



Revision 3A

Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment

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Preface

^[3]This revision of the Generic Implementation Procedure (GIP) is an augmented version of the latest revision of the GIP that the Staff of the U.S. Nuclear Regulatory Commission (NRC) has reviewed and approved (i.e., GIP Revision 3, Updated 5/16/97). This augmented version (GIP-3A) includes changes to address the clarifications, interpretations, positions, and exceptions that had been identified by the Staff during their review of the GIP Revision 2, Corrected 2/14/92 (GIP-2) and GIP Revision 3, Updated 5/16/97 (GIP-3). GIP-3A also includes changes to address the issues identified by the Staff in their review of plant-specific implementation of the USI A-46 program at the SQUG member plants and in their review of SQUG's guidance on use of the GIP for new and replacement equipment (NARE).

The documents containing the Staff's clarifications, interpretations, positions, exceptions, and issues along with SQUG's understanding of these are listed below.

1. NRC Generic Letter (GL) 87-02, dated February 19, 1987, Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46.
2. NRC Generic Letter 87-02, Supplement 1, dated May 22, 1992, forwarding Supplemental Safety Evaluation Report No. 2 (SSER No. 2) on GIP-2.
3. SQUG (N. Smith) letter to NRC (J. Partlow), dated August 21, 1992, describing SQUG's understanding of SSER No. 2.
4. NRC (J. Parlow) letter to SQUG (N. Smith), dated October 2, 1992, with enclosure containing NRC Staff comments on SQUG's 8/21/92 letter.
5. SQUG (N. Smith) letter to NRC (J. Partlow), dated March 26, 1993, forwarding Revision 2A of the Generic Implementation Procedure (GIP-2A).
6. NRC (W. Butler) letter to SQUG (N. Smith), dated May 24, 1993, NRC Response to SQUG Letter Dated March 26, 1993, on GIP-2A.
7. SQUG (N. Smith) memorandum to SQUG members, dated August 4, 1993, Use of GIP Revision 2A.
8. NRC (J. Stolz) letter to SQUG (N. Smith), dated December 4, 1997, forwarding Supplemental Safety Evaluation Report No. 3 (SSER No. 3) on GIP-3.

9. SQUG (N. Smith) letter to NRC (R. Capra) dated July 15, 1998, forwarding the Report on the Use of the GIP for New and Replacement Equipment and Parts (NARE).
10. NRC (E. Adensam) letter to SQUG (N. Smith) dated June 23, 1999, forwarding the NRC's Review of SQUG's Report on the Use of the Generic Implementation Procedure for New and Replacement Equipment and Parts (NARE).
11. SQUG (J. Richards and R. Kassawara) memorandum to SQUG members, dated July 25, 2000, forwarding the NARE Guidelines, Revision 4, "Implementation Guidelines for Seismic Qualification of New and Replacement Equipment/Parts (NARE) Using the Generic Implementation Procedure (GIP)."

The changes included in GIP-3A are similar to the changes included in Revision 2A of the GIP (GIP-2A) that was sent to the NRC Staff for review and approval (Document 5 above). The NRC Staff declined to review GIP-2A (Document 6 above) because they considered SSER No. 2 to be their official position on using GIP-2 for resolving USI A-46; they considered these two documents (GIP-2 and SSER No. 2) to be sufficient to implement resolution of USI A-46. They indicated that these two documents form the bases against which the Staff will judge the acceptability of the plant specific implementation of the USI A-46 program.

Even though the NRC Staff declined to review GIP-2A, they did not object to its use as a working document. Therefore, SQUG recommended to its members that they use GIP-2A for their day-to-day seismic verification and for implementation of the USI A-46 program (Document 7 above). The advantage of using GIP-2A was that it eliminated the need for users to refer to two separate documents or to interpret potential conflicts. Since publishing GIP-2A, additional changes to the GIP criteria and guidelines have been identified in Documents 8 to 11. Therefore, the need for an augmented version of the GIP became even more important so that all these additional changes and the NRC Staff positions on these changes can be viewed in a single working document.

In developing GIP-3A, SQUG has incorporated the Staff clarifications, interpretations, positions, exceptions, and issues in a manner that we believe would be acceptable to the Staff without adding new, substantive criteria or guidance into the document. Therefore, even though GIP-3A

has not been formally reviewed and approved by the NRC Staff, SQUG considers that this document remains a statement of the accepted criteria and guidance, and is not a change.

At each location in GIP-3A where changes from GIP-3, Updated 5/16/97 have been made, a superscript number in square brackets (e.g., ^[1]) is included prior to the change. These numbers correspond to the endnotes at the end of each section where the reasons for the changes are listed.

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Revision Status

<u>Rev. No.</u>	<u>Pages Affected</u>	<u>Date</u>
0	Initial Issue of GIP	6/3/88
1	All pages revised except the following: <ul style="list-style-type: none"> • Part II, Section 8, Appendices A, B • Part III 	12/23/88
2	All pages revised	9/21/90
2, Corrected on 2/28/91	<p><u>Front Matter</u>: ii, iii, iv, v, ix, x, xv, xiii, xvi</p> <p><u>Part II</u></p> <p><u>Section 4</u>: 4-7, 4-25, 4-26, 4-29 thru 4-38, 4-41, 4-43 thru 4-50, 4-63</p> <p><u>Section 6</u>: 6-1, 6-16 thru 6-27</p> <p><u>Section 10</u>: 10-1 thru 10-3</p> <p><u>Appendix A</u>: A-ii, A-49</p> <p><u>Appendix B</u>: B.1-6 thru B.1-8, B.2-2 thru B.2-7, B.3-3 thru B.3-8, B.4-3 thru B.4-7, B.7-10, B.8-6 thru B.8-8, B.8-10, B.8-11, B.14-5, B.14-6</p> <p><u>Appendix C</u>: C-ii, C-iii, C.2-2 thru C.2-6, C.2-8 thru C.2-28, C.3-3 thru C.3-14, C.4-2 thru C.4-6, C.5-2, C.6-2 thru C.6-4</p> <p><u>Appendix D</u>: D-4, D-7, D-8</p> <p><u>Appendix G</u>:</p> <p>SEWS Class 1: Sheet 2</p> <p>SEWS Class 2: Sheet 1, 2</p> <p>SEWS Class 3: Sheet 1, 2</p> <p>SEWS Class 4: Sheet 1, 2</p> <p>SEWS Class 8A: Sheet 2</p> <p>SEWS Class 8B: Sheet 2</p> <p>SEWS Class 14: Sheet 2</p>	2/28/91

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2, Corrected on 6/28/91	<u>Front Matter</u> : ii, iii, iv, v, vi, vii, viii, ix, x, xi, xiv, xv, xvi, xvii, xviii <u>Part I</u> – All pages <u>Part II</u> <u>Section 1</u> : 1-2 thru 1-10 <u>Section 2</u> : 2-3, 2-5, 2-6, 2-7 <u>Section 3</u> : 3-1 thru 3-3, 3-5, 3-6, 3-8 thru 3-47 <u>Section 4</u> : 4-1, 4-3 thru 4-70 <u>Section 5</u> : 5-2 thru 5-11 <u>Section 6</u> : 6-4 thru 6-19, 6-21 thru 6-27 <u>Section 7</u> : All pages <u>Section 8</u> : All pages <u>Section 9</u> : All pages <u>Section 10</u> : All pages <u>Appendix A</u> : A-33, A35 <u>Appendix B</u> : All pages <u>Appendix C</u> : C-iii, C-1, C.1-1 thru C.1-4, C.2-2, C.2-11, C.2-12, C.2-13, C.2-24, C.3-2, C.6-3 thru C.6-4 <u>Appendix D</u> : D-2 <u>Appendix E</u> : E-1, E-2, E-4 <u>Appendix F</u> : F-2 <u>Appendix G</u> : All pages except G-i	6/28/91

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2, Corrected on 2/14/92	<u>Front Matter</u> : i, ii, xiv.i <u>Part I</u> : 2, 8, 9, 12, 13, 15, 16, 25, 26 <u>Part II</u> <u>Section 1</u> : 1-6, 1-7 <u>Section 4</u> : 4-17, 4-18, 4-23, 4-53 <u>Section 5</u> : 5-1 <u>Section 6</u> : 6-13, 6-14, 6-16, 6-25 <u>Section 7</u> : 7-67, 7-68 <u>Section 8</u> : 8-2, 8-4, 8-34, 8-39, 8-40, 8-43	2/14/92

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3	<p><u>[4]Front Matter</u>: i, ii, iii, x, xiii, xiv, xiv.i, xv, xvi, xix, xx, xxi, xxii, xxiii, xxiv, xxv</p> <p><u>Part I</u>: 1, 3, 4, 6, 10, 22, 24, 26</p> <p><u>Part II</u></p> <p><u>Section 1</u>: 1-10</p> <p><u>Section 3</u>: 3-2, 3-12, 3-16 thru 3-18, 3-26, 3-40</p> <p><u>Section 4</u>: 4-19, 4-20, 4-22, 4-27, 4-29, 4-33, 4-38, 4-53, 4-54, 4-65,</p> <p><u>Section 5</u>: 5-8</p> <p><u>Section 6</u>: 6-1, 6-17, 6-18, 6-20, 6-21</p> <p><u>Section 7</u>: 7-17, 7-54</p> <p><u>Section 8</u>: 8-28, 8-32, 8-39, 8-61 thru 8-65</p> <p><u>Section 9</u>: 9-3, 9-6, 9-11, 9-12</p> <p><u>Section 10</u>: All pages</p> <p><u>Appendix A</u>: A-38,</p> <p><u>Appendix B</u>: B-ii, B.1-2, B.1-3, B.1-5, B.2-2, B.5-1, B.6-2, B.7-2, B.7-4, B.8A-1 thru B.8A-9, B.8B-1 thru B.8B-8, B.17-3, B.18-6,</p> <p><u>Appendix C</u>: C-2, C.1-1, C.2-3, C.2-4, C.2-7, C.2-14 thru C.2-17, C.2-20, C.3-9, C.3-11, C.3-13, C.3-14,</p> <p><u>Appendix E</u>: E-4</p> <p><u>Appendix G</u>: G-ii, G.1-1, G.1-2, G.2-1, G.2-2, G.3-1, G.3-2, G.4-1, G.4-2, G.5-1, G.6-1, G.7-1, G.8A-1, G.8A-2, G.8B-1, G.8B-2, G.9-1, G.10-1, G.11-1, G.12-1, G.13-1, G.14-1, G.14-2, G.15-1, G.15-2, G.16-1, G.16-2, G.17-1, G.18-1, G.18-2, G.19-1, G.20-1, G.20-2</p>	7/31/95
3, Updated on 5/16/97	<p><u>[4]Front Matter</u>: i, ii, iii, xix, xxi, xxii, xxiii</p> <p><u>Part I</u>: 1, 3, 24, 26</p> <p><u>Part II</u></p> <p><u>Section 8</u>: 8-32, 8-61 thru 8-65</p> <p><u>Section 10</u>: 10-3</p> <p><u>Appendix B</u>: B.7-2, B.8A-2, B.8B-1</p> <p><u>Appendix C</u>: C.2-3, C.2-4</p>	5/16/97

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3A	^[4] All pages revised. The changes include those to address the NRC Staff clarifications, interpretations, exceptions, and issues from their review of GIP-2 (SSER No. 2), GIP-3 (SSER No. 3), plant-specific implementation of the USI A-46 program, and the NARE Guidelines. Editorial and typographical changes were also made to incorporate lessons learned from using the GIP.	12/21/01

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The ^[1]companies that were members of SQUG when the GIP was first developed and newer members are listed below. In those cases where the company that owns the SQUG plant has changed, the new company name is included in parentheses. Companies not currently members of SQUG are denoted by an asterisk (*).

Alabama Power Co. (Southern Nuclear Operating Co.)	New York Power Authority (Entergy Nuclear Northeast)
American Electric Power Co., Inc.	Niagara Mohawk Power Corp. (Constellation Nuclear)
Arkansas Power & Light Co. (Entergy Nuclear South)	Northeast Utilities (Dominion Nuclear Connecticut, Inc.)
Baltimore Gas & Electric Co. (Calvert Cliffs Nuclear Power Plant, Inc.)	Northern States Power Co. – Nuclear Management Co.
Boston Edison Co. (Entergy Nuclear Northeast)	Nuclear Electric PLC [UK] (British Energy Generation)
Carolina Power & Light Co. (CP&L A Progress Energy Co.)	Nuclenor, S.A. [Spain]
CEA [France]	OKG AB [Sweden]
Central Nuclear de Almaraz [Spain]	Omaha Public Power District
Commonwealth Edison Co. (Exelon Nuclear)	Pennsylvania Power & Light Co.*
Consolidated Edison Company of New York, Inc. (Entergy Nuclear Northeast)	Philadelphia Electric Co.* (Exelon Nuclear)
Consumers Power Co. (Consumers Energy – Nuclear Management Co.)	Portland General Electric Co.*
Detroit Edison Company*	Public Service Company of Colorado*
Duke Power Company	Public Service Electric & Gas Co. (PSEG Nuclear)
Duquesne Light Co. (First Energy Corp. – Beaver Valley)	Rochester Gas & Electric Corp.
Electrabel Tractebel, S.A. [Belgium]	Sacramento Municipal Utility District*
ElectricitJ de France [France]	Siemens AG/KWU [Germany]
ENEL ctn (NIRA)* [Italy]	Southern California Edison Co.*
Florida Power Corp. (FPC A Progress Energy Co.)	Tennessee Valley Authority
Forsmarks Kraftgrupp AB [Sweden]	Toledo Edison Co. (First Energy Corp.-Davis Besse)
Georgia Power Co. (Southern Nuclear Operating Co.)	Vattenfall AB, Ringhals [Sweden]
GPU Nuclear Corp. (AmerGen Energy Co.)	Vermont Yankee Nuclear Power Corp. (Entergy Nuclear Northeast)
Iowa Electric Light & Power Co. (Alliant Energy – Nuclear Management Co.)	Virginia Power (Dominion Generation)
Korea Electric Power Research Institute [Korea]	Westinghouse Savannah River Co.*
Magnox Electric [UK]	Wisconsin Electric Power Co. – Nuclear Management Co.
Maine Yankee Atomic Power Co.*	Wisconsin Public Service Corp. – Nuclear Management Co.
Nebraska Public Power District	Yankee Atomic Electric Co.*

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Glossary of Terms

AC	- Alternating Current
ADS	- Automatic Depressurization System
AF	- Amplification Factor
AFW	- Auxiliary Feedwater
ARS	- Amplified Response Spectra
ASME	- American Society of Mechanical Engineers
B&PV	- Boiler and Pressure Vessel
BWR	- Boiling Water Reactor
CCW	- Component Cooling Water
CRD	- Control Rod Drive
CST	- Condensate Storage Tank
CVCS	- Chemical and Volume Control System
DC	- Direct Current
DG	- Diesel Generator
DH	- Decay Heat
EE	- Earthquake Experience
EPRI	- Electric Power Research Institute
ESW	- Emergency Service Water
FRS	- Floor Response Spectrum
FS	- Factor of Safety
FSAR	- Final Safety Analysis Report
FWCI	- Feedwater Coolant Injection
GERS	- Generic Equipment Ruggedness Spectra
GIP	- Generic Implementation Procedure
GRS	- Ground Response Spectra
HCLPF	- High Confidence, Low Probability of Failure
HELB	- High Energy Line Break
HPCI	- High Pressure Coolant Injection
HPCS	- High Pressure Core Spray
HVAC	- Heating Ventilating and Air Conditioning
HX	- Heat Exchanger
IRS	- In-structure Response Spectrum
LOCA	- Loss of Coolant Accident
LPCI	- Low Pressure Coolant Injection
LPCS	- Low Pressure Core Spray
MCC	- Motor Control Center
MS	- Main Steam
MSIV	- Main Steam Isolation Valve
NEP	- Non-Exceedance Probability
NPSH	- Net Positive Suction Head
NRC	- Nuclear Regulatory Commission

NSSS	-	Nuclear Steam Supply System
OSVS	-	Outlier Seismic Verification Sheet
P&ID	-	Piping and Instrumentation Diagram
PGA	-	Peak Ground Acceleration
PORV	-	Power-Operated Relief Valve
PWR	-	Pressurized Water Reactor
RBCCW	-	Reactor Building Closed Cooling Water
RC	-	Reactor Coolant
RCIC	-	Reactor Core Isolation Cooling
RCS	-	Reactor Coolant System
RTD	-	Resistance Temperature Detector
RHR	-	Residual Heat Removal
RHRS	-	Residual Heat Removal System
RWC	-	Reactor Water Cleanup
RWST	-	Refueling Water Storage Tank
SAV	-	Specified Acceleration Value
SC	-	Shutdown Cooling
SCE	-	Seismic Capability Engineer
SEWS	-	Screening Evaluation Work Sheets
SLC	-	Standby Liquid Control
SQUG	-	Seismic Qualification Utility Group
SRP	-	Standard Review Plan
SRT	-	Seismic Review Team
SRV	-	Safety Relief Valve
SSE	-	Safe Shutdown Earthquake
SSEL	-	Safe Shutdown Equipment List
SSRAP	-	Senior Seismic Review and Advisory Panel
SVDS	-	Screening Verification Data Sheet
SW	-	Service Water
USI	-	Unresolved Safety Issue
ZPA	-	Zero Period Acceleration
ZPGA	-	Zero Period Ground Acceleration

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Reasons for Changes to GIP, Front Matter

Listed below are the specific reasons for making the changes marked with a vertical line in the margin of this front matter to create GIP-3A from GIP-3, Updated 5/16/97. The endnote numbers listed below correspond to the bracketed numbers (e.g., ^[1]) located in the text of this front matter where the changes are made.

¹ Update of company and personnel names.

² The list of companies that prepared the GIP was rearranged in alphabetical order.

³ Preface added to explain the reasons and bases for the changes made in going from GIP-3, Updated 5/16/97 to GIP-3A.

⁴ Updated list of pages affected by changes to previous revisions of GIP.