WOLF CREEK
NUCLEAR OPERATING CORPORATION

Jaime H. McCoy
Vice President Engineering

November 17, 2016
ET 16-0020

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

References:
1) Letter dated March 12, 2012, from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "Request for Information Pursuant to Title 10 of the Code of Federal Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident"

2) Letter WO 14-0095 dated December 23, 2014, from C. O. Reasoner, WCNOC, to USNRC

3) Letter ET 15-0015 dated June 24, 2015, from J. H. McCoy, WCNOC, to USNRC

4) Electronic Mail dated August 6, 2015, from S. M. Wyman, USNRC, to T. W. Solberg, WCNOC

5) Letter ET 15-0026 dated November 11, 2015, from J. H. McCoy, WCNOC, to USNRC

6) Letter dated January 4, 2016, from N. J. DiFrancesco, USNRC, to A. C. Heflin, WCNOC, "Wolf Creek Generating Station-Staff Review of Interim Evaluation Associated with Reevaluated Seismic Hazard Implementing Near-Term Task Force Recommendation 2.1"

Subject: Docket No. 50-482: Supplement to the Expedited Seismic Evaluation Process Report

Gentlemen:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Reference 1 to Wolf Creek Nuclear Operating Corporation (WCNOC). The Enclosure of Reference 2 provided the Wolf Creek Generating Station (WCGS) Expedited Seismic Evaluation Process (ESEP) Report requested in Enclosure 1 of Reference 1. Reference 3 provided a response to a request for additional information related to the ESEP Report in Reference 2. Reference 4 provided a request for additional information related to the WCGS ESEP Report. Reference 5 provided WCNOC's response to the request for additional information. Reference 6 provided the NRC staff review of the WCNOC ESEP report, concluding implementation of the interim evaluation

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met the intent of the guidance. This letter provides the information and updates requested in Reference 6.

Enclosures I-VI of this letter serve as a supplement to References 2 and 5. The enclosures identify changes to four sections and one attachment of the Wolf Creek Generating Station's Expedited Seismic Evaluation Process (ESEP) Report (Enclosure to letter WO 14-0095). Enclosure VI of this letter is a new attachment. The changes made to the enclosures are designated by revision bars. The enclosures replace in their entirety the following sections in the ESEP Report:

I. Update to Section 6.2.2, "Generic Screening Results," Table 6-1: "Summary of Generic Screening per NP-6041-SL, Table 2-4, 1.2g Screening Level"
II. Update to Section 6.3, "Seismic Walkdown Approach"
III. Update to Section 6.6, "Tabulated ESEL HCLPF Values (Including Key Failure Modes)," Table 6-3:"HCLPF Analysis Results"
IV. Update to Section 9, "References"
V. Update to Attachment B. ESEP HCLPF Values and Failure Modes Tabulation
VI. Insertion of Attachment C. Seismic Review Team

As requested in Reference 6, Sections 7.0 and 8.0 of the WCGS ESEP final report remain unchanged, all walkdowns have been performed, and no modifications are needed.

This letter also serves as closure to a commitment (Regulatory Commitment Management System 2015-500) provided in Attachment I of Reference 5; no further regulatory commitments exist.

If you have any questions concerning this matter, please contact me at (620) 364-4156, or Cynthia R. Hafenstine (620) 364-4204.

Sincerely,

Jaime H. McCoy

JHM/rlt

Enclosures: I Section 6.2.2, "Generic Screening Results," Table 6-1: "Summary of Generic Screening per NP-6041-SL, Table 2-4, 1.2g Screening Level"
II Section 6.3, "Seismic Walkdown Approach"
III Section 6.6, "Tabulated ESEL HCLPF Values (Including Key Failure Modes)," Table 6-3:"HCLPF Analysis Results"
IV Section 9, "References"
V Attachment B. ESEP HCLPF Values and Failure Modes Tabulation
VI Attachment C. Seismic Review Team

cc: K. M. Kennedy (NRC), w/e,
B. K. Singal (NRC), w/e,
N. H. Taylor (NRC), w/e,
Senior Resident Inspector (NRC), w/e,

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Jaime H. McCoy, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By _____
Jaime H. McCoy
Vice President Engineering

SUBSCRIBED and sworn to before me this 17th day of November, 2016.

STATE OF KANSAS NOTARY PUBLIC
GAYLE SHEPHEARD
My Appointment Expires
July 24, 2019

_____
Notary Public

Expiration Date 7/24/2019

Section 6.2.2, "Generic Screening Results," Table 6-1: "Summary of Generic Screening per NP-6041-SL, Table 2-4, 1.2g Screening Level"
(2 Pages)

Table 6-1: Summary of generic screening per NP-6041-SL, Table 2-4, 1.2g Screening Level

Equipment Type	Generic Screening Criteria	Screening Result
Active valves	Note (f) applies.	Although there are no extremely large extended motor operators on 2-inch or smaller piping, valves EPHV8808A/B/C/D are large MOVs with extended, heavy operators falling outside the NP-6041-SL Figure F-26 criteria and require evaluation.
Passive valves	No evaluation required.	
Atmospheric storage tanks	Evaluation required.	HCLPF analyses required for the atmospheric storage tanks.
Pressure vessels	Notes (h), (i) apply	For the pressurized tanks on the ESEL, anchorage and load path were verified by bounding calculations using qualification reports during screening. Potential failure modes of the vessel bodies were addressed by walkdown and design review. The Safety Injection Tanks (Accumulators) were designed satisfactorily to Note (i) requirements; however, the anchorage requires evaluation.
Batteries and racks	Note (k) applies.	Batteries are in plastic shell frames braced for overturning by steel rods and are designed for seismic loads. HCLPF analyses are required for the battery rack structure and anchorage.
Horizontal pumps	No evaluation required.	Although no evaluation is required for the component per se, a HCLPF evaluation for the auxiliary feedwater turbine-driven pump is required.
Active electrical power distribution panels	Notes (s) and (t) apply.	Note (s) was addressed by walkdown and design review. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required. Relays are evaluated separately per Reference 5.
Passive electrical power distribution panels	Note (s) applies.	Note (s) was addressed by walkdown and design review. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required.
Transformers	Notes (u) and (v) apply.	The ESEL includes dry-type transformers. A design review verified coil restraint. HCLPF analysis of anchorage is required.

Battery chargers & inverters	Note (w) applies.	Per walkdown and design review, the items on the ESEL are solid state units. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required.
Instrumentation and control panels and racks	Notes (s) and (t) apply.	Note (s) was addressed by walkdown and design review. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required. Relays are evaluated separately per Reference 5.
Temperature sensors; pressure and level sensors.	Note (x) applies.	Note (x) was addressed by walkdown and design review. Sensors in the scope were typically mounted in-line on piping.

Relevant notes from NP-6041-SL Table 2-4

f. Evaluation recommended for MOVs in piping lines of 2 inches diameter or less.
h. Margin evaluation only needs to consider anchorage and supports.
i. For vessels designed by dynamic analysis or equivalent static analysis enveloping vessel inertial and piping loading, only the anchorage and supports require evaluation. For vessel not meeting these criteria, all potential failure modes require evaluation.
k. Batteries mounted in braced racks designed for seismic loads or qualified by dynamic testing do not require evaluation. Rigid spacers between batteries and end restraints are required. Batteries should be tightly supported by side rails.
s. Walkdown should be conducted to verify that the instruments are properly attached to the cabinets.
t. Relays, contactors, switches, and breakers must be evaluated for chatter and trip if functionality during strong shaking is required.
u. Anchorage evaluation required.
v. Liquid-filled transformers require evaluation of overpressure safety switches. The transformer coils should be restrained within the cabinet for dry transformers.
w. Solid state units require anchorage checks. Others require evaluation.
x. Insufficient data are available for screening guidelines. Emphasis should be on attachments.

Section 6.3, "Seismic Walkdown Approach"
(5 Pages)

6.3 Seismic Walkdown Approach

6.3.1 Walkdown Approach

Walkdowns were performed by two-person seismic review teams (SRTs) consisting of engineers with seismic experience. Walkdowns followed the guidance of Section 5 of EPRI 3002000704 and Section 2 of NP-6041-SL. The SRT used NP-6041-SL, Appendix F to evaluate item-specific equipment caveats. The SRT also recorded notes and took photographs of the items under review.

Four walkdown sessions have been performed as indicated below.

Walkdown Date	SRT	Plant Support
Week of June 13, 2013	Hunter Young (S&A) Apostolos Karavoussianis (S&A)	Tim Solberg (WCNOC)
Week of March 24, 2014	Hunter Young (S&A) Timothy Nealon (S&A)	Tim Solberg (WCNOC) Bud Freeman (WCNOC)
Week of July 20, 2014	Hunter Young (S&A) Samer El-Bahey (S&A)	Tim Solberg (WCNOC)
Week of November 3, 2014	Hunter Young (S&A) Apostolos Karavoussianis (S&A)	Tim Solberg (WCNOC)

The walkdown findings for each item are documented in screening evaluation work sheets (SEWS). The SEWS notes also identify evaluations and reviews performed to support screening. The SEWS are included in Appendix C of Reference 10f. Also, Appendix A [10f] provides a concise summary of screening results in tabular format.

6.3.2 Application of Previous Walkdown Information

New seismic walkdowns were performed for ESEL equipment. Walkdown data ascertained in recent walkdowns of items as part of a seismic probabilistic risk assessment (S-PRA) were re-evaluated by the SRT and used for certain items. The results of the previous seismic margin evaluation, performed for the Seismic IPEEE program [11], were reviewed and used for background purposes only.

6.3.3 Significant Walkdown Findings

The walkdown and screening results are summarized in Table 6-2.

Table 6-2: Items Selected for HCLPF Analysis

No.	ID	Description	Bldg	Elev	Basis for Selection
1.	NB001	4.16KV SWGR NB001 (Class 1E, Train A)	CB	2000 -00	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage.
2.	NG001	480 V LOAD CENTER NG01	CB	2000 -00	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage. Apply results to similar items NG002 and NG003.
3.	NK001	125 VDC BUS SWITCHBOARD NK001	CB	2016 -00	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage. Apply results to similar items NK003, NK004, NK041 and NK043.
4.	NK011	125 V BATTERY NK011	CB	2016 -00	Battery rack is not comprised of steel bracing. Perform HCLPF analysis for plastic frame. Apply results to similar items NK013 and NK014.
5.	NK011	125 V BATTERY NK011	CB	2016 -00	Rack Anchorage could not be readily screened. Perform HCLPF analysis for anchorage. Apply results to similar items NK013 and NK014.
6.	NK021	125 V BATTERY CHARGER NK021	CB	2016 -00	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage. Apply results to similar items NK023, NK024, and NK025.

No.	ID	Description	Bldg	Elev	Basis for Selection
7.	NN011	7.5KVA INVERTER (FED FROM BATT CHARGER NK021)	CB	2016 -00	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage. Apply results to similar items NN013 and NN014.
8.	PAL02	TDAFW Pump	AB	2000 -00	Pump Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage.
9.	RL021	REACTOR AUX CNTRL PANEL	CB	2047 -06	Console embedded plate could not be readily screened out for RLGM. Perform HCLPF analysis for embedded plate. Apply results to similar items RL002, RL005, RL006, RL018, RL022.
10.	RP053DB	BOP INSTR RACK RP053DB	CB	2047 -06	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage. Apply results to similar items RP053AC, RP053BC, and RP053DA.
11.	RP081A	T/C SUBCOOLING MONITOR CABINET	CB	2047 -06	Door cutout sizes exceed threshold of experience database in NP-6041-SL. Evaluate component structure (including anchorage) and functionality via HCLPF analysis. Apply results to similar item RP081B.
12.	SE054A	W NUC INSTM NIS 1	CB	2047 -06	Cabinet Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage.

No.	ID	Description	Bldg	Elev	Basis for Selection
13.	TAP01	Condensate Storage Tank	YARD	2000 -00	Per NP-6041-SL Table 2-4 seismic capacity cannot be screened and HCLPF analysis is required for overall seismic capacity. In addition, HCLPF evaluation required for block wall doghouse adjacent to tank.
14.	TBN01	REFUELING WATER STORAGE TANK	YARD	2000 -00	Per NP-6041-SL Table 2-4 seismic capacity cannot be screened and HCLPF analysis is required for overall seismic capacity.
15.	XNG01	4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001	CB	2000 -00	Transformer Anchorage could not be readily screened out for RLGM. Perform HCLPF analysis for anchorage. Apply results to similar item XNG03.
16.	Generic	BLOCK WALLS	AB/ CB	Var.	Per NP-6041-SL Table 2-4 seismic capacity cannot be screened and HCLPF analysis is required for block wall seismic capacity. Affected components include NB001, NG003, TAP01, NK043, NN003, NN013, NK041, NN001, NK021, NN011, NK051, NK001, NK023, NK071, NK073, NK011, NK013, AB007, NK003, RP209, NG001A, NG002, RP334, RP147A/B, NK004, NK074, NN004, NN014, NK024, and NK014.
17.	Generic	Cabinets containing essential relays	AB/CB	Var.	Per 14C4257-RPT-003 [Ref. 5], the following components contain essential relays that do not screen and require HCLPF evaluation: NG001A, NG002B, NG003C, NG004, and FC0219.

No.	ID	Description	Bldg	Elev	Basis for Selection
18.	TEP01A	Safety Injection Accumulator Tank (Accumulators)	RB	1998	Pressure vessel with circular skirt anchored to concrete foundation. Perform HCLPF analysis of the accumulator anchorage. Additional item(s) bounded by evaluation: TEP01B, TEP01C, and TEP01D
19.	ABPV0001	Steam Generator A Atmospheric Dump (Steam Generator ARV)	AB	2046	AOV meets criteria per Figure F-25 of NP-6041-SL. However, the valve is located more than 40 feet above grade; therefore further assessment of capacity versus demand at base of component required. Additional item(s) bounded by evaluation: ABPV0002
20.	AELT0539	Steam Generator Narrow Range Water Level Transmitter	RB	2026	The concrete expansion anchors (CEAs) were noted to have substantial offset, from which the anchorage cannot be readily screened against the RLGM. Therefore, an evaluation of the transmitter's anchorage is required.
21.	BBHV8001A	RCS Reactor Vessel Head Vent A Upstream Valve (Reactor Head Vent)	RB	2047	SOV meets criteria per Figure F-26 of NP-6041-SL. However, the valve is located more than 40 feet above grade; therefore further assessment of capacity versus demand at base of component required. Additional item(s) bounded by evaluation: BBHV8002A
22.	EPHV8808A	Accumulator Tank A Outlet Isolation Valve (Accumulator Isolation Valves)	RB	1998	Large MOV does not screen per Figure F-26 of NP-6041-SL and an evaluation showing margin against the RLGM is required. Additional item(s) bounded by evaluation: EPHV8808B, EPHV8808C, and EPHV8808D

Section 6.6, "Tabulated ESEL HCLPF Values (Including Key Failure Modes)," Table 6-3:"HCLPF Analysis Results"
(3 Pages)

Table 6-3: HCLPF Analysis Results

No.	ID	Description	Bldg	Elev	HCLPF[1] (g, PGA)	Failure Mode Analyzed	Basis	Related Components
1.	NB001	4.16KV SWGR NB001 (Class 1E, Train A)	CB	2000-00	0.37	Equipment capacity and anchorage	14C4257-CAL-005	n/a
2.	NG001	480 V LOAD CENTER NG01	CB	2000-00	0.29	Equipment capacity and anchorage	14C4257-CAL-005	NG002, NG003
3.	NK001	125 VDC BUS SWITCHBOARD NK001	CB	2016-00	0.32	Equipment capacity and anchorage	14C4257-CAL-005	NK003, NK004, NK041, NK043, NN003
4.	NK011	125 V BATTERY NK011	CB	2016-00	0.45	Anchorage	14C4257-CAL-004	NK013, NK014
5.	NK011	125 V BATTERY NK011	CB	2016-00	0.69	Equipment capacity	14C4257-CAL-005	NK013, NK014
6.	NK021	125 V BATTERY CHARGER NK021	CB	2016-00	2.24	Anchorage	14C4257-CAL-004	NK023, NK024, NK025
7.	NN011	7.5KVA INVERTER (FED FROM BATT CHARGER NK021)	CB	2016-00	0.68	Anchorage	14C4257-CAL-004	NN013, NN014
8.	PAL02	TDAFW Pump	AB	2000-00	1.70	Anchorage	14C4257-CAL-004	n/a
9.	RL021	REACTOR AUX CNTRL PANEL	CB	2047-06	0.32	Anchorage	14C4257-CAL-004	RL002, RL005, RL006, RL018, RL022
10.	RP053DB	BOP INSTR RACK RP053DB	CB	2047-06	0.56	Anchorage	14C4257-CAL-004	RP053AC, RP053BC, RP053DA
11.	RP081A	T/C SUBCOOLING MONITOR CABINET	CB	2047-06	0.61	Equipment capacity and anchorage	14C4257-CAL-005	RP081B
12.	SE054A	W NUC INSTM NIS 1	CB	2047-06	0.86	Anchorage	14C4257-CAL-004	n/a
13.	TAP01	Condensate Storage Tank	YARD	2000-00	0.30	Equipment capacity and anchorage	14C4257-CAL-002	n/a

[1] HCLPFs based upon RLGM (PGA=0.29g) as the seismic margins earthquake with the exception of TAP01, TBN01, and the CST pipe house block walls, which are based upon the GMRS (PGA=0.29g).

No.	ID	Description	Bldg	Elev	HCLPF[2] (g, PGA)	Failure Mode Analyzed	Basis	Related Components
14.	TBN01	REFUELING WATER STORAGE TANK	YARD	2000-00	0.32	Equipment capacity and anchorage	14C4257-CAL-002	n/a
15.	XNG01	4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001	CB	2000-00	0.47	Anchorage	14C4257-CAL-004	XNG03
16.	Generic	BLOCK WALLS	AB/CB	Var.				
	CTRL 2000'	All block walls on CTRL 2000' elev	CB	2000-00	2.66	Seismic interaction	14C4257-CAL-003	NB001, NG003, NG001A, NG002, RP334, RP147A/B,
	CTRL 2016'	All block walls no CTRL 2016' elev	CB	2016-00	1.85	Seismic interaction	14C4257-CAL-003	NK043, NN003, NN013, NK041, NN001, NK021, NN011, NK051, NK001, NK023, NK071, NK073, NK011, NK013, AB007, NK003, NK004, NK074, NN004, NN014, NK024, NK014
	AUX 2000'	2000' elev wall on column line AF north of Stair A-2	AUX	2000-00	1.15	Seismic interaction	14C4257-CAL-003	RP209
	CST House	CST Pipe house masonry walls	YARD	2000-00	0.37	Seismic interaction	14C4257-CAL-003	TAP01
17.	Generic	Cabinets containing essential relays	AB/CB	Var.				
	NG003C	MCC NG03C BUS	CB	2047-06	0.44	Functional capacity and host component capacity	14C4257-CAL-005	NG001A, NG002B, NG004C
	FC0219	LOCAL CONTROL PANEL FOR TD AFW PUMP	AB	2000-00	0.61	Functional capacity and host component capacity	14C4257-CAL-005	n/a
18	TEP01A	Safety Injection Accumulator Tank (Accumulators)	RB	1998	0.53	Anchorage	15C4353-CAL-001	TEP01B, TEP01C, and TEP01D

No.	ID	Description	Bldg	Elev	HCLPF[3] (g, PGA)	Failure Mode Analyzed	Basis	Related Components
19	ABPV0001	Steam Generator A Atmospheric Dump (Steam Generator ARV)	AB	2046	>RLGM	Equipment Capacity	15C4353-CAL-001	ABPV0002
20	AELT0539	Steam Generator Narrow Range Water Level Transmitter	RB	2026	>RLGM	Anchorage	15C4353-CAL-001	n/a
21	BBHV8001A	RCS Reactor Vessel Head Vent A Upstream Valve (Reactor Head Vent)	RB	2047	>RLGM	Equipment Capacity	15C4353-CAL-001	BBHV8002A
22	EPHV8808A	Accumulator Tank A Outlet Isolation Valve (Accumulator Isolation Valves)	RB	1998	>RLGM	Equipment Capacity	15C4353-CAL-001	EPHV8808B, EPHV8808C, and EPHV8808D,

Section 9, "References"
(2 Pages)

9.0 References

1. Letter from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "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," March 12, 2012. ADAMS Accession No. ML12053A340.

2. Letter from E. J. Leeds, USNRC, to J. E. Pollock, NEI, "Electric Power Research Institute Final Draft Report XXXXXX, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," as an Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations," May 7, 2013. 3002000704; ADAMS Accession No. ML13106A331.

3. WCNOC Overall Integrated Plan (OIP) in Response to the March 12, 2012, Commission Order EA-12-049

    a. WCNOC Letter WO 13-0014, "Wolf Creek Nuclear Operating Corporation Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," February 28, 2013. ADAMS Accession No. ML13070A026.

    b. WCNOC Letter ET 13-0027, "Wolf Creek Nuclear Operating Corporation's First Six-Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," August 28, 2013. ADAMS Accession No. ML13247A277.

    c. WCNOC Letter ET 14-0011, "Wolf Creek Nuclear Operating Corporation's Second Six-Month Status Report for the Implementation of Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," February 26, 2014. ADAMS Accession No. ML14064A190.

    d. WCNOC Letter ET 14-0024, "Wolf Creek Nuclear Operating Corporation's Third Six-Month Status Report for the Implementation of Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," August 28, 2014. ADAMS Accession No. ML14246A191.

4. SAP-15-78, Revision 1, "Transmittal of the Revised Expedited Seismic Equipment List (ESEL) Update," October 2015.

5. S&A Report 14C4257-RPT-003 Rev. 0, "Wolf Creek ESEL Relay Assessment," December 2014.

6. WCNOC USAR, "Wolf Creek Updated Safety Analysis Report (USAR)," Revision 27, March 2014.

7. WCNOC Letter WO 14-0042, "Wolf Creek Nuclear Operating Corporation's Seismic Hazard and Screening Report (CEUS Sites), Response NRC Request for information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," March 31, 2014. ADAMS Accession No. ML14097A020.

8. Electric Power Research Institute Report, NP-6041-SLR1, Revision 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin," 1991.

9. Electric Power Research Institute Report, TR-103959, "Methodology for Developing Seismic Fragilities," 1994.

10. S&A Documents:

    a. 14C4257-CAL-001, Revision. 2, "Generation of Scaled In-Structure Response Spectra for WCGS," December 2014.

    b. 14C4257-CAL-002, Revision 0, "Seismic Capacity of CST (TAP01) and RWST (TBN01)," December 2014.

    c. 14C4257-CAL-003, Revision 0, "HCLPF Analyses for Block Walls," December 2014.

    d. 14C4257-CAL-004, Revision 0, "HCLPF Seismic Capacity Evaluations of Anchorage for Selected Equipment," December 2014.

    e. 14C4257-CAL-005, Revision 0, "HCLPF Analysis of Components Based on Seismic Test Data," December 2014.

    f. 14C4257-RPT-002, Revision 1, "Seismic Evaluation of Equipment at WCGS for the Expedited Seismic Evaluation Process," December 2014.

    g. 15C4353-CAL-001, Revision 1, "Screening and HCLPF Evaluations for ESEP Supplemental Items," January 2015.

    h. 15C4353-RPT-001, Revision 1, "Seismic Evaluation of ESEP Supplemental Items for WCGS," January 2015.

11. Wolf Creek Generating Station Individual Plant Examination of External Events (IPEEE), June 1995.

12. Electric Power Research Institute Report, NP-5223-SL, Revision 1, "Generic Seismic Ruggedness of Power Plant Equipment," 1991.

13. Electric Power Research Institute Technical Report, TR-1019200, "Seismic Fragility Applications Guide Update," 2009.

14. Letter from A. R. Pietrangelo, NEI, to E. J. Leeds, USNRC, "Seismic Risk Evaluations for Plants in the Central and Eastern United States," March 12, 2014. ADAMS Accession No. ML14083A584.

15. NRC (E Leeds) Letter to All Power Reactor Licensees et al., "Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(F) Regarding Seismic Hazard Re-Evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-Ichi Accident," May 9, 2014. ADAMS Accession No. ML14111A147.

16. Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic. EPRI, Palo Alto, CA: February 2013. 1025287.

17. Letter from A. R. Pietrangelo, NEI, to D. L. Skeen, USNRC, "Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations," April 9, 2013. ADAMS Accession No. ML13107B386.

Attachment B. ESEP HCLPF Values and Failure Modes Tabulation
(21 Pages)

Attachment B. ESEP HCLPF Values and Failure Modes Tabulation

HCLPF values are listed in Table B-1. These notes are applicable:

1. The listed HCLPF value is for comparison to the horizontal PGA at the surface.
2. Items covered by the NP-6041-SL "rule of the box" (ROB) are identified in Table A-2 [9]. In each case, the HCLPF value for the parent item applies.
3. Where an anchorage HCLPF is performed but the component per se is screened, the equipment capacity is assigned based upon the 1.2g peak spectral acceleration coinciding with the 2nd screening lane of NP-6041-SL, Table 2-4. Since the WCGS RLGM has a peak spectral acceleration of 0.93g and PGA of 0.29g [Reference 10e], the 1.2g peak spectral acceleration corresponds with a PGA of 0.38g (witness 1.2g/0.93g*0.29g=0.38g). For equipment located above 40', the equipment capacity is conservatively assigned at the RLGM level of 0.29g.
4. For the CST and RWST only (TAP01 and TBN01, respectively), the applied ground motion was based on the GMRS (PGA = 0.29).
5. As a result of the relay chatter evaluation, additional items were added to the ESEL list for evaluation.

Table B-1: HCLPF Values

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
1	TAP01	Condensate Storage Tank	YARD	2000-00	0.3	Equipment Capacity	Tank and anchorage capacity evaluated in 14C4257-CAL-002.Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
2	PAL02	TDAFW Pump	AUX	2000-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
3	ALHV0034	MOV	AUX	1988-00	>RLGM	Screened	SRT disposition
4	ALHV0035	MOV	AUX	1988-00	>RLGM	Screened	SRT disposition
5	ALFE0049	Flow Element	AUX	2000-00	>RLGM	Screened	SRT disposition
6	ALHV0012	Air Operated Valve	AUX	2004-07	>RLGM	Screened	SRT disposition
7	ALFE0004	Flow Element	AUX	2000-00	>RLGM	Screened	SRT disposition
8	ALFT0004	Flow Transmitter	AUX	2016-01	>RLGM	Screened	SRT disposition
9	ALFT0011	Flow Transmitter	AUX	2000-00	>RLGM	Screened	SRT disposition
10	ALHV0010	Air Operated Valve	AUX	2002-09	>RLGM	Screened	SRT disposition
11	ALFE0003	Flow Element	AUX	2000-00	>RLGM	Screened	SRT disposition
12	ALFT0003	Flow Transmitter	AUX	2016-00	>RLGM	Screened	SRT disposition
13	ALFT0009	Flow Transmitter	AUX	2000-00	>RLGM	Screened	SRT disposition
14	ALHV0008	Air Operated Valve	AUX	2004-00	>RLGM	Screened	SRT disposition
15	ALFE0002	Flow Element	AUX	2000-00	>RLGM	Screened	SRT disposition
16	ALFT0002	Flow Transmitter	AUX	2016-00	>RLGM	Screened	SRT disposition
17	ALFT0007	Flow Transmitter	AUX	2000-00	>RLGM	Screened	SRT disposition
18	ALHV0006	Air Operated Valve	AUX	2001-06	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
19	ALFE0001	Flow Element	AUX	2000-00	>RLGM	Screened	SRT disposition
20	ALFT0001	Flow Transmitter	AUX	2015-00	>RLGM	Screened	SRT disposition
21	ABHV0005	Air Operated Valve	AUX	2027-10	>RLGM	Screened	SRT disposition
22	ABHV0048	Air Operated Valve	AUX	2026-00	>RLGM	Screened	SRT disposition
23	ABHV0006	Air Operated Valve	AUX	2027-10	>RLGM	Screened	SRT disposition
24	ABHV0049	Air Operated Valve	AUX	2026-00	>RLGM	Screened	SRT disposition
25	FCFV0310	Level Control Valve			>RLGM	Screened	SRT disposition
26	FCLT0010	Level Indicator			>RLGM	Screened	SRT disposition
27	FCHV0312	Trip and Throttle Valve	AUX	2000-00	>RLGM	Screened	SRT disposition
28	Speed Governor	Speed Governor	AUX	2000-00	0.38	Equipment Capacity	Item is ROB to PAL02. Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
29	FCFV0313	Speed Governor Valve	AUX	2000-00	0.38	Equipment Capacity	Item is ROB to PAL02. Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
30	KFC02	AFW Pump Turbine	AUX	2000-00	0.38	Equipment Capacity	Item is ROB to PAL02. Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
31	TEM01	Boron Injection Tank	AUX	1974-00	>RLGM	Screened	SRT disposition
32	EMPT0947	BIT Outlet Pressure Transmitter	AUX	1974-00	>RLGM	Screened	SRT disposition
33	EMPI0947	BIT Outlet Pressure Indicator	CB	2047-06	0.29	Equipment Capacity	Item is ROB to RL018. Component per se screened. Anchorage evaluated per 14C4257-CAL-004.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
34	EMHV8801B	MOTOR-OPERATED VALVE EMHV8801B	AUX	2002-00	>RLGM	Screened	SRT disposition
35	EMFE0924	ECCS FLOW TO RCS COLD-LEG 1	RB	1998-06	>RLGM	Screened	SRT disposition
36	EMFE0925	ECCS FLOW TO RCS COLD-LEG 2	RB	1998-06	>RLGM	Screened	SRT disposition
37	EMFE0926	ECCS FLOW TO RCS COLD-LEG 3	RB	1998-06	>RLGM	Screened	SRT disposition
38	EMFE0927	ECCS FLOW TO RCS COLD-LEG 4	RB	1998-06	>RLGM	Screened	SRT disposition
39	TBN01	RWST	YRD	2000-00	0.32	Equipment Capacity	Tank and anchorage capacity evaluated in 14C4257-CAL-002.Anchorage evaluated per 14C4257-CAL-004.
40	BNLT0930	RWST Level Transmitter	YRD	1993-00	>RLGM	Screened	SRT disposition
41	EJFCV0610	RHR PUMP A MINIFLOW VALVE	AUX	1968-01	>RLGM	Screened	SRT disposition
42	TBG03A	Boric Acid Tank	AUX	1974-00	>RLGM	Screened	SRT disposition
43	BGLT0102	BORIC ACID TANK A LEV	CB	2047-06	>RLGM	Screened	SRT disposition
44	BGLI0102	BORIC ACID TANK A LEV	CB	2047-06	0.29	Equipment Capacity	Item is ROB to RL002. Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
45	BBPV8702A	RHR TO RCS	RB	2007-09	>RLGM	Screened	SRT disposition
46	NB001	4.16KV SWGR NB001 (Class 1E, Train A)	CB	2000-00	0.36	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
47	NB00101	4.16 kV FDR BKR FOR RHRP-A DPEJ01A (Residual Heat Removal Pump A)	CB	2000-00	0.36	Equipment Capacity	Item is ROB to NB001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
48	NB00107	4.16 kV FDR BKR FOR CCWP-A DPEG01A (Component Cooling Water Pump A)	CB	2000-00	0.36	Equipment Capacity	Item is ROB to NB001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
49	NB00110	4.16 kV FDR BKR FOR XFMR XNG03 (4160 V to 480 V for LC NG003)	CB	2000-00	0.36	Equipment Capacity	Item is ROB to NB001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
50	NB00113	4.16 kV FDR BKR FOR XFMR XNG01 (4160 V to 480 V for LC NG001)	CB	2000-00	0.36	Equipment Capacity	Item is ROB to NB001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
51	NB00109	4.16 kV FLEX GEN TIE-IN POINT (BKR) FOR TRAIN A	CB	2000-00	0.36	Equipment Capacity	Item is ROB to NB001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
52	XNG01	4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001	CB/CC	2000-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
53	NG001	480 V LOAD CENTER NG01	CB/CC	2000-00	0.29	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
54	NG00101	MAIN BKR FOR LC NG01	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005.
55	NG00103	FDR BKR FOR 125 V VITAL BATTERY CHARGER NK021	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005.
56	NG00112	FLEX 350 kW TIE IN BRK	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005.
57	NG00116	TIE BKR (CONNECTS NG01 AND NG03)	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005.
58	XNG03	4.16-KV/480 V LOAD CENTER TRANSFORMER XNG03 FOR LC NG003	CB/CC	2000-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
59	NG003	480 V LOAD CENTER NG03	CB/CC	2000-00	0.29	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
60	NG00301	MAIN BKR FOR LC NG03	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG003. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
61	NG00303	FDR BKR FOR 125 V VITAL BATTERY CHARGER NK023	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG003. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
62	NK021	125 V BATTERY CHARGER NK021	CB/CC	2016-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
63	NK071	TRANSFER SWITCH BUS NK01 BATTERY CHARGER NK21/NK25	CB/CC	2016-00	>RLGM	Screened	SRT disposition
64	NK001	125 VDC BUS SWITCHBOARD NK001	CB/CC	2016-00	0.32	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
65	NK00102	FDR BKR FROM BATT CHGR NK021 TO NK001	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
66	NK00104	MAIN BREAKER FOR CNTRL AND DIST PNL NK041 (PART OF SWBD NK001)	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
67	NK00105	MAIN BREAKER FOR CNTRL AND DIST PNL NK051 (PART OF SWBD NK001)	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
68	NK011	125 V BATTERY NK011	CB/CC	2016-00	0.44	Anchorage	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
69	NK00101	ISOLATION BKR FOR BATTERY NK011	CB/C C	2016-00	0.32	Equipment Capacity	Item is ROB to NK001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
70	NK00111	FDR BKR FOR INVERTER NN011 (PART OF SWBD NK001)	CB/C C	2016-00	0.32	Equipment Capacity	Item is ROB to NK001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
71	NN011	7.5KVA INVERTER (FED FROM BATT CHARGER NK021)	CB/C C	2016-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
72	NN001	Class 1E AC DIST SWBD NN01 (SEP GRP 1)	CB/C C	2016-00	>RLGM	Screened	SRT disposition
73	SA036A	ESFAS CH1 TERM	CB/C C	2047-00	>RLGM	Screened	SRT disposition
74	SENY0060A	NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 60A	AUX	2026-00	>RLGM	Screened	SRT disposition
75	SENY0060B	NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 60B	AUX	2026-00	>RLGM	Screened	SRT disposition
76	SB032A	W SS PROT SYS INPUT TRN B	CB/C C	2047-00	>RLGM	Screened	SRT disposition
77	SB029A	W SS PROT SYS INPUT TRN A	CB/C C	2047-06	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
78	SB038	W PROCESS ANALOG PROTECTIO N SET CAB-01	CB/C C	2047-06	>RLGM	Screened	SRT disposition
79	SB029D	W SS PROT SYS OUT 2 TRN A	CB/C C	2047-06	>RLGM	Screened	SRT disposition
80	SE054A	W NUC INSTM NIS 1	CB/C C	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
81	SB030A	SSPS TRN A #1 TEST	CB	2047-06	>RLGM	Screened	SRT disposition
82	RP053AC	BOP INSTRUMEN TATION RACK (TERMINATI ON AREA)	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
83	SB078	RPV LEVEL INSTR SYS (RVLIS) PROC PROT SYS CABINET	CB	2047-06	>RLGM	Screened	SRT disposition
84	RP081A	T/C SUBCOOLIN G MONITOR CABINET	CB	2047-06	>RLGM	Screened	SRT disposition
85	NK041	CNTRL & INSTR DIST SWBD NK041 (CLASS 1E 125 VDC)	CB/C C	2016-00	0.32	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
86	RL005	TURBINE GENERATOR AND FW CONSOLE	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
87	RL006	TURBINE GENERATOR AND FW CONSOLE	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
88	RP139	B AUXILIARY RELAY RACK RP139	CB	2000-00	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
89	NK051	CNTRL & INSTR DIST SWBD NK051 (CLASS 1E 125 VDC)	CB/CC	2016-00	>RLGM	Screened	SRT disposition
90	BBPCV0455A	BBPCV0455A PORV SOLENOID FAILS TO OPEN ON DEMAND	RB	2070-00	>RLGM	Screened	SRT disposition
91	RL021	REACTOR AUX CNTRL PANEL	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
92	RL022	REACTOR AUX CNTRL PANEL	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
93	RP209	B AUXILIARY RELAY RACK	AUX	2000-00	>RLGM	Screened	SRT disposition
94	RP289	DC DIST PNL RP289	AUX	2047-06	>RLGM	Screened	SRT disposition
95	RP330	AUX RELAY RACK RP330	AUX	2000-00	>RLGM	Screened	SRT disposition
96	RP332	B AUXILIARY RELAY RACK	AUX	2000-00	>RLGM	Screened	SRT disposition
97	NK051A	EM'CY LIGHTING DIST SWBD NK051A (SUBPNL OF NK051)	CB/CC	2016-00	>RLGM	Screened	SRT disposition
98	NK023	125 V BATTERY CHARGER NK023	CB/CC	2016-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
99	NK073	TRANSFER SWITCH BUS NK03 BATTERY CHARGER NK23/NK25	CB/CC	2016-00	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
100	NK003	125 VDC BUS SWITCHBOARD NK003	CB/CC	2016-00	0.32	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
101	NK00302	FDR BKR FROM BATT CHGR NK023 TO NK003	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK003. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
102	NK00304	MAIN BREAKER FOR CNTRL AND DIST PNL NK043 (PART OF SWBD NK003)	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK003. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
103	NK013	125 V BATTERY NK013	CB/CC	2016-00	0.44	Anchorage	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
104	NK00301	ISOLATION BKR FOR BATTERY NK013	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK003. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
105	NK00311	FDR BKR FOR INVERTER NN013 (PART OF SWBD NK003)	CB/CC	2016-00	0.32	Equipment Capacity	Item is ROB to NK003. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
106	NN013	7.5KVA INVERTER (FED FROM BATT CHARGER NK023)	CB/CC	2016-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
107	NN003	Class 1E AC DIST SWBD NN03 (SEP GRP 3)	CB/CC	2016-00	>RLGM	Screened	SRT disposition
108	RP053DB	BOP INSTR RACK RP053DB	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
109	SB037	W PROCESS ANALOG PROTECTION SET CAB-03	CB/CC	2047-06	>RLGM	Screened	SRT disposition
110	NK043	CNTRL & INSTR DIST SWBD NK043 (CLASS 1E 125 VDC)	CB/CC	2016-00	0.32	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
111	AB007	Aux Relay Rack	CB	2026-00	>RLGM	Screened	SRT disposition
112	NG00109	FDR BKR FOR 125 V SWING BATTERY CHARGER NK025	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG001. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005.
113	NK025	125 V BATTERY CHARGER NK025 (Swing Battery Charger)	CB/CC	2000-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
114	NG002	480 V LOAD CENTER NG02	CB	2000-00	0.29	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
115	NG00212	FLEX 500 kW TIE IN BKR from FD201 (Phase 2 connection point)	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG002. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
116	NG00203	FDR BKR FOR 125 V VITAL BATTERY CHARGER NK024	CB	2000-00	0.29	Equipment Capacity	Item is ROB to NG002. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
117	NK024	125 V BATTERY CHARGER NK024	CB	2016-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
118	NK074	TRANSFER SWITCH BUS NK04 BATTERY CHARGER NK24/NK26	CB	2016-00	>RLGM	Screened	SRT disposition
119	NK004	125 VDC BUS SWITCHBOARD NK004	CB	2016-00	0.32	Equipment Capacity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
120	NK00402	FDR BKR FROM BATT CHGR NK024 TO NK004	CB	2016-00	0.32	Equipment Capacity	Item is ROB to NK004. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
121	NK014	125 V BATTERY NK014	CB	2016-00	0.44	Anchorage	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-004. Block wall evaluated per 14C4257-CAL-003.
122	NK00401	ISOLATION BKR FOR BATTERY NK014	CB	2016-00	0.32	Equipment Capacity	Item is ROB to NK004. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
123	NK00411	FDR BKR FOR INVERTER NN011 (PART OF SWBD NK004)	CB	2016-00	0.32	Equipment Capacity	Item is ROB to NK004. Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003.
124	NN014	7.5KVA INVERTER (FED FROM BATT CHARGER NK024)	CB	2016-00	0.38	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
125	NN004	Class 1E AC DIST SWBD NN04 (SEP GRP 4)	CB	2016-00	>RLGM	Screened	SRT disposition
126	SA036B	ESFAS CH4 TERM	CB	2047-06	>RLGM	Screened	SRT disposition
127	RP147B	BOP Instrumentation Rack RP147B	CB	2000-00	>RLGM	Screened	SRT disposition
128	SENY0061A	NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 61A	AUX	2047-00	>RLGM	Screened	SRT disposition
129	SENY0061B	NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 61B	AUX	2047-00	>RLGM	Screened	SRT disposition
130	SB032D	W SSPS Train B #2 Output	CB	2047-06	>RLGM	Screened	SRT disposition
131	SB033A	SSPS Train B #1 Test	CB	2047-06	>RLGM	Screened	SRT disposition
132	SB041	W PROCESS ANALOG PROTECTION SET CAB-04	CB	2047-06	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
133	RP053BC	BOP Instrumentation Rack RP053BC	CB	2047-06	0.29	Equipment Capacity	Component per se screened. Anchorage evaluated per 14C4257-CAL-004.
134	SB079	RVLIS Process Cabinet SB079	CB	2047-06	>RLGM	Screened	SRT disposition
135	RP081B	Subcooling Monitor Cabinet	CB	2047-06	>RLGM	Screened	SRT disposition
136	SB148B	W PROCESS PROTECTION (Fire Isolation)	CB	2000-00	>RLGM	Screened	SRT disposition
See Note 5	SA066B	STATUS INDICATING SYS	CB	2047-06	>RLGM	Screened	SRT disposition
See Note 5	EJFIS0610	RHR PMP PEJ01A Miniflow Control Discharge	AUX	2002-00	>RLGM	Screened	SRT disposition
See Note 5	FC0219	LOCAL CONTROL PANEL FOR TD AFW PUMP	AUX	2002-00	0.61	Anchorage	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Relay functionality evaluated per 14C4257-CAL-005.
See Note 5	NG001A	MCC NG01A BUS	CB	2000-00	0.44	Relay Functional-ity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Block wall evaluated per 14C4257-CAL-003. Relay functionality evaluated per 14C4257-CAL-005.
See Note 5	NG002B	MCC NG02B BUS	AUX	2026-00	0.44	Relay Functional-ity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Relay functionality evaluated per 14C4257-CAL-005.
See Note 5	NG003C	MCC NG03C BUS	AUX	2047-00	0.44	Relay Functional-ity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Relay functionality evaluated per 14C4257-CAL-005.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
See Note 5	NG004C	MCC NG04C BUS	AUX	2047-00	0.44	Relay Functional-ity	Equipment capacity evaluated in 14C4257-CAL-005. Anchorage evaluated per 14C4257-CAL-005. Relay functionality evaluated per 14C4257-CAL-005.
See Note 5	RP334	LOCKOUT RELAY RACK	CB	2000-00	>RLGM	Screened	SRT disposition
See Note 5	SA036C	ESFAS CH2 LOGIC/TERM CABINET	CB	2047-06	>RLGM	Screened	SRT disposition
See Note 5	SB029C	W SS PROT SYS OUT 1 TRN	CB	2047-06	>RLGM	Screened	SRT disposition
137	ABPT0514	Steam Generator A Pressure Transmitter (Steam Generator Pressure)	AUX	2030-00	>RLGM	Screened	SRT disposition
138	ABPT0524	Steam Generator B Pressure Transmitter (Steam Generator Pressure)	AUX	2029-10	>RLGM	Screened	SRT disposition
139	ABPT0534	Steam Generator C Pressure Transmitter (Steam Generator Pressure)	AUX	2029-01	>RLGM	Screened	SRT disposition
140	ABPT0544	Steam Generator D Pressure Transmitter (Steam Generator Pressure)	AUX	2029-00	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
141	ABPV0001	Steam Generator A Atmospheric Steam Dump (Steam Generator Atmospheric Relief Valves)	AUX	2046-00	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.
142	ABPV0002	Steam Generator B Atmospheric Steam Dump (Steam Generator Atmospheric Relief Valves)	AUX	2042-00	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.
143	AELT0529	Steam Generator B Narrow Range Level Transmitter (Steam Generator Water Level)	RB	2026-00	>RLGM	Screened	SRT disposition
144	AELT0539	Steam Generator C Narrow Range Level Transmitter (Steam Generator Water Level)	RB	2026-00	>RLGM	Screened	Transmitter anchorage shown to screen per analysis in 15C4353-CAL-001.
145	BBHV8001 A	RCS Reactor Vessel Head Vent A Upstream Valve (Reactor Head Vent)	RB	2047	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
146	BBHV8002A	RCS Reactor Vessel Head Vent A Downstream Valve (Reactor Head Vent)	RB	2047	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.
147	BBPCV455A	Pressurizer Power Operated Relief Valve (Pressurizer PORV)	RB	2070-00	>RLGM	Screened	SRT disposition
148	BBPT0455	RCS Pressurizer Pressure Channel 1 (RCS Pressure)	RB	2026-00	>RLGM	Screened	SRT disposition
149	BBTE0413A	RCS LOOP 1 Wide Range Hot Leg Prot. A Temperature Element (RCS Temperature)	RB	2000-00	>RLGM	Screened	SRT disposition
150	BBTE0413B	RCS LOOP 1 Wide Range Cold Leg Prot. A Temperature Element (RCS Temperature)	RB	2000-00	>RLGM	Screened	SRT disposition
151	BBTE0423A	RCS LOOP 2 Wide Range Hot Leg Prot. A Temperature Element (RCS Temperature)	RB	2000-00	>RLGM	Screened	SRT disposition

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
152	BBTE0423B	RCS LOOP 2 Wide Range Cold Leg Prot. A Temperatur e Element (RCS Temperatur e)	RB	2000-00	>RLGM	Screened	SRT disposition
153	EPHV8808 A	Accumulator Tank A Outlet Isolation Valve (Accumulato r Isolation Valves)	RB	1998-06	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.
154	EPHV8808B	Accumulator Tank B Outlet Isolation Valve (Accumulato r Isolation Valves)	RB	1998-06	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.
155	EPHV8808C	Accumulator Tank C Outlet Isolation Valve (Accumulato r Isolation Valves)	RB	1998-06	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.
156	EPHV8808 D	Accumulator Tank D Outlet Isolation Valve (Accumulato r Isolation Valves)	RB	1998-06	>RLGM	Screened	Valve functionality demonstrated to screen per analysis in 15C4353-CAL-001.

ESEL Item Number	ID	Description	Bldg	Elev	HCLPF (g, PGA)	Failure Mode	Basis
157	GNPT0936	Containment Atmospheric Pressure Channel 2 Pressure Transmitter (Containment Pressure)	AUX	2026-00	>RLGM	Screened	SRT disposition
158	GNPT0937	Containment Atmospheric Pressure Channel 1 Pressure Transmitter (Containment Pressure)	AUX	2026-00	>RLGM	Screened	SRT disposition
159	TEP01A	Safety Injection Accumulator Tank A (Accumulators)	RB	1998	0.53	Anchorage Capacity	Tank and anchorage evaluated per 15C4353-CAL-001.
160	TEP01B	Safety Injection Accumulator Tank B (Accumulators)	RB	1998	0.53	Anchorage Capacity	Tank and anchorage evaluated per 15C4353-CAL-001.
161	TEP01C	Safety Injection Accumulator Tank C (Accumulators)	RB	1998	0.53	Anchorage Capacity	Tank and anchorage evaluated per 15C4353-CAL-001.
162	TEP01D	Safety Injection Accumulator Tank D (Accumulators)	RB	1998	0.53	Anchorage Capacity	Tank and anchorage evaluated per 15C4353-CAL-001.

Attachment C. Seismic Review Team
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Attachment C. Seismic Review Team

The Seismic Review Team (SRT) consisted of seismic engineers from Stevenson & Associates (S&A). Brief resumes for team members are provided below.

Apostolos Karavoussianis

Mr. Karavoussianis is a senior consultant in the S&A Phoenix office. He has performed seismic walkdowns of structures and components at numerous facilities for the GIP A-46 and IPEEE programs. Mr. Karavoussianis has also managed, led, or participated in several seismic walkdown initiatives associated with NTTF Recommendation 2.1 and NTTF Recommendation 2.3. He has also prepared, reviewed, and approved seismic evaluations for electrical and mechanical equipment. Mr. Karavoussianis is a qualified Seismic Capable Engineer (SCE) and has completed the Seismic Qualification Utility Group (SQUG) Walkdown Screening and Seismic Evaluation Training Course.

Hunter A. Young, P.E.

Mr. Young is a Senior Engineer and qualified SCE in the S&A Phoenix office with specialization in structural dynamic analysis of structures and equipment for natural and man-made phenomena hazards. He has managed, led, or participated in over 20 seismic walkdown initiatives associated with NTTF Recommendation 2.1 (including WCGS), NTTF Recommendation 2.3 (including WCGS), EPRI NP-6695, and various S-PRA fragility endeavors. Mr. Young has a Master of Engineering in Structural Engineering from the Massachusetts Institute of Technology and Bachelors of Science in Civil Engineering (BSCE) from the University of Notre Dame. He is a licensed P.E. (civil) in California, Kansas, and Missouri and has completed the SQUG Walkdown Screening and Seismic Evaluation Training Course.