Joseph M. Farley Nuclear Plant – Unit 2
Updated Seismic Recommendation 2.3 Walkdown Report Requested by 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

Enclosure 2

Updated Farley Unit 2 Seismic Walkdown Report for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic

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Farley Unit 2 SEISMIC WALKDOWN REPORT, RER SNC432467

For

Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic

Prepared by: H Patel for James Dovel Per Telecon — Date: 8/30/2013

Reviewed by: Paul A Miktus — Date: 8/30/13
Paul A. Miktus

Approved by: (ENERCON) — Date: 8/30/2013
Project Manager or Designee
Bill Henne

Approved by:
(SNC) — Date: 9-3-2013
Technical Lead or Designee / Peer Review Team Leader
Melanie Brown

Approved by:
(SNC) — Date: 9/3/2013
Project Manager or Designee
David Whitman

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EXECUTIVE SUMMARY

The Seismic Walkdowns at Farley Unit 2 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 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 number 1025286). Plant Farley Unit 2 had no significant degraded, non-conforming or unanalyzed conditions that warranted modification to the plant. Plant Farley Unit 2 had no as-found conditions that would prevent SSCs from performing their required safety functions.

1.0 SCOPE AND OBJECTIVE

The objective of this report is to document the results of the Seismic Walkdowns at Farley Unit 2 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 2 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.

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 2 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.

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.

It should be noted that the FNP Unit 2 seismic qualification program, i.e., IEEE 344-71 type qualification, was previously audited by the NRC's Seismic Qualification Review Team (SQRT). It was concluded in NUREG-0117 Supplement No. 5 (dated March, 1981) Safety Evaluation Report related to the operation of Unit 2 that "the licensee's seismic qualification program provides reasonable assurance that the seismic category I mechanical and electrical equipment is adequately qualified, meets the applicable requirements of General Design Criterion 2, and is therefore acceptable for full-power operation".

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 (½ SSE) and the SSE with different intensities of ground motion. The ½ 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 ½ SSE and SSE is defined from the history of seismic activity in the area around the site.

The ½ 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 ½ 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 OBE and to ensure they will perform their required safety-related functions during and/or 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.

All Seismic Category I safety-related instrumentation and mechanical and electrical equipment meet the requirements and recommendations of 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 2 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

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		
Maggie Farah				X	X
Ryan Harlos (See Note 3)	X	X		X	X
Chelicia Hill				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

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
Robert Ashworth*		X	X	X	X
Melanie Brown*	X	X	X	X	X
Richard Starck*		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.

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, the 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 2 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.

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 a Shift Supervisor assigned to the Operations staff 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,
- 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.

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 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 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 B. S. 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 earthwork and 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.

Robert Ashworth, SCE (MPR)

Melanie Brown, SCE (SNC)

Ryan Harlos, SWE (SNC)

Chelicia Hill, SWE (SNC) [Version 2 Only]

Laura Maclay SWE (ENERCON)

Alan Mullenix, SWE (ENERCON)

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

Richard Starck, SCE (MPR)

Taylor Youngblood, SWE (SNC)

Chelicia Hill, SWE (SNC)

Ms. Hill is currently a Design Engineer in the Civil & Mechanical Group at Farley Nuclear Power Plant. She has a B. S. in Civil Engineering from University of Alabama at Birmingham and is currently working towards a Masters of Engineering in Information Engineering & Management at the University of Alabama at Birmingham. Chelicia has four years of experience with all of those years at Farley Nuclear Power Plant in the areas of civil/structural design. Her design experience includes evaluations and calculations for seismically qualifying various supports and structures. Her specialty is in the area of structural design. Ms. Hill completed the EPRI training on Near Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns in February 2013.

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.

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 final Seismic Walkdown Equipment List (SWEL) for Farley Unit 2 included 18 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 18 items were implemented.

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).

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 1 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 2 (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.

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

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 2 (Reference 10.6).

Risk Significance – Information from the Farley Unit 2 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.

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 2, the only Seismic Category 1 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.
- 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 2, 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.

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 NTTF 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.

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 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.

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 108 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 2.

A total of 110 component inspections were originally scheduled to be performed as documented in Version 1 of this report. Of these 110 component inspections, 7 were delayed due to inaccessibility, while 32 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.

For Version 2 of this report, all 32 cabinet re-inspections were performed, but only 5 of 7 previously inaccessible components were walked down. The 2 inaccessible components are as follows:

- Q2E21MOV8112, RCP SEAL WATER RETURN ISOLATION, was not inspected due to its plant location (very high in the overhead) and was deleted from SWEL 1 and;
- Q2H11NGNIS2503A, NIS EXCORE DETECTOR CABINET, was partially inspected, however, welds of the cabinet to the floor structure could not be fully inspected due to the presence of a vinyl kick plate that could not be removed and was conservatively considered inaccessible for the purposes of the overall effort. This item was removed from the SWEL.

The 37 component inspections completed for Version 2 of this report are shown in Table 7-1. These two inaccessible components have been left in Table 7-1 for information. All areas of the plant that contain items on the SWEL were included in the Area Walk-bys.

SWEL 2 Walkdowns

A total of four of four 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.

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, 39 components were originally determined to be inaccessible. These items are located throughout the plant and the required Seismic Walkdowns and Area Walk-bys for 37 of these items were performed before and during the Unit 2 outage, 2R22 in April, 2013. Notes 4 and 5, following Table 7-1 address the remaining 2 components

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. Those checklists were revised to include information from walkdowns performed as documented in Version 2 of the report. Completion of these checklists was tracked under CR numbers 520511, 520818, 521821 and 530517.

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	Q2B31MOV8000B	Pressurizer Power Relief Iso Valve	(1)	SWC and AWC for Containment el. 175'	Completed 4/17/13
2	Q2B31PCV0445A	Pressurizer Power Relief Valve	(1)	SWC and AWC for Containment el. 173'	Completed 4/17/13
3	Q2E11LT3594B	CTMT Sump Level Transmitter	(1)	SWC and AWC for Containment el. 105'	Completed 4/18/13

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)
4	Q2E11MOV8702A	RHR Inlet Isolation Valve	(1)	SWC and AWC for Containment el. 105'	Completed 4/18/13
5	Q2E21MOV8112	RCP Seal Water Return Isolation	(1)	SWC and AWC for Containment el. 105'	See Note 4
6	Q2E21MOV8808B	Accumulator B Disch Valve	(1)	SWC and AWC for Containment el. 105'	Completed 4/18/13
7	Q2H11NGASC2506D	Aux Safeguards Cabinet D	(2)	Inspect panel internals	Completed 5/9/13
8	Q2H11NGB2504K	BOP Instrumentation Cabinet K	(2)	Inspect panel internals	Completed 1/7/13
9	Q2H11NGNIS2503A	NIS Excore Detector Cabinet	(2)	Inspect panel internals	See Note 5
10	Q2H11NGPIC2505D	Process Protection Cab CH 4	(2)	Inspect panel internals	Completed 1/7/13
11	Q2H11NGPIC2505H	Process Control Cab Channel 4	(2)	Inspect panel internals	Completed 1/7/13
12	Q2H11NGSSP2506N	Solid State Protection Test Cab	(2)	Inspect panel internals	Completed 5/9/13
13	Q2H21E005	4.16KV Swgr 2G Local Cnt Panel	(2)	Inspect panel internals	Completed 1/11/13
14	Q2H21E505	4.16KV Swgr 2J Local Cont Panel	(2)	Inspect panel internals	Completed 1/11/13

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)
15	Q2H21E507	4.16KV Swgr 2L Local Cont Panel	(2)	Inspect panel internals	Completed 3/25/13
16	Q2H22L001D	Multiplying Relay Cabinet 2D	(2)	Inspect panel internals	Completed 1/11/13
17	Q2H22L003	Transfer Relay Cabinet 2	(2)	Inspect panel internals	Completed 1/25/13
18	Q2H22L503	Diesel Local Relay Panel 2B	(2)	Inspect panel internals	Completed 1/7/13
19	Q2P16L002	SW Disch Valve Relay Cab 2B	(2)	Inspect panel internals	Completed 2/8/13
20	Q2P17MOV3046	CCW Return from RCPS	(1)	SWC and AWC for Containment el. 129'	Completed 4/18/13
21	Q2R16B007	600V Load Center 2E	(2)	Inspect panel internals	Completed 2/7/13
22	Q2R17B510	MCC 2T	(2)	Inspect panel internals	Completed 3/25/13
23	Q2R18B030	Power Disconnect Switch	(2)	Inspect panel internals	Completed 2/12/13
24	Q2R18B032	Circuit Breaker Box	(2)	Inspect panel internals	Completed 2/12/13
25	Q2R18B034	Power Disconnect Switch	(2)	Inspect panel internals	Completed 2/8/13
26	Q2R18B043	MOV Power Disconnect Switch	(2)	Inspect panel internals	Completed 2/8/13

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)
27	Q2R21B001D	120V Reg Panel 2F	(2)	Inspect panel internals	Completed 3/7/13
28	Q2R21E009D	Inverter 2D	(2)	Inspect panel internals	Completed 3/25/13
29	Q2R21L001D	Vital AC Distribution Panel 2D	(2)	Inspect panel internals	Completed 3/25/13
30	Q2R36A501	4.16KV Swgr 2K Surge Arrestor	(2)	Inspect panel internals	Completed 2/12/13
31	Q2R41L001A	125VDC Distribution Panel 2A	(2)	Inspect panel internals	Completed 5/9/13
32	Q2R42E001A	Battery Charger 2A	(2)	Inspect panel internals	Completed 2/11/13
33	Q2R43E001B	Sequencer B2G	(2)	Inspect panel internals	Completed 2/7/13
34	Q2R43E002A	Sequencer B2F Aux Panel	(2)	Inspect panel internals	Completed 2/12/13
35	Q2R43E002B	Sequencer B2G Aux Relay Panel	(2)	Inspect panel internals	Completed 2/7/13
36	Q2R16B006-A	600V Load Center 2D	(2)	Inspect panel internals	Completed 3/6/13
37	Q2R17B001-A	MCC 2A	(2)	Inspect panel internals	Completed 5/17/13
38	Q2R17B098-A	MCC 2CC	(2)	Inspect panel internals	Completed 3/20/13
39	Q2R17B002-B	MCC 2B	(2)	Inspect panel internals	Completed 2/7/13

Table notes:

1) Farley Unit 2 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 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 #Q2R11B507, LC TRANSFORMER 1S

2) Entries in Table 7-1 under column heading: "Reason for Inaccessibility" refer to the condition for inaccessibility discussed in Section 7.1

3) All walkdowns were completed as documented in Report Version 2.

4) Table 7-1, Item 5, (Q2E21MOV8112, RCP SEAL WATER RETURN ISOLATION), was deleted from the SWEL during the performance of the walkdowns for Version 2 of this Report. For additional discussion, refer to the information provided in "SWEL 1 Walkdowns" in Section 7.0, above.

5) Table 7-1, Item 9, (Q2H11NGNIS2503A, NIS EXCORE DETECTOR CABINET), was removed from the SWEL with an explanatory Note for Version 2 of this Report. For additional discussion, refer to the information provided in "SWEL 1 Walkdowns" in Section 7.0, above.

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 Corrective Action Program (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 below 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 12 Unit 2 Potentially Adverse Conditions were identified and entered into the Corrective Action Program. 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.

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 Q2R43E001B	A heavy metal breaker racking tool was identified to be hanging from a four inch long rod approximately three feet from the Sequencer for Bus 2G (Q2R43E0001B) in Room 2229. During a seismic event the tool has the potential to fall from the currently staged location and strike the sequencer.	504952	Seismic walkdown personnel determined damage to the cabinet would not occur if the tool struck the cabinet. However, Q2R43E0001B is marked as sensitive equipment and as such, the effect of the impact on the components in the cabinet (e.g. relays) must be evaluated or the tool relocated or adequately secured if any adverse impacts are suspected.	The breaker racking tool was removed from its location to remove the existing adverse seismic condition.	Closed
Area Room 2233, El. 121'	A "fiberglass hot stick" was identified to be hanging from a pipe support. The stick has the potential to strike Q2R18A003B and Q2R15BKRDG04, 05, and 06 during a seismic event.	504965	The hot stick would not cause physical damage to the cabinet itself. The concern is an adverse effect to internal subcomponents (e.g. relays).	Relocated the hot stick to resolve the adverse seismic concern. CR 539958 written based off trends to evaluate extent of condition and put long term corrective actions in place.	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 Q2H21E005	Test cable N2R15G001D is wrapped around a junction box in Room 2233 as documented by Deficiency Report 565268 on 4/7/2005. The cable and attached piece of equipment have the potential to impact panel Q2H21E005 during a seismic event.	504967	It was determined that the equipment will not damage the cabinet in the event the cabinet is impacted. However, Q2H21E005 is identified as sensitive equipment and should be evaluated for any adverse impacts that could occur as a result of impact (e.g. effects on internal relays) or the test cable and equipment needs to be secured such that an impact cannot occur during a seismic event.	The breaker testing attachment was unwrapped and place on the ground – seismic interaction no longer exists.	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)
Area Main Control Room	The DEH Log Printer and stand represent a seismic concern.	506338	The wheels have been removed and the stand has been ty-wrapped to the DEH cabinet to prevent tipping. The U2 printer has been moved to a lower shelf for increased stability. Misc parts and the wheels were moved to the light bulb/chart paper cabinet until the decision is made to throw them away. A deficiency report tag was hung on the DEH printer stand. An evaluation should be made for a permanent solution.	The adverse seismic condition has been eliminated as documented in the CR.	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 Q2E11P001B	The actual support anchorage from Pump 2B does not match drawings: D206723 Ver.10, D206725 Ver. 9, D206593 Ver. 12. The actual conditions for Pump 2B match the details shown on the above referenced drawings for Pump 2A.	506365	The Seismic Walkdown team performing the walkdown of RHR Pump 2B concluded that the robustness of the support structure is sufficient to withstand a seismic event and that the configuration does not affect the operability of the pump. This condition was also evaluated against the SEWS which showed that the same anchorage existed and was evaluated during the previous IPEEE-A-46 walkdown.	TE 507862 exists to correct the drawing issues. This TE has been closed. This is no longer an adverse seismic concern following verification of adequacy through comparison against SEWS.	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)
Area Main Control Room	Unrestrained or unanchored equipment near safety related equipment in the Main Control Room. The unrestrained pieces of equipment included two filing cabinets (approximately five feet tall), two carts, and one book case.	506373	Control room operators relocated/ modified the carts and book case (CR 506338 was written on August 23, 2012 to address the cart modification to prevent adverse impact). An evaluation performed demonstrated that the two filing cabinets would remain stable and not overturn during a seismic event. Therefore there is no impact to the nearby safety related equipment.	The one condition was already corrected in CR 506338. The remaining adverse conditions were shown in a quick evaluation that demonstrated the filing cabinets would remain stable. CR 539942 has been written to have an evaluation be performed via TE 540860 which has been closed.	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 N2R15A002	The Seismic Walkdown Team observed breaker racking tools hanging from a four inch long rod approximately three feet from N2R15A002-N (4160 VAC Switchgear 2B) which is not included in the Seismic Safe Shutdown Equipment in Room 2343. There is no equipment in the proximity of the swinging radius however during a seismic event the tools have the potential to interact with the switchgear cabinet. The need for the tools to be relocated or adequately secured to eliminate the potential of any potential adverse seismic interactions should be evaluated.	509362	It has been determined that no Seismic Safe Shutdown Equipment is located within the impact zone of the breaker racking tools but this is a common condition which has been identified throughout the plant where breaker racking tools are staged. As such, the Seismic Team recommends the plant investigate removing or providing more adequate means of storage for all wall mounted staged tooling with the potential to fall during a seismic event and impact nearby electrical cabinets and equipment needed during a safe shutdown event.	There is no impact on Safe shutdown equipment.	In Progress

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 Q2P16PS502	While performing SAM NTTF 2.3 for Farley Units 1 & 2 in 2VB-1B, walkdown team identified corrosion on anchor bolts for pressure switch support. (Q2P16PS502). This condition was also written up in the latest Unit 2 Structural Monitoring Program report which can be found in CR 366963.	515556	The Seismic Team has documented the condition on the SWC as NOT being an adverse seismic condition.	WO SNC432761 was generated to clean the anchor bolts. The corrosive material has been removed and the WO has been closed.	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 Q2R16B0007	"While performing NTTF 2.3 Seismic Walkdown for Unit 2, on the 600V Load Center 2E, Agastat Relay for Q2R16BKREE02 was discovered to only have 2 mounting screws on the top and to not contain the lower mounting screws. This was written up as an IPEEE Outlier in 1993 and subsequently reported to be repaired during closeout of the original IPEEE Outliers. Based on this relay being originally classified as an outlier by SQUG qualified engineers, a WO is requested to reinstall the lower two mounting screws.	586528	TE 586835	Screws were reinstalled in relay. TE contains evaluation which states that the relay remained operable in its as-found condition.	In Progress

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 Q2R16B0006A	While performing NTTF 2.3 Seismic Walkdowns for Farley U2-D 600 Volt Load Center, a plastic panduit cover (conduit cover) was found with burn marks from sliding down to the top of the cabinet heater. For the interim, the conduit cover was removed and all of the cables are secure inside the panduit. For extent of condition, all of the 600 volt load centers need to be walked down to determine if other load centers have this same issue. This is the second one found in two weeks in the same condition.	589480	Determine if other load centers have this same condition.	The Panduit cover has been removed. TE 590219 was generated to address the broadness of this issue with the slipping cover. WO SNC465381 was generated to attach a new Panduit cover.	In Progress

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 Q2R16B0006A	While performing NTTF 2.3 Seismic Walkdown for Unit 2, on the 600V Load Center 2D, Agastat Relays for Q2R16BKRED15 and Q2R16BKRED16 were discovered to only have 2 center mounting screws which is not consistent with the seismic qualification of four mounting screws. A WO is requested to install two additional mounting screws to each relay. A similar CR was written (CR 586528) for a relay on the 2E 600V load center and an evaluation was performed by Enercon to confirm acceptability of only 2 screws.	589508	Same style panel, relays and condition as identified in CR 586528 in which an evaluation proved the as-found condition of the relays is operable.	TE 590221 was generated to determine actions needed to address the extent of condition for missing seismic relay screws. WO SNC465387 was generated to install the two missing screws.	In Progress

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 Q2R17B0001A	While performing NTTF 2.3 Seismic Walkdown for Farley Unit 2 for 2A MCC there were eleven instances identified where seismically qualified Agastat relays were installed with less than four of four required mounting screws with the worst case being installed with a two screw arrangement on a single vertical or horizontal line.	640948	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). As a result, 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. WO SNC490436 was generated to install the missing screws.	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.

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 2 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.

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.

9.0 PEER REVIEW

9.1 PEER REVIEW PROCESS

The peer review for the NTTF 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. Except for a few minor editorial changes, there are two versions of information included in the following subsections. 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.

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.

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, and in cases where there were 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.

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 2 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 2 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 are 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. Two SWEL 1 items were listed as inaccessible in Table 7-1 of the Version 1 walkdown report (Q2E21MOV8112, RCP Seal Water Return Isolation valve and Q2H11NGNIS2503A, NIS Excore Detector Cabinet), and were removed from the SWEL for Version 2 since the items were still inaccessible for the outage walkdowns. Removing the items 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.

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.

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, in particular Mr. Ashworth and Ms. Brown, 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 Taylor Youngblood, Ryan Harlos, Alan Mullenix, and Laura Maclay) performed the majority of the remaining walkdowns documented in Version 2 of this report.

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 Peer Team Leader/SNC Seismic Technical Lead, Melanie 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 Members Robert Ashworth and Melanie Brown 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 and the walkdown Peer Review Team just as was done during the initial walkdowns (see section 9.2.3). The Peer Review Team 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. The Peer Review Team provided suggestions for performing walkdowns and answered

questions raised by the new SWEs. Each of the new SWEs completed walkdown checklists which were reviewed and critiqued on site by Robert Ashworth and Melanie Brown.

The Peer Review team members (Ashworth and Brown) 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 EPRI Report 1025286 (Reference 10.2).

Of the new SWEs trained at Plant Farley, Brian Nelson and Chelicia Hill performed walkdowns at Plant Farley Unit 2, which are addressed by Version 2 of this report. They were paired with more experienced SWEs (Taylor Youngblood or Ryan Harlos) when performing the walkdowns. To be conservative and to ensure consistency, all checklists prepared and provided in Attachments 7 and 8 of this report were reviewed by two Peer Review Team members (Ms. Brown and Mr. Ashworth). 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 "retype" previous info that was handwritten (and was provided in Attachments 3 and 4 in Version 1 of the report) for clarity and consistency purposes. Peer Review verified that all information was correctly transcribed to the "retyped" checklists.

The Peer Review Team members (Ashworth and Brown) concluded that the 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 included all necessary elements of the Peer Review and met the requirements of the 50.54(f) letter.

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.

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, 1981Safety 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, June 2013 (Version 2)

10.15 NMP-GM-033-GL01 Ver. 1.0, SAM NTTF Seismic Walkdowns Guide

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)