

Section 9

Documentation

9.0 INTRODUCTION

The purpose of this section is to describe the various types of documents which should be generated for the USI A-46 program and how they relate to each other. This section also describes the types of information which should be submitted to the NRC.

The following four major types of documents are described in this section.

- Safe Shutdown Equipment List (SSEL) Report
- Relay Evaluation Report
- Seismic Evaluation Report
- Completion Letter

The relationship between these documents and the time sequence for preparing them are illustrated in Figure 9-1. This figure also shows other minor documents which should be prepared to support the above four major documents. The important features of these documents as shown in this figure are summarized below.

The first type of document to be generated is a Safe Shutdown Equipment List (SSEL) Report. There are three types of SSELS that can be developed for this report, as described in Section 3 and Appendix A:

- The Composite SSEL includes all of the equipment identified as being needed for safe shutdown of the plant including (1) equipment which should be reviewed for seismic adequacy, (2) equipment which could be adversely affected by relay chatter, and, at the option of the utility, (3) other types of equipment needed for safe shutdown but which need not be reviewed for seismic adequacy or relay chatter, e.g., inherently rugged equipment like check valves and manual valves or passive equipment like filters.

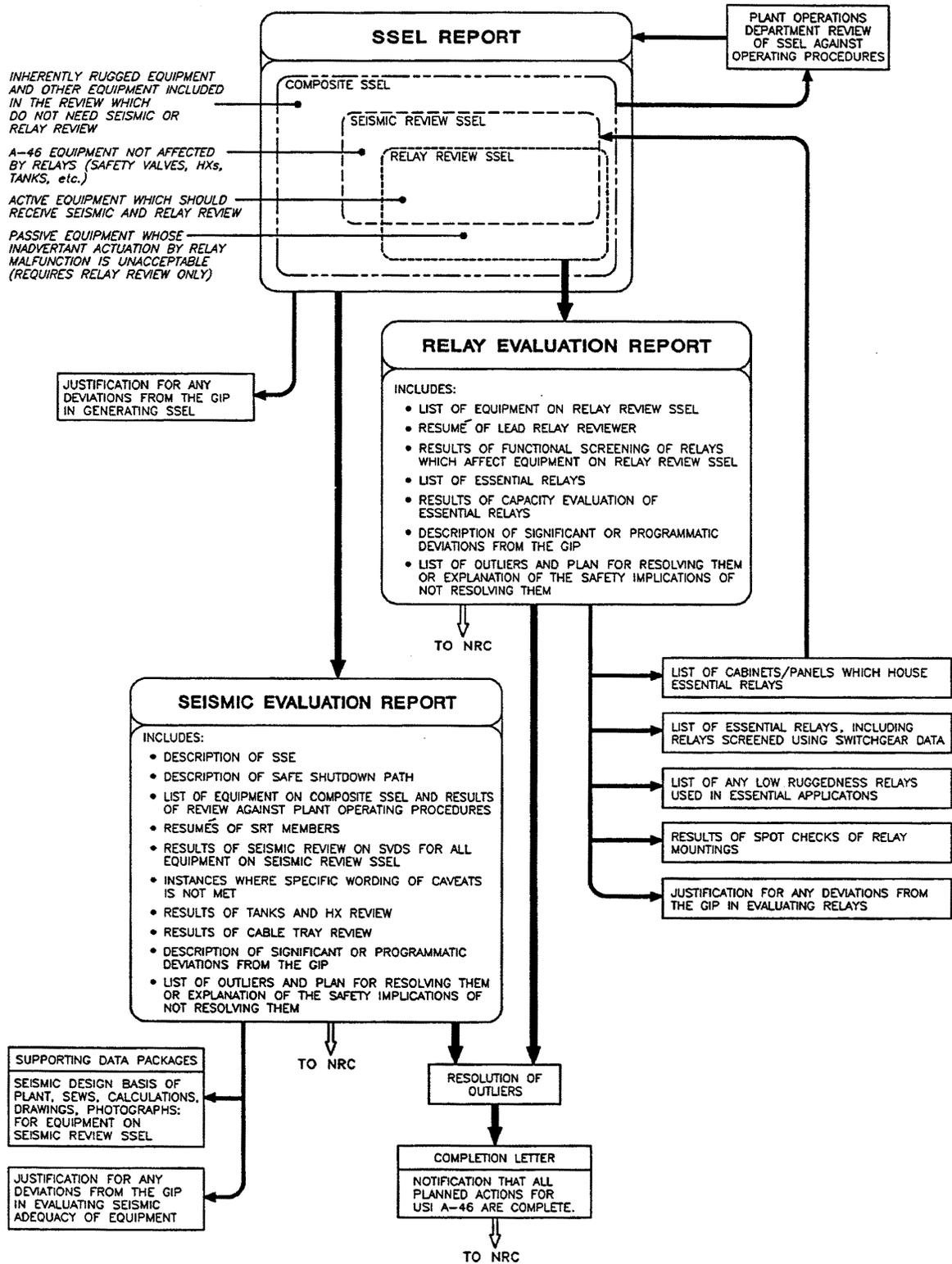


Figure 9-1. Documentation for USI A-46

- The Seismic Review SSEL is a subset of the Composite SSEL and includes only those items of active mechanical and electrical equipment and tanks and heat exchangers for which a seismic review should be performed.
- The Relay Review SSEL is also a subset of the Composite SSEL and overlaps (i.e., includes some of the same equipment as) the Seismic Review SSEL. The Relay Review SSEL includes those items of equipment which could inadvertently change state, operate, or not operate due to relay chatter in the control circuits of this equipment.

The Seismic Review and Relay Review SSELs are input for the Seismic Evaluation Report and the Relay Evaluation Report, respectively. Note also that the plant Operations Department should review the SSEL against the plant operating procedures.

The second document to be generated for a USI A-46 review is the Relay Evaluation Report. This report describes the results of the relay review covered in Section 6 and Reference 8 in which (1) the essential relays are identified in the circuits of mechanical and electrical equipment needed for safe shutdown of the plant, and (2) the seismic capacity of these essential relays is compared to the seismic demand imposed on them. Note that one of the products of the relay review is a list of cabinets and panels which house essential relays. These cabinets and panels should be added to the Seismic Review SSEL in the SSEL Report so that they can be evaluated for seismic adequacy. The Relay Review Report should be submitted to the NRC. Also, if there are any relays identified as outliers during the review, they would be subject to resolution.

The Seismic Evaluation Report is the third type of document to be generated the USI A-46 review. This report describes the results of the seismic reviews of active mechanical and electrical equipment (Section 4), tanks and heat exchangers (Section 7), and cable and conduit raceways (Section 8). The Seismic Evaluation Report should be submitted to the NRC. Also, if there are any items of equipment identified as outliers during these seismic reviews, they would be subject to resolution.

After resolving all the outliers which the licensee plans to address, a Completion Letter should be sent to the NRC notifying them that all planned actions for resolution of USI A-46 are complete.

This section describes both the type of documentation to be developed and retained by the utility to support the resolution of USI A-46 and the documentation to be sent to the NRC at the completion of the program. The documentation to be sent to the NRC at the start of the program is not covered here; see Part I, Section 2.2.1, for a description of the implementation schedule and commitment letter to be submitted before beginning implementation.

The extent of documentation required in this section is limited. The underlying reason for this is that the seismic evaluations are to be done by highly qualified individuals who have been trained in the use and application of the GIP. For example, Seismic Capability Engineers should have the background, experience, and training to make engineering judgments during the plant walkdown and thus avoid having to develop large quantities of backup documentation to record every decision made in applying this procedure. These Seismic Capability Engineers are then held accountable for the scope, accuracy, and completeness of the Screening Verification and Walkdown process by having all these engineers certify that the results of the Screening Verification and Walkdown are correct and accurate. One of these signatories should also be a licensed professional engineer.

9.1 SQUG COMMITMENTS

Members of SQUG adopting the Generic Implementation Procedure for USI A-46 resolution commit to the following in regard to documenting and reporting to the NRC the results of the safe shutdown equipment identification, the screening verification and walkdown, the relay evaluation, the tanks and heat exchangers review, the cable and conduit raceway review, and the outlier identification and resolution. ^[1]As specified in GIP, Part I, Section 1.3, any substantial deviations from the SQUG Commitments must be justified to the NRC in writing prior to implementation. Likewise the NRC should be notified of significant or programmatic deviations from the GIP guidance (Sections 9.2 through 9.5) but implementation may begin without first obtaining NRC concurrence (at the licensee's own risk).

The licensee will submit to the NRC the following plant-specific information for resolution of USI A-46.

1. Description of the safe shutdown path(s) chosen for resolution of USI A-46, i.e., systems selected for achieving and maintaining safe shutdown. If the scope of review is expanded beyond the systems required for safe shutdown and this expanded scope of equipment is submitted as part of the USI A-46 summary report, then these additional systems should be identified.
2. A summary of the main steps in the plant operating procedures used to bring the plant to a safe shutdown condition and the results of the plant Operations Department review of the SSEL against the plant operating procedures.
3. List of the equipment on the Composite SSEL.
4. List of equipment on the Seismic Review SSEL and the location of equipment in the plant (building and floor elevation).
5. List of equipment on the Relay Review SSEL.
6. Description of the SSE used in the USI A-46 program including a description of how the seismic demand input motion to each item of equipment was determined. This can be done on the SVDS form (Exhibit 4-1, Column 10).
7. Qualifications of the Seismic Capability Engineers and the Lead Relay Reviewer.
8. Results of the Screening Verification and Walkdown for mechanical and electrical equipment.
9. Identification of instances in which the intent of the caveat is met without meeting the specific wording of the caveat rule.
10. List of essential relays, including their plant identification numbers, when available, the manufacturer's model number, and the floor elevations in the plant where the relays are mounted. The manufacturer's model number should include any submodel designation or other reference which can be used to uniquely identify the GERS or the vendor qualification analysis or test data which is used as the basis for the seismic capacity of the relay.
11. Results of the functional screening of relays which affect equipment on the Relay Review SSEL and the results of the seismic capacity evaluations of essential relays.
12. Results of the tanks and heat exchangers review.
13. Results of the cable and conduit raceway review.
14. Description of the significant or programmatic deviations from the GIP.
15. Description of the outliers and any deficiencies.
16. List of the unresolved outliers (i.e., those not meeting the GIP screening guidelines) and an explanation of the safety implications of not resolving these outliers.

17. Proposed schedule for complete resolution, future modifications, and replacements of those outliers which will be resolved.
18. Results of the third-party audit.

After all planned actions to resolve outliers are complete, the utility will inform the NRC of this fact by letter.

9.2 SSEL REPORT

The Safe Shutdown Equipment List (SSEL) Report and supporting documents should describe the overall approach used in the resolution of USI A-46 for shutting down the plant following a postulated safe shutdown earthquake (SSE). The systems selected for accomplishing each of the four safe shutdown functions and the basis for selecting them should be summarized in this report.

The equipment selected within these systems should be identified and included on three types of SSELs which are described below.

- The Composite SSEL should contain all of the equipment described in Section 3 which should be evaluated for seismic adequacy and equipment for which relay chatter could cause inappropriate operation. Other equipment in the safe shutdown systems (e.g., inherently rugged and passive equipment) may also be added to this SSEL at the option of the utility.
- The Seismic Review SSEL is a subset of the Composite SSEL and contains all of the mechanical and electrical equipment and the tanks and heat exchangers for which a seismic evaluation should be done as described in Sections 4 and 7, respectively.
- The Relay Review SSEL is a subset of the Composite SSEL and contains all of the mechanical and electrical equipment for which relay chatter could cause inappropriate operation. This list is the starting point for performing the Relay Functionality Review described in Section 6.
- Justification for any deviations from the GIP (per Part I, Section 1.3).

The SSEL Report should also describe the method used by the Operations Department for verifying the compatibility of the SSEL with the plant operating procedures.

The information from the SSEL Report which should be sent to the NRC is listed below. Note that it is not necessary to submit the SSEL Report itself. The information listed below may be included with the Relay Evaluation Report and/or the Seismic Evaluation Report described below.

- Description of the safe shutdown path(s) chosen for resolution of USI A-46, i.e., systems selected for achieving and maintaining safe shutdown. If the scope of review is expanded beyond the systems required for safe shutdown and this expanded scope of equipment is submitted as part of the USI A-46 summary report, then these additional systems should be identified.
- List of equipment included on the Composite SSEL.
- List of equipment included on the Seismic Review SSEL and location of equipment in the plant (building and floor elevation).
- List of equipment included on the Relay Review SSEL.
- A summary of the main steps in the plant operating procedures used to bring the plant to a safe shutdown condition and the results of the plant Operations Department review of the SSEL against the plant operating procedures.
- Description of significant or programmatic deviations from the GIP (per Part I, Section 1.3).

9.3 RELAY EVALUATION REPORT

The information which should be documented for the Relay Functionality Review (Section 6) is listed below.

- Identification and listing of all the safe shutdown equipment for which a relay evaluation should be done.
- Résumé of Lead Relay Reviewer.
- Identification and listing of all relays or groups of relays which affect the operation of the safe shutdown equipment. The documentation should be sufficiently detailed such that a

reviewer can trace the conclusions reached regarding the effect of relay malfunction on operation of any safe shutdown item of equipment. The relays (including all contact devices) which are screened out, because chatter is acceptable, or by use of the other screening approaches which do not require relay-specific evaluation, do not need to be identified individually. Only the essential relays which require relay-specific seismic capacity evaluations need to be individually identified.

- Identification of relays screened out using switchgear GERS.
- List of any low ruggedness relays used in essential applications.
- Description of the methods used and the results of the functional screening and capacity evaluations.
- ^[2]Assumptions and judgements used in the evaluations (optional).
- Description and justification of the method used to determine the in-cabinet response spectra for Screening Level 3 in Section 6.4.2, if Reference 33 was not used to generate the response spectra.
- Identification of cabinets, panels, and other enclosures which house essential relays.
- Results of walkdown spot checks.
- Description of the outliers.
- Recommended corrective actions.
- Justification for any deviations from the GIP (per Part I, Section 1.3).

The Relay Evaluation Report to be submitted to the NRC should contain the following information. (Note: Some of the information from the SSEL Report may also be included in this report.)

- Résumé of the Lead Relay Reviewer.
- Results of the functional screening of relays which affect equipment on the Relay Review SSEL.
- List of essential relays including their plant identification number, when available, the manufacturer's model number and the plant floor elevations where the relays are mounted. The manufacturer's model number should include any submodel designation or other reference which can be used to uniquely identify the GERS or the vendor qualification analysis or test data which is used as the basis for the seismic capacity of the relay.
- Results of seismic capacity evaluations of essential relays.

- Description of the relay outliers.
- List of the unresolved outliers (i.e., those not meeting the GIP screening guidelines) and an explanation of the safety implications of not resolving these outliers.
- Proposed schedule for complete resolution, future modifications, and replacements of those outliers which will be resolved.
- Description of significant or programmatic deviations from the GIP (per Part I, Section 1.3).

After submitting this information to the NRC, the utility may use normal methods for implementing and tracking licensing commitments for resolving outliers.

9.4 SEISMIC EVALUATION REPORT

As a result of the screening evaluations described in Sections 4, 5, 7, and 8, the following information should be documented:

- Description of the seismic design basis of plant including SSE ground and floor response spectra, description of the earth on which the plant is founded (e.g., rock or soil; effective grade of plant; etc.),^[3] and basis for establishing the degree of uncertainty in the natural frequency of the building structure if unbroadened response spectra are used with frequency shifting of response peaks.
- List of the equipment on the Seismic Review SSEL.
- Résumés of Seismic Capability Engineers.
- Checklists (e.g., SEWS and Exhibits 8-1, 8-2, and 8-3).
- Notes, photographs, drawings, calculations,^[2] assumptions, judgements, etc. used to back up the Screening Verification and Walkdown (optional).
- Results of the Screening Verification and Walkdown for mechanical and electrical equipment on SVDS forms, including descriptions of any cases which specific caveats are met by intent without meeting the specific wording of the caveat rule.
- Results of the tanks and heat exchangers evaluation.
- Results of the cable and conduit raceway review including the basis for identifying which raceway systems support the electrical, control, and instrumentation cable for safe shutdown equipment.

- Description of the outliers on OSVS forms.
- Results of engineering evaluations, tests, calculations, and equipment modifications and replacements used to resolve outliers.
- Justification for any deviations from the GIP (per Part I, Section 1.3).
- Results of the third-party audit.

The Seismic Evaluation Report to be submitted to the NRC should contain the following information. (Note: Some of the information from the SSEL Report may also be included in this report.)

- Description of the Safe Shutdown Earthquake (SSE) used in the USI A-46 program including a description of how the seismic demand input motion to each item of equipment was determined. This can be done on the SVDS form (Exhibit 4-1, Column 10).
- Résumés of the Seismic Capability Engineers.
- Results of the Screening Verification and Walkdown for mechanical and electrical equipment.
- Identification of instances in which the intent of caveat is met without meeting the specific wording of the caveat rule.
- Results of the tanks and heat exchangers review.
- Results of the cable and conduit raceway review.
- Description of the equipment outliers.
- List of the unresolved outliers (i.e., those not meeting the GIP screening guidelines) and an explanation of the safety implications of not resolving these outliers.
- Proposed schedule for complete resolution, future modifications, and replacements of those outliers which will be resolved.
- Description of significant or programmatic deviations from the GIP (per Part I, Section 1.3).
- Results of the third-party audit.

After submitting this information to the NRC, the utility may use normal methods for implementing and tracking licensing commitments for resolving outliers.

9.5 COMPLETION LETTER

A completion letter should be sent to the NRC advising them that any corrective actions identified in the Relay Evaluation Report and the Seismic Evaluation Report or any corrective actions agreed to with the NRC Staff as a result of other related correspondence have been completed.

REASONS FOR CHANGES TO GIP, PART II, SECTION 9

Listed below are the specific reasons for making the changes marked with a vertical line in the margin of this section 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 section where the changes are made.

¹ SSER No. 2, Sec. II.4.1 – The Staff position is that the licensee must commit to both the SQUG commitments and the use of the entire implementation guidance provided in GIP-2, unless otherwise justified to the staff as described in GIP-2 and SSER No. 2.

The GIP has been amended in the “SQUG Commitments” sections of Part II to reiterate the requirement contained in the GIP, Part I, Section 1.3 to (1) provide written justification to the NRC for prior approval of any substantial deviations from the SQUG commitments and (2) notify the NRC of significant or programmatic deviations from the GIP guidance no later than the summary report.

² SSER No. 2, Sec. II.2 and II.9 – The Staff recommends that where judgments are needed to determine the seismic adequacy of equipment, the assumptions and the basis for the judgmental conclusions should be documented. This will facilitate the reconstruction of relevant bases for the licensee’s evaluations.

The GIP has been amended in Part II, Sections 9.3 and 9.4 to include assumptions and judgements as information that optionally should be documented in the Relay Evaluation Report and the Seismic Evaluation Report.

³ SSER No. 2, Sec. II.4.4.13 – The Staff position is that licensees should provide a reference or basis for the “frequency shifting” method when it is used so that the uncertainty in the natural frequency of the building structure is addressed.

The GIP has been amended in Part II, Sections 4.2, 4.4.3, and 9.4 where use of unbroadened response spectra is discussed to recommend that a reference or basis be included in the plant records for establishing the uncertainty in the estimated natural frequency of the building.