seismic Walkdown Equipment List. Further detail is included in Enclosure 2. FNP Unit 1 had no significant degraded, non-conforming or unanalyzed conditions that warrant modification to the plant. FNP Unit 1 had no as-found conditions that would prevent SSCs from performing their required safety functions.

In accordance with References 2 and 3, this letter provides the updated seismic walkdown report for FNP Unit 1. This letter completes the required actions and responses of Enclosure 3 to Reference 1. This letter completes the Regulatory Commitment made in Enclosure 2 of Reference 3.

Enclosure 1 of this letter provides a licensing summary of the updated seismic walkdown report. Enclosure 2 of this letter contains the updated seismic walkdown report.

This letter contains no new NRC commitments. If you have any questions, please contact John Giddens at 205.992.7924.

Mr. C. R. Pierce states he is Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and, to the best of his knowledge and belief, the facts set forth in this letter are true.

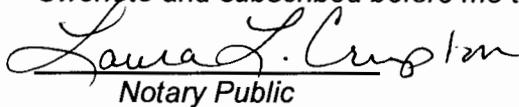
Respectfully submitted,



C. R. Pierce
Regulatory Affairs Director

CRP/JMG/RCW

Sworn to and subscribed before me this 20 day of February, 2014.



Notary Public

My commission expires: 10/8/2017

- Enclosures: 1. Licensing Summary of Walkdown Report
2. Updated Farley Unit 1 Seismic Walkdown Report for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Ms. C. A. Gayheart, Vice President – Farley
Mr. B. L. Ivey, Vice President – Regulatory Affairs
Mr. D. R. Madison, Vice President – Fleet Operations
RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Mr. G. E. Miller, NRR Senior Project Manager – Farley
Mr. P. K. Niebaum, Senior Resident Inspector– Farley
Mr. J. R. Sowa, Senior Resident Inspector – Farley

Alabama Department of Public Health
Dr. D. E. Williamson, State Health Officer

Joseph M. Farley Nuclear Plant – Unit 1
Updated Seismic Recommendation 2.3 Walkdown Report

Enclosure 1

Licensing Summary of Walkdown Report

LICENSING SUMMARY OF WALKDOWN REPORT

The report objective is to document the results of the Seismic Walkdowns at the Joseph M. Farley Nuclear Plant (FNP) Unit 1 in response to the NRC 10 CFR 50.54(f) letter dated March 12, 2012, "Enclosure 3, Recommendation 2.3: Seismic". The scope of the walkdowns was to identify potentially degraded, unanalyzed, or nonconforming conditions relative to the seismic licensing basis. The Seismic Walkdowns followed the guidance contained in EPRI Report 1025286 (Reference 2), which was endorsed by the NRC on May 31, 2012. This final report submits the entire body of the report, Attachments 1, 2, 3, 5, and 6 (which are revised from Version 1 submitted November 27, 2012), and new Attachments 7 and 8 added by Version 2 of this report.

SNC submitted its original walkdown report for FNP Unit 1 on November 27, 2012, in accordance with the March 12, 2012, NRC 10 CFR 50.54(f) letter. During that initial walkdown, some equipment was identified as not being accessible, as noted in Table 7-1 of SNC's November 27, 2012, response. This equipment could not be accessed because of one of two conditions: (1) plant operating conditions, or (2) component inspections required the opening of cabinet/panel doors which was not permitted by plant Operations personnel during the time of the walkdowns. Consequently, walkdowns had to be deferred until the outage. Additionally, supplemental guidance/clarification for opening cabinets to inspect for adverse seismic conditions was received after the FNP Unit 1 walkdowns were complete. Consequently, walkdown of equipment affected by this guidance was deferred until after SNC's November response and was included in Table 7-1 of the November 27, 2012, response. Walkdowns of this equipment along with the equipment originally deemed as inaccessible have been completed. Table 7-1 has been updated to show this equipment as complete with the completion date noted.

During the course of the seismic walkdowns, a total of fourteen (14) Unit 1 Potentially Adverse Conditions were identified and entered into the Corrective Action Program. Eleven of these were identified and included in Version 1.0 of the FNP Seismic Walkdown Report while 3 were identified during the most recent walkdowns. It has been determined that none of these as-found conditions would prevent SSCs from performing their required safety functions as defined by Reference 2. Table 8-1 provides additional details on the SSCs that were identified during the walkdowns and entered into the CAP as degraded, nonconforming, or unanalyzed relative to their seismic licensing basis. This table has been updated to provide the status of these areas.

During the most recent walkdowns, one item was deemed inaccessible and was removed from the Seismic Walkdown Equipment List (SWEL) 1. Item 34 in Table 7-1 was not inspected as the anchorage was not completely accessible without extensive disassembly. This change to the SWEL is acceptable since an adequate number of similar component walkdowns that satisfy the minimum SWEL component types for this category were performed. The number of samples to be included in the SWEL as required by Reference 2 of this letter is still met.

In conclusion, the Seismic Walkdowns at FNP Unit 1 in response to the NRC 10 CFR 50.54(f) letter dated March 12, 2012, "Enclosure 3, Recommendation 2.3: Seismic" are complete. FNP Unit 1 had no significant degraded, non-conforming or unanalyzed conditions that warrant modification to the plant. FNP Unit 1 had no as-found conditions that would prevent SSCs from performing their required safety functions.

Joseph M. Farley Nuclear Plant – Unit 1
Updated Seismic Recommendation 2.3 Walkdown Report

Enclosure 2

**Updated Farley Unit 1 Seismic Walkdown Report for Resolution of
Fukushima Near-Term Task Force Recommendation 2.3: Seismic**

**PROJECT REPORT
COVER SHEET**

NO. SNCF164-RPT-01

VERSION 2.0

Page 1 of 58

Farley Unit 1 SEISMIC WALKDOWN REPORT, RER SNC432467
For
Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic

Prepared by:

James Dovel
James Dovel

Date:

2-15-2014

Reviewed by:

Paul A. Miktus
Paul A. Miktus

Date:

2-15-2014

Approved by: (ENERCON)

Bill Henne
Bill Henne

Date:

2/15/2014

Project Manager or Designee

Approved by:

(SNC)

Technical Lead or Designee /
Peer Review Team Leader

Melanie Brown
Melanie Brown

Date:

2-17-2014

Approved by:

(SNC)

Project Manager or Designee

Terry Mitchell
Terry Mitchell

Date:

2/17/2014

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 2 OF 58

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
EXECUTIVE SUMMARY		3
1.0	SCOPE AND OBJECTIVE	4
2.0	SEISMIC WALKDOWN PROGRAM IMPLEMENTATION APPROACH	5
3.0	SEISMIC LICENSING BASIS SUMMARY	6
3.1	SAFE SHUTDOWN EARTHQUAKE	6
3.2	DESIGN CODES, STANDARDS AND METHODS	8
4.0	PERSONNEL QUALIFICATIONS	9
4.1	OVERVIEW OF PROJECT RESPONSIBILITIES	11
4.2	TEAM EXPERIENCE SUMMARIES (Report Version 1)	12
4.3	TEAM EXPERIENCE SUMMARIES (Report Version 2)	17
5.0	IPEEE VULNERABILITIES REPORTING	19
6.0	SEISMIC WALKDOWN EQUIPMENT LIST DEVELOPMENT	20
6.1	DEVELOPMENT OF SWEL 1	21
6.2	DEVELOPMENT OF SWEL 2	24
7.0	SEISMIC WALKDOWNS AND AREA WALK-BYS	26
7.1	INACCESSIBLE ITEMS	28
8.0	RESULTS	35
8.1	POTENTIALLY ADVERSE SEISMIC CONDITIONS	35
8.2	EQUIPMENT OPERABILITY	47
8.3	PLANT CHANGES	47
8.4	OTHER NON-SEISMIC CONDITIONS	48
9.0	PEER REVIEW	49
9.1	PEER REVIEW PROCESS	49
9.2	PEER REVIEW RESULTS SUMMARY	49
10.0	REFERENCES	57
11.0	ATTACHMENTS	58

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 3 OF 58

EXECUTIVE SUMMARY

The Seismic Walkdowns at Farley Unit 1 in response to the NRC 50.54(f) letter dated March 12, 2012, "Enclosure 3, Recommendation 2.3: Seismic" are complete as all items on the Seismic Walkdown Equipment List (SWEL) have been inspected. The walkdowns were performed using the methodology outlined in the NRC endorsed "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic" (EPRI Report 1025286). Plant Farley Unit 1 had no significant degraded, non-conforming or unanalyzed conditions that warranted modification to the plant. Plant Farley Unit 1 had no as-found conditions that would prevent SSCs from performing their required safety functions.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 4 OF 58

1.0 SCOPE AND OBJECTIVE

The objective of this report is to document the results of the Seismic Walkdowns at Farley Unit 1 in response to the NRC 50.54(f) letter dated March 12, 2012, "Enclosure 3, Recommendation 2.3: Seismic" (Reference 10.1).

The Seismic Walkdowns followed the guidance contained in EPRI Report 1025286 (Reference 10.2), which was endorsed by the NRC on May 31, 2012. The scope of the walkdowns was to identify potentially degraded, unanalyzed, or nonconforming conditions relative to the seismic licensing basis.

The 2.3: Seismic Walkdowns for Farley Unit 1 are complete as all items on the SWEL have been inspected. This is the final report and documents the findings from all Seismic Walkdowns and Area Walk-bys. This final report submits the entire body of the report, Attachments 1, 2, 3, 5 and 6 which are revised from Version 1 submitted November 27, 2012, and the new Attachments 7 and 8 added by Version 2 of this report.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 5 OF 58

2.0 SEISMIC WALKDOWN PROGRAM IMPLEMENTATION APPROACH

The requirements of the 50.54(f) Letter are satisfied by application of and compliance with the NRC endorsed methodology provided in EPRI Report 1025286 (Reference 10.2). In accordance with Reference 10.2, the following topics are addressed in this report:

- Documentation of the seismic licensing basis for the Systems, Structures and Components (SSCs) in the plant (Section 3.0);
- Assignment of appropriately qualified personnel (Section 4.0);
- Reporting of actions taken to reduce/eliminate seismic vulnerabilities identified by the Individual Plant Examination for External Events IPEEE program (Section 5.0);
- Selection of Seismic Category I SSCs that were inspected in the plant (Section 6.0);
- Performance of the Seismic Walkdowns and Area Walk-bys (Section 7.0);
- Evaluation of potentially adverse seismic conditions with respect to the seismic licensing bases (Section 8.0); and
- Performance of Peer Reviews (Section 9.0).

Supplemental guidance/clarification for opening cabinets to inspect for adverse conditions was received on September 18, 2012. This required the opening of cabinets, electrical boxes, and switchgear to inspect the internals for potentially adverse seismic conditions, even when opening the components was not required to be able to inspect the anchorage. At the time of this supplemental guidance/clarification, the Farley Unit 1 walkdowns were complete for the items that were considered accessible. However, the components affected by the supplemental guidance were identified and have been re-inspected with component doors opened. The walkdowns for all components are now complete. Further discussion is given in Section 7.0.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 6 OF 58

3.0 SEISMIC LICENSING BASIS SUMMARY

This section provides a summary of the licensing bases for the Seismic Category I Structures, Systems, and Components (SSCs) in the plant. It includes a discussion of the Safe Shutdown Earthquake (SSE) and the codes and standards used in the design of the Seismic Category I SSCs for meeting the plant-specific seismic licensing basis requirements.

3.1 SAFE SHUTDOWN EARTHQUAKE

The criteria for determining the adequacy of Seismic Category I mechanical and electrical equipment for the Farley Nuclear Plant are described in various areas of the Updated Final Safety Analysis Report (UFSAR) (Reference 10.14). In some cases the criteria are specified in general terms to require verification by tests or analyses. In other cases, more specific criteria are specified such as verification in accordance with IEEE Standard 344-1971. At the time of the original design and licensing of the plant the requirements were changing to the use of IEEE 344-1975. These two separate programs were used to verify the seismic adequacy of Farley's mechanical and electrical equipment.

By letter dated February 19, 1987, the NRC issued Generic Letter (GL) 87-02, (Reference 10.4). On May 22, 1992, the NRC issued GL 87-02, Supplement 1 (Reference 10.8). As documented in NUREG-1211 (Reference 10.9), GL 87-02 is applicable to Farley Nuclear Plant (FNP) Unit 1, since Unit 1 had not previously been audited by the NRC's Seismic Qualification Review Team (SQRT). Southern Nuclear Operating Company (SNC) replied to GL 87-02 by letter dated September 10, 1992. The SNC letter included a commitment to use the Seismic Qualification Utility Group (SQUG) methodology as documented in the Generic Implementation Procedure (GIP) for the resolution of seismic issues identified in GL 87-02 for FNP Unit 1. The SQUG methodology is based on application of earthquake experience data to verify the seismic adequacy of equipment. The seismic evaluation for FNP Unit 1 was completed, and the results were documented in a document entitled, "Unresolved Safety Issue A-46 Summary Report." This document was submitted to the NRC by letter dated May 18, 1995, as a 10 CFR 50.54(f) response. SNC received an SER dated July 9, 1998, concerning FNP Unit 1 Unresolved Safety Issue (USI) A-46 resolution and it stated that SNC's USI A-46 program implementation resulted in safety enhancements beyond the original licensing basis and SNC actions provide sufficient basis to close the USI A-46 review at the facility.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 7 OF 58

Geologic and seismologic surveys of the site have been conducted to establish two "design earthquakes" with different intensities of ground motion. These are the 50 percent SSE ($\frac{1}{2}$ SSE) and the SSE with different intensities of ground motion. The $\frac{1}{2}$ SSE, sometimes referred to as the operating basis earthquake (OBE), is postulated to be the earthquake that could be expected to occur at the site during the operating life of the plant. The SSE represents the strongest earthquake that is hypothetically postulated to occur during an infinite period. The intensity postulated to occur at the site for both the $\frac{1}{2}$ SSE and SSE is defined from the history of seismic activity in the area around the site.

The $\frac{1}{2}$ SSE and SSE are specified in terms of a set of idealized, smooth curves, called the design spectra because they specify a range of values for two of the important properties of an earthquake ground motion, i.e., the maximum ground acceleration and the frequency distribution. The SSE produces the vibratory ground motion for which Category I structures, systems and components are designed to remain functional.

The $\frac{1}{2}$ SSE and SSE spectra are each developed for 0%, 0.5%, 1.0%, 2.0%, 3.0%, and 5.0% of critical damping, with a horizontal ground peak acceleration of 0.05 g and 0.10 g, and vertical ground acceleration of 0.033 g and 0.067 g, respectively.

POWER GENERATION DESIGN BASIS

Seismic Category I structures, systems and components are designed so that stresses remain within normal code allowable limits during the $\frac{1}{2}$ SSE and to ensure they will perform their required safety-related functions during and after an SSE.

MAJOR COMPONENT DESIGN BASIS

The horizontal and vertical OBE and SSE in-structure response spectra curves form the basis for the seismic qualification and design of Category I SSCs and for demonstrating the structural integrity of Seismic Category II SSCs, where required. In addition, systems supported by more than one structure shall be designed to withstand the seismic relative displacements between the supporting structures.

The seismic analyses of safety related systems, equipment, and components are based on either the response spectra method, the time-history method, or the equivalent static method.

Although original seismic qualification was done to IEEE 344-1971, the USI A-46 Program verified that the original seismic qualification was adequate to support the seismic qualification of the equipment to the later requirements of IEEE 344-1975. Seismic qualification for new and replacement

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 8 OF 58

equipment is therefore based on the guidelines of IEEE 344-1975. Any new, replacement or changes to electrical and mechanical equipment are evaluated to the guidelines contained in IEEE 344-1975. Damping values are provided in UFSAR Table 3.7-1.

3.2 DESIGN CODES, STANDARDS AND METHODS

The design codes and standards for seismic qualification are listed throughout Section 3.0 of the Farley UFSAR (Reference 10.14). Examples of the pertinent codes, standards, and methods used in the original design of Farley Unit 1 are listed below.

- ACI 318-71, Building Code Requirements for Reinforced Concrete
- American Institute of Steel Construction (AISC), Manual of Steel Construction, 7th Edition
- ASME III Boiler and Pressure Vessel Code, 1968 Edition
- ASME Boiler and Pressure Vessel Code for Pumps and Valves for Nuclear Power.
- ASME VIII Boiler and Pressure Vessel Code, 1968 Edition
- ANSI B31.1 Power Piping
- ANSI B31.7 Nuclear Power Piping
- BC-TOP-4, Seismic Analysis of Structures and Equipment for Nuclear Power Plants, September, 1972
- IEEE 317-1976, Standard for Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations
- IEEE 323-1974, Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations
- IEEE 344-1971 Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations. Methods include both analysis and testing.
- IEEE 344-1975 Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations. Methods include both analysis and testing.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 9 OF 58

4.0 PERSONNEL QUALIFICATIONS

Table 4-1 identifies the project team members and their project responsibilities per the EPRI Report 1025286 (Reference 10.2). Table 4-2 and Table 4-3 identify the Peer Review Team members and responsibilities for Versions 1 and 2 of this report, respectively. Section 4.1 provides an overview of the project responsibilities. Section 4.2 and Section 4.3 include brief experience summaries for all project personnel in alphabetical order.

Table 4-1 Project Team Members and Responsibilities

Name	Site Point of Contact (POC)	Equipment Selection / IPEEE Reviewer	Plant Operations	Seismic Walkdown Engineer (SWE)	Licensing Basis Reviewer
William Arens		X	X		
Nikole Arrant				X	X
Maggie Farah				X	X
Ryan Harlos (See Note 3)	X	X		X	X
Crystal Lovelady				X	X
Laura Maclay				X	X
Paul Miktus*				X	X
Ronald Miranda*				X	X
Alan Mullenix				X	X
Brian Nelson (See Note 3)	X			X	X
Scott Walden*				X	X
Robert Wood		X	X		
Taylor Youngblood		X		X	X
Stephen Yuan				X	X

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 10 OF 58

Table 4-2 Peer Review Team Members and Responsibilities
(Report Version 1)

Name	Peer Review Team Leader	SWEL Peer Reviewer	Walkdown Peer Reviewer	Licensing Basis Peer Reviewer	Submittal Report Peer Reviewer
Robert Ashworth*		X	X	X	X
Melanie Brown*	X	X		X	X
Richard Starck*		X			X
Kenneth Whitmore*		X	X	X	X

Table 4-3 Peer Review Team Members and Responsibilities
(Report Version 2)

Name	Peer Review Team Leader	SWEL Peer Reviewer	Walkdown Peer Reviewer	Licensing Basis Peer Reviewer	Submittal Report Peer Reviewer
Melanie Brown*	X	X	X	X	X
Richard Starck*		X	X	X	X

Notes (Table 4-1, Table 4-2 and Table 4-3):

- 1) * Indicates Seismic Capability Engineer
- 2) As stated in Section 7.0, all potentially adverse conditions were entered into the plant Corrective Action Program (CAP) system. However, as part of the process of entering the condition into the CAP, the SWEs made a preliminary assessment of the condition with respect to the plant licensing basis. Further licensing basis reviews were performed as discussed in Section 8.0 as part of the CAP resolution process by personnel not directly involved in the walkdowns.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 11 OF 58

- 3) Brian Nelson was named Site Point of Contact subsequent to the completion of the walkdowns required for Version 2. Prior to this, Ryan Harlos was the Site Point of Contact.

4.1 OVERVIEW OF PROJECT RESPONSIBILITIES

The Site Point of Contact (POC) is a site engineer from Southern Nuclear that has experience with the site equipment, site procedures, plant operations, and overall personnel organization. The site POC coordinated site access for walkdown personnel and any resources required for the walkdowns such as inspection equipment and support from plant operations. The POC was responsible for development of the walkdown schedule and any updates to the schedule based on equipment availability.

Equipment Selection Personnel (ESP) were responsible for identifying the sample of SSCs for the Seismic Walkdowns. The ESP have knowledge of plant operations, plant documentation, and associated SSCs. The ESP also have knowledge of the IPEEE program. For this project, site engineers and plant operations personnel participated in the equipment selection. The ESP also performed the responsibilities of the IPEEE Reviewers. The IPEEE Reviewers also ensured that the walkdown scope included a sample of equipment that had IPEEE seismic vulnerabilities.

Plant Operations Personnel provided detailed review of the sample of SSCs Seismic Walkdown Equipment List (SWEL) and Base List to ensure the walkdown scope included equipment located in a variety of environments, equipment in a variety of systems, and equipment accessible for a walkdown. Plant Operations Personnel also assisted in obtaining access to components and component internals and helped to coordinate with plant maintenance. For the Farley Unit 1 project, the Plant Operations Personnel were either former or currently licensed Senior Reactor Operators.

The SWEs were trained on the NTTF Recommendation 2.3: Seismic, and on the material contained in the EPRI Report 1025286 (Reference 10.2). SWEs who had previously completed the Seismic Walkdown Training Class developed by the SQUG were not required to complete training on the NTTF Seismic recommendations but were trained on the differences between SQUG activities and activities associated with the NTTF Seismic recommendations.

The Licensing Basis Reviewers were responsible for determining whether any potentially adverse seismic conditions identified by the SWEs met the plant seismic licensing basis. The Licensing Basis Reviewers have knowledge of and experience with the seismic licensing basis and documentation for the SSCs at Farley.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 12 OF 58

A Peer Review Team was formed for this project to provide both oversight and review of all aspects of the walkdowns. The Peer Review Team members have extensive experience in seismic design and qualification of structures, systems and components as well as extensive field experience. The Peer Review Team for this project interfaced with the ESP and SWEs to ensure that the walkdown program satisfied the guidance in the EPRI Report 1025286 (Reference 10.2).

4.2 TEAM EXPERIENCE SUMMARIES (Report Version 1)

Listed below are the experience summaries of the personnel who contributed to Version 1 of this report.

William Arens (SNC)

Mr. Arens is the Licensing Supervisor at Farley Nuclear Plant. He earned a B.S. in Mechanical Engineering from the University of Oklahoma in 1980. Mr. Arens served for eight years as an officer in the U.S. Navy nuclear submarine force. He has been employed at Farley Nuclear Plant since 1988, obtaining a Senior Reactor Operator License in 1991. His experience at Farley includes serving as a MOV engineer, Shift Support Supervisor, Shift Supervisor, Operations Superintendent, and Shift Manager.

Robert Ashworth, SCE (MPR)

Mr. Ashworth is a structural engineer with MPR and has more than six years of experience with providing engineering solutions for a wide variety of nuclear power plant components and systems. His experience includes equipment walkdowns at industrial facilities to assess material condition, structural modeling and analyses, and seismic qualification in accordance with current industry standards for mechanical and electrical equipment in nuclear power plants. Mr. Ashworth has completed the training course for the EPRI Seismic Walkdown Guidance and is also a Seismic Capability Engineer (SCE) as defined in the SQUG GIP for resolution of USI A-46.

Melanie Brown, SCE (SNC)

Ms. Brown has over 31 years of experience with Southern Company, the majority of which has been serving the nuclear fleet. Ms. Brown's most recent assignment was as a Seismic Qualification Engineer in the Fleet Design Department, where she was responsible for performing activities associated with the Governance, Oversight, Support, and Perform (GOSP) Model including:

- Management of the seismic design bases,
- Seismic equipment qualification,

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 13 OF 58

- Seismic evaluation of plant structures and components,
- Design documentation and configuration management.

She is currently serving as the Southern Nuclear Seismic Technical Lead for the Fukushima Near-Term Task Force (NTTF) 2.3 Seismic Walkdowns for all three Southern Nuclear plants. Ms. Brown is a Seismic Capability Engineer (SCE) as defined in the SQUG GIP for resolution of USI A-46.

Maggie Farah, SWE (ENERCON)

Ms. Farah is a Structural Engineer with a B.S. in Civil Engineering from the New Jersey Institute of Technology and currently pursuing a Master's degree in Structural Engineering. Ms. Farah has been employed as a structural engineer at ENERCON for more than four years and has extensive experience in performing seismic equipment evaluations and structural analysis. She has performed numerous plant walkdowns as part of seismic design and modifications and had extensive on-site experience at Humboldt Bay and at the Metropolis Works fuel processing plant. She has been involved in various plant modifications, including design of dry fuel storage installations. Ms. Farah completed the NTTF 2.3 Seismic Walkdown Training Course and was qualified as a SWE.

Ryan Harlos, SWE (SNC)

Mr. Harlos is a mechanical engineer in the Farley Engineering Systems Department at Southern Nuclear Operating Company and has a B.S. in Mechanical Engineering from Auburn University. He has been employed in the nuclear industry for approximately three years and has extensive experience in the design, operation, and monitoring of systems with respect to their applicable design bases. His primary experience is with SSCs on the Primary Side of PWR nuclear operating plants. Mr. Harlos also worked as a co-op employee for Southern Company for more than a year, while in college, prior to joining the staff at Farley Nuclear Station as a full-time employee. Mr. Harlos completed the EPRI training on Near Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns.

Crystal Lovelady, SWE (SNC)

Ms. Lovelady is a civil engineer in the Fleet Design Engineering Mechanical/Civil group at Southern Nuclear Operating Company. She has a B.S. in Civil Engineering from the University of Alabama, Huntsville. She has more than five years of experience in structural analysis and design of structures in the power industry. She has additional experience as a member of the structural monitoring team at Plant Hatch and Plant Farley. Ms. Lovelady completed training on Near Term Task Force Recommendation 2.3 –Seismic Walkdowns to qualify as a SWE.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 14 OF 58

Laura Maclay, SWE (ENERCON)

Ms. Maclay has over three years of experience as a structural engineer with ENERCON. Her tasks have ranged from assisting with the development and preparation of design change packages to performing design calculations and markups, comment resolutions, and drawing revisions. She worked on-site at Turkey Point Nuclear Plant for a year preparing structural evaluations of SSCs for an Extended Power Uprate (EPU). She designed safety related supports for computer and electrical equipment for the Turbine Digital Controls Upgrade package and other similar packages. Her responsibilities also included the review of calculations, drawings and vendor documentation for the seismic evaluation of the Unit 3 Palfinger Crane inside containment and new platforms in the High Pressure Turbine enclosure. Recent work includes Fukushima flooding walkdowns at Limerick Generating Station. Ms. Maclay recently completed the NTTF 2.3 Seismic Walkdown Training Course and was qualified as a SWE.

Paul Miktus, SCE (ENERCON)

Mr. Miktus, P.E., has over 35 years of Civil/Structural experience in the design, construction and operation of nuclear power plants and process/industrial facilities retrofits. Mr. Miktus held positions of responsibility in a number of supervisory and management positions for ENERCON for clients including Florida Power and Light, Southern Company and Entergy. His design experience includes structural steel design (including anchorages); suspended systems (piping, ductwork, raceways) supports; seismic qualification of equipment, parts and structures; rigging and scaffolds; piping stress analysis; and concrete slabs, beams and foundations. At River Bend Station, while with Entergy, Mr. Miktus was Engineering Supervisor for many large projects and completed the SQUG Walkdown Screening and Seismic Evaluation Training and the Seismic IPEEE Add-On Training Courses.

Ronald Miranda, SCE (ENERCON)

Mr. Miranda is a member of the ENERCON Senior Technical and Management staff with 40 years of experience in the Nuclear Power Generation industry. He has held various engineering and management positions in the industry, holds a MS degree in Civil Engineering and is a SCE certified by the SQUG. Mr. Miranda is experienced in structural steel and reinforced concrete design, anchorage to concrete, identification and assessment of degraded structural conditions, evaluations using SQUG methodologies, and the management of large, complex, and high-visibility projects. Mr. Miranda is currently the ENERCON Dry Fuel Storage Product Line Manager responsible for the development and the design of Independent Spent Fuel Storage Installations at power generating facilities under static, dynamic, and flooding conditions compliant with 10 CFR 50 and 10 CFR 72

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 15 OF 58

regulations and industry standards. Mr. Miranda is recognized as an expert within the dry fuel storage industry.

Alan Mullenix, SWE (ENERCON)

Mr. Mullenix is a Registered Professional Engineer with over five years of Civil/Structural experience. He has a B.S. in Civil Engineering and a Master of Science degree in Structural Engineering. His primary responsibilities include structural design, seismic design, and Design Change Package development. Mr. Mullenix assisted with 10 CFR 73.55 Nuclear Plant Security upgrades, Independent Spent Fuel Storage Installations, and other design changes at Plant Farley, Plant Hatch, Brunswick, Crystal River, and Fort Calhoun Nuclear Stations. Mr. Mullenix completed his training on Near Term Task Force Recommendation 2.3 – Seismic Walkdowns as a SWE.

Richard Starck, SCE (MPR)

Mr. Starck is a registered Professional Engineer with more than 30 years of experience in seismic qualification of nuclear plant equipment. He is the principal author of the EPRI Seismic Walkdown Guidance Document (Reference 10.2) and developed and taught the six sessions of the NTTF 2.3 Seismic Walkdown Training Course to over 200 engineers. He provided technical oversight of work for various SQUG projects aimed at resolving USI A-46. Mr. Starck developed for SQUG the generic guidelines, criteria, and procedure for identifying safe shutdown equipment for resolution of USI A-46, is the editor and principal author of the SQUG GIP, and has interfaced with the NRC Staff and the SQUG Steering Group to resolve open issues on several revisions of the GIP. Mr. Starck is a SCE and has performed Seismic Walkdowns and evaluations of nuclear plant electric and mechanical equipment as part of the NRC required USI A-46 program. This work included equipment qualification, anchorage evaluation, seismic interaction review, outlier resolution, and operability determination.

Scott Walden, SCE (SNC)

Mr. Walden is a senior engineer in the Fleet Design Analysis / Civil department at SNC. He has a B.S. in Civil Engineering from Mississippi State University. Mr. Walden has more than 33 years of experience in structural analysis and design of structures for electric utilities, including extensive experience in seismic analysis of nuclear power plant structures and seismic qualification of equipment. He has extensive experience in the area of analysis of supports and also worked in developing the response spectra curves for Plant Hatch. He also has extensive experience in the Structure Monitoring Program (SMP) for Maintenance Rule and is responsible for oversight of the

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 16 OF 58

SMP for Plant Farley. He successfully completed the SQUG training course, is a Seismic Capability Engineer and participated in the original IPEEE/SQUG walkdown for Plant Farley and the conduit/cable tray SQUG walkdowns for Plant Hatch. He is a registered Professional Engineer in the states of Alabama and Mississippi.

Kenneth Whitmore, SCE (ENERCON)

Mr. Whitmore is a Registered Professional Engineer with more than 30 years of experience in seismic design and seismic equipment qualification in nuclear power plants. Mr. Whitmore is a Seismic Capability Engineer that was involved in the development of the SQUG methodology for verification of nuclear plant components. Specifically, Mr. Whitmore served on the sub-committee that developed the SQUG methodology for evaluation of raceways and on the sub-committee that performed the peer review of the SQUG walkdown training class. Mr. Whitmore performed A-46 and IPEEE walkdowns at Oyster Creek and Three Mile Island and has subsequently performed SQUG evaluations at numerous nuclear power plants. Mr. Whitmore served as both Chairman and Technical Chairman of the Seismic Qualification Reporting and Testing Service (SQRTS), has witnessed numerous seismic tests and is a recognized industry expert in seismic qualification of components. Mr. Whitmore has significant experience in all aspects of structural analysis and design and has extensive experience in performing plant walkdowns associated with seismic issues. Mr. Whitmore completed his EPRI training on Near Term Task Force Recommendation 2.3 – Seismic Walkdowns as a Seismic Walkdown Engineer (SWE) in June 2012.

Robert Wood (SNC)

Mr. Wood is the Farley Severe Accident Management Program Manager. He holds BS degrees in Physical Science, Mathematics, and Chemistry from Troy State University. Mr. Wood has over 37 years of experience at operating nuclear plants, was licensed as a SRO and served seven years on shift as Shift Support Supervisor and Unit Shift Supervisor. He has supervisory experience in chemistry, work management, strategic analysis and major project management.

Taylor Youngblood, SWE (SNC)

Mr. Youngblood is a Site Projects Lead at Plant Farley working primarily in major projects. He has a B.S. in Civil Engineering from the University of Alabama at Birmingham. Mr. Youngblood has 12 years of civil engineering experience with more than four of those years spent at Plant Farley in the areas of civil/structural design. His design experience includes evaluations and calculations for seismically qualifying various supports and structures. His specialties are in the areas of concrete and

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNC164-RPT-01
		VERSION 2.0
		PAGE 17 OF 58

earthwork, and he has developed an expertise in lifting and rigging evaluations. Mr. Youngblood is a registered Professional Engineer in the State of Alabama. Mr. Youngblood completed the EPRI training on Near Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns in June 2012.

Stephen Yuan, SWE (ENERCON)

Mr. Yuan, P.E., is a Senior Civil Engineer in ENERCON’s New Jersey office. He has over 20 years of experience in structural modeling, design, upgrading, electrical facility structure analyses and maintenance of industrial installations and nuclear power plants, including significant experience at Perry, Pilgrim and Vermont Yankee Plant. Mr. Yuan was one of the key civil engineers in support of the transformer replacement project at Perry Nuclear Power Plant. He holds a M.S. in Civil Engineering from the City University of New York. Mr. Yuan recently completed the NTTF 2.3 Seismic Walkdown Training Course and was qualified as a Seismic Walkdown Engineer (SWE).

4.3 TEAM EXPERIENCE SUMMARIES (Report Version 2)

Listed below are the names of personnel who contributed to the work addressed by Version 2 of this report. The personnel shown worked on Version 1 as well as Version 2 unless noted otherwise. Experience summaries for personnel who only worked on Version 2 are provided below. Experience summaries for the others are provided in Section 4.2. The experience levels of personnel listed in Section 4.2 have not been updated for Version 2.

William Arens (SNC)

Nikole Arrant, SWE (SNC) [Version 2 Only]

Melanie Brown, SCE (SNC)

David Hall (SNC) [Version 2 Only]

Ryan Harlos, SWE (SNC)

Laura Maclay, SWE (ENERCON)

Alan Mullenix, SWE (ENERCON)

Brian Nelson, SWE (SNC) [Version 2 Only]

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 18 OF 58

Richard Starck, SCE (MPR)

Taylor Youngblood, SWE (SNC)

Nikole Arrant, SWE (SNC)

Ms. Arrant is a civil engineer in the Farley Mechanical/Civil Design Department at Southern Nuclear Operating Company. She has a B.S. in Civil Engineering from Florida State University and has been employed in the nuclear industry for approximately four years, all of which have been spent in the Plant Farley Mechanical/Civil Design Department in the area of civil/structural design. Her design experience and specialties include evaluations and calculations for seismically qualifying various supports and structures. Ms. Arrant completed the EPRI training on Near Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns in February 2013.

David Hall (SNC)

Mr. Hall is the Farley Severe Accident Management Program Manager. He holds a B.S. in Nuclear Science Management from Troy State University. He has over 35 years of experience at operating nuclear plants. He was licensed as an SRO for 30 years and served on shift as Shift Foreman. He has supervisory experience in Operations, Training and major project management.

Brian Nelson, SWE (SNC)

Mr. Nelson is a Mechanical Engineer in the Farley Site Design Department and has a B.S. in Mechanical Engineering from Auburn University. He has been an employee with Southern Nuclear Operating Company at Plant Farley for approximately four years and has extensive experience in design of components and systems relative to their design basis. His primary experience has been in the area of mechanical design, but has performed calculations for the qualification of supports in the area of seismic design. Mr. Nelson completed the EPRI training on Near Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns in February 2013.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 19 OF 58

5.0 IPEEE VULNERABILITIES REPORTING

Information on the seismic vulnerabilities identified during the IPEEE program is reported in Attachment 5. Within this context, “vulnerabilities” means seismic anomalies, outliers, or other findings. For each vulnerability, Attachment 5 also provides a description of the action taken to eliminate or reduce the seismic vulnerability.

Plant Farley completed modifications for all non-relay items on or before December 31, 1995, and for all relays on or before December 31, 1996. The Equipment Selection/IPEEE Reviewers (see Table 4-1) reviewed the IPEEE implementation documents and final report to determine the list of items identified as having vulnerabilities and the required modifications.

The SWEL for Farley Unit 1 included 28 components for which seismic vulnerabilities were previously identified during the IPEEE program. During the walkdowns, the walkdown teams verified that the recommended resolutions to the IPEEE vulnerabilities associated with these 28 items were resolved.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 20 OF 58

6.0 SEISMIC WALKDOWN EQUIPMENT LIST DEVELOPMENT

A team of individuals with extensive knowledge of Plant Farley systems and components developed the SWEL. Qualifications of the personnel responsible for developing the SWEL are provided in Section 4.0 of this report. The equipment selection personnel used a SNC-template to ensure compliance with the EPRI Report 1025286 (Reference 10.2) and consistency across the fleet.

Two SWELs were developed (SWEL 1 and SWEL 2) consistent with the guidance in the EPRI Report 1025286 (Reference 10.2). SWEL 1 consists of a sample of equipment related to safe shutdown of the reactor and maintaining containment integrity as described in Section 3.0 of the EPRI Report 1025286 (Reference 10.2). SWEL 2 consists of items related to the spent fuel pool as described in Section 3.0 of the EPRI Report 1025286 (Reference 10.2). The two SWELs form the overall SWEL for the plant. Attachment 1 provides the final SWEL 1 and SWEL 2.

In some cases, components listed on the SWEL were removed from the SWEL or were replaced with equivalent components. These changes were made when it was determined during the Seismic Walkdown that access to the equipment on the original SWEL would be impractical to achieve during a walkdown. For example, components located very high in the overhead were replaced with equivalent items that could be seen without erecting scaffolding. All such changes meet the provisions of the EPRI Report 1025286 (Reference 10.2). Attachment 1 in Version 1 of this report contains the SWELs after all changes were incorporated (at the time of Version 1 report submittal).

Under Version 2 of this report, Attachment 1 also contains the final SWELs resulting from the completed walkdowns (items indicated in Table 7-1).

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 21 OF 58

6.1 DEVELOPMENT OF SWEL 1

SWEL 1 was developed using the four screens described in EPRI Report 1025286 (Reference 10.2).

Screens 1 through 3

These screens were used to select Seismic Category I equipment that does not undergo regular inspection but support the five safety functions described in the EPRI Report 1025286 (Reference 10.2). Page 3-1 of the EPRI Report 1025286 (Reference 10.2) lists three screens for use in selecting the Base List 1 if a utility was to not start from an existing equipment list used in previous plant evaluations. Applying these three screens would result in an acceptable base list that was comprised of Seismic Category I SSCs associated with maintaining the five safety functions listed in the EPRI Report 1025286 (Reference 10.2).

In accordance with the EPRI Report 1025286 (Reference 10.2), page 3-3, Screens 1 through 3 can be satisfied using previous equipment lists developed for the IPEEE program. Consequently, the Seismic Review Safe Shutdown Equipment List (SSEL) developed for the Farley IPEEE Report for Unit 1 (Reference 10.6), Appendix A–Seismic Report, was used as the Base List for the development of SWEL 1.

The intent of the Base List 1 was to provide an equipment list of the SSCs used to safely shut down the reactor and maintain containment integrity following a SSE. The specific guidance used to create the IPEEE Seismic SSEL was EPRI Report NP-6041, “A Methodology for Assessment of Nuclear Power Plant Seismic Margin”, (Reference 10.13). The Seismic SSEL from IPEEE – Seismic was checked and verified to meet the intentions set forth in the EPRI Report 1025286 (Reference 10.2).

As stated in EPRI Report 1025286, the equipment on the SWEL must include equipment required to perform the following five safety functions:

- Reactor reactivity control
- Reactor coolant pressure control
- Reactor coolant inventory control
- Decay heat removal, and
- Containment function.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 22 OF 58

The criteria used in selection of the Seismic SSEL are detailed in Section 3.0.2 of the IPEEE – Seismic Report. Specifically, one preferred and one alternate path capable of achieving and maintaining a safe-shutdown condition for at least 72 hours following a Plant Farley Safe Shutdown Earthquake was selected for each unit. Further, it was assumed that a Small Break Loss of Coolant Accident (SBLOCA) had occurred and as such, the paths were also selected as being capable of mitigating a SBLOCA following an SSE. Plant Operations’ input resulted in the inclusion of swing components not listed on the original IPEEE SSEL. Other suggestions by Plant Operations for inclusion in the SWEL, such as instrumentation stanchions and piping components, were determined to be covered by existing plant programs. Based on this, samples of those component types were not required to be added to the SWEL.

Therefore, based upon the review of the Base List, it was determined that the list did satisfy the requirements as specified in the EPRI Report 1025286 (Reference 10.2) which is a list comprised of Seismic Category I SSCs associated with maintaining the aforementioned five safety functions that are used to safely shut down the reactor and maintain containment cooling integrity.

Base List 1 is presented in Attachment 1.

Screen 4

Screen 4 provides the sample considerations used to select components that make up the SWEL from the components contained in Base List 1. The selection of components for SWEL 1 was developed through an iterative process that ensured a representative sample of components was included in the SWEL. Various drafts of SWEL 1 were provided to Farley licensed Senior Reactor Operators (SROs) for review and input. The SROs identified and recommended inclusion of additional equipment important to plant operations.

The following list summarizes the sample considerations used to develop SWEL 1:

- Variety of systems
- Major new or replacement equipment
- Classes of equipment
- Variety of environments
- Equipment enhanced due to vulnerabilities identified during the IPEEE program
- Risk Significance

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 23 OF 58

Variety of Systems – The EPRI Report 1025286 (Reference 10.2) specifies that equipment from a variety of plant systems must be included on the SWEL 1. The systems represented in the Base List were reviewed and components from a majority of these systems are included on the SWEL.

Major New and Replacement Equipment – Major new or replacement equipment installed within the previous 15 years was identified through a search of work order (WO) histories for selected equipment from input from plant personnel familiar with plant modifications and from the Probabilistic Risk Assessment (PRA) group on equipment changes to components that are included in the PRA.

Variety of Equipment Classes – A list of the 21 Classes of Equipment that should be included on the SWEL is provided in Appendix B of the EPRI Report 1025286 (Reference 10.2). The final SWEL contains a wide variety of components and includes a representative sample of components from each equipment class except classes 11, 13 and 19. The SWEL does not contain Class 11 or 13 components since it was developed from the SSEL associated with the IPEEE as described previously which does not contain Class 11 or 13 equipment. This is consistent with the EPRI Report 1025286 (Reference 10.2) for development of the SWEL.

Equipment Class 19 is not in scope for SWEL 1. The only Class 19 components on the Base List are Reactor Coolant System (RCS) RTDs installed on the RCS Piping. This is also consistent with the EPRI Report 1025286 (Reference 10.2) which states, “The major pieces of equipment in the NSSS that are located inside the containment are excluded from the scope of this program. Also excluded are the supports for this equipment along with all the components mounted in or on this NSSS equipment”.

Variety of Environments – The EPRI Report 1025286 specifies that the SWEL contains components located in various plant environments, including environments subject to corrosion and high temperatures. SWEL 1 includes equipment in three environment types. These include Harsh (e.g. Containment Building, Main Steam Valve Room), Mild (e.g. Control Room, Auxiliary Building), and Outdoors/Intake Structures (e.g. Valve Boxes, Service Water Intake Structure).

IPEEE Vulnerabilities – SWEL 1 includes equipment identified as having seismic vulnerabilities as reported in Farley IPEEE Report for Unit 1 (Reference 10.6).

Risk Significance – Information from the Farley Unit 1 PRA and the Maintenance Rule implementation documentation were used to determine whether items were risk significant. A representative sample of Risk Significant items are included on the SWEL. As stated, plant SROs reviewed the SWEL to ensure that equipment important to plant operation were included on the list.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 24 OF 58

6.2 DEVELOPMENT OF SWEL 2

SWEL 2 is developed using four screens described in the EPRI Report 1025286 (Reference 10.2). SWEL 2 is presented in Attachment 1.

Screens 1 through 2

The equipment selected through Screens 1 and 2 provide Seismic Category I components associated with the Spent Fuel Pool (SFP) that are also accessible for a walkdown. For Farley Unit 1, the only Seismic Category I equipment associated with the SFP is the Spent Fuel Cooling and Purification System. The Seismic Category I SSCs in the Spent Fuel Cooling and Purification System that are accessible and available for a walkdown comprise Base List 2.

Screen 3

Screen 3 is the sample considerations that ensure that a broad category of equipment is included in SWEL 2. These considerations include:

- Variety of systems
- Major new or replacement equipment
- Classes of equipment
- Variety of environments

Using the Base List 2 developed from the SFP System, the following criteria were used to select a sample of the SFP Seismic Category I equipment and systems:

- Variety of systems – Only one system comprises Base List 2
- Major new or replacement equipment – No major new or replacement equipment installations with the past 15 years.
- Classes of equipment – There are only 3 types of equipment in Base list 2: manual valves, 1 pump per train, and 1 heat exchanger per train. Additionally, one heat exchanger was included on SWEL 1 and therefore this selected heat exchanger was not chosen on SWEL 2 but applies to the SWEL 2 variety of equipment to prevent duplicates. The reason for the inclusion on SWEL 1 is due to Component Cooling Water (CCW) being the cooling medium for the SFP Heat Exchanger which requires the heat exchanger to maintain structural integrity during a seismic event for both SFP Cooling and CCW.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT	NO. SNCF164-RPT-01
	FOR	VERSION 2.0
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	PAGE 25 OF 58

- Variety of environments – All SFP components are located in a mild environment and are not submerged.

The Farley SFP System has a very basic system design with very limited component types and the system contains only one active component in each train; the SFP Cooling Pump. Since 3 of the 4 objectives for selecting the sample consideration of items for SWEL 2 did not have any variance, the only remaining criteria to satisfy the sample objectives was to ensure that a component from each category was chosen and these selected equipment varieties were used to comprise SWEL 2.

Screen 4

Screen 4 identifies any items that could potentially lead to rapid drain down of the SFP. These include any penetrations in the SFP that are below 10 feet above the top of the fuel assemblies.

For Farley Unit 1, the SFP Cooling and Purification System contains three penetrations; two SFP pump suctions and one pump discharge. Neither the discharge line nor the suction line penetrations are located within 10 feet of the top of the fuel assemblies. However, the SFP discharge piping terminates approximately 6 feet above the top of the fuel assemblies in the SFP. Due to this, the discharge piping has a ½” hole on the bottom side of a 180° bend at elevation 152’-0”. This hole acts as a siphon breaker and is located approximately 23 feet above the top of the fuel assemblies. Since there are no penetrations within 10 feet of the fuel and since the design of the anti-siphon hole in the SFP discharge piping prevents water from being siphoned through this piping, no rapid drain-down of the pool can occur.

Therefore, there are no components associated with rapid drain down of the Spent Fuel Pool included on SWEL 2.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 26 OF 58

7.0 SEISMIC WALKDOWNS AND AREA WALK-BYS

Walkdowns were performed for all components on the (combined) SWEL. A Seismic Walkdown Checklist (SWC) was completed for each component and an Area Walk-by Checklist (AWC) was completed for each area containing equipment on the SWEL. Copies of the SWCs can be found in Attachments 3 and 7 while the AWCs are provided in Attachments 4 and 8, for Version 1 and Version 2 of the report, respectively.

The personnel performing walkdowns received training on the NTF 2.3 Seismic Walkdown guidance. Prior to the walkdown teams arriving onsite, walkdown packages were assembled into folders that contained the SWCs and AWCs and other pertinent information (e.g., calculations, test reports, IPEEE walkdowns, equipment location, and layout drawings). Each walkdown team consisted of two SWEs. The walkdown teams spent the first week on site obtaining unescorted plant access and organizing for the walkdowns. Organization included assignment of specific components to the walkdown teams, review of the walkdown packages, development of a process for tracking the Seismic Walkdowns/Area Walk-bys and familiarization with the plant.

The second week on site began with the peer reviewers (Whitmore and Ashworth) providing an overview on the information contained in the EPRI Report 1025286 (Reference 10.2). Expectations for the walkdowns were discussed and questions answered. After this overview, each walkdown team performed an initial Seismic Walkdown and Area Walk-by in the presence of the other teams and at least one peer reviewer. The purpose of this initial walkdown was to ensure consistency between the teams, to reinforce the expectations for identifying potential adverse seismic conditions and to allow team members to ask questions and provide and obtain feedback.

Following the initial walkdowns, the walkdown teams began performing the Seismic Walkdowns and Area Walk-bys. Support from plant personnel (operators, electricians and engineering) was obtained, as required, to access equipment and to assist in locating and identifying components. All Component Walkdowns and Area Walk-bys were documented on the SWCs and AWCs, respectively. The final status of all SWCs and AWCs indicates one of the following statuses:

- “Y” – Yes, the equipment is free from potentially adverse seismic conditions,
- “N” – No, the equipment is not free from at least one potentially adverse seismic condition, or
- “U” – Undetermined, a portion(s) of the walkdown could not be completed due to equipment inaccessibility and the condition is not known.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 27 OF 58

The walkdowns focused on anchorage and seismic spatial interactions but also included inspections for other potentially adverse seismic conditions. Anchorage in all cases was considered to be anchorage to the structure. This included anchor bolts to concrete walls or floors, structural bolts to structural steel and welds to structural steel or embedded plates. For welds, the walkdown team looked for cracks and corrosion in the weld and base metal. Other bolts such as flange bolts on in-line components were not considered to be anchorage. These connections were evaluated and any potentially adverse seismic concerns were documented under “other adverse seismic conditions.”

As part of the walkdown, the anchorage of at least 50% of the anchored components were evaluated to verify if the anchorage was consistent with plant documentation. The document that provided the anchorage configuration was identified on the SWC and the anchorage in the field was compared to the information on this referenced document. Reference documents for anchorage verifications included plant drawings as well as Screening and Evaluation Worksheet (SEWS) packages created during IPEEE walkdowns of the plant. In some cases, equipment anchorages were verified to be in accordance with SEWS but it was also determined that some equipment had been modified or replaced since the completion of the original accessible walkdowns during which the SEWS were developed. Anchorage checks performed under these conditions duly verified that anchorage evaluations performed under the IPEEE program were still applicable, appropriate and adequate.

In cases where the anchorage could not be observed (e.g. where the anchorage was inside a cabinet that could not be opened except during an outage), the items related to anchorage were marked as “U” (Undetermined) and deferred until an outage when the piece of equipment would be available for inspection. However, as of the issuance of Version 2 of this report, all inspections have been completed and the results are documented on the SWCs (see Attachment 7).

In cases where the Seismic Walkdown team members identified a potential adverse condition, the condition was noted on the SWC or on the AWC and a Condition Report (CR) was written to document and evaluate/resolve the condition. As part of the process of generating the CR, preliminary licensing basis evaluations were performed by the SWEs during the walkdowns. Additionally, detailed licensing basis reviews were conducted as part of the resolution of the CR, as required. Conditions that were not obviously acceptable were documented on the checklists and a basis was provided for why the observed condition was determined to be acceptable.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 28 OF 58

Area Walk-bys were performed in the rooms containing the SSCs for walkdowns. For cases in which the room where a component was located was large, the extent of the area encompassed by the Area Walk-by was clearly indicated on the AWCs. For large areas, the walk-by included all structures, systems and components within a 35-foot radius of the equipment being walked down, as described on the AWC. The AWCs are included in Attachments 4 and 8.

SWEL 1 Walkdowns

Credit was taken for a total of 114 component inspections that were completed during the combined work performed as documented in Versions 1 and 2 of this report. This is the total number of component inspections required for Farley Unit 1.

A total of 115 component inspections were originally scheduled to be performed as documented in Version 1 of this report. Of these 115 component inspections, 3 were delayed due to inaccessibility, while 42 others were required to be scheduled for re-inspections based on additional guidance/clarification regarding the opening of cabinets to inspect for other adverse conditions.

As documented in Version 2 of this report, the walkdowns of the 3 previously inaccessible components were completed. However, only 41 of the 42 planned cabinet re-inspections could be completed. During the inspection of Q1R42B001B it was found the anchorage was not completely accessible without racking out the breakers. Therefore the item was removed from the SWEL. Table 7-1 is updated to show the completion of 44 out of 45 items. It is also updated to indicate Q1R42B001B was not completed and therefore removed from the SWEL. Removal of Q1R42B001B from the SWEL does not invalidate the conclusion in Section 6.1 that the screening requirements specified in the EPRI Report 1025286 (Reference 10.2) are met. All areas of the plant that contain items on the SWEL were included in the Area Walk-bys.

SWEL 2 Walkdowns

A total of six component walkdowns were performed. All areas of the plant that contain items on the SWEL were included in the Area Walk-bys.

7.1 INACCESSIBLE ITEMS

Table 7-1 identifies the components originally determined to be inaccessible for walkdowns. These items are located throughout the plant and the required Seismic Walkdowns and Area Walk-bys were not completed for these items during the initial phase of walkdowns. These items have been inspected as documented in Version 2 of this report as discussed in "SWEL 1 Walkdowns" above.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 29 OF 58

Inaccessibility of equipment or plant areas, as originally determined during efforts for Version 1 of this Report, occurred due to one of two conditions: (1) plant operating conditions, or (2) component inspections required the opening of cabinet/panel doors which was not conducted, or not permitted by plant Operations personnel during the time of the walkdowns. Items listed in Table 7-1 associated with Item 2 above include those that required walkdowns in accordance with the supplemental guidance to open cabinets to inspect for other adverse conditions as discussed in Section 2.0.

Based on the above, 45 components were originally determined to be inaccessible. These items are located throughout the plant and the required Seismic Walkdowns and Area Walk-bys for 44 of these items were performed before and during the Unit 1 outage, 1R25 in October 2013. Note 4 following Table 7-1 addresses the remaining component.

Note that in Version 1 of the report, the majority of the checklists associated with the components determined to be inaccessible based on condition 2 indicated that the walkdowns of these components were complete. The supplemental guidance on opening cabinets was received after these walkdowns/checklists were complete. Since the anchorage of these components was accessible without opening the cabinets, cabinet internals were not included in the inspections performed during the walkdowns for Version 1 of the report. The supplemental inspections of these components focused primarily upon those aspects that were not reviewed originally, i.e., the internal inspections. Those checklists were revised to include information from both walkdowns as documented in Version 2 of the report.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 30 OF 58

Table 7-1. Inaccessible Equipment per Original Walkdown Scope (see Note 1)

#	Item No.	Description	Reason for Inaccessibility (Note 2)	Remaining Walkdown Scope	Completion (See Note 3)
1	Q1C11E004B	Reactor Trip Switchgear No. 2	(2)	Inspect panel internals	Completed 10/9/13
2	Q1E11LQ3594B	Ctmt Sump Level Transmitter Power Supply	(2)	Inspect panel internals	Completed 1/30/13
3	Q1E11MOV8701B	RHR Inlet Isolation Valve	(1)	SWC and AWC for Containment El. 105'	Completed 9/30/13
4	Q1H11NGASC2506C	Aux Safeguards Cabinet C	(2)	Inspect panel internals	Completed 1/7/13
5	Q1H11NGB2504J	BOP Instrumentation Cabinet J	(2)	Inspect panel internals	Completed 8/9/13
6	Q1H11NGNIS2503A	NIS Excore Detector Cabinet	(2)	Inspect panel internals	Completed 1/7/13
7	Q1H11NGPIC2505F	Process Control Cabinet Channel 2	(2)	Inspect panel internals	Completed 1/7/13
8	Q1H11NGR2504I	Radiation Monitor Panel	(2)	Inspect panel internals	Completed 1/7/13
9	Q1H11NGSSP2506G	Solid State Protection Input Cabinet	(2)	Inspect panel internals	Completed 9/20/13
10	Q1H21E005	4.16KV Switchgear 1G Local Cont Panel	(2)	Inspect panel internals	Completed 1/7/13
11	Q1H21E505	4.16KV Switchgear 1J Local Cont Panel	(2)	Inspect panel internals	Completed 1/7/13
12	Q1H21E506	4.16KV Switchgear 1K Local Cont Panel	(2)	Inspect panel internals	Completed 10/16/13

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 31 OF 58

Table 7-1. Inaccessible Equipment per Original Walkdown Scope (see Note 1)

#	Item No.	Description	Reason for Inaccessibility (Note 2)	Remaining Walkdown Scope	Completion (See Note 3)
13	Q1H21E527	Diesel Generator 1B Local Cont Panel	(2)	Inspect panel internals	Completed 10/9/13
14	Q1H21NBAFP2605A	Hot Shutdown Panel A	(2)	Inspect panel internals	Completed 1/25/13
15	Q1H22L001E	Multiplying Relay Cabinet 1E	(2)	Inspect panel internals	Completed 1/25/13
16	Q1H22L002	Transfer Relay Cabinet 1	(2)	Inspect panel internals	Completed 1/25/13
17	Q1H22L503	Diesel Local Relay Panel 1B	(2)	Inspect panel internals	Completed 1/7/13
18	Q1N11PT0476	Steam Generator 1A Discharge Pressure	(1)	Complete SWC after removal of insulating material from around the instrument. This was not allowed by Plant Operations at the time the SWC was performed	Completed 10/16/13
19	Q1P13HV2867D	Containment Purge Isolation Inside Ctmt Valve	(1)	SWC and AWC for Containment El. 129'	Completed 9/30/13
20	Q1P16G517B	Turb Bldg SW Iso Valve Relay Box	(2)	Inspect panel internals	Completed 1/30/13
21	Q1R15A504	4.16KV Switchgear 1J	(2)	Inspect panel internals	Completed 1/10/14
22	Q1R16B006	600V Load Center 1D	(2)	Inspect panel internals	Completed 2/11/13

Table 7-1. Inaccessible Equipment per Original Walkdown Scope (see Note 1)

#	Item No.	Description	Reason for Inaccessibility (Note 2)	Remaining Walkdown Scope	Completion (See Note 3)
23	Q1R17B001-A	MCC 1A	(2)	Inspect panel internals	Completed 10/16/13
24	Q1R17B002	MCC 1B	(2)	Inspect panel internals	Completed 2/5/13
25	Q1R17B504-A	MCC 1K	(2)	Inspect panel internals	Completed 10/17/13
26	Q1R17B507-A	MCC 1N	(2)	Inspect panel internals	Completed 10/16/13
27	Q1R18B029	Power Disconnect Switch	(2)	Inspect panel internals	Completed 2/11/13
28	Q1R18B031	Circuit Breaker Box	(2)	Inspect panel internals	Completed 2/11/13
29	Q1R18B035	Circuit Breaker Box	(2)	Inspect panel internals	Completed 1/30/13
30	Q1R21B001A	Vital AC Breaker Box	(2)	Inspect panel internals	Completed 1/30/13
31	Q1R21E009C	Inverter 1C	(2)	Inspect panel internals	Completed 9/20/13
32	Q1R36A511	4.16KV Switchgear 1L Surge Arrestor	(2)	Inspect panel internals	Completed 2/12/13
33	Q1R41L001B	125VDC Distribution Panel 1B	(2)	Inspect panel internals	Completed 8/9/13
34	Q1R42B001B	125VDC Bus 1B	(2)	Inspect panel internals	See Note 4
35	Q1R42E001A	Aux Bldg Battery Charger 1A	(2)	Inspect panel internals	Completed 2/11/13

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 33 OF 58

Table 7-1. Inaccessible Equipment per Original Walkdown Scope (see Note 1)					
#	Item No.	Description	Reason for Inaccessibility (Note 2)	Remaining Walkdown Scope	Completion (See Note 3)
36	Q1R43E001A	Sequencer B1F	(2)	Inspect panel internals	Completed 2/11/13
37	Q1R43E002A	Sequencer B1F Aux Relay Panel	(2)	Inspect panel internals	Completed 2/12/13
38	QSH21E525	Diesel Gen 1-2A Local Control Panel	(2)	Inspect panel internals	Completed 10/25/13
39	QSH21E528	Diesel Generator 1C Local Control Panel	(2)	Inspect panel internals	Completed 8/9/13
40	QSH21L503B	Service Water B Train Battery Room HVAC LCS	(2)	Inspect panel internals	Completed 2/6/13
41	QSH22L502	Diesel Local Relay Panel 1-2A	(2)	Inspect panel internals	Completed 9/26/13
42	QSR42B516A	U1 Service Water Battery Fuse Box Train A	(2)	Inspect panel internals	Completed 2/12/13
43	QSR42B520B	SW Battery NO. 3 or 4 Detection Cabinet	(2)	Inspect panel internals	Completed 2/8/13
44	QSR42B525A	SW Building A Train Battery SEL SW	(2)	Inspect panel internals	Completed 2/12/13
45	QSR42B526B	Svc Water Bldg Battery Charger No.2 (Standby)	(2)	Inspect panel internals	Completed 10/16/13

Table notes:

1) Farley Unit 1 has one transformer (Equipment Class 4) in the SWEL 1. It was inspected to the extent practical. All visible anchors, hardware and surfaces were inspected. The anchorage for the transformer was visible without opening the component. To inspect the transformer further would

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 34 OF 58

require disassembly and therefore would not be considered part of a normal electrical inspection. The inspection of this transformer meets the requirements of the guidance document and the 50.54(f) Letter. The subject transformer is: MPL #Q1R11B004, LC TRANSFORMER 1D

- 2) Entries in Table 7-1 under column heading: "Reason for Inaccessibility" refer to the condition for inaccessibility discussed in Section 7.1.
- 3) 44 of 45 walkdowns were completed. See Note 4 for additional information.
- 4) Table 7-1, Item 34 (Q1R42B001B, 125VDC BUS 1B) was deleted from the SWEL during the performance of the walkdowns as the anchorage was inaccessible.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 35 OF 58

8.0 RESULTS

This section discusses the results of the Seismic Walkdowns that were performed in response to the NRC 50.54(f) letter dated March 12, 2012, "Enclosure 3, Recommendation 2.3: Seismic". As potentially adverse conditions were identified, condition reports were initiated in the Plant's Corrective Action Program (CAP) and evaluated. The sections below discuss the results of these walkdowns and evaluations.

8.1 POTENTIALLY ADVERSE SEISMIC CONDITIONS

All potentially adverse conditions were conservatively entered into the Plant's CAP per Southern Nuclear expectations in a timely fashion. While some preliminary licensing basis evaluations were performed by the SWEs as part of the generation of the CAP entries, the items did not first undergo a detailed seismic licensing basis review as described in EPRI Report 1025286. Consequently, the as-found conditions in Table 8-1 do not necessarily indicate that SSCs are deficient or not in conformance with their seismic licensing basis. Instead, it is an indication that Southern Nuclear has a very low threshold for CRs and actively uses the system.

SNC personnel familiar with the Plant Farley Seismic Licensing basis, Plant Farley seismic qualification methods and documentation, and Southern Nuclear requirements and procedures for entering items into the CAP reviewed and dispositioned all of the potentially adverse seismic conditions as part of the CAP process. The subsections below summarize the key findings from the CAP reviews that pertain to equipment operability, SSC conformance with the seismic licensing basis, and any required plant changes.

During the course of the seismic walkdowns, a total of 14 Unit 1 Potentially Adverse Conditions were identified and entered into the CAP. In addition, another 3 were entered that are common to both Units 1 and 2. Table 8-1 provides additional details on the SSCs that were identified during the walkdowns and entered into the CAP as degraded, nonconforming, or unanalyzed relative to their seismic licensing basis.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 36 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Area 121' Piping Pen Room 223	A cable from tray BHMS06 was found to be overhanging the edge of the tray in several places. At one location, the cable rested on a sharp edge where it crosses the boundary of the tray. The tray is ~ 9' in the overhead behind the cubicle wall of the room entrance. The cable needs to be placed back in the cable tray.	504947	Although this has been marked as a potential adverse seismic concern, the seismic walkdown team has concluded that it is unlikely for the cable to be damaged to the point that it would not perform its intended function during a seismic event.	WO SNC428446 created - Cable needs to be placed back in tray	Closed
Component U1 4160V Switchgear 1G (Q1R15A007-B) Breaker Cabinet	Breaker racking tools were found hanging from a 4" long rod ~ 3' from the U1 4160V Switchgear 1G (Q1R15A007-B) Breaker Cabinet 7 in Rm 233. During a seismic event the tool will potentially fall from the currently staged location and strike the switchgear.	505403	Seismic walkdown personnel determined damage to the cabinet would not occur in the event that the tool struck the cabinet. However, there is potential to damage the relays located on the front of the switchgear. The effect of the impact on the components in the cabinet should be evaluated and/or the tool relocated or adequately secured if any adverse impacts are suspected.	Breaker racking tools have been removed which eliminates the adverse seismic interaction condition.	Closed

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1P18C002B	The Seismic Walkdown Team observed a potential seismic interaction hazard on the Unit 1 Train B Emergency Air Compressor in Room 189 (Q1P18C002B). The Seismic Walkdown team observed a small gap of less than 0.5" between a 0.25" dia stainless steel compressor instrument tubing and an insulated pipe. The quarter inch instrument tubing is located directly on top of the compressor at eye level and has been identified as the constant speed unloader interconnecting line. The Walkdown Team judged that the insulation could impact the tubing since the lateral displacement of the insulated pipe during a seismic event could fill the 0.5" gap. The Seismic Walkdown Engineering Team judged the instrument tubing is too soft to tolerate interaction with the piping.	505553	An initial assessment of the condition was performed and there are no immediate operability concerns. The constant speed unloader is used to prevent overloading the compressor and is actuated when the receiver pressure exceeds the pre-set pressure for the auxiliary valve spring. When the auxiliary valve opens, air is routed to the constant speed unloaders and forces them open. If the interconnecting line is lost, the auxiliary valve will still mitigate overloading of the compressor by relieving pressure to atmosphere when pre- set values are exceeded.	WO SNC428541 removed the adverse Seismic Spatial interaction. WO closed.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 38 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Area: U1 A Charging Pump room (Room 181)	Loose bolts were found in the mounting hardware of the Gaitronics system inside the U1 A Charging Pump room (room 181).	507934	The Gaitronics speaker could become a concern if the mounting hardware was to loosen further.	All actions are completed to prevent the adverse interaction.	Closed
Component Multiplying Relay Cabinet 1E, Q1H22L001E	A 1 1/2" dia. conduit is within 1/4" of the side of Multiplying Relay Cabinet 1E (Q1H22L001E). The conduit spans ~ 10' and passes the relay panel about mid-span, and is therefore very flexible. The conduit must be moved away from the panel or supported near the panel to reduce any interaction effects during a seismic event. An immediate solution is to clamp the small conduit to the adjacent larger conduit to restrain it from the relay cabinet. (AB,139', rm. 318). It's possible that no sensitive equipment is in the panel, in which case the interaction effects are credible but insignificant. The walkdown team could not make this determination.	508376	Ops Shift Supervisor Review: The cabinet and conduit are installed per design. No indication of missing hardware is evident. Installation of stiffening hardware to minimize potential for contact between the cabinet and conduit in the event of a seismic event will be pursued via the corrective action process.	WO SNC429765 created. TE 540860 evaluated the condition and found the condition of the conduit near the Multiplying Relay Cabinet as acceptable as is. WO SNC429765 voided.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 39 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1H21NBAFP2 605A	While performing SAM NTTF 2.3 Seismic Walkdowns for Farley Units 1 & 2 in the Aux Bldg, Room 254, the rear door of Hot Shutdown Panel A (Q1H21NBAFP2605A) was found unlatched, but should be latched to minimize impact to the panel from the door during a seismic event.	508387	The panel was re- walked down on 10/26/12 and identified to be closed. Latch is operable but hard to operate based on discussions with Operations. WO has been created to fully fix the latch.	WO SNC429766 created.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 40 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Area Room 184	While performing SAM NTTF 2.3 Seismic Walkdowns for Farley Units 1 & 2 in Room 184, the seismic walkdown team observed a flexible cable attached to the IA Isolation Outside CTMT Valve with limited flexibility. The flex cable is routed to the valves upper limit switch.	508690	This configuration has been compared against the original IPEEE Screening Evaluation Work Sheet (SEWS) which was performed by qualified SQUG Engineers. The SEWS package shows that the flex cable was in the same configuration during this evaluation at the area where flexibility is limited. This seismic interaction has previously been evaluated as acceptable. This condition was present during SQUG/IPEE walkdowns performed in 1993 and is documented in the SEWS package for Q1P19HV3611.	The original IPEEE SEWs package did not specifically refer to the flex conduit but using pictures the valve and flex conduit was identified to be in the same state. Based on this not being called out as an issue during the original walkdown, no further actions are needed.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 41 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1P17HV3096A	While performing SAM NTF 2.3 Seismic Walkdowns for Farley Unit 1, one of the seismic walkdown teams noted two (2) potential seismic concerns with the 3096 A valve (Q1P17HV3096A): 1) Rigid conduit within ½" of pressure gage. During a seismic event, the worst credible failure would result in breaking the pressure gage glass. 2) Insufficient flex in cables to the upper and lower limit switches. One of the questions of the seismic walkdown packages is "Do attached lines have adequate flexibility to avoid damage?"	508692	This same configuration was observed during the Farley SQUG/IPEEE walkdowns back in the mid 90's and there were no identified discrepancies on the Seismic Evaluation Work Sheets (SEWS) concerning inadequate flexibility of lines attached to the 3096 A valve. Additionally, the SEWS package did not mention any concern for the conduit in close proximity of the pressure gage. 3096A also has difficulties in operating and the valve is already jacked closed, declared inoperable, and is being replaced during 1R25 so no impact.	TE 509140- DCP has been confirmed to remove the adverse Seismic Condition.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 42 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1E11MOV881 2A Room 131 (El. 83')	A permanent ladder was installed in contact with the Containment Sump to RHR Pump 1A Isolation Valve (Q1E11MOV8812A). The seismic walkdown team that performed the walkdown has determined that this is a potentially adverse seismic condition the 8812A.	508694	This configuration was compared against the original IPEEE Screening Evaluation Work Sheet (SEWS) which was performed by qualified SQUG Engineers. The SEWS package for Q1E11MOV8812A performed during the SQUG/IPEE walkdowns in 1993 visually shows that the ladder and valve were in the same configuration during performance of the SEWS. This condition was not called out as an adverse seismic interaction on the SEWS.	The condition was verified against the SEWS which shows the ladder and valve in the same position and configurations. This was not evaluated as a Seismic Concern on the SEWS and thus the condition is SAT.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 43 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1P16F501A	Seismic Walkdown team identified corrosion on a Service Water Strainer 1A (Q1P16F501A) hold down bolt.	515693	This condition is similar to the condition of a SW strainer bolt identified during 1R24 (CR:442339 and MDC SNC387300) showing excessive corrosion. The nut was cleaned and a torque applied to fully seat the nut. The nut was apparently cocked/cross threaded and could not be moved further. The torque applied was in excess of 1000ft-lbs proving the bolt was sound. After cleaning the nut, the material condition showed little surface degradation. This reference is provided to document that the degradation for this strainer hold down bolt is exacerbated by the wet environment which typically causes the corrosion layer to swell and look significantly worse than the actual sound material condition. Based on known pre and post cleaned condition of one of the strainer anchor bolts/nut, the seismic walkdown team is confident that the strainer bolt is sound and is capable to perform its intended function. The team members are qualified to use engineering judgment to make the Seismic Evaluation based on being qualified either through SQUG or EPRI training for Seismic Evals.	WO SNC432772 created – Clean and coat the bolts.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 44 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1P18C002B	While reviewing AWBs performed by the Seismic Walkdown Teams, it has been discovered that one of the four anchor bolts for the U1 Auxiliary Steam Condensate Tank is bent and has been documented as an adverse seismic concern.	539901	Based on initial review from the site POC for the Seismic Walkdowns, this condition is not of concern during a seismic event. The nut on the affected anchor bolt appears to be installed correctly with no gap between it and the concrete pad which results in negligible impact to the load bearing portion of the bolt. Also, the remaining 3 anchor bolts are SAT with no further discrepancies identified. The initial review has also determined that there is no effect on the current seismic design basis since the component is classified as non-seismic, Crit-N.	TE 540855 created to evaluate the condition. Bent bolt was found to be acceptable. TE has been closed.	Closed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR	NO. SNCF164-RPT-01
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	VERSION 2.0
		PAGE 45 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component QH21E527	Seismic Walkdown team found that grout needs to be placed around all anchor bolts on the south side of the panel.	716676	This condition was originally noted in the SEWS package dated 5/24/94. Subsequent evaluation showed this condition is not an operability concern. Enhancements have been made to the anchorage including: shimming between the panel and grout pad; adding additional anchors to the North side; welding on a new plate to the South side and installing two new anchors. Therefore this condition is not a seismic concern.	Repair existing grout around the existing anchors. WO SNC 526618 created.	In Progress

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 46 OF 58

Table 8-1. Potentially Adverse Conditions

Comp/ Area	Brief Description of Potentially Adverse Condition	CR #	Brief discussion of Analysis/Conclusion	Action Taken/Planned to Address/Resolve the Condition	Status (In Progress /Closed)
Component Q1R17B001-A	While performing the NTTF 2.3 Seismic Walkdown for Farley Unit 1 for 1A MCC, there were two instances identified where seismically qualified Agastat Relays were installed with only 3 of 4 required mounting screws.	719207	This condition has been evaluated for the 2A MCC and it has been determined that the current mounting configuration does not adversely impact the functionality of any of the relays in any of its operating modes (before, during, and after a DBE). The U2 evaluation has been reviewed and is bounding for the conditions found on U1 1A MCC. Therefore, the condition does not bring into question the operability or functionality of the relays.	The evaluation that addresses the condition found on 2A MCC is attached to TE 640206(Closed). WO SNC527527 and SNC 527528 created.	In Progress
Component Q1R17B507-A	While performing the NTTF 2.3 Seismic Walkdown for Farley Unit 1 for 1N MCC, one of the terminal strips in FNB1 was found to be missing a lower mounting screw.	722630	This is not considered to be an operability concern or a seismic concern due to the minimal weight of the strip.	WO SNC528556 created to replace the missing mounting screw.	In Progress

During the course of the walkdowns the team identified issues that, while not rising to the level of a seismic concern, warranted evaluation to determine if programmatic enhancements are warranted. These issues have been entered into the SNC corrective action program.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 47 OF 58

CR 539958: While performing a review of the Condition Reports resulting from the SAM NTTF 2.3 Seismic Walkdowns, an adverse trend was identified with regards to storing tools and equipment throughout the plant. Several events were documented where tools and equipment (e.g. breaker racking tools, hot sticks) were stored in such a way that they had the potential to fall and strike nearby equipment (e.g. Switchgears) during a seismic event. The extent of condition should be investigated by the groups that use the tooling, all further conditions corrected, and actions put in place to prevent future recurrences.

CR 539961: While performing a review of the Condition Reports resulting from the SAM NTTF 2.3 Seismic Walkdowns, an adverse trend was identified with regards to maintaining the coating on components subject to corrosive environments. Several events were documented where anchorage and associated supports were corroded due to a lack of coatings and preventive maintenance to protect the material. The extent of the damage varied from minor surface corrosion to more significant wastage of the components. The extent of condition should be investigated and appropriate corrective actions put in place to promote the long-term sustainability of anchorage, support, and components subject to corrosive environments.

CR 539962: While performing a review of the Condition Reports resulting from the SAM NTTF 2.3 Seismic Walkdowns, an adverse trend was identified with regards to maintaining the housekeeping of cable trays and their cables. Several events were documented where cable trays had damaged panels or cables overhanging the cable tray. The extent of condition should be investigated and appropriate corrective actions, as needed, put in place.

8.2 EQUIPMENT OPERABILITY

Plant Farley Unit 1 had no as-found conditions that would prevent SSCs from performing their required safety functions.

8.3 PLANT CHANGES

There were no plant changes that resulted from the as-found conditions. Plant changes are any planned or newly installed protection and mitigation features (i.e., plant modifications) that result from the Seismic Walkdowns or Area Walk-bys.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 48 OF 58

8.4 OTHER NON-SEISMIC CONDITIONS

Housekeeping items were identified during walkdowns and walk-bys that were not potentially seismic adverse conditions. All such items were brought to the attention of plant personnel and CRs were generated as necessary. These issues included water on the floor and loose items (small tools, trash, etc.) stored in the plant areas. These items were processed through the Plant's CAP process and are not specifically documented in this report though are available in the Plant CAP database.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 49 OF 58

9.0 PEER REVIEW

9.1 PEER REVIEW PROCESS

The peer review for the NTF Recommendation 2.3 Seismic Walkdowns was performed in accordance with Section 6 of the EPRI Report 1025286 (Reference 10.2). The peer review included an evaluation of the following activities:

- review of the selection of the structures, systems, and components (SSCs) that are included in the Seismic Walkdown Equipment List (SWEL);
- review of a sample of the checklists prepared for the Seismic Walkdowns and Area Walk-bys;
- review of licensing basis evaluations and decisions for entering the potentially adverse seismic conditions in to the Plant’s Corrective Action Plan (CAP); and
- review of the final submittal report.

This report provides a summary of peer review results as well as the results of the above peer review activities. In Section 9, “Version 1” describes the work completed during the initial evaluation and submitted in November 2012. “Version 2” describes the subsequent work completed since that time and transmitted in this final submittal.

9.2 PEER REVIEW RESULTS SUMMARY

9.2.1 Seismic Walkdown Equipment List Development – Version 1

The selection of items for the SWEL underwent peer review according to Section 3 of the EPRI Report 1025286 (Reference 10.2). The SSCs to be evaluated during the seismic walkdown were selected as described in Section 6.0 of this report. The list of components was provided to the members of the Peer Review Team, which consisted of the peer reviewers listed in Section 4.0. The Peer Review Team members independently provided comments to the personnel who selected the components on the SWEL. All comments were addressed and the Peer Review Team reviewed the changes made to the SWEL and the final SWEL, to ensure all recommendations from Reference 10.2 were met. Specifically, the Peer Reviewers confirmed that all SSCs in SWEL 1 and 2 were Seismic Category I components that do not undergo regular inspections. Specific considerations for the peer review process are described below for SWEL 1 and SWEL 2. The peer review checklist of the SWEL is provided in Attachment 2.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 50 OF 58

For SWEL 1, the Peer Review Team verified that the list of SSCs represented a diverse sample of the equipment required to perform the following five safety functions, as specified in the EPRI Report 1025286 (Reference 10.2):

- Reactor Reactivity Control;
- Reactor Coolant Pressure Control;
- Reactor Coolant Inventory Control;
- Decay Heat Removal; and
- Containment Function.

For SWEL 1, the Peer Review Team also verified that the SSCs included an appropriate representation of items having the following sample selection attributes:

- Various types of systems;
- Major new and replacement equipment;
- Various types of equipment;
- Various environments;
- Equipment enhanced based on the findings of the IPEEE; and
- Risk insight consideration.

The final SWEL 1 contains items that perform each of the five safety functions specified in the EPRI Report 1025286 (Reference 10.2). Numerous components perform more than one of the safety functions and all five safety functions are well represented by the components on the list. SWEL 1 contains components from all applicable classes of equipment listed in Appendix B of the EPRI Report 1025286 (Reference 10.2), except for equipment classes 11, 13 and 19, where there are no safety-related components at the plant that fall into that specific equipment class. The list contains major new and replacement items, and items enhanced based on the IPEEE as well as equipment located in various environments and areas of the plant. All major safety-related systems are represented and risk factors were considered in development of the list.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 51 OF 58

For SWEL 2, the Peer Review Team determined that the process to select spent fuel pool related items complied with the EPRI Report 1025286 (Reference 10.2). Portions of the spent fuel pool cooling system at Farley Unit 1 are Seismic Category I and all different types of components are represented on the SWEL 2. No items that could cause rapid drain down of the Spent Fuel Pool for Farley Unit 1 were identified. Therefore, SWEL 2 does not contain any components associated with potential rapid drain down of the pool. The Peer Review Team concluded that the bases for including/excluding items associated with the spent fuel pool were well documented and that the final SWEL 2 complies with the EPRI Report 1025286 (Reference 10.2).

In summary, all of the peer review comments made during development of SWEL 1 and SWEL 2 were resolved by the team that prepared the SWELs. The resolutions were reviewed by the Peer Review Team and it was determined that all comments were adequately addressed. The SWEL was determined to incorporate all comments made by the Peer Review Team during the process.

During the walkdowns, a small number of isolated components that were not accessible were removed from the list and, in some cases, equivalent items that were determined to be accessible were added. The Peer Review Team reviewed all changes made to the SWELs and determined that these changes had no impact on the adequacy of the SWELs with respect to the provisions contained in the EPRI Report 1025286 (Reference 10.2). The Peer Review Team concludes that the team that developed the SWELs appropriately followed the SWEL development process described in Section 3 of the EPRI Report 1025286 (Reference 10.2).

The Peer Review Checklist for development of the SWEL is provided in Attachment 2.

9.2.2 Seismic Walkdown Equipment List Development – Version 2

The Peer Review Team was consulted as necessary during the walkdowns to ensure that no equipment substitutions (due to equipment availability, being energized, etc.) would conflict with the EPRI report requirements. One SWEL item was listed as inaccessible in Table 7-1 of the Version 1 walkdown report. Component no. Q1R42B001B 125v DC BUS 1B was removed from the SWEL for Version 2 since the item could not be inspected without extensive disassembly. Removing the item from the SWEL 1 did not invalidate any of the EPRI report requirements such as variety of systems, variety of classes of equipment, variety of environments, etc.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 52 OF 58

The final SWELs are provided in Attachment 1 and reflect completion of all seismic walkdowns of equipment. The Peer Review Team reviewed the final SWELs and concluded that both SWELs (for original walkdowns and the outage walkdowns) met the requirements in Section 3 of EPRI Report 1025286 (Reference 10.2).

The Peer Review Checklist of the final SWEL is provided in Attachment 2.

9.2.3 Seismic Walkdowns and Area Walk-Bys – Version 1

The Peer Review Team was on-site and very involved with the Seismic Component Walkdowns and Area Walk-bys. The Peer Review was performed as follows:

- Each of the walkdown teams performed an initial equipment Seismic Walkdown and an Area Walk-by while being observed by the other teams and at least one member of the walkdown Peer Review Team. The Peer Review Team provided comments and suggestions and answered questions raised by the team performing the walkdown and the other walkdown teams.
- During the first week of walkdowns, a member of the walkdown Peer Review Team individually accompanied each of the SWE walkdown teams and observed the SWE team conducting the Seismic Walkdowns and Area Walk-bys. The Peer Review Team confirmed first-hand that the SWE walkdown teams performed the Seismic Walkdowns and Area Walk-bys as described in Section 4 of the EPRI Report 1025286 (Reference 10.2). A member of the Peer Review Team accompanied each of the four walkdown teams on at least one full day of walkdowns. SWE walkdown teams were encouraged and expected to carry a copy of Section 4 of the EPRI Report 1025286 (Reference 10.2) and refer to it, as necessary, during conduct of the Seismic Walkdowns and Area Walk-bys.
- Finally, the walkdown Peer Review Team reviewed the Seismic Walkdown and Area Walk-by packages completed during the first week to ensure that the checklists were completed in accordance with the EPRI Report 1025286 (Reference 10.2). The walkdown Peer Review Team confirmed that the Seismic Walkdown and Area Walk-by packages were consistent, thorough, and the packages accurately reflected the results of the Seismic Walkdowns and Area Walk-bys as witnessed during the first week of walkdowns.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 53 OF 58

The Peer Review Team concluded that the SWE teams were familiar with the process for Seismic Equipment Walkdowns and Area Walk-bys. The SWE teams adequately demonstrated their ability to identify potentially adverse seismic conditions such as adverse anchorage, adverse spatial interaction, and other adverse conditions related to anchorage, and perform anchorage configuration verifications, where applicable. The SWEs also demonstrated the ability to identify seismically-induced flooding interactions and seismically-induced fire interactions. The SWEs documented the results of the Seismic Walkdowns and Area Walk-bys on the appropriate checklists from Appendix C of the EPRI Report 1025286 (Reference 10.2).

The Peer Review Team inspected all the checklists completed during the first week of walkdowns, representing approximately 40% of the total number of checklists. Peer review of the Seismic Walkdowns and Area Walk-bys identified minor editorial errors and also some instances where comments in the checklists required additional explanation and information. Mr. Ashworth and Mr. Whitmore provided verbal feedback to the SWEs to adjust these entries accordingly. The SWEs understood the comments and incorporated the recommendations and updates from the Peer Review Team.

Since the peer review occurred at the start of the walkdowns, the peer reviewers were able to provide comments at the early stages of the walkdown process to ensure consistency in the reporting for all packages. Subsequently, the Peer Review Team considered the number of completed walkdown packages reviewed to be appropriate. In addition, all members of the Peer Review Team, including Mr. Ashworth, Ms. Brown, Mr. Starck and Mr. Whitmore were available by phone as necessary during the entire Walkdown process.

9.2.4 Seismic Walkdowns and Area Walk-bys – Version 2

The Peer Review Team was available by phone and email for consultation to the Plant Farley SWEs for the scope of walkdowns covered by Version 2 of this report. SWEs that were involved with work transmitted under Version 1 of this report (particularly Mr. Youngblood, Mr. Harlos, Mr. Mullenix, and Ms. Maclay) performed many of the walkdowns documented in Version 2 of this report.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT	NO. SNCF164-RPT-01
	FOR	VERSION 2.0
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	PAGE 54 OF 58

Plant Farley also trained additional SWEs to support completion of the remaining walkdowns. The Peer Review of the new SWEs was performed as follows:

- The new SWEs completed the EPRI NTTF 2.3 Seismic Walkdown Training course onsite at Plant Farley. The instructor of this session of the course Ken Whitmore had attended the June 12, 2012 session of the EPRI-sponsored Seismic 2.3 Seismic Walkdown Training course and used the training materials provided by EPRI. The Peer Team Leader/SNC Seismic Technical Lead, Ms. Brown, attended the training session in order to share Lessons Learned from the previous walkdowns.
- Before the new SWEs performed any walkdowns on the SWEL items, Peer Team Member Ms. Brown as well as Mr. Ashworth (who was part of the Peer Review Team under Version 1 of this report) traveled to Plant Farley to witness the new SWEs perform practice walkdowns in the site Protected Area. Each of the new SWEs performed practice equipment Seismic Walkdowns and Area Walk-bys under the observation of the other new SWE team members, Ms. Brown and Mr. Ashworth just as was done during the initial walkdowns (see section 9.2.3). Ms. Brown and Mr. Ashworth interviewed the new SWEs to verify their understanding of the NTTF 2.3 Seismic Walkdown objectives and their ability to identify potentially adverse seismic conditions. They provided suggestions for performing walkdowns and answered questions raised by the new SWEs. Each of the new SWEs completed practice walkdown checklists which were reviewed and critiqued on site by Ms. Brown and Mr. Ashworth.

Ms. Brown and Mr. Ashworth concluded that the new SWEs were performing walkdowns and completing checklists in a manner consistent with that witnessed/performed in support of Version 1 of this report. The new SWEs are familiar with the process for Seismic Equipment Walkdowns and Area Walk-bys. Additionally, the SWEs adequately demonstrated their ability to identify potentially adverse seismic conditions such as adverse anchorage, adverse spatial interaction, and other adverse conditions related to anchorage. They also performed anchorage configuration verifications, where applicable. The new SWEs also demonstrated their ability to identify seismically-induced flooding interactions and seismically-induced fire interactions. They documented the results of the outage Seismic Walkdowns and Area Walk-bys on the appropriate checklists from Appendix C of the EPRI Report 1025286 (Reference 10.2).

Of the new SWEs trained at Plant Farley, Mr. Nelson and Ms. Arrant performed walkdowns at Plant Farley Unit 1, which are addressed by Version 2 of this report. To be conservative and to ensure consistency, all checklists prepared and provided in Attachments 7 and 8 of this report were reviewed

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT	NO. SNCF164-RPT-01
	FOR	VERSION 2.0
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	PAGE 55 OF 58

by two Peer Review Team members (Ms. Brown and Mr. Richard Starck). This Peer Review of checklists is in addition to the “10 to 25% requirement” that was met during Version 1 of the report. Verbal and written comments were provided by the Peer Review Team and incorporated by the SWEs. It is noted that the checklists for Version 2 include several pictures that show the overall condition of the equipment. Having numerous pictures was an efficient way to document resolution of the checklist questions. In addition, the checklists often “retyped” previous information that was handwritten (and was provided in Attachments 3 and 4 in Version 1 of the report) for clarity and consistency purposes. Preparation of these “retyped” checklists relied upon the results of the inspections from the original checklists.

The Peer Review Team members (Ms. Brown and Mr. Starck) concluded that checklists were completed in a manner consistent with the requirements of the EPRI Report 1025286 (Reference 10.2).

9.2.5 Licensing Basis Evaluations – Versions 1 and 2

All potentially adverse seismic conditions identified were immediately entered into the plant CAP for further review and disposition as discussed in Section 8.1 of this report. Therefore, the Seismic Walkdown teams did not perform licensing basis evaluations apart from evaluations performed for the CAP. The Peer Review Team considers this CAP process approach fully comprehensive and acceptable for addressing the potentially adverse seismic conditions observed during the Seismic Walkdowns.

9.2.6 Submittal Report – Version 1

The Peer Review Team was provided with drafts of the submittal report. This allowed the Peer Review Team to provide guidance and input and to verify that the submittal report met the objectives and requirements of the EPRI Report 1025286 (Reference 10.2).

The Peer Review Team provided both verbal and written comments on the draft reports and was active in ensuring the report was thorough, complete and accurate. The final version of the submittal report includes all necessary elements of the Peer Review and meets the requirements of the 50.54(f) letter.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT	NO. SNCF164-RPT-01
	FOR	VERSION 2.0
	RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	PAGE 56 OF 58

9.2.7 Submittal Report – Version 2

Similar to the process for Version 1, the Peer Review Team was provided with drafts of the submittal report. This allowed the Peer Review Team to provide input and to verify that the submittal report met the requirements of EPRI Report 1025286 (Reference 10.2).

The Peer Review Team provided both verbal and written comments on the drafts and was active in ensuring the report was thorough, complete and accurate. The final version of the submittal report included all necessary elements of the Peer Review and met the requirements of the 50.54(f) letter.

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 57 OF 58

10.0 REFERENCES

- 10.1 10 CFR 50.54(f) Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, dated March 12, 2012
- 10.2 EPRI Report 1025286, Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic, June 2012
- 10.3 Generic Letter No. 88-20, Supplement 4, Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities
- 10.4 Generic Letter No. 87-02, Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46
- 10.5 Not used.
- 10.6 Joseph M. Farley Nuclear Plant, Unit 1 and Unit 2, Individual Plant Examination of External Events – Seismic.
- 10.7 RER SNC432467, SAM NTTF 2.3: Seismic, Unit 1 and 2 Walkdowns at Plant Farley, (Recommendation) 2.3 – Seismic
- 10.8 Generic Letter No. 87-02, Supplement 1 to Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46
- 10.9 NUREG-1211, Regulatory Analysis for Resolution of Unresolved Safety Issue A-46, Seismic Qualification of Equipment in Operating Plants
- 10.10 NUREG-0117 Supplement No. 5 dated March, 1981 Safety Evaluation Report
- 10.11 Not used
- 10.12 Not used
- 10.13 EPRI Report NP-6041, A Methodology for Assessment of Nuclear Power Plant Seismic Margin
- 10.14 Farley Nuclear Plant Updated Final Safety Analysis Report (UFSAR), Rev. 24, August 2012 (Version 1) and Rev. 25, December 2013 (Version 2).
- 10.15 NMP-GM-033-GL01 Ver. 1.0, SAM NTTF Seismic Walkdowns Guide

	FARLEY UNIT 1 SEISMIC WALKDOWN REPORT FOR RESOLUTION OF FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC	NO. SNCF164-RPT-01
		VERSION 2.0
		PAGE 58 OF 58

11.0 ATTACHMENTS

ATTACHMENT 1 – SEISMIC WALKDOWN EQUIPMENT LISTS (Version 1 and Version 2)

ATTACHMENT 2 – PEER REVIEW CHECKLISTS FOR SWEL 1 AND 2 (Version 1 and Version 2)

ATTACHMENT 3 – SEISMIC WALKDOWN CHECKLISTS (Version 1 and Version 2)

ATTACHMENT 4 – AREA WALK-BY CHECKLISTS (Version 1)

ATTACHMENT 5 – IPEEE VULNERABILITIES INFORMATION (Version 1 and Version 2)

ATTACHMENT 6 – SEISMIC WALKDOWN ENGINEER CERTIFICATIONS (Version 1 and Version 2)

ATTACHMENT 7 – SEISMIC WALKDOWN CHECKLISTS (Version 2)

ATTACHMENT 8 – AREA WALK-BY CHECKLISTS (Version 2)