ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1

RESPONSE TO NRC GENERIC LETTER 87-02, SUPPLEMENT 1
TRANSMITTAL OF
SUPPLEMENTAL SAFETY EVALUATION REPORT NO. 2 (SSER No. 2)
ON SQUG GENERIC IMPLEMENTATION PROCEDURE, REVISION 2
AS CORRECTED ON FEBRUARY 14, 1992 (GIP-2)

USI A-46 / SEISMIC IPEEE RELAY EVALUATION
BROWNS FERRY NUCLEAR PLANT UNIT 1

(See attached)

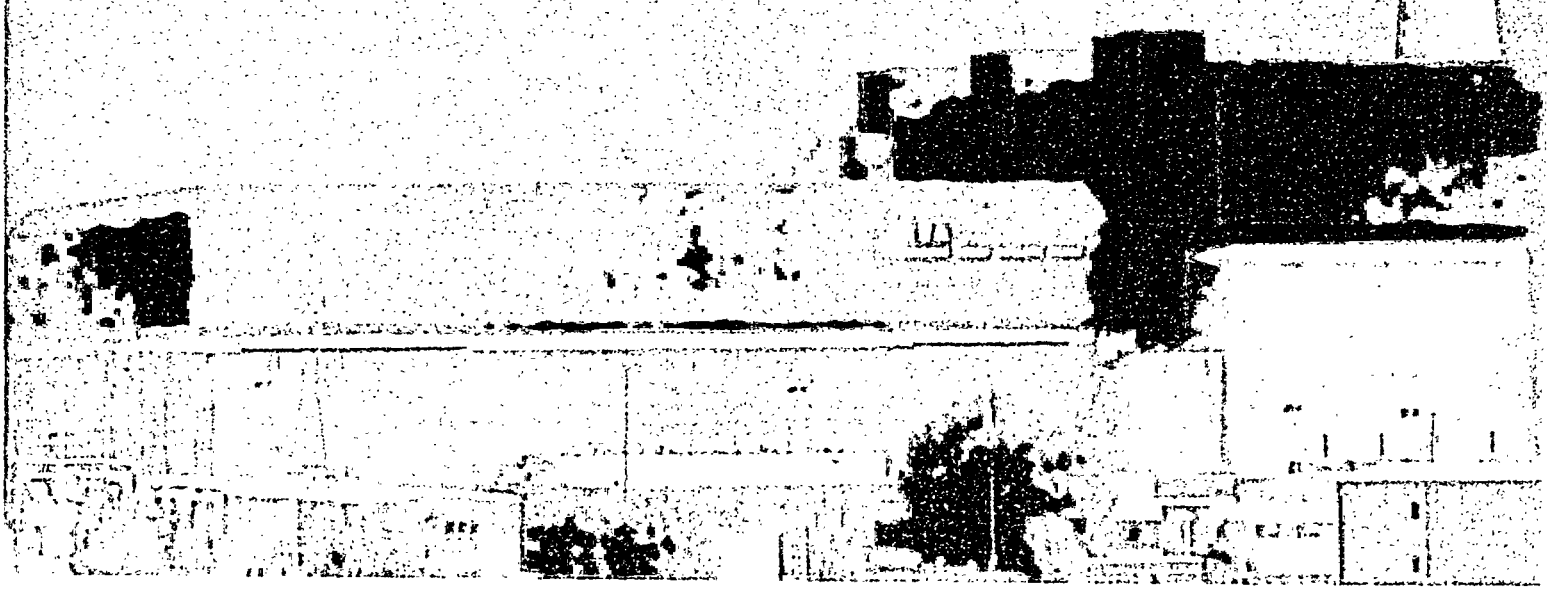
FACILITY RISK
CONSULTANTS, INC.

USI A-46 / SEISMIC IPEEE RELAY EVALUATION BROWNS FERRY NUCLEAR PLANT UNIT 1

Prepared for:

BROWNS FERRY UNIT 1 RESTART PROJECT

January 2004



USI A-46 / SEISMIC IPEEE RELAY EVALUATION BROWNS FERRY NUCLEAR PLANT UNIT 1

Prepared for:

BROWNS FERRY UNIT 1 RESTART PROJECT

Prepared by:

FACILITY RISK CONSULTANTS, INC.

APPROVAL COVER SHEET

Title:	USI A-46 / Seismic IPEEE Relay Evaluation, Browns Ferry Nuclear Plant Unit 1
Report Number:	TVA/BFN-01-R-001
Client:	Browns Ferry Unit 1 Restart Project
Project Number:	TVA/BFN-01

Revision Number	Approval Date	Prepared	Reviewed	Approved
0	1/23/04	Jess O. Betlack	Stephen J. Eder	John O. Dizon

TABLE OF REVISIONS		
Revision No.	**Description of Revision**	**Date**
0	ORIGINAL ISSUE This report contains 99 pages total	1/23/04

EXECUTIVE SUMMARY

The Browns Ferry Nuclear Plant Unit 1(BFN-1) relay evaluation for Unresolved Safety Issue (USI) A-46 and the seismic portion of the Individual Plant Examination for External Events (IPEEE) was performed in accordance with the appropriate industry guidance documents developed by the Seismic Qualification Utility Group (SQUG) and the Electric Power Research Institute (EPRI), and approved by the Nuclear Regulatory Commission (NRC). The relay evaluation also utilized results of the similar relay evaluations for BFN-2 and BFN-3.

In summary, the relay evaluation findings are as follows:

- Inherent ruggedness of contact devices, chatter acceptability and seismic adequacy were sufficient to satisfactorily resolve the seismic acceptability of contact devices affecting the USI A-46 Safe Shutdown Equipment List (SSEL) components.
- No outliers were identified in the evaluation.
- No low ruggedness (bad actor) relays were found to be essential relays.
- No operator actions were identified in the evaluation as necessary to correct relay-chatter-caused malfunctions.

Essential relays and the cabinets housing those essential relays were identified for the seismic capability engineers performing the seismic verification walkdowns and evaluations.

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1. INTRODUCTION

This report documents the combined USI A-46 and Seismic IPEEE relay evaluations for the Browns Ferry Nuclear Plant Unit 1 (BFN-1). The evaluation was performed to assess the seismic adequacy of relays and other contact devices in the control circuits of equipment selected to bring the plant to safe shutdown in the event of an earthquake. It was performed in accordance with guidance documents discussed below and followed the approach discussed in Chapter 3. The evaluation provides traceability between each safe shutdown system component, the relays, including contact devices, that effect control of that component and the seismic adequacy of those relays.

Seismic adequacy of equipment in operating nuclear power plants was identified as a potential safety concern in U. S. Nuclear Regulatory Commission Unresolved Safety Issue (USI) A-46, "Seismic Qualification of Equipment in Operating Nuclear Power Plants." In response to this issue, a number of nuclear plant owners formed the Seismic Qualification Utility Group (SQUG). SQUG undertook a pilot program to show the feasibility of using earthquake experience data to demonstrate the seismic adequacy of similar equipment in nuclear power plants. The Senior Seismic Review and Advisory Panel (SSRAP), the NRC staff and the Advisory Committee for Reactor Safeguards (ACRS) reviewed and concurred in the SQUG results. As a consequence, the NRC plan for demonstrating seismic adequacy of equipment in operating nuclear plants, Generic Letter 87-02 (Reference 6-1) is based on the use of seismic experience data. The SQUG developed methodology for performing this verification is documented in the Generic Implementation Procedure (GIP, Reference 6-2).

The functionality of electrical relays during the strong motion period of an earthquake, however, cannot be readily ascertained because the most common seismic failure mode is contact chatter during the strong motion with little evidence of the occurrence afterward. Accordingly, SQUG, working with the Electric Power Research Institute (EPRI) developed a methodology to evaluate relays. This methodology is documented in the "Procedure for Evaluating Nuclear Power Plant Relay Seismic Functionality," EPRI NP-7148-SL (Reference 6-3). This methodology and report were reviewed and approved by the NRC staff and a four member NRC staff relay review group. Three

changes resulting from the NRC Supplemental Safety Evaluation Report Number 2 (SSER-2) to the GIP were incorporated in an Addendum to EPRI NP-7148-SL (Reference 6-4). The overall approach of the relay screening and evaluation procedure is to narrow the scope of relays to those that affect each component required for safe shutdown so that only a minimum number of essential relays need to be examined for seismic adequacy. Seismic capacity versus demand assessments are then made for these essential relays.

NRC relay review guidance for the Individual Plant Examination of External Events (IPEEE) for severe accident vulnerabilities, Generic Letter 88-20 (Reference 6-4) and NUREG 1407 (Reference 6-6) also include the use of EPRI NP-7148-SL. For focused scope plants such as BFN-1, NUREG 1407 recommends a "bad actors" review for the relays affecting additional IPEEE designated components. The "bad actors" are low ruggedness relays listed in Appendix E of EPRI NP-7148-SL and a check for them is included as one of the steps of the NP-7148 procedure. Accordingly, a "bad actor" check is made as part of the A-46 review of all SSEL components.

1.1 Report Organization

This report is organized as follows. Chapter 2 provides the overall summary and conclusions from the relay review for USI A-46 and IPEEE. The approach used for the relay evaluation is described in Chapter 3. The relay safe shutdown equipment list is provided in Chapter 4. The detailed results of the relay screening and evaluation are provided in Chapter 5. This includes the G.4 forms signed by the relay reviewers. References are listed in Chapter 6.

There are 6 Appendices to this report. Appendix A contains a summary of the in-structure floor response spectra for BFN-1. Appendix B provides descriptions of the systems, circuits, and components reviewed. The essential relay list generated by this relay evaluation is provided in Appendix C. The relays that were screened using the switchgear GERS are summarized in Appendix D. Walkdown results are summarized in Appendix E. This includes example photographs of relay mounting configurations. The cabinets that house essential relays are listed in Appendix F. Photographs of the essential relay cabinets are also provided.

2. SUMMARY AND CONCLUSIONS

The BFN-1 relay evaluation was performed in accordance with EPRI NP-7148-SL (Reference 6-3) and other guidance discussed in Chapter 1. It included certain special evaluation methods discussed in Chapter 3 since BFN-1 is essentially identical to BFN-2 and BFN-3 which have been previously evaluated and some BFN-1 equipment is shared with BFN-2 and BFN-3. Equipment items common to BFN-2 and BFN-3 which were evaluated in the BFN-2 and BFN-3 evaluation are reported in Reference 6-7 and were not reevaluated or included in this report.

Traceability between each relay SSEL component of Chapter 4 is provided on the G.4 tabulation forms (see Chapter 5 of this report). This includes traceability from the component identification to the appropriate control circuit drawings, to each contact of contact devices affecting the component control and the resultant resolution for those contact devices. Appendices A through F provide supporting and summary information for the evaluations tabulated on the G.4 forms.

The relay evaluation findings are as follows:

- Inherent ruggedness of contact devices, chatter acceptability and seismic adequacy were sufficient to satisfactorily resolve the seismic acceptability of contact devices affecting the SSEL components.
- No outliers were identified in the evaluation.
- No low ruggedness (bad actor) relays were found to be essential relays.
- No operator actions were identified in the evaluation as necessary to correct relay-chatter-caused malfunctions. Note that the Unit 2 & 3 report (Reference 6-7) includes some operator actions for equipment common to Unit 1. However, those actions were found to be acceptable by the SER (Reference 6-8) and that equipment was not reevaluated or included in this report.

Essential relays were identified (see Appendix C of this report). The cabinets housing the essential relays were also identified (see Appendix F of this report). This information was provided to the seismic capability engineers performing the seismic verification walkdowns and evaluations. The anchorage and structural inspection

corrective actions will address any structural or anchorage modifications necessary to resolve relay cabinet, panel or mounting inadequacies. These corrective actions will be included in the anchorage and structural inspection Screening Evaluation Work Sheets (SEWS) prepared by the seismic capability engineers performing the USI A-46 walkdowns for BFN-1 as documented in WDP-CEB-1-A46/Seismic IPEEE (Reference 6-16).

3. APPROACH

The EPRI NP-7148-SL methodology was used in performing the Browns Ferry Nuclear Plant Unit 1 (BFN-1) relay evaluation. In general the methodology consists of the following steps:

1. Examine the control circuits for the safe shutdown system components.
2. Screen out non-essential relays using systems and circuit evaluation techniques. Also screen out contact devices such as large switches, which are considered not vulnerable to seismic motion and relays considered inherently rugged such as solid state relays.
3. Assess the seismic adequacy of the remaining, essential relays.
4. Provide a traceable documentation of the evaluation.
5. For IPEEE additional components, perform a "bad actors" review.

Certain additional special evaluation methods were utilized for BFN-1 since it is essentially identical to BFN-2 and BFN-3 which have already been reviewed. This commonality is documented in the BFN Final Safety Analysis Report (FSAR), which applies to all three units, and based on safe shutdown equipment identification and seismic verification walkdowns of the equipment. These special case evaluation methods included:

1. Maintain compatibility with BFN-2 and BFN-3 by utilizing the BFN-2 and BFN-3 USI A-46/IPEEE review results, resolutions, calculations, Request for Additional Information (RAI) responses and conclusions of the NRC issued SER (Reference 6-8) for that review.
2. Do not reevaluate BFN-1 equipment common to BFN-2 or BFN-3 which was evaluated in the prior review for those units.
3. Utilize qualification data for new replacement switchgear, MCC buckets and relays which are being purchased as qualified equipment. Note that this planned evaluation method was not used because during the evaluation, replacement switchgear, MCC buckets and relays had not yet been installed. Accordingly, installed equipment was evaluated. However, TVA

design criteria BFN-50-C-7105 (Reference 6-14) specifies that new equipment is qualified by current or USI A-46 methods, so the new equipment will maintain or improve the seismic ruggedness of the safe shutdown equipment.

The G.4 forms of Chapter 5 provide a traceable evaluation path from each component on the SSEL of Chapter 4. For each SSEL component, the control circuit drawings which identify the contact devices affecting the operation of that device are listed. These drawings were reviewed and the contacts of those devices which affect component operation are identified. EPRI NP- 7148 screening and evaluation methods were then applied to arrive at a resolution which is noted on the G.4 forms. Supporting information and discussions are provided on the G.4 forms and in the appendices of Chapter 7.

Often more than one screening method can be used. Usually one method is simpler or more efficient. Two of the screening methods were chosen whenever possible. Chatter acceptable screening is used for cases in which contact chatter leads to an acceptable system or component safe shutdown state. This screening method is useful for contact devices where the seismic demand is high or when seismic capacity data is not available. An additional benefit of chatter acceptable screening is that it reduces the number of essential relays, which are those that must pass a seismic capacity versus demand screen, and it reduces the number of panels and cabinets having essential relays. This in turn reduces walkdown efforts. Appendices B and C of EPRI NP-7148 provide numerous examples of chatter acceptable screening. These examples were reviewed and approved for chatter acceptable screening guidance by the NRC staff and a four member NRC staff relay review group.

For safety systems such as reactor protection, ECCS and containment isolation, relay chatter in the control logic may cause actuation of the system, just as a valid initiation signal would. Chatter in failsafe systems such as reactor protection and containment isolation, however, will not prevent or reverse the actuation of the system. These design features provide the basis for the use of relay chatter acceptability for the initiation logic of these systems. Although USI A-46 does not assume a Loss of Cooling Accident (LOCA), initiation of the ECCS is acceptable, and may be desirable for some situations. These fluid systems have protective features to prevent damage

during unneeded operation and operators in the control room can shut down any of the ECCS not needed.

The second screening method chosen whenever possible is the Level 1 screen. This seismic acceptability screen was developed as a simple screen for cases in which high capacity relays are located low in the plant. Specific criteria for this screening method are discussed in EPRI NP-7148, Section 3.6. In general, relay contacts with a seismic capacity of 8g or more located less than about 40 feet above grade satisfy the Level 1 seismic adequacy screen. The 8g capacity screen can be used for most panels and cabinets when the other Level 1 criteria are met. For moderate capacity relays, a 5g screen can be applied when the relay is in a low amplification cabinet or panel and the other Level 1 criteria are met. Appendix I of EPRI NP-7148 provides guidance in determining cabinet and panel amplification categories.

4. SAFE SHUTDOWN SYSTEM COMPONENTS

The safe shutdown system components for relay evaluation listed in this Chapter are evaluated and results are provided on the G.4 forms in Chapter 5. The method of selecting and the bases for the selection of the components are provided in Reference 6-9. Table 4-1 provides the relay SSEL for the mechanical equipment components. Table 4-2 provides the relay SSEL for electrical equipment components.

In Tables 4-1 and 4-2, items with a single strikethrough drawn through (~~example~~) are on the composite SSEL but are not on the relay SSEL. Items with a double strikethrough (~~example~~) are those specifically associated with the diesel generator systems. The diesel generator systems are not included on the relay SSEL because they are common to Unit 2, were evaluated in the BFN-2 and BFN-3 relay evaluation, and were specifically addressed in the SER (Reference 6-8).

TABLE 4-1: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
10001	00	1-HCU-85,1-185	CRD/HYDRAULIC CONTROL UNIT	U1 RB	565
10002	07	1-FCV-85-82A	CRD/WEST SDV VENT VALVE	U1 RB	565
10003	07	1-FCV-85-82	CRD/WEST SDV VENT VALVE	U1 RB	565
10004	07	1-FCV-85-37C	CRD/WEST SDV DRAIN VALVE	U1 RB	565
10005	07	1-FCV-85-37D	CRD/WEST SDV DRAIN VALVE	U1 RB	565
10006	07	1-FCV-85-83A	CRD/EAST SDV VENT VALVE	U1 RB	565
10007	07	1-FCV-85-83	CRD/EAST SDV VENT VALVE	U1 RB	565
10008	07	1-FCV-85-37E	CRD/EAST SDV DRAIN VALVE	U1 RB	565
10009	07	1-FCV-85-37F	CRD/EAST SDV DRAIN VALVE	U1 RB	565
~~10010~~	~~21~~	~~1-TNK-85-901~~	~~CRD/WEST SCRAM INSTRUMENT VOLUME~~	~~U1 RB~~	~~565~~
~~10011~~	~~21~~	~~1-TNK-85-902~~	~~CRD/EAST SCRAM INSTRUMENT VOLUME~~	~~U1 RB~~	~~565~~
10012	08B	1-FSV-85-37A	CRD/SCRAM DUMP VALVE	U1 RB	565
10013	08B	1-FSV-85-37B	CRD/SCRAM DUMP VALVE	U1 RB	565
10014	08B	1-FSV-85-35A	CRD/BACKUP SCRAM VALVE	U1 RB	565
10015	08B	1-FSV-85-35B	CRD/BACKUP SCRAM VALVE	U1 RB	565
10016	20	1-HS-99-5A/S1A	RPS/REACTOR MANUAL SCRAM CHANNEL A1	U1 CB	617
10017	20	1-HS-99-5A/S1B	RPS/REACTOR MANUAL SCRAM CHANNEL B1	U1 CB	617
10018	20	1-HS-99-5A-S1	RPS/REACTOR MODE SWITCH	U1 CB	617
10019	8B	1-FSV-85-70A	CRD/BACKUP PILOT SCRAM VALVE 'A'	U1 RB	565
10020	8B	1-FSV-85-70B	CRD/ BACKUP PILOT SCRAM VALVE 'B'	U1 RB	565
~~10021~~	~~R~~	~~1-CKV-85-330~~	~~CRD/ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~10022~~	~~R~~	~~1-CKV-85-576~~	~~CRD/ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
10023	8B	1-FSV-85-39A	CRD/ISOLATION VALVE	U1 RB	565
10024	8B	1-FSV-85-39B	CRD/ISOLATION VALVE	U1 RB	565
10025	18	1-PI-85-88	PRESSURE INDICATOR	U1 RB	565
10026	18	1-PI-85-89	PRESSURE INDICATOR	U1 RB	565
10027	18	1-PI-85-90	PRESSURE INDICATOR	U1 RB	565
~~10028~~	~~R~~	~~1-CKV-85-597~~	~~CRD/ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~10029~~	~~R~~	~~1-CKV-85-616~~	~~CRD/ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
11001	08A	1-FCV-74-1	RHR/PUMP 1A SUCTION VALVE FROM SUPRESSION POOL	U1 RB	519
11002	08A	1-FCV-74-2	RHR/PUMP 1A SUCTION VALVE FROM SHUTDOWN COOLING	U1 RB	519
11003 *	08A	2-FCV-74-96 *	RHR/U2 TO U1 RHR X-TIE ISOLATION VALVE	U2 RB	519
11004	06	1-PMP-74-5	RHR/PUMP 1A	U1 RB	519
~~11005~~	~~R~~	~~1-CKV-74-560A~~	~~RHR/PUMP 1A MINIMUM FLOW CHECK VALVE~~	~~U1 RB~~	~~519~~
11006	08A	1-FCV-74-7	RHR/PUMP 1A & 1C MINIMUM FLOW VALVE	U1 RB	519
~~11007~~	~~R~~	~~1-CKV-171-547~~	~~RCIC/RCIC MINIMUM FLOW CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11008~~	~~R~~	~~1-CKV-74-559A~~	~~RHR/PUMP 1A DISCHARGE CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11009~~	~~21~~	~~1-HEX-74-900A~~	~~RHR/HEAT EXCHANGER 1A~~	~~U1 RB~~	~~565~~
11010 *	08A	2-FCV-74-100 *	RHR/U2 TO U1 RHR DISCHARGE X-TIE ISOLATION VALVE (A,C)	U2 RB	565
11011	08A	1-FCV-74-12	RHR/PUMP 1C SUCTION VALVE FROM SUPRESSION POOL	U1 RB	519
11012	08A	1-FCV-74-13	RHR/PUMP 1C SUCTION VALVE FROM SHUTDOWN COOLING	U1 RB	519
11013 *	08A	2-FCV-74-97 *	RHR/U2 TO U1 RHR X-TIE ISOLATION VALVE	U2 RB	519

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
11014	06	1-PMP-74-16	RHR/PUMP 1C	U1 RB	519
~~11015~~	~~R~~	~~1-CKV-74-560C~~	~~RHR/PUMP 1C MINIMUM FLOW CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11016~~	~~R~~	~~1-CKV-74-559C~~	~~RHR/PUMP 1C DISCHARGE CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11017~~	~~21~~	~~1-HEX-74-900C~~	~~RHR/HEAT EXCHANGER 1C~~	~~U1 RB~~	~~565~~
11018	18	1-FI-74-50	RHR/LOOP I FLOW INDICATOR	U1 RB	519
11019	18	1-FI-74-56	RHR/LOOP I FLOW INDICATOR	U1 RB	519
11020	08A	1-FCV-74-57	RHR/LOOP I TORUS CONTAINMENT COOLING/SPRAY VALVE	U1 RB	519
11021	08A	1-FCV-74-59	RHR/LOOP I SUPRESSION POOL COOLING VALVE	U1 RB	519
11022	08A	1-FCV-74-58	RHR/LOOP I SUPRESSION POOL SPRAY VALVE	U1 RB	519
11023	08A	1-FCV-74-52	RHR/LOOP I OUTBOARD INJECTION VALVE	U1 RB	565
11024	08A	1-FCV-74-53	RHR/LOOP I INBOARD INJECTION VALVE	U1 RB	565
11025	R	1-FCV-74-54	RHR/LOOP I TESTABLE CHECK VALVE	U1 DW	
11026	08A	1-FCV-78-61	FPC/SPENT FUEL POOL COOLING X-TIE TO RHR	U1 RB	621
11027	08A	1-FCV-74-60	RHR/LOOP I OUTBOARD DRYWELL SPRAY VALVE	U1 RB	565
11028	08A	1-FCV-74-61	RHR/LOOP I INBOARD DRYWELL SPRAY VALVE	U1 RB	565
11029	08A	1-FCV-74-24	RHR/PUMP 1B SUCTION VALVE FROM SUPRESSION POOL	U1 RB	519
11030	08A	1-FCV-74-25	RHR/PUMP 1B SUCTION VALVE FROM SHUTDOWN COOLING	U1 RB	519
11031	06	1-PMP-74-28	RHR/PUMP 1B	U1 RB	519
~~11032~~	~~R~~	~~1-CKV-74-560B~~	~~RHR/PUMP 1B MINIMUM FLOW CHECK VALVE~~	~~U1 RB~~	~~519~~
11033	08A	1-FCV-74-30	RHR/PUMP 1B & 1D MINIMUM FLOW VALVE	U1 RB	519
~~11034~~	~~R~~	~~1-CKV-73-559~~	~~HPCI/HPCI PUMP MINIMUM FLOW CHECK VALVE~~	~~U1 RB~~	
~~11035~~	~~R~~	~~1-CKV-74-559B~~	~~RHR/PUMP 1B DISCHARGE CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11036~~	~~21~~	~~1-HEX-74-900B~~	~~RHR/HEAT EXCHANGER 1B~~	~~U1 RB~~	~~565~~
11037	08A	1-FCV-74-35	RHR/PUMP 1D SUCTION VALVE FROM SUPRESSION POOL	U1 RB	519
11038	08A	1-FCV-74-36	RHR/PUMP 1D SUCTION VALVE FROM SHUTDOWN COOLING	U1 RB	519
11039	06	1-PMP-74-39	RHR/PUMP 1D	U1 RB	519
~~11040~~	~~R~~	~~1-CKV-74-560D~~	~~RHR/PUMP 1D MINIMUM FLOW CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11041~~	~~R~~	~~1-CKV-74-559D~~	~~RHR/PUMP 1D DISCHARGE CHECK VALVE~~	~~U1 RB~~	~~519~~
~~11042~~	~~21~~	~~1-HEX-74-900D~~	~~RHR/HEAT EXCHANGER 1D~~	~~U1 RB~~	~~565~~
11043	18	1-FI-74-64	RHR/LOOP II FLOW INDICATOR	U1 RB	519
11044	18	1-FI-74-70	RHR/LOOP II FLOW INDICATOR	U1 RB	519
11045	08A	1-FCV-74-71	RHR/LOOP II TORUS CONTAINMENT COOLING/SPRAY VALVE	U1 RB	519
11046	08A	1-FCV-74-73	RHR/LOOP II SUPRESSION POOL COOLING VALVE	U1 RB	519
11047	08A	1-FCV-74-72	RHR/LOOP II SUPRESSION POOL SPRAY VALVE	U1 RB	519
11048	08A	1-FCV-74-66	RHR/LOOP II OUTBOARD INJECTION VALVE	U1 RB	565
11049	08A	1-FCV-74-67	RHR/LOOP II INBOARD INJECTION VALVE	U1 RB	565
11050	R	1-FCV-74-68	RHR/LOOP II TESTABLE CHECK VALVE	U1 DW	
11051	08A	1-FCV-74-74	RHR/LOOP II OUTBOARD DRYWELL SPRAY VALVE	U1 RB	593
11052	08A	1-FCV-74-75	RHR/LOOP II INBOARD DRYWELL SPRAY VALVE	U1 RB	593
11053	08A	1-FCV-74-101	RHR/U2 TO U1 RHR DISCHARGE X-TIE ISOLATION VALVE (B,D)	U1 RB	565

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
12001	07	1-PCV-1-4	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12002~~	~~R~~	~~1-CKV-10-521~~	~~RVVD/MSRV 1-4 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12003	07	1-PCV-1-5	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12004~~	~~R~~	~~1-CKV-10-507~~	~~RVVD/MSRV 1-5 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12005~~	~~R~~	~~1-CKV-10-522~~	~~RVVD/MSRV 1-5 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12006	07	1-PCV-1-18	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12007~~	~~R~~	~~1-CKV-10-508~~	~~RVVD/MSRV 1-18 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12008~~	~~R~~	~~1-CKV-10-523~~	~~RVVD/MSRV 1-18 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12009	07	1-PCV-1-19	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12010~~	~~R~~	~~1-CKV-10-509~~	~~RVVD/MSRV 1-19 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12011~~	~~R~~	~~1-CKV-10-524~~	~~RVVD/MSRV 1-19 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12012	07	1-PCV-1-22	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12013~~	~~R~~	~~1-CKV-10-510~~	~~RVVD/MSRV 1-22 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12014~~	~~R~~	~~1-CKV-10-525~~	~~RVVD/MSRV 1-22 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12015	07	1-PCV-1-23	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12016~~	~~R~~	~~1-CKV-10-511~~	~~RVVD/MSRV 1-23 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12017~~	~~R~~	~~1-CKV-10-526~~	~~RVVD/MSRV 1-23 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12018	07	1-PCV-1-179	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12019~~	~~R~~	~~1-CKV-10-519~~	~~RVVD/MSRV 1-179 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12020~~	~~R~~	~~1-CKV-10-532~~	~~RVVD/MSRV 1-179 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12021	07	1-PCV-1-30	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12022~~	~~R~~	~~1-CKV-10-512~~	~~RVVD/MSRV 1-30 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12023~~	~~R~~	~~1-CKV-10-527~~	~~RVVD/MSRV 1-30 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12024	07	1-PCV-1-31	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12025~~	~~R~~	~~1-CKV-10-513~~	~~RVVD/MSRV 1-31 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12026~~	~~R~~	~~1-CKV-10-528~~	~~RVVD/MSRV 1-31 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12027	07	1-PCV-1-34	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12028~~	~~R~~	~~1-CKV-10-514~~	~~RVVD/MSRV 1-34 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12029~~	~~R~~	~~1-CKV-10-529~~	~~RVVD/MSRV 1-34 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12030	07	1-PCV-1-41	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12031~~	~~R~~	~~1-CKV-10-515~~	~~RVVD/MSRV 1-41 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12032~~	~~R~~	~~1-CKV-10-530~~	~~RVVD/MSRV 1-41 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12033	07	1-PCV-1-42	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12034~~	~~R~~	~~1-CKV-10-516~~	~~RVVD/MSRV 1-42 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12035~~	~~R~~	~~1-CKV-10-531~~	~~RVVD/MSRV 1-42 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
12036	07	1-PCV-1-180	MS/MAIN STEAM SAFETY RELIEF VALVE	U1 DW	584
~~12037~~	~~R~~	~~1-CKV-10-520~~	~~RVVD/MSRV 1-180 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12038~~	~~R~~	~~1-CKV-10-506~~	~~RVVD/MSRV 1-4 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
~~12039~~	~~R~~	~~1-CKV-10-533~~	~~RVVD/MSRV 1-180 DISCHARGE LINE VACUUM BKR~~	~~U1 DW~~	
13001	07	1-FCV-1-14	MSIV "A" INBOARD ISOLATION VALVE	U1 DW	563
13002	07	1-FCV-1-15	MSIV "A" OUTBOARD ISOLATION VALVE	U1 RB	564
13003	07	1-FCV-1-26	MSIV "B" INBOARD ISOLATION VALVE	U1 DW	563
13004	07	1-FCV-1-27	MSIV "B" OUTBOARD ISOLATION VALVE	U1 RB	564
13005	07	1-FCV-1-37	MSIV "C" INBOARD ISOLATION VALVE	U1 DW	563
13006	07	1-FCV-1-38	MSIV "C" OUTBOARD ISOLATION VALVE	U1 RB	564
13007	07	1-FCV-1-51	MSIV "D" INBOARD ISOLATION VALVE	U1 DW	563

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
13008	07	1-FCV-1-52	MSIV "D" OUTBOARD ISOLATION VALVE	U1 RB	564
13009	08A	1-FCV-1-55	MAIN STEAM LINE DRAIN ISOLATION VALVE	U1 DW	563
~~13010~~	~~R~~	~~1-CKV-3-558~~	~~FEEDWATER "A" INBOARD ISOLATION VALVE~~	~~U1 DW~~	
~~13011~~	~~R~~	~~1-CKV-3-554~~	~~FEEDWATER "A" OUTBOARD ISOLATION VALVE~~	~~U1 RB~~	
~~13012~~	~~R~~	~~1-CKV-3-572~~	~~FEEDWATER "B" INBOARD ISOLATION VALVE~~	~~U1 DW~~	
~~13013~~	~~R~~	~~1-CKV-3-568~~	~~FEEDWATER "B" OUTBOARD ISOLATION VALVE~~	~~U1 RB~~	
13014	07	1-FCV-32-63	DRYWELL CONTROL AIR SUCTION VALVE	U1 RB	565
13015	07	1-FCV-64-17	CONTAINMENT VENTILATION ISOLATION VALVE	U1 RB	565
13016	07	1-FCV-64-30	CONTAINMENT VENTILATION ISOLATION VALVE	U1 RB	621
13017	07	1-FCV-64-33	CONTAINMENT VENTILATION ISOLATION VALVE	U1 RB	565
13018	07	1-FCV-64-139	CONTAINMENT DW DP ISOLATION VALVE	U1 RB	565
13019	07	1-FCV-64-140	CONTAINMENT DW DP ISOLATION VALVE	U1 RB	565
13020	07	1-FCV-64-28A	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13021	07	1-FCV-64-28B	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13022	07	1-FCV-64-28C	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13023	07	1-FCV-64-28D	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13024	07	1-FCV-64-28E	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13025	07	1-FCV-64-28F	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13026	07	1-FCV-64-28G	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13027	07	1-FCV-64-28H	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13028	07	1-FCV-64-28J	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13029	07	1-FCV-64-28K	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13030	07	1-FCV-64-28L	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13031	07	1-FCV-64-28M	SUPPRESSION CHAMBER/DRYWELL VACUUM BREAKERS	U1 DW	<550
13032	08A	1-FCV-69-1	RWCU INBOARD ISOLATION VALVE	U1 DW	584
13033	08A	1-FCV-69-2	RWCU OUTBOARD ISOLATION VALVE	U1 RB	593
~~13034~~	~~R~~	~~1-CKV-69-579~~	~~RWCU SYSTEM RETURN CHECK VALVE~~	~~U1 RB~~	
13035	08A	1-FCV-70-47	RBCCW DRYWELL RETURN VALVE	U1 RB	519
~~13036~~	~~R~~	~~1-CKV-70-506~~	~~RBCCW DRYWELL SUPPLY CHECK VALVE~~	~~U1 RB~~	
13037	08A	1-FCV-71-2	RCIC INBOARD ISOLATION VALVE	U1 DW	584
13038	08A	1-FCV-71-3	RCIC OUTBOARD ISOLATION VALVE	U1 RB	565
13039	08A	1-FCV-71-18	RCIC OUTBOARD SUCTION VALVE	U1 RB	519
13040	08A	1-FCV-73-2	HPCI STEAM SUPPLY ISOLATION VALVE	U1 DW	563
13041	08A	1-FCV-73-3	HPCI STEAM SUPPLY ISOLATION VALVE	U1 RB	519
13042	08A	1-FCV-73-81	HPCI STEAM SUPPLY ISOLATION BYPASS VALVE	U1 RB	519
13043	08A	1-FCV-73-27	HPCI OUTBOARD SUCTION VALVE	U1 RB	519
13044	07	1-FCV-75-57	PSC PUMP SUCTION ISOLATION VALVE	U1 RB	519

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
13045	07	1-FCV-75-58	PSC PUMP SUCTION ISOLATION VALVE	U1 RB	519
13046	07	1-FCV-76-24	PRIMARY CONTAINMENT ISOLATION VALVE	U1 RB	565
13047	07	1-FCV-77-2B	DRYWELL FLOOR DRAIN SUMP DISCHARGE	U1 RB	519
13048	07	1-FCV-77-15B	DRYWELL EQUIPMENT DRAIN SUMP DISCHARGE	U1 RB	519
13049	07	1-FCV-84-19	CAD ISOLATION VALVE	U1 RB	621
13050	07	1-FCV-84-20	CAD ISOLATION VALVE	U1 RB	621
13051	20	1-LI-3-58A	RPV LEVEL INSTRUMENT	U1 CB	617
13052	20	1-LI-3-58B	RPV LEVEL INSTRUMENT	U1 CB	617
13053	20	1-PI-3-74A	RPV PRESSURE INSTRUMENT	U1 CB	617
13054	20	1-PI-3-74B	RPV PRESSURE INSTRUMENT	U1 CB	617
13055	20	1-XR-64-159	TORUS LEVEL AND DRYWELL PRESSURE INSTRUMENT	U1 CB	617
13056	20	1-LI-64-159A	TORUS LEVEL INSTRUMENT	U1 CB	617
13057	20	1-TI-64-161	TORUS TEMPERATURE INSTRUMENT	U1 CB	617
13058	20	1-TI-64-162	TORUS TEMPERATURE INSTRUMENT	U1 CB	617
13059	20	1-PI-64-67B	DRYWELL PRESSURE INSTRUMENT	U1 CB	617
13060	20	1-PI-64-160A	DRYWELL PRESSURE INSTRUMENT	U1 CB	617
13061	20	1-TI-64-52A/B	DRYWELL TEMPERATURE INSTRUMENT	U1 CB	617
13062	20	1-XR-64-50	DRYWELL TEMPERATURE AND PRESSURE INSTRUMENT	U1 CB	617
13063	07	1-FCV-76-17	CONTAINMENT INERTING N2 MAKEUP	U1 RB	565
13064	07	1-FCV-64-222	HARDENED WETWELL VENT	U1 RB	565
13065	20	1-NM-92-7/41A	CHANNEL "A" IRM INDICATOR	U1 CB	617
13066	20	1-NM-92-7/41B	CHANNEL "B" IRM INDICATOR	U1 CB	617
~~13067~~	~~R~~	~~1-CKV-63-525~~	~~PRIMARY CONTAINMENT ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~13068~~	~~R~~	~~1-CKV-63-526~~	~~PRIMARY CONTAINMENT ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
13069	08A	1-FCV-71-40	PRIMARY CONTAINMENT ISOLATION VALVE	U1 RB	565
~~13070~~	~~R~~	~~1-CKV-71-580~~	~~PRIMARY CONTAINMENT ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~13071~~	~~R~~	~~1-CKV-71-592~~	~~PRIMARY CONTAINMENT ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~13072~~	~~R~~	~~1-CKV-73-603~~	~~PRIMARY CONTAINMENT ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~13073~~	~~R~~	~~1-CKV-73-609~~	~~PRIMARY CONTAINMENT ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
13074	08A	1-FCV-71-17	RCIC INBOARD SUCTION VALVE	U1 RB	519
13075	08A	1-FCV-1-56	MAIN STEAM LINE DRAIN ISOLATION VALVE	U1 RB	565
13076	08A	1-FCV-73-26	HPCI INBOARD SUCTION VALVE	U1 RB	519
~~13077~~	~~R~~	~~1-CKV-73-517~~	~~HPCI CHECK VALVE~~	~~U1 RB~~	~~519~~
13078	20	1-XR-64-156	TORUS LEVEL AND DRYWELL PRESSURE INSTRUMENT	U1 CB	617
13079	07	1-FCV-32-62	DRYWELL CONTROL AIR SUCTION VALVE	U1 RB	565
13080	07	1-FCV-77-2A	DRYWELL FLOOR DRAIN SUMP DISCHARGE	U1 RB	519
13081	07	1-FCV-77-15A	DRYWELL EQUIPMENT DRAIN SUMP DISCHARGE	U1 RB	519
13082	07	1-FCV-64-18	COOLING/PURGE AIR TO DRYWELL	U1 RB	565
13083	07	1-FCV-64-19	COOLING/PURGE AIR TO SUPPRESSION CHAMBER	U1 RB	565
13084	07	1-FCV-76-18	CONTAINMENT INERTING DRYWELL N2 MAKEUP VALVE	U1 RB	565
13085	07	1-FCV-76-19	CONTAINMENT INERTING - PSC N2 MAKEUP VALVE	U1 RB	565
14001	10	1-CLR-67-917	EECW/RHR PUMP 1A ROOM COOLER	U1 RB	519
14002	10	1-CLR-67-919	EECW/CS PUMP 1A ROOM COOLER	U1 RB	519

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
14003	10	1-CLR-67-921	EECW/RHR PUMP 1C ROOM COOLER	U1 RB	519
~~14004~~	~~21~~	~~1-HEX-67-915~~	~~EECW/RHR SEAL HX 1A~~	~~U1 RB~~	~~519~~
~~14005~~	~~R~~	~~1-CKV-67-638~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO A & C RHR~~	~~U1 RB~~	~~565~~
~~14006~~	~~R~~	~~1-CKV-67-639~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO A & C RHR~~	~~U1 RB~~	~~565~~
~~14007~~	~~R~~	~~1-CKV-67-648~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO A CS~~	~~U1 RB~~	~~565~~
~~14008~~	~~R~~	~~1-CKV-67-649~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO A CS~~	~~U1 RB~~	~~565~~
~~14009~~	~~R~~	~~1-CKV-67-659~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO B&D RHR~~	~~U1 RB~~	~~565~~
~~14010~~	~~R~~	~~1-CKV-67-660~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO B&D RHR~~	~~U1 RB~~	~~565~~
~~14011~~	~~R~~	~~1-CKV-67-656~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO B CS~~	~~U1 RB~~	~~565~~
~~14012~~	~~R~~	~~1-CKV-67-657~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO B CS~~	~~U1 RB~~	~~565~~
14013	10	1-CLR-67-918	EECW/RHR PUMP 1B ROOM COOLER	U1 RB	519
14014	10	1-CLR-67-920	EECW/CS PUMP 1B ROOM COOLER	U1 RB	519
14015	10	1-CLR-67-922	EECW/RHR PUMP 1D ROOM COOLER	U1 RB	519
~~14016~~	~~21~~	~~1-HEX-67-923~~	~~EECW/RHR SEAL HX 1B~~	~~U1 RB~~	~~519~~
~~14017~~	~~R~~	~~1-CKV-67-558~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO A & C RHR~~	~~U1 RB~~	~~593~~
~~14018~~	~~R~~	~~1-CKV-67-559~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO A & C RHR~~	~~U1 RB~~	~~593~~
~~14019~~	~~R~~	~~1-CKV-67-541~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO A CS~~	~~U1 RB~~	~~593~~
~~14020~~	~~R~~	~~1-CKV-67-542~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO A CS~~	~~U1 RB~~	~~593~~
~~14021~~	~~R~~	~~1-CKV-67-600~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO B & D RHR~~	~~U1 RB~~	~~593~~
~~14022~~	~~R~~	~~1-CKV-67-601~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO B & D RHR~~	~~U1 RB~~	~~593~~
~~14023~~	~~R~~	~~1-CKV-67-584~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO B CS~~	~~U1 RB~~	~~593~~
~~14024~~	~~R~~	~~1-CKV-67-585~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO B CS~~	~~U1 RB~~	~~593~~
~~14025~~	~~21~~	~~1-HEX-67-916~~	~~EECW/RHR SEAL HX 1C~~	~~U1 RB~~	~~519~~
~~14026~~	~~21~~	~~1-HEX-67-924~~	~~EECW/RHR SEAL HX 1D~~	~~U1 RB~~	~~519~~
~~14027~~	~~R~~	~~1-CKV-67-598~~	~~EECW SEAL DISCHARGE CHECK VALVE~~	~~U1 RB~~	~~593~~
~~14028~~	~~R~~	~~1-CKV-67-554~~	~~EECW CHECK VALVE~~	~~U1 RB~~	~~593~~
14031 *	06	0-PMP-23-85	RHRSW PUMP A3	INTAKE	565
~~14032 *~~	~~R~~	~~0-CKV-23-588~~	~~RHRSW PMP A3 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
~~14033 *~~	~~00~~	~~0-STN-67-925~~	~~A EECW PUMP DISCHARGE STRAINER~~	~~INTAKE~~	~~565~~
14034 *	08A	0-FCV-67-1	A EECW PUMP DISCHARGE STRAINER DRAIN VALVE	INTAKE	565
~~14035 *~~	~~R~~	~~0-CKV-67-622~~	~~EECW SYSTEM NORTH HEADER CHECK VALVE~~	~~U1/2 DG~~	~~565~~
~~14040 *~~	~~R~~	~~0-CKV-67-671~~	~~EECW SYSTEM NORTH HEADER CHECK VALVE~~	~~RB~~	~~565~~
14041 *	06	0-PMP-23-91	RHRSW PUMP C3	INTAKE	565

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~14042 *~~	~~R~~	~~0-CKV-23-594~~	~~RHRSW PMP C3 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
~~14043 *~~	~~00~~	~~0-STN-67-927~~	~~C EECW PUMP DISCHARGE STRAINER~~	~~INTAKE~~	~~565~~
14044 *	08A	0-FCV-67-8	C EECW PUMP DISCHARGE STRAINER DRAIN VALVE	INTAKE	565
14045 *	08A	0-FCV-67-49	RHRSW PUMP C1 TO EECW SYSTEM CROSS-CONNECT	INTAKE	565
14046 *	07	1-FCV-67-50	EECW NORTH HEADER BACKUP TO RBCCW	U1 RB	593
14049 *	07	0-FCV-67-53	EECW NORTH HEADER BACKUP TO THE AIR COMPRESSORS	U1 RB	565
~~14058 *~~	~~R~~	~~0-CKV-67-634~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE A DG~~	~~U1/2 DG~~	~~565~~
~~14059 *~~	~~R~~	~~0-CKV-67-635~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE A DG~~	~~U1/2 DG~~	~~565~~
~~14060 *~~	~~R~~	~~0-CKV-67-630~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE B DG~~	~~U1/2 DG~~	~~565~~
~~14061 *~~	~~R~~	~~0-CKV-67-631~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE B DG~~	~~U1/2 DG~~	~~565~~
~~14062 *~~	~~R~~	~~0-CKV-67-624~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE C DG~~	~~U1/2 DG~~	~~565~~
~~14063 *~~	~~R~~	~~0-CKV-67-625~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE C DG~~	~~U1/2 DG~~	~~565~~
~~14064 *~~	~~R~~	~~0-CKV-67-627~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE D DG~~	~~U1/2 DG~~	~~565~~
~~14065 *~~	~~R~~	~~0-CKV-67-628~~	~~EECW NORTH HEADER SUPPLY CHECK VALVE TO THE D DG~~	~~U1/2 DG~~	~~565~~
14071 *	20	0-EI-23-85/3	EECW PUMP A3 AMPERAGE INDICATION	N/A	N/A
14072 *	20	0-EI-23-91/3	EECW PUMP C3 AMPERAGE INDICATION	N/A	N/A
14074 *	06	0-PMP-23-88	RHRSW PUMP B3	INTAKE	565
~~14075 *~~	~~R~~	~~0-CKV-23-591~~	~~RHRSW PMP B3 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
~~14076 *~~	~~00~~	~~0-STN-67-926~~	~~B EECW PUMP DISCHARGE STRAINER~~	~~INTAKE~~	~~565~~
14077 *	08A	0-FCV-67-5	B EECW PUMP DISCHARGE STRAINER DRAIN VALVE	INTAKE	565
~~14078 *~~	~~R~~	~~0-CKV-67-502~~	~~EECW SYSTEM SOUTH HEADER CHECK VALVE~~	~~U1/2 DG~~	~~565~~
~~14083 *~~	~~R~~	~~0-CKV-67-619~~	~~EECW SYSTEM SOUTH HEADER CHECK VALVE~~	~~RB~~	~~565~~
14084 *	06	0-PMP-23-94	RHRSW PUMP D3	INTAKE	565
~~14085 *~~	~~R~~	~~0-CKV-23-597~~	~~RHRSW PMP D3 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
~~14086 *~~	~~00~~	~~0-STN-67-928~~	~~D EECW PUMP DISCHARGE STRAINER~~	~~INTAKE~~	~~565~~
14087 *	08A	0-FCV-67-11	D EECW PUMP DISCHARGE STRAINER DRAIN VALVE	INTAKE	565
14088 *	08A	0-FCV-67-48	RHRSW PUMP D1 TO EECW SYSTEM CROSS-CONNECT	INTAKE	565
14089 *	07	1-FCV-67-51	EECW SYSTEM SOUTH HEADER BACKUP TO RBCCW	U1 RB	565
~~14090 *~~	~~R~~	~~0-CKV-67-528~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE A DG~~	~~U1/2 DG~~	~~565~~
~~14091 *~~	~~R~~	~~0-CKV-67-529~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE A DG~~	~~U1/2 DG~~	~~565~~
~~14092 *~~	~~R~~	~~0-CKV-67-514~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE C DG~~	~~U1/2 DG~~	~~565~~
~~14093 *~~	~~R~~	~~0-CKV-67-515~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE C DG~~	~~U1/2 DG~~	~~565~~

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~14094 *~~	~~R~~	~~0-CKV-67-521~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE B DG~~	~~U1/2 DG~~	~~565~~
~~14095 *~~	~~R~~	~~0-CKV-67-522~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE B DG~~	~~U1/2 DG~~	~~565~~
~~14096 *~~	~~R~~	~~0-CKV-67-507~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE D DG~~	~~U1/2 DG~~	~~565~~
~~14097 *~~	~~R~~	~~0-CKV-67-508~~	~~EECW SOUTH HEADER SUPPLY CHECK VALVE TO THE D DG~~	~~U1/2 DG~~	~~565~~
14098 *	20	0-EI-23-88/3	EECW PUMP B3 AMPERAGE INDICATION	N/A	N/A
14099 *	20	0-EI-23-94/3	EECW PUMP D3 AMPERAGE INDICATION	N/A	N/A
15001	08A	1-FCV-75-2	CS/PUMP 1A SUCTION ISOLATION VALVE	U1 RB	519
15002	06	1-PMP-75-5	CS/PUMP 1A	U1 RB	519
~~15003~~	~~R~~	~~1-CKV-75-537A~~	~~CS/PUMP 1A DISCHARGE CHECK VALVE~~	~~U1 RB~~	
~~15004~~	~~R~~	~~1-CKV-75-5170A~~	~~CS/PUMP 1A MINI-FLOW CHECK VALVE~~	~~U1 RB~~	
15005	08A	1-FCV-75-9	CS/PUMPS 1A & 1C MINI-FLOW VALVE	U1 RB	519
15006	08A	1-FCV-75-11	CS/PUMP 1C SUCTION ISOLATION VALVE	U1 RB	519
15007	06	1-PMP-75-14	CS/PUMP 1C	U1 RB	519
~~15008~~	~~R~~	~~1-CKV-75-537C~~	~~CS/PUMP 1C DISCHARGE CHECK VALVE~~	~~U1 RB~~	
~~15009~~	~~R~~	~~1-CKV-75-5170C~~	~~CS/PUMP 1C MINI-FLOW CHECK VALVE~~	~~U1 RB~~	
15010	08A	1-FCV-75-22	CS/PUMPS 1A & 1C TEST ISOLATION VALVE	U1 RB	519
15011	18	1-FI-75-21	CS/PUMPS 1A & 1C FLOW INDICATOR	U1 RB	
15012	08A	1-FCV-75-23	CS/DIV I OUTBOARD INJECTION VALVE	U1 RB	593
15013	08A	1-FCV-75-25	CS/DIV I INBOARD INJECTION VALVE	U1 RB	593
15014	R	1-FCV-75-26	CS/DIV I TESTABLE CHECK VALVE	U1 DW	
15015	08A	1-FCV-75-30	CS/PUMP 1B SUCTION ISOLATION VALVE	U1 RB	519
15016	06	1-PMP-75-33	CS/PUMP 1B	U1 RB	519
~~15017~~	~~R~~	~~1-CKV-75-537B~~	~~CS/PUMP 1B DISCHARGE CHECK VALVE~~	~~U1 RB~~	
~~15018~~	~~R~~	~~1-CKV-75-5170B~~	~~CS/PUMP 1B MINI-FLOW CHECK VALVE~~	~~U1 RB~~	
15019	08A	1-FCV-75-37	CS/PUMPS 1B & 1D MINI-FLOW VALVE	U1 RB	519
15020	08A	1-FCV-75-39	CS/PUMP 1D SUCTION ISOLATION VALVE	U1 RB	519
15021	06	1-PMP-75-42	CS/PUMP 1D	U1 RB	519
~~15022~~	~~R~~	~~1-CKV-75-537D~~	~~CS/PUMP 1D DISCHARGE CHECK VALVE~~	~~U1 RB~~	
~~15023~~	~~R~~	~~1-CKV-75-5170D~~	~~CS/PUMP 1D MINI-FLOW CHECK VALVE~~	~~U1 RB~~	
15024	08A	1-FCV-75-50	CS/PUMPS 1B & 1D TEST ISOLATION VALVE	U1 RB	519
15025	18	1-FI-75-49	CS/PUMPS 1B & 1D FLOW INDICATOR	U1 RB	
15026	08A	1-FCV-75-51	CS/DIV II OUTBOARD DISCHARGE VALVE	U1 RB	593
15027	08A	1-FCV-75-53	CS/DIV II INBOARD DISCHARGE VALVE	U1 RB	593
15028	R	1-FCV-75-54	CS/DIV II TESTABLE CHECK VALVE	U1 DW	
16001	08B	1-FSV-84-8A	CAD/CAD TO DW (1-FCV-64-18) SOLENOID VALVE	U1 RB	565
16002	08B	1-FSV-84-8B	CAD/CAD TO DW (1-FCV-64-19) SOLENOID VALVE	U1 RB	565
16003	07	1-PREG-84-52	CAD/CAD SYSTEM "A" TO UNIT 1 DRYWELL CONTROL AIR	U1 RB	565
16004	08B	1-FSV-84-48	CAD/CAD SYSTEM "A" TO UNIT 1 DRYWELL CONTROL AIR	U1 RB	565
~~16005~~	~~R~~	~~1-CKV-32-2521~~	~~CA/CHECK VALVE FROM DWCA CMPRSSR TO DRYWELL PATH 1~~	~~U1 RB~~	
~~16006~~	~~R~~	~~1-CKV-32-915~~	~~CA/CHECK VALVE FROM DWCA CMPRSSR TO DRYWELL PATH 2~~	~~U1 DW~~	

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~16007~~	~~R~~	~~1-CKV-32-2515~~	~~CA/CHECK VALVE FROM DWCA CMPRSSR TO DRYWELL PATH 1~~	~~U1 DW~~	
~~16008~~	~~R~~	~~1-CKV-32-872~~	~~CA/DRYWELL CONTROL AIR TO PSV-1-19~~	~~U1 DW~~	
~~16009~~	~~21~~	~~1-ACC-32-6105~~	~~CA/ACCUMULATOR FOR PSV-1-19~~	~~U1 DW~~	~~584~~
16010	08B	1-PSV-1-19	MS/SOLENOID VALVE FOR PCV-1-19	U1 DW	584
~~16011~~	~~R~~	~~1-CKV-32-826~~	~~CA/DRYWELL CONTROL AIR TO PSV-1-22~~	~~U1 DW~~	
~~16012~~	~~21~~	~~1-ACC-32-6107~~	~~CA/ACCUMULATOR FOR PSV-1-22~~	~~U1 DW~~	~~584~~
16013	08B	1-PSV-1-22	MS/SOLENOID VALVE FOR PCV-1-22	U1 DW	584
~~16014~~	~~R~~	~~1-CKV-32-869~~	~~CA/DRYWEWLL CONTROL AIR TO PSV-1-5~~	~~U1 DW~~	
~~16015~~	~~21~~	~~1-ACC-32-6106~~	~~CA/ACCUMULATOR FOR PSV-1-5~~	~~U1 DW~~	~~584~~
16016	08B	1-PSV-1-5	MS/SOLENOID VALVE FOR PCV-1-5	U1 DW	584
16017	08B	1-PSV-1-23	MS/SOLENOID VALVE FOR PCV-1-23	U1 DW	584
16018	08B	1-PSV-1-179	MS/SOLENOID VALVE FOR PCV-1-179	U1 DW	584
16019	08B	1-PSV-1-4	MS/SOLENOID VALVE FOR PCV-1-4	U1 DW	584
16021	08B	1-PSV-1-18	MS/SOLENOID VALVE FOR PCV-1-18	U1 DW	584
16023	08B	1-FSV-84-8C	CAD/CAD TO DW (1-FCV-64-19) SOLENOID VALVE	U1 RB	565
16024	08B	1-FSV-84-8D	CAD/CAD TO DW (1-FCV-64-18) SOLENOID VALVE	U1 RB	565
16025	07	1-PREG-84-54	CAD/CAD SYSTEM "B" TO UNIT 1 DRYWELL CONTROL AIR	U1 RB	565
16026	08B	1-FSV-84-49	CAD/CAD SYSTEM "B" TO UNIT 1 DRYWELL CONTROL AIR	U1 RB	565
~~16027~~	~~R~~	~~1-CKV-32-336~~	~~CA/CHECK VALVE FROM DWCA CMPRSSR TO DRYWELL PATH 2~~	~~U1 RB~~	
~~16028~~	~~R~~	~~1-CKV-32-919~~	~~CA/DRYWELL CONTROL AIR TO PSV-1-30~~	~~U1 DW~~	
~~16029~~	~~21~~	~~1-ACC-32-6111~~	~~CA/ACCUMULATOR FOR PSV-1-30~~	~~U1 DW~~	~~584~~
16030	08B	1-PSV-1-30	MS/SOLENOID VALVE FOR PCV-1-30	U1 DW	584
~~16031~~	~~R~~	~~1-CKV-32-894~~	~~CA/DRYWELL CONTROL AIR TO PSV-1-31~~	~~U1 DW~~	~~584~~
~~16032~~	~~21~~	~~1-ACC-32-6108~~	~~CA/ACCUMULATOR FOR PSV-1-31~~	~~U1 DW~~	~~584~~
16033	08B	1-PSV-1-31	MS/SOLENOID VALVE FOR PCV-1-31	U1 DW	584
~~16034~~	~~R~~	~~1-CKV-32-895~~	~~CA/DRYWELL CONTROL AIR TO PSV-1-34~~	~~U1 DW~~	
~~16035~~	~~21~~	~~1-ACC-32-6109~~	~~CA/ACCUMULATOR FOR PSV-1-34~~	~~U1 DW~~	~~584~~
16036	08B	1-PSV-1-34	MS/SOLENOID VALVE FOR PCV-1-34	U1 DW	584
16038	08B	1-PSV-1-41	MS/SOLENOID VALVE FOR PCV-1-41	U1 DW	584
16040	08B	1-PSV-1-42	MS/SOLENOID VALVE FOR PCV-1-42	U1 DW	584
16041	08B	1-PSV-1-180	MS/SOLENOID VALVE FOR PCV-1-180	U1 DW	584
~~16042~~	~~R~~	~~1-CKV-32-3749~~	~~CAD/CONTROL AIR/CAD CHECK VALVE~~	~~U1 RB~~	
16043	07	1-FCV-64-20	CONTAINMENT VENTILATION ISOLATION VALVE	U1 RB	565
16044	07	1-FCV-64-21	CONTAINMENT VENTILATION ISOLATION VALVE	U1 RB	565
~~16045~~	~~R~~	~~1-CKV-64-800~~	~~CONTAINMENT VENTILATION ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
~~16046~~	~~R~~	~~1-CKV-64-801~~	~~CONTAINMENT VENTILATION ISOLATION CHECK VALVE~~	~~U1 RB~~	~~565~~
		1-FCV-84-20	See SSEL Item No. 13049		
		1-FCV-84-19	See SSEL Item No. 13050		
~~16051 *~~	~~21~~	~~0-TNK-84-635~~	~~CAD/NITROGEN STORAGE TANK "A"~~	~~YARD~~	~~565~~
16052 *	07	0-FCV-84-5	CAD/N2 TANK "A" ISOLATION VALVE	YARD	565
16053 *	08B	0-FSV-84-5	CAD/N2 TANK "A" ISOLATION SOLENOID VALVE	YARD	565

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~16054 *~~	~~00~~	~~0-VPR-84-639~~	~~CAD/N2 TANK "A" VAPORIZER~~	~~YARD~~	~~565~~
16055 *	00	0-HTR-84-5	CAD/N2 TANK "A" ELECTRIC HEATER	YARD	565
~~16061 *~~	~~21~~	~~0-TNK-84-636~~	~~CAD/NITROGEN STORAGE TANK "B"~~	~~YARD~~	~~565~~
16062 *	07	0-FCV-84-16	CAD/N2 TANK "B" ISOLATION VALVE	YARD	565
16063 *	08B	0-FSV-84-16	CAD/N2 TANK "B" ISOLATION SOLENOID VALVE	YARD	565
~~16064 *~~	~~00~~	~~0-VPR-84-640~~	~~VAD/N2 TANK "B" VAPORIZER~~	~~YARD~~	~~565~~
16065 *	00	0-HTR-84-16	CAD/N2 TANK "B" ELECTRIC HEATER	YARD	565
~~17001 *~~	~~17~~	~~0-GEN-82-A~~	~~UNIT 1 & 2 DIESEL GENERATOR "A"~~	~~U1/2 DG~~	~~565~~
~~17002 *~~	~~21~~	~~0-TNK-18-45/4~~	~~DG "A" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~17003 *~~	~~21~~	~~0-TNK-18-45/3~~	~~DG "A" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~17004 *~~	~~21~~	~~0-TNK-18-45/3~~	~~DG "A" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~17005 *~~	~~21~~	~~0-TNK-86-650A~~	~~DG A LEFT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17006 *~~	~~21~~	~~0-TNK-86-651A~~	~~DG A LEFT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17007 *~~	~~21~~	~~0-TNK-86-652A~~	~~DG A LEFT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17008 *~~	~~21~~	~~0-TNK-86-653A~~	~~DG A LEFT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17009 *~~	~~21~~	~~0-TNK-86-654A~~	~~DG A LEFT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17010 *~~	~~21~~	~~0-TNK-86-655A~~	~~DG A RIGHT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17011 *~~	~~21~~	~~0-TNK-86-656A~~	~~DG A RIGHT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17012 *~~	~~21~~	~~0-TNK-86-657A~~	~~DG A RIGHT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17013 *~~	~~21~~	~~0-TNK-86-658A~~	~~DG A RIGHT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17014 *~~	~~21~~	~~0-TNK-86-659A~~	~~DG A RIGHT BANK STARTING AIR RECIEVERS~~	~~U1/2 DG~~	~~565~~
~~17015 *~~	~~00~~	~~0-FAN-30-64~~	~~DG ROOM A EXHAUST FAN "A"~~	~~U1/2 DG~~	~~593~~
~~17016 *~~	~~00~~	~~0-FAN-30-65~~	~~DG ROOM A EXHAUST FAN "B"~~	~~U1/2 DG~~	~~593~~
~~17017 *~~	~~10~~	~~0-FCO-30-64A~~	~~OUTLET DAMPER FOR FAN "A" IN DG ROOM "A"~~	~~U1/2 DG~~	~~593~~
~~17018 *~~	~~10~~	~~0-FCO-30-64B~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "A"~~	~~U1/2 DG~~	~~593~~
~~17019 *~~	~~10~~	~~0-FCO-30-64C~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "A"~~	~~U1/2 DG~~	~~593~~
~~17020 *~~	~~10~~	~~0-FCO-30-65A~~	~~OUTLET DAMPER FOR FAN "B" IN DG ROOM "A"~~	~~U1/2 DG~~	~~593~~
~~17021 *~~	~~10~~	~~0-FCO-30-65B~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "A"~~	~~U1/2 DG~~	~~593~~
~~17022 *~~	~~10~~	~~0-FCO-30-65C~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "A"~~	~~U1/2 DG~~	~~593~~
~~17023 *~~	~~17~~	~~0-GEN-82-B~~	~~UNIT 1 & 2 DIESEL GENERATOR "B"~~	~~U1/2 DG~~	~~565~~
~~17024 *~~	~~21~~	~~0-TNK-18-46/4~~	~~DG "B" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~17025 *~~	~~21~~	~~0-TNK-18-46/3~~	~~DG "B" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~17026 *~~	~~21~~	~~0-TNK-18-46/3~~	~~DG "B" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~17027 *~~	~~21~~	~~0-TNK-86-650B~~	~~DG "B" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~17028 *~~	~~21~~	~~0-TNK-86-651B~~	~~DG "B" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~17029 *~~	~~21~~	~~0-TNK-86-652B~~	~~DG "B" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~17030 *~~	~~21~~	~~0-TNK-86-653B~~	~~DG "B" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~17031 *~~	~~21~~	~~0-TNK-86-654B~~	~~DG "B" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~17032 *~~	~~21~~	~~0-TNK-86-655B~~	~~DG "B" RIGHT BANK STARTING AIR RECEIVER~~	~~U1/2 DG~~	~~565~~
~~17033 *~~	~~21~~	~~0-TNK-86-656B~~	~~DG "B" RIGHT BANK STARTING AIR RECEIVER~~	~~U1/2 DG~~	~~565~~
~~17034 *~~	~~21~~	~~0-TNK-86-657B~~	~~DG "B" RIGHT BANK STARTING AIR RECEIVER~~	~~U1/2 DG~~	~~565~~
~~17035 *~~	~~21~~	~~0-TNK-86-658B~~	~~DG "B" RIGHT BANK STARTING AIR RECEIVER~~	~~U1/2 DG~~	~~565~~
~~17036 *~~	~~21~~	~~0-TNK-86-659B~~	~~DG "B" RIGHT BANK STARTING AIR RECEIVER~~	~~U1/2 DG~~	~~565~~
~~17037 *~~	~~00~~	~~0-FAN-30-66~~	~~DG ROOM B EXHAUST FAN "A"~~	~~U1/2 DG~~	~~593~~
~~17038 *~~	~~00~~	~~0-FAN-30-67~~	~~DG ROOM B EXHAUST FAN "B"~~	~~U1/2 DG~~	~~593~~
~~17039 *~~	~~10~~	~~0-FCO-30-66A~~	~~OUTLET DAMPER FOR FAN "A" IN DG ROOM "B"~~	~~U1/2 DG~~	~~593~~

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~47040*~~	~~40~~	~~0-FCO-30-66B~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "B"~~	~~U1/2 DG~~	~~583~~
~~47041*~~	~~40~~	~~0-FCO-30-66C~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "B"~~	~~U1/2 DG~~	~~583~~
~~47042*~~	~~40~~	~~0-FCO-30-67A~~	~~OUTLET DAMPER FOR FAN "B" IN DG ROOM "B"~~	~~U1/2 DG~~	~~583~~
~~47043*~~	~~40~~	~~0-FCO-30-67B~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "B"~~	~~U1/2 DG~~	~~583~~
~~47044*~~	~~40~~	~~0-FCO-30-67C~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "B"~~	~~U1/2 DG~~	~~583~~
~~47045*~~	~~47~~	~~0-GEN-82-C~~	~~UNIT 1 & 2 DIESEL GENERATOR "C"~~	~~U1/2 DG~~	~~565~~
~~47046*~~	~~21~~	~~0-TNK-18-47/4~~	~~DG "C" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~47047*~~	~~21~~	~~0-TNK-18-47/3~~	~~DG "C" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~47048*~~	~~21~~	~~0-TNK-18-47/3~~	~~DG "C" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~47049*~~	~~21~~	~~0-TNK-86-650C~~	~~DG "C" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47050*~~	~~21~~	~~0-TNK-86-651C~~	~~DG "C" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47051*~~	~~21~~	~~0-TNK-86-652C~~	~~DG "C" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47052*~~	~~21~~	~~0-TNK-86-653C~~	~~DG "C" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47053*~~	~~21~~	~~0-TNK-86-654C~~	~~DG "C" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47054*~~	~~21~~	~~0-TNK-86-655C~~	~~DG "C" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47055*~~	~~21~~	~~0-TNK-86-656C~~	~~DG "C" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47056*~~	~~21~~	~~0-TNK-86-657C~~	~~DG "C" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47057*~~	~~21~~	~~0-TNK-86-658C~~	~~DG "C" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47058*~~	~~21~~	~~0-TNK-86-659C~~	~~DG "C" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47059*~~	~~00~~	~~0-FAN-30-68~~	~~DG ROOM C EXHAUST FAN "A"~~	~~U1/2 DG~~	~~583~~
~~47060*~~	~~00~~	~~0-FAN-30-69~~	~~DG ROOM C EXHAUST FAN "B"~~	~~U1/2 DG~~	~~583~~
~~47061*~~	~~40~~	~~0-FCO-30-68A~~	~~OUTLET DAMPER FOR FAN "A" IN DG ROOM "C"~~	~~U1/2 DG~~	~~583~~
~~47062*~~	~~40~~	~~0-FCO-30-68B~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "C"~~	~~U1/2 DG~~	~~583~~
~~47063*~~	~~40~~	~~0-FCO-30-68C~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "C"~~	~~U1/2 DG~~	~~583~~
~~47064*~~	~~40~~	~~0-FCO-30-69A~~	~~OUTLET DAMPER FOR FAN "B" IN DG ROOM "C"~~	~~U1/2 DG~~	~~583~~
~~47065*~~	~~40~~	~~0-FCO-30-69B~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "C"~~	~~U1/2 DG~~	~~583~~
~~47066*~~	~~40~~	~~0-FCO-30-69C~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "C"~~	~~U1/2 DG~~	~~583~~
~~47067*~~	~~47~~	~~0-GEN-82-D~~	~~UNIT 1 & 2 DIESEL GENERATOR "D"~~	~~U1/2 DG~~	~~565~~
~~47068*~~	~~21~~	~~0-TNK-18-48/4~~	~~DG "D" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~47069*~~	~~21~~	~~0-TNK-18-48/3~~	~~DG "D" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~47070*~~	~~21~~	~~0-TNK-18-48/3~~	~~DG "D" 7 DAY FUEL OIL TANK~~	~~U1/2 DG~~	~~565~~
~~47071*~~	~~21~~	~~0-TNK-86-650D~~	~~DG "D" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47072*~~	~~21~~	~~0-TNK-86-651D~~	~~DG "D" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47073*~~	~~21~~	~~0-TNK-86-652D~~	~~DG "D" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47074*~~	~~21~~	~~0-TNK-86-653D~~	~~DG "D" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47075*~~	~~21~~	~~0-TNK-86-654D~~	~~DG "D" LEFT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47076*~~	~~21~~	~~0-TNK-86-655D~~	~~DG "D" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47077*~~	~~21~~	~~0-TNK-86-656D~~	~~DG "D" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47078*~~	~~21~~	~~0-TNK-86-657D~~	~~DG "D" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47079*~~	~~21~~	~~0-TNK-86-658D~~	~~DG "D" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47080*~~	~~21~~	~~0-TNK-86-659D~~	~~DG "D" RIGHT BANK STARTING AIR RECEIVERS~~	~~U1/2 DG~~	~~565~~
~~47081*~~	~~00~~	~~0-FAN-30-170~~	~~DG ROOM D EXHAUST FAN "A"~~	~~U1/2 DG~~	~~583~~
~~47082*~~	~~00~~	~~0-FAN-30-171~~	~~DG ROOM D EXHAUST FAN "B"~~	~~U1/2 DG~~	~~583~~
~~47083*~~	~~40~~	~~0-FCO-30-170A~~	~~OUTLET DAMPER FOR FAN "A" IN DG ROOM "D"~~	~~U1/2 DG~~	~~583~~
~~47084*~~	~~40~~	~~0-FCO-30-170B~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "D"~~	~~U1/2 DG~~	~~583~~
~~47085*~~	~~40~~	~~0-FCO-30-170C~~	~~INLET DAMPER FOR FAN "A" IN DG ROOM "D"~~	~~U1/2 DG~~	~~583~~

TABLE 4-1, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – MECHANICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~17086 *~~	~~10~~	~~0-FCO-30-171A~~	~~OUTLET DAMPER FOR FAN "B" IN DG ROOM "D"~~	~~U1/2 DG~~	~~583~~
~~17087 *~~	~~10~~	~~0-FCO-30-171B~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "D"~~	~~U1/2 DG~~	~~583~~
~~17088 *~~	~~10~~	~~0-FCO-30-171C~~	~~INLET DAMPER FOR FAN "B" IN DG ROOM "D"~~	~~U1/2 DG~~	~~583~~
~~18001~~	~~R~~	~~1-CKV-23-510~~	~~RHRSW TO HX A INLET CHECK VALVE~~	~~U1 RB~~	~~565~~
18002	08A	1-FCV-23-034	RHR/RHRSW HX A OUTLET VALVE	U1 RB	565
~~18003~~	~~R~~	~~1-CKV-23-550~~	~~RHRSW TO HX C INLET CHECK VALVE~~	~~U1 RB~~	~~565~~
18004	08A	1-FCV-23-040	RHR/RHRSW HX C OUTLET VALVE	U1 RB	565
~~18005~~	~~R~~	~~1-CKV-23-530~~	~~RHRSW TO HX B INLET CHECK VALVE~~	~~U1 RB~~	~~565~~
18006	08A	1-FCV-23-046	RHR/RHRSW HX B OUTLET VALVE	U1 RB	565
~~18007~~	~~R~~	~~1-CKV-23-569~~	~~RHRSW TO HX D INLET CHECK VALVE~~	~~U1 RB~~	~~565~~
18008	08A	1-FCV-23-052	RHR/RHRSW HX D OUTLET VALVE	U1 RB	565
18009	20	1-FI-23-36	RHRSW HX A FLOW INDICATOR	U1 RB	565
18010	20	1-FI-23-42	RHRSW HX C FLOW INDIC ATOR	U1 RB	565
18011	20	1-FI-23-48	RHRSW HX B FLOW INDICATOR	U1 RB	565
18012	20	1-FI-23-54	RHRSW HX D FLOW INDICATOR	U1 RB	565
18021 *	06	0-PMP-23-005	RHRSW PUMP A2	INTAKE	565
~~18022 *~~	~~R~~	~~0-CKV-23-506~~	~~RHRSW PMP A2 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
18023 *	08A	1-FCV-23-034	RHR/RHRSW HX A OUTLET VALVE	U1 RB	565
18024 *	06	0-PMP-23-012	RHRSW PUMP C2	INTAKE	565
~~18025 *~~	~~R~~	~~0-CKV-23-542~~	~~RHRSW PMP C2 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
18026 *	08A	1-FCV-23-040	RHR/RHRSW HX C OUTLET VALVE	U1 RB	565
18027 *	06	0-PMP-23- 19	RHRSW PUMP B2	INTAKE	565
~~18028 *~~	~~R~~	~~0-CKV-23-526~~	~~RHRSW PMP B2 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
18029 *	08A	1-FCV-23-046	RHR/RHRSW HX B OUTLET VALVE	U1 RB	565
18030 *	06	0-PMP-23-027	RHRSW PUMP D2	INTAKE	565
~~18031 *~~	~~R~~	~~0-CKV-23-561~~	~~RHRSW PMP D2 DISCHARGE CHECK VALVE~~	~~INTAKE~~	~~565~~
18032 *	08A	1-FCV-23-052	RHR/RHRSW HX D OUTLET VALVE	U1 RB	565
18033 *	08A	1-FCV-23-57	RHR/RHRSW CROSS CONNECT VALVE	U1 RB	565

* Note that these equipment items are either common to or shared by both Units 1 & 2, and have previously been evaluated under the Unit 2 USI A-46 program. These items are included here in the Unit 1 Safe Shutdown Equipment List for completeness.

TABLE 4-2: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~19001~~	~~20~~	~~1-PNLA-009-0023/1~~	~~ELECTRICAL CONTROL PANEL 1-9-23-1~~	~~U1 CB~~	~~617~~
~~19002~~	~~20~~	~~1-PNLA-009-0023/2~~	~~ELECTRICAL CONTROL PANEL 1-9-23-2~~	~~U1 CB~~	~~617~~
~~19003~~	~~20~~	~~1-PNLA-009-0023/3~~	~~ELECTRICAL CONTROL PANEL 1-9-23-3~~	~~U1 CB~~	~~617~~
~~19004~~	~~20~~	~~1-PNLA-009-0023/4~~	~~ELECTRICAL CONTROL PANEL 1-9-23-4~~	~~U1 CB~~	~~617~~
~~19005~~	~~20~~	~~1-PNLA-009-0023/5~~	~~ELECTRICAL CONTROL PANEL 1-9-23-5~~	~~U1 CB~~	~~617~~
~~19006~~	~~20~~	~~1-PNLA-009-0023/6~~	~~ELECTRICAL CONTROL PANEL 1-9-23-6~~	~~U1 CB~~	~~617~~
~~19007~~	~~20~~	~~1-PNLA-009-0023/7~~	~~ELECTRICAL CONTROL PANEL 1-9-23-7~~	~~U1 CB~~	~~617~~
~~19008~~	~~20~~	~~1-PNLA-009-0023/8~~	~~ELECTRICAL CONTROL PANEL 1-9-23-8~~	~~U1 CB~~	~~617~~
~~19010**~~	~~14~~	~~1-JBOX-268-5986~~	~~MG SET 1DN CONTROL STATION (1-HS-268-0001DN)~~	~~U1 RB~~	~~621~~
~~19011**~~	~~14~~	~~1-JBOX-268-5988~~	~~MG SET 1EN CONTROL STATION (1-HS-268-0001EN)~~	~~U1 RB~~	~~639~~
~~19012**~~	~~14~~	~~1-JBOX-268-5947~~	~~MG SET 1DN CONTROL BOX (RELAYS) - SEALED BOX~~	~~U1 RB~~	~~621~~
19013**	14	V.R. Box 1DN	MG SET 1DN VOLTAGE REGULATOR BOX	U1 RB	621
~~19014**~~	~~14~~	~~1-JBOX-268-5949~~	~~MG SET 1EN CONTROL BOX (RELAYS) - SEALED BOX~~	~~U1 RB~~	~~639~~
19015**	13	1-MGEN-268-0001DN	LPCI MG SET 1DN	U1 RB	621
19016**	01	1-BDBB-268-0001D	480V RMOV BOARD 1D	U1 RB	593
19017**	13	1-MGEN-268-0001EN	LPCI MG SET 1EN	U1 RB	639
19018**	01	1-BDBB-268-0001E	480V RMOV BOARD 1E	U1 RB	621
19019**	14	VR Box 1EN	MG SET 1EN VOLTAGE REGULATOR BOX	U1 RB	621
19030	01	1-BDBB-281-0001A	250V DC RMOV BOARD 1A	U1 RB	621
19031	01	1-BDBB-281-0001B	250V DC RMOV BOARD 1B	U1 RB	593
19033	01	1-BDBB-281-0001C	250V DC RMOV BOARD 1C	U1 RB	565
~~19039~~	~~14~~	~~1-JBOX-253-6455~~	~~I&C BUS 1A DISC SWITCH 1A1~~	~~U1 RB~~	~~621~~
19040	04	1-XFA-253-0001A1	I&C BUS 1A 480/208-120V TRANSFORMER	U1 RB	621
19041	04	1-XFA-253-0001A	I&C BUS 1A REGULATING TRANSFORMER	U1 RB	621
~~19042~~	~~14~~	~~1-JBOX-253-6457~~	~~I&C BUS 1A DISC SW 1A2~~	~~U1 CB~~	~~593~~
~~19043~~	~~14~~	~~1-JBOX-253-6456~~	~~I&C BUS 1A DISC SWITCHES 1A3, 1A4, 1A5, 1A6~~	~~U1 RB~~	~~621~~
~~19044~~	~~14~~	~~1-JBOX-253-8862~~	~~I&C BUS 1A DISC SWITCH~~	~~U1 RB~~	~~621~~
~~19045~~	~~20~~	~~1-PNLA-009-0009~~	~~I&C BUS 1A (CAB 2 OF PNL 1-9-9)~~	~~U1 CB~~	~~617~~
19046	20	1-PX-64-160B	POWER SUPPLY (PNL 1-9-19: 1-LI-64-159B,160B)	U1 CB	593
19047	20	1-PXMC-23-114	POWER SUPPLY (PNL 1-9-18: FI-23-36,42 : FI-74-50)	U1 CB	593
19048	20	1-PXMC-23-115 A&B	POWER SUPPLY (PNL 1-9-19: FI-23-48,54; FI-74-64)	U1 CB	593
19049	04	1-XFA-253-0001B1	I&C BUS 1B 480/208-120V TRANSFORMER	U1 RB	593
19050	04	1-XFA-253-0001B2	I&C BUS 1B REGULATING TRANSFORMER	U1 RB	593
~~19051~~	~~14~~	~~1-JBOX-253-6460~~	~~I&C BUS 1B DISC SW 1B2~~	~~U1 CB~~	~~593~~
~~19052~~	~~14~~	~~1-JBOX-253-8865~~	~~I&C BUS 1B DISC SWITCH~~	~~U1 RB~~	~~593~~
~~19053~~	~~14~~	~~1-JBOX-253-6459~~	~~I&C BUS 1B DISC SWITCHES 1B3, 1B4, 1B5, 1B6~~	~~U1 RB~~	~~593~~
~~19054~~	~~20~~	~~1-PNLA-009-0009~~	~~I&C BUS 1B (CAB 3 OF PNL 1-9-9)~~	~~U1 CB~~	~~617~~
19055	20	1-PX-64-159B	POWER SUPPLY (PNL 1-9-19)	U1 CB	593
~~19068~~	~~14~~	~~1-JBOX-253-7160~~	~~I&C BUS 1B DISC SWITCH 1B1~~	~~U1 RB~~	~~593~~
19070	16	1-INVT-256-0001	DIV I ECCS ATU INVERTER	U1 RB	593
19071	20	1-PX-71-60-1	ECCS ATU CAB 1-9-81 POWER SUPPLY	U1 CB	593

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
19072	20	1-PX-71-60-1A	ECCS ATU CAB 1-9-81 POWER SUPPLY	U1 CB	593
19073	20	1-PX-64-50	POWER SUPPLY (PNL 1-25-31: XR-64-50 [DEV BA TERM 11/12])	U1 RB	621
19074	20	1-PX-74-56	POWER SUPPLY (PNL 1-9-18: FI-74-56)	U1 CB	593
19075	16	1-INVT-256-0002	DIV II ECCS ATU INVERTER	U1 RB	621
19076	20	1-PX-71-60-2	ECCS ATU CAB 1-9-82 POWER SUPPLY	U1 CB	593
19077	20	1-PX-71-60-2A	ECCS ATU CAB 1-9-82 POWER SUPPLY	U1 CB	593
19078	20	1-PX-74-70	POWER SUPPLY (PNL 1-9-19: FI-74-70)	U1 CB	593
19079	20	1-PX-64-159A	POWER SUPPLY (1-9-18)	U1 CB	593
19080	20	1-PX-64-160A	POWER SUPPLY (1-9-18)	U1 CB	593
19081	20	1-PX-64-67B	POWER SUPPLY (1-9-19)	U1 CB	593
19082	20	1-PX-64-161	POWER SUPPLY (PNL 9-87)	U1 CB	593
19083	20	1-PX-64-162	POWER SUPPLY (PNL 9-88)	U1 CB	593
19084	18	1-PS-67-50	PRESSURE SWITCH FOR 1-FCV-67-50 (14046)	U1 RB	593
19085	18	1-PS-67-51	PRESSURE SWITCH FOR 1-FCV-67-51 (14047)	U1 RB	565
~~19088~~	~~20~~	~~1-LPNL-925-044A/11~~	~~COMMON BD LOGIC RELAY PANEL 25-44-A11~~	~~U1 RB~~	~~621~~
~~19089~~	~~20~~	~~1-LPNL-925-044A/12~~	~~COMMON BD LOGIC RELAY PANEL 25-44-A12~~	~~U1 RB~~	~~621~~
~~19090~~	~~20~~	~~1-LPNL-925-044B/11~~	~~COMMON BD LOGIC RELAY PANEL 25-44-B11~~	~~U1 RB~~	~~621~~
~~19091~~	~~20~~	~~1-LPNL-925-044B/12~~	~~COMMON BD LOGIC RELAY PANEL 25-44-B12~~	~~U1 RB~~	~~621~~
19100 *	14	3-ECAB-231-001A	250V DC CONT PWR TRANSFER SW - 480V SD BD 1A	U3 RB	593
19101 *	14	3-ECAB-231-001B	250V DC CONT PWR TRANSFER SW - 480V SD BD 1B	U3 RB	593
~~19114~~	~~20~~	~~1-PNLA-009-0003A~~	~~REACTOR SD & CONT. COOLING PNL~~	~~U1 CB~~	~~617~~
~~19115~~	~~20~~	~~1-PNLA-009-0003B~~	~~REACTOR SD & CONT. COOLING PNL~~	~~U1 CB~~	~~617~~
~~19116~~	~~20~~	~~1-PNLA-009-0004~~	~~CLEANUP & RECIRC PNL~~	~~U1 CB~~	~~617~~
~~19117~~	~~20~~	~~1-PNLA-009-0005~~	~~REACTOR CONTROL PNL~~	~~U1 CB~~	~~617~~
~~19118~~	~~20~~	~~1-PNLA-009-0006~~	~~FW & COND. PNL~~	~~U1 CB~~	~~617~~
~~19120~~	~~20~~	~~1-PNLA-009-0015~~	~~RPS CH A (DIV I)~~	~~U1 CB~~	~~593~~
~~19121~~	~~20~~	~~1-PNLA-009-0016~~	~~RPS CH A, B, C, D~~	~~U1 CB~~	~~593~~
~~19122~~	~~20~~	~~1-PNLA-009-0017~~	~~RPS CH B (DIV II)~~	~~U1 CB~~	~~593~~
~~19123~~	~~20~~	~~1-PNLA-009-0018~~	~~FW & RECIRC PNL~~	~~U1 CB~~	~~593~~
~~19124~~	~~20~~	~~1-PNLA-009-0019~~	~~PROCESS INSTR PNL~~	~~U1 CB~~	~~593~~
~~19125~~	~~20~~	~~1-PNLA-009-0021~~	~~TEMP RECORDING PNL~~	~~U1 CB~~	~~617~~
~~19126~~	~~20~~	~~1-PNLA-009-0028~~	~~CRD SELECT RELAY AUX PNL~~	~~U1 CB~~	~~593~~
~~19127~~	~~20~~	~~1-PNLA-009-0030~~	~~AUTO BLOWNDOWN AUX PNL~~	~~U1 CB~~	~~593~~
~~19128~~	~~20~~	~~1-PNLA-009-0032~~	~~RHR, CS, & HPCI (CH A) PNL~~	~~U1 RB~~	~~593~~
~~19129~~	~~20~~	~~1-PNLA-009-0033~~	~~RHR, CS, & HPCI (CH B) PNL~~	~~U1 CB~~	~~593~~
~~19130~~	~~20~~	~~1-PNLA-009-0039~~	~~HPCI RELAY AUX PNL~~	~~U1 CB~~	~~593~~
~~19131~~	~~20~~	~~1-PNLA-009-0042~~	~~MSIV (INBOARD) DIV II PNL~~	~~U1 CB~~	~~593~~
~~19132~~	~~20~~	~~1-PNLA-009-0043~~	~~MSIV (OUTBOARD) DIV II PNL~~	~~U1 CB~~	~~593~~
~~19133~~ *	~~20~~	~~1-PNLA-009-0054~~	~~CONTAINMENT ATM. DILUTION PNL~~	~~U1 CB~~	~~617~~
~~19134~~ *	~~20~~	~~1-PNLA-009-0055~~	~~CONTAINMENT ATM. DILUTION PNL~~	~~U1 CB~~	~~617~~
~~19135~~	~~20~~	~~1-PNLA-009-0081~~	~~DIV I ECCS ATU CABINET~~	~~U1 CB~~	~~593~~

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~19136~~	~~20~~	~~1-PNLA-009-0082~~	~~DIV II ECCS ATU CABINET~~	~~U1 CB~~	~~593~~
~~19137~~	~~20~~	~~1-PNLA-009-0083~~	~~RPS ATU CAB~~	~~U1 CB~~	~~593~~
~~19138~~	~~20~~	~~1-PNLA-009-0084~~	~~RPS ATU CAB~~	~~U1 CB~~	~~593~~
~~19139~~	~~20~~	~~1-PNLA-009-0085~~	~~RPS ATU CAB~~	~~U1 CB~~	~~593~~
~~19140~~	~~20~~	~~1-PNLA-009-0086~~	~~RPS ATU CAB~~	~~U1 CB~~	~~593~~
~~19141~~	~~20~~	~~1-PNLA-009-0087~~	~~DIV I TORUS TEMP MONITORING~~	~~U1 CB~~	~~593~~
~~19142~~	~~20~~	~~1-PNLA-009-0088~~	~~DIV II TORUS TEMP MONITORING~~	~~U1 CB~~	~~593~~
~~19145~~	~~20~~	~~1-PNLA-009-0093~~	~~NEW PNL (INSTALLED BY DCN W19433)~~	~~U1 CB~~	~~593~~
19146	18	1-HS-74-7B	LOCAL HS STATION	U1 RB	541
~~19147~~	~~14~~	~~1-JB-668~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~541~~
19148	18	1-HS-74-57B	LOCAL HS STATION	U1 RB	551
~~19149~~	~~14~~	~~1-JB-654~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~551~~
19150	18	1-HS-74-59B	LOCAL HS STATION	U1 RB	551
19151	18	1-HS-74-58B	LOCAL HS STATION	U1 RB	551
19153	18	1-HS-74-52B	LOCAL HS STATION	U1 RB	565
~~19154~~	~~14~~	~~1-JB-1079~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~583~~
19155	18	1-HS-74-53B	LOCAL HS STATION	U1 RB	565
19156	18	1-HS-74-60B	LOCAL HS STATION	U1 RB	593
~~19157~~	~~14~~	~~1-JBOX-74-1032~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~593~~
19158	18	1-HS-74-61B	LOCAL HS STATION	U1 RB	593
19160	18	1-HS-74-30B	LOCAL HS STATION	U1 RB	541
~~19161~~	~~14~~	~~1-JBOX-74-0658~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~519~~
19162	18	1-HS-74-71B	LOCAL HS STATION	U1 RB	551
~~19163~~	~~14~~	~~1-JB-665~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~551~~
19164	18	1-HS-74-72B	LOCAL HS STATION	U1 RB	551
19165	18	1-HS-74-66B	LOCAL HS STATION	U1 RB	583
~~19166~~	~~14~~	~~1-JB-1080~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~583~~
19167	18	1-HS-74-67B	LOCAL HS STATION	U1 RB	583
~~19169~~	~~14~~	~~1-JBOX-74-1080~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~593~~
19170	18	1-HS-74-75B	LOCAL HS STATION	U1 RB	565
19171	18	1-HS-70-47B	LOCAL HS STATION	U1 RB	551
~~19172~~	~~14~~	~~1-JB-1204~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~551~~
19173	18	1-HS-75-09B	LOCAL HS STATION	U1 RB	519
~~19174~~	~~14~~	~~1-JBOX-75-09B~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~519~~
19175	18	1-HS-75-25B	LOCAL HS STATION	U1 RB	593
~~19176~~	~~14~~	~~1-JBOX-1064~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~593~~
19177	18	1-HS-75-37B	LOCAL HS STATION	U1 RB	519
~~19178~~	~~14~~	~~1-JBOX-75-37B~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~519~~
19179	18	1-HS-75-53B	LOCAL HS STATION (TERM BLOCK) - SEALED BOX	U1 RB	593
~~19180~~	~~14~~	~~1-JBOX-1067~~	~~LOCAL HS STATION (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~593~~
19181	18	1-HS-23-34B	LOCAL HS STATION (TERM BLOCK) - SEALED BOX	U1 RB	565
~~19182~~	~~14~~	~~1-JBOX-1077~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~565~~
19183	18	1-HS-23-40B	LOCAL HS STATION (TERM BLOCK) - SEALED BOX	U1 RB	565
19184	18	1-HS-23-46B	LOCAL HS STATION	U1 RB	565
~~19185~~	~~14~~	~~1-JB-1087~~	~~JUNCTION BOX (TERM BLOCK) - SEALED BOX~~	~~U1 RB~~	~~565~~
19186	18	1-HS-23-52B	LOCAL HS STATION	U1 RB	565

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
19187	18	1-HS-74-0005B	LOCAL HS STATION - RHR PUMP 1A	U1 RB	519
19188	18	1-HS-74-0028B	LOCAL HS STATION - RHR PUMP 1B	U1 RB	519
19189	18	1-HS-74-0016B	LOCAL HS STATION - RHR PUMP 1C	U1 RB	519
19190	18	1-HS-74-0039B	LOCAL HS STATION - RHR PUMP 1D	U1 RB	519
19191	18	1-HS-75-0005B	LOCAL HS STATION - CS PUMP 1A	U1 RB	519
19192	18	1-HS-75-0033B	LOCAL HS STATION - CS PUMP 1B	U1 RB	519
19193	18	1-HS-75-0014B	LOCAL HS STATION - CS PUMP 1C	U1 RB	519
19194	18	1-HS-75-0042B	LOCAL HS STATION - CS PUMP 1D	U1 RB	519
~~19195~~	~~18~~	~~1-LPNL-925-005A~~	~~LOCAL PANEL 25-5A~~	~~U1 RB~~	~~593~~
~~19196~~	~~18~~	~~1-LPNL-925-005B~~	~~LOCAL PANEL 25-5B~~	~~U1 RB~~	~~593~~
~~19197~~	~~18~~	~~1-LPNL-925-005D~~	~~LOCAL PANEL 25-5-001~~	~~U1 RB~~	~~593~~
~~19198~~	~~18~~	~~1-LPNL-925-006A~~	~~LOCAL PANEL 25-6A~~	~~U1 RB~~	~~593~~
~~19199~~	~~18~~	~~1-LPNL-925-006D~~	~~LOCAL PANEL 25-6-001~~	~~U1 RB~~	~~593~~
~~19200~~	~~18~~	~~1-LPNL-925-0059~~	~~LOCAL PANEL 25-59~~	~~U1 RB~~	~~519~~
~~19201~~	~~18~~	~~1-LPNL-925-0062~~	~~LOCAL PANEL 25-62~~	~~U1 RB~~	~~519~~
~~19204~~	~~20~~	~~1-PNLA-925-0031~~	~~LOCAL PANEL 25-31~~	~~U1 RB~~	~~621~~
~~19205~~	~~20~~	~~1-PNLA-925-0032~~	~~LOCAL PANEL 25-32~~	~~U1 RB~~	~~621~~
~~19206~~	~~18~~	~~1-LPNL-925-0001~~	~~LOCAL PANEL 25-1~~	~~U1 RB~~	~~519~~
~~19207~~	~~18~~	~~1-LPNL-925-0060~~	~~LOCAL PANEL 25-60~~	~~U1 RB~~	~~519~~
19208**	13	1-MGEN-268-0001DA	LPCI MG SET 1DA	U1 RB	621
19209**	14	VRBOX 1DA	MG SET 1DA VOLTAGE REGULATOR BOX	U1 RB	621
~~19210**~~	~~14~~	~~1-JBOX-268-5987~~	~~MG SET 1DA CONTROL STATION (1-HS-268-0001DA)~~	~~U1 RB~~	~~621~~
~~19211**~~	~~20~~	~~1-JBOX-268-5948~~	~~MG SET 1DA CONTROL BOX (RELAYS)~~	~~U1 RB~~	~~621~~
19212**	13	1-MGEN-268-0001EA	LPCI MG SET 1EA	U1 RB	639
19213**	14	VRBOX 1EA	MG SET 1EA VOLTAGE REGULATOR BOX	U1 RB	621
~~19214**~~	~~14~~	~~1-JBOX-268-5989~~	~~MG SET 1EA CONTROL STATION (1-HS-268-0001EA)~~	~~U1 RB~~	~~621~~
~~19215**~~	~~20~~	~~1-JBOX-268-5950~~	~~MG SET 1EA CONTROL BOX (RELAYS)~~	~~U1 RB~~	~~639~~
~~19220~~	~~20~~	~~1-PROT-099-0001A1~~	~~RPS CIRCUIT PROTECTOR CABINET 1A1~~	~~U1 RB~~	~~593~~
~~19221~~	~~20~~	~~1-PROT-099-0001A2~~	~~RPS CIRCUIT PROTECTOR CABINET 1A2~~	~~U1 RB~~	~~593~~
~~19222~~	~~20~~	~~1-PROT-099-0001B1~~	~~RPS CIRCUIT PROTECTOR CABINET 1B1~~	~~U1 RB~~	~~593~~
~~19223~~	~~20~~	~~1-PROT-099-0001B2~~	~~RPS CIRCUIT PROTECTOR CABINET 1B2~~	~~U1 RB~~	~~593~~
~~19224~~	~~20~~	~~1-PROT-099-0001C1~~	~~RPS CIRCUIT PROTECTOR CABINET 1C1~~	~~U1 RB~~	~~593~~
~~19225~~	~~20~~	~~1-PROT-099-0001C2~~	~~RPS CIRCUIT PROTECTOR CABINET 1C2~~	~~U1 RB~~	~~593~~
~~19226~~	~~18~~	~~1-LPNL-925-247A~~	~~LOCAL PANEL 1-25-247A (CAD DRYWELL & SUPP. CHAMB. V.)~~	~~U1 RB~~	~~621~~
19227	01	1-BDBB-265-0001B	480V RB VENT BD 1B	U1 RB	565
~~19228~~	~~20~~	~~1-PNLA-009-0036A~~	~~PANEL 1-9-36A~~	~~U1 CB~~	~~593~~
~~19229~~	~~18~~	~~1-LPNL-925-0247B~~	~~LOCAL PANEL 1-25-247B (CAD N2 SUPPLY PANEL B)~~	~~U1 RB~~	~~621~~

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~19230~~	~~18~~	~~1-LPNL-925-0007A~~	~~LOCAL PANEL 1-25-7A~~	~~U1 RB~~	~~541~~
~~19231~~	~~18~~	~~1-LPNL-925-0007B~~	~~LOCAL PANEL 1-25-7B~~	~~U1 RB~~	~~541~~
19232	14	1-HS-74-101B	HANDSWITCH FOR 1-FCV-74-101 (11055)	U1 RB	565
19239	18	1-TS-64-68	HANDSWITCH FOR 1-CLR-67-917 (14001)	U1 RB	541
19240	18	1-HS-64-69	HANDSWITCH FOR 1-CLR-67-918 (14013)	U1 RB	541
19241	18	1-TS-64-70	HANDSWITCH FOR 1-CLR-67-921 (14003)	U1 RB	541
19242	18	1-HS-64-71	HANDSWITCH FOR 1-CLR-67-922 (14015)	U1 RB	541
19243	14	1-HS-69-2B	HANDSWITCH FOR 1-FCV-69-2 (13033)	U1 RB	593
19244	14	1-HS-71-18B	HANDSWITCH FOR 1-FCV-71-18 (13039)	U1 RB	519
19245	01	1-HS-71-2B	HANDSWITCH FOR 1-FCV-71-2 (13037)	U1 RB	593
19246	14	1-HS-73-27	HANDSWITCH FOR 1-FCV-73-27 (13043)	U1 RB	519
19247	18	1-HS-73-3B	HANDSWITCH FOR 1-FCV-73-3 (13041)	U1 RB	551
19248	18	1-HS-73-81B	HANDSWITCH FOR 1-FCV-73-81 (13042)	U1 RB	551
19249 *	14	2-HS-74-100B	HANDSWITCH FOR 2-FCV-74-100 (11010)	U2 RB	565
19250	14	1-HS-74-12B	HANDSWITCH FOR 1-FCV-74-12 (11011)	U1 RB	519
19251	14	1-HS-74-13B	HANDSWITCH FOR 1-FCV-74-13 (11012)	U1 RB	541
19252	14	1-HS-74-1B	HANDSWITCH FOR 1-FCV-74-1 (11001)	U1 RB	519
19253	14	1-HS-74-24B	HANDSWITCH FOR 1-FCV-74-24 (11029)	U1 RB	519
19254	14	1-HS-74-25B	HANDSWITCH FOR 1-FCV-74-25 (11030)	U1 RB	541
19255	14	1-HS-74-2B	HANDSWITCH FOR 1-FCV-74-2 (11002)	U1 RB	541
19256	14	1-HS-74-35B	HANDSWITCH FOR 1-FCV-74-35 (11037)	U1 RB	519
19257	14	1-HS-74-36B	HANDSWITCH FOR 1-FCV-74-36 (11038)	U1 RB	541
19258	18	1-HS-74-73B	HANDSWITCH FOR 1-FCV-74-73 (11046)	U1 RB	551
19259 *	14	2-HS-74-97B	HANDSWITCH FOR 2-FCV-74-97 (11013)	U1 RB	519
19260	18	1-HS-75-11B	HANDSWITCH FOR 1-FCV-75-11 (15006)	U1 RB	519
19261	14	1-HS-75-22B	HANDSWITCH FOR 1-FCV-75-22 (15010)	U1 RB	541
19262	18	1-HS-75-23B	HANDSWITCH FOR 1-FCV-75-23 (15012)	U1 RB	593
19263	18	1-HS-75-2B	HANDSWITCH FOR 1-FCV-75-2 (15001)	U1 RB	519
19264	18	1-HS-75-30B	HANDSWITCH FOR 1-FCV-75-30 (15015)	U1 RB	519
19265	18	1-HS-75-39B	HANDSWITCH FOR 1-FCV-75-39 (15020)	U1 RB	519
19266	14	1-HS-75-50B	HANDSWITCH FOR 1-FCV-75-50 (15024)	U1 RB	541
19267	18	1-HS-75-51B	HANDSWITCH FOR 1-FCV-75-51 (15026)	U1 RB	593
19268	14	1-HS-78-61B	HANDSWITCH FOR 1-FCV-78-61 (11026)	U1 RB	621
19269	14	1-HS-64-72	HANDSWITCH FOR 1-CLR-67-919 (14002)	U1 RB	541
19270	14	1-HS-64-73	HANDSWITCH FOR 1-CLR-67-920 (14014)	U1 RB	541
19271	18	1-TS-64-68	TEMPERATURE SWITCH FOR 1-CLR-67-917 (14001)	U1 RB	519
19272	18	1-TS-64-69	TEMPERATURE SWITCH FOR 1-CLR-67-918 (14013)	U1 RB	519
19273	18	1-TS-64-70	TEMPERATURE SWITCH FOR 1-CLR-67-921 (14003)	U1 RB	519
19274	18	1-TS-64-71	TEMPERATURE SWITCH FOR 1-CLR-67-922 (14015)	U1 RB	519
19275	18	1-TS-1-17A	MAIN STEAM VAULT TEMPERATURE SWITCH	U1 RB	565
19276	18	1-TS-1-17B	MAIN STEAM VAULT TEMPERATURE SWITCH	U1 RB	565
19277	18	1-TS-1-17C	MAIN STEAM VAULT TEMPERATURE SWITCH	U1 RB	565
19278	18	1-TS-1-17D	MAIN STEAM VAULT TEMPERATURE SWITCH	U1 RB	565
19279	18	1-TS-1-29A	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	565
19280	18	1-TS-1-29B	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	565
19281	18	1-TS-1-29C	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	565

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
19282	18	1-TS-1-29D	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	565
19283	18	1-TS-1-40A	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19284	18	1-TS-1-40B	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19285	18	1-TS-1-40C	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19286	18	1-TS-1-40D	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19287	18	1-TS-1-54A	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19288	18	1-TS-1-54B	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19289	18	1-TS-1-54C	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19290	18	1-TS-1-54D	MAIN STEAM TUNNEL TEMPERATURE SWITCH	U1 TB	586
19291	18	1-TS-64-72	TEMPERATURE SWITCH FOR 1-CLR-67-919 (14002)	U1 RB	519
19292	18	1-TS-64-73	TEMPERATURE SWITCH FOR 1-CLR-67-920 (14014)	U1 RB	519
19293*	14	2-HS-74-96B	HAND SWITCH FOR 2-FCV-74-96 (11003)	RB	519
19294	00	1-AMP-092-0007/41A	IRM CH. "A" VOLTAGE PREAMPLIFIER 7-34A	RB	565
19295	00	1-AMP-092-0007/41B	IRM CH. "B" VOLTAGE PREAMPLIFIER 7-34B	RB	565
~~19296~~	~~14~~	~~1-LPNL-925-0027~~	~~PANEL 1-25-27 IRM PREAMP. RPS I~~	~~RB~~	~~565~~
19297	00	1-AMP-092-0007/41C	IRM CH. "C" VOLTAGE PREAMPLIFIER 7-34C	RB	577
19298	00	1-AMP-092-0007/41D	IRM CH. "D" VOLTAGE PREAMPLIFIER 7-34D	RB	577
~~19299~~	~~14~~	~~1-LPNL-925-0061~~	~~PANEL 1-25-61 IRM PREAMP. RPS II~~	~~RB~~	~~577~~
19300	20	1-NM-92-7/41A	CHANNEL "A" IRM INDICATOR	CB	617
19301	20	1-NM-92-7/41B	CHANNEL "B" IRM INDICATOR	CB	617
19302	20	1-NM-92-7/41C	CHANNEL "C" IRM INDICATOR	CB	617
19303	20	1-NM-92-7/41D	CHANNEL "D" IRM INDICATOR	CB	617
~~19304~~	~~20~~	~~1-PNLA-009-012~~	~~PANEL 1-9-12~~	~~CB~~	~~617~~
19305	15	1-BATD-283-000A1	24V NEUTRON MONITORING BATTERY, U1 CHANNEL A	CB	593
19306	15	1-BATD-283-000B1	24V NEUTRON MONITORING BATTERY, U1 CHANNEL B	CB	593
19307	16	1-CHGD-283-A1-1	24V NEUTRON BATTERY CHARGERS A1-1	CB	593
19308	16	1-CHGD-283-A2-1	24V NEUTRON BATTERY CHARGERS A2-1	CB	593
19309	16	1-CHGD-283-B1-1	24V NEUTRON BATTERY CHARGERS B1-1	CB	593
19310	16	1-CHGD-283-B2-1	24V NEUTRON BATTERY CHARGERS B2-1	CB	593
19311	14	1-HS-74-71B	HANDSWITCH FOR 1-FCV-74-71 (11045)	U2 RB	565
19312	14	1-HS-71-17B	HANDSWITCH FOR 1-FCV-71-17 (13074)	U1 RB	519
19313	20	1-HS-1-56A	HANDSWITCH FOR 1-FCV-1-56 (13075)	U1 CB	617
19314	14	1-HS-73-26B	HANDSWITCH FOR 1-FCV-73-26 (13076)	U1 RB	519
19315	20	1-HS-32-62A	HANDSWITCH FOR 1-FCV-32-62 (13079)	U1 CB	617
19316	20	1-HS-77-2A	HANDSWITCH FOR 1-FCV-77-2A (13080)	U1 CB	617
19317	20	1-HS-77-15A	HANDSWITCH FOR 1-FCV-77-15A (13081)	U1 CB	617
19318	20	1-HS-64-18	HANDSWITCH FOR 1-FCV-64-18 (13082)	U1 CB	617
19319	20	1-HS-64-19	HANDSWITCH FOR 1-FCV-64-19 (13083)	U1 CB	617
19320	20	1-HS-76-18	HANDSWITCH FOR 1-FCV-76-18 (13084)	U1 CB	617
19321	20	1-HS-76-19	HANDSWITCH FOR 1-FCV-76-19 (13085)	U1 CB	617
19323	14	1-JB-0375	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	519

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
19324	14	1-JB-0662	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	541
19325	14	1-JB-0658	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	541
19326	14	1-JB-1032	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	593
19327	14	1-JB-1095	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	565
19328	14	1-JB-1559	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	565
19329	14	1-JB-0670	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	541
19330	14	1-JB-0791	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	519
19331	14	1-JB-0681	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	541
19332	14	1-CS-75-9B	CONTROL STATION FOR 1-HS-75-9B	U1 RB	519
19333	14	1-CS-75-37B	CONTROL STATION FOR 1-HS-75-37B	U1 RB	519
19334	14	1-JB-1231	JUNCTION BOX (TERM BLOCK) - SEALED BOX	U1 RB	565
19404 *	04	0-OXF-219-TDA	4KV/480V XFMR TDA	U1/2 DG	583
19405 *	04	0-OXF-219-TDB	4KV/480V XFMR TDB	U1/2 DG	583
19412 *	03	0-BDAA-211-0000A	4KV SHDN BD A	U1 RB	621
19413 *	03	0-BDAA-211-0000B	4KV SHDN BD B	U1 RB	593
19414 *	03	0-BDAA-211-0000C	4KV SHDN BD C	U2 RB	621
19415 *	03	0-BDAA-211-0000D	4KV SHDN BD D	U2 RB	593
19418 *	02	1-BDBB-231-0001A	480V SHDN BD 1A	U1 RB	621
19419 *	02	1-BDBB-231-0001B	480V SHDN BD 1B	U1 RB	621
19423 *	01	1-BDBB-268-0001A	480V RMOV BD 1A	U1 RB	621
19424 *	01	1-BDBB-268-0001B	480V RMOV BD 1B	U1 RB	593
19431 *	01	0-BDBB-219-0000A	480V DSL AUX BD A	U1/2 DG	583
19432 *	01	0-BDBB-219-0000B	480V DSL AUX BD B	U1/2 DG	583
19437 *	14	0-BDDD-280-0001	250V BATTERY BD 1	U1 RB	593
19438 *	14	0-BDDD-280-0002	250V BATTERY BD 2	U2 RB	593
19439 *	14	0-BDDD-280-0003	250V BATTERY BD 3	U3 RB	593
~~19451 *~~	~~20~~	~~0-PNLA-009-0023/7~~	~~PANEL 0-9-23-7~~	~~U2 CB~~	~~617~~
~~19452 *~~	~~20~~	~~0-PNLA-009-0023/8~~	~~PANEL 0-9-23-8~~	~~U2 CB~~	~~617~~
~~19457 *~~	~~20~~	~~0-PNLA-009-0028~~	~~PANEL 9-28~~	~~U2 CB~~	~~593~~
~~19476 *~~	~~20~~	~~0-LPNL-925-0041A~~	~~PANEL 25-41A~~	~~U1/2 DG~~	~~583~~
~~19477 *~~	~~20~~	~~0-LPNL-925-0041B~~	~~PANEL 25-41B~~	~~U1/2 DG~~	~~583~~
~~19478 *~~	~~20~~	~~0-LPNL-925-0041C~~	~~PANEL 25-41C~~	~~U1/2 DG~~	~~583~~
~~19479 *~~	~~20~~	~~0-LPNL-925-0041D~~	~~PANEL 25-41D~~	~~U1/2 DG~~	~~583~~
~~19480 *~~	~~20~~	~~0-LPNL-925-0042A1~~	~~PANEL 25-42A1~~	~~U2 RB~~	~~621~~
~~19481 *~~	~~20~~	~~0-LPNL-925-0042A2~~	~~PANEL 25-42A2~~	~~U2 RB~~	~~621~~
~~19482 *~~	~~20~~	~~0-LPNL-925-0042B1~~	~~PANEL 25-42B1~~	~~U2 RB~~	~~621~~
~~19483 *~~	~~20~~	~~0-LPNL-925-0042B2~~	~~PANEL 25-42B2~~	~~U2 RB~~	~~621~~
~~19484 *~~	~~20~~	~~0-LPNL-925-0043A1~~	~~PANEL 25-43A1~~	~~U1/2 DG~~	~~583~~
~~19485 *~~	~~20~~	~~0-LPNL-925-0043A2~~	~~PANEL 25-43A2~~	~~U1/2 DG~~	~~583~~
~~19486 *~~	~~20~~	~~0-LPNL-925-0043B1~~	~~PANEL 25-43B1~~	~~U1/2 DG~~	~~583~~

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~19487 *~~	~~20~~	~~0-LPNL-925-0043B2~~	~~PANEL 25-43B2~~	~~U1/2 DG~~	~~593~~
~~19492 *~~	~~20~~	~~0-LPNL-925-0045A~~	~~PANEL 25-45A~~	~~U1 RB~~	~~621~~
~~19493 *~~	~~20~~	~~0-LPNL-925-0045B~~	~~PANEL 25-45B~~	~~U1 RB~~	~~593~~
~~19494 *~~	~~20~~	~~0-LPNL-925-0045C~~	~~PANEL 25-45C~~	~~U2 RB~~	~~621~~
~~19495 *~~	~~20~~	~~0-LPNL-925-0045D~~	~~PANEL 25-45D~~	~~U2 RB~~	~~593~~
~~19496 *~~	~~20~~	~~0-LPNL-925-0046A~~	~~PANEL 25-46A~~	~~U1/2 DG~~	~~565~~
~~19497 *~~	~~20~~	~~0-LPNL-925-0046B~~	~~PANEL 25-46B~~	~~U1/2 DG~~	~~565~~
~~19498 *~~	~~20~~	~~0-LPNL-925-0046C~~	~~PANEL 25-46C~~	~~U1/2 DG~~	~~565~~
~~19499 *~~	~~20~~	~~0-LPNL-925-0046D~~	~~PANEL 25-46D~~	~~U1/2 DG~~	~~565~~
~~19500 *~~	~~20~~	~~0-LPNL-925-0047A~~	~~PANEL 0-25-47A~~	~~U1/2 DG~~	~~565~~
~~19501 *~~	~~20~~	~~0-LPNL-925-0047B~~	~~PANEL 0-25-47B~~	~~U1/2 DG~~	~~565~~
~~19502 *~~	~~20~~	~~0-LPNL-925-0047C~~	~~PANEL 0-25-47C~~	~~U1/2 DG~~	~~565~~
~~19503 *~~	~~20~~	~~0-LPNL-925-0047D~~	~~PANEL 0-25-47D~~	~~U1/2 DG~~	~~565~~
~~19508 *~~	~~20~~	~~0-PNLA-082-0000A~~	~~DG A ELECTRICAL CONTROL CABINET~~	~~U1/2 DG~~	~~565~~
~~19509 *~~	~~20~~	~~0-PNLA-082-0000B~~	~~DG B ELECTRICAL CONTROL CABINET~~	~~U1/2 DG~~	~~565~~
~~19510 *~~	~~20~~	~~0-PNLA-082-0000C~~	~~DG C ELECTRICAL CONTROL CABINET~~	~~U1/2 DG~~	~~565~~
~~19511 *~~	~~20~~	~~0-PNLA-082-0000D~~	~~DG D ELECTRICAL CONTROL CABINET~~	~~U1/2 DG~~	~~565~~
19516 *	14	0-XSW-248-0001	250V MAIN BATT CHGR OUTPUT XFR SW 1	U1 RB	593
19517 *	14	0-XSW-248-0002A	250V MAIN BATT CHGR OUTPUT XFR SW 2A	U2 RB	593
19518 *	14	0-XSW-248-0003	250V MAIN BATT CHGR OUTPUT XFR SW 3	U3 RB	593
19519 *	15	0-BATA-248-0000A	250V BATTERY SB-A	U1 RB	621
19520 *	14	0-PNLA-248-A	250V DISTRIBUTION PANEL SB-A	U1 RB	621
19521 *	16	0-CHGA-248-0000A	250V BATTERY CHARGER SB-A	U1 RB	621
19522 *	15	0-BATA-248-0000B	250V BATTERY SB-B	U1 RB	621
~~19523 *~~	~~14~~	~~0-PNLA-248-B~~	~~250V DISTRIBUTION PANEL SB-B~~	~~U1 RB~~	~~621~~
19524 *	16	0-CHGA-248-0000B	250V BATTERY CHARGER SB-B	U1 RB	621
19525 *	15	0-BATA-248-0000C	250V BATTERY SB-C	U2 RB	621
~~19526 *~~	~~14~~	~~0-PNLA-248-0000C~~	~~250V DISTRIBUTION PANEL SB-C~~	~~U2 RB~~	~~621~~
19527 *	16	0-CHGA-248-0000C	250V BATTERY CHARGER SB-C	U2 RB	621
19528 *	15	0-BATA-248-0000D	250V BATTERY SB-D	U2 RB	621
~~19529 *~~	~~14~~	~~0-PNLA-248-0000D~~	~~250V DISTRIBUTION PANEL SB-D~~	~~U2 RB~~	~~621~~
19530 *	16	0-CHGA-248-0000D	250V BATTERY CHARGER SB-D	U2 RB	621
19534 *	16	0-CHGA-248-0001	250V BATTERY CHARGER 1	U1 RB	593
19535 *	16	0-CHGA-248-0002A	250V BATTERY CHARGER 2A	U2 RB	593
19536 *	16	0-CHGA-248-0003	250V BATTERY CHARGER 3	U3 RB	593
~~19537 *~~	~~15~~	~~0-BATA-248-0001~~	~~250V MAIN BATTERY 1~~	~~U1 RB~~	~~593~~
~~19538 *~~	~~15~~	~~0-BATA-248-0002~~	~~250V MAIN BATTERY 2~~	~~U2 RB~~	~~593~~
~~19539 *~~	~~15~~	~~0-BATA-248-0003~~	~~250V MAIN BATTERY 3~~	~~U3 RB~~	~~593~~
~~19542 *~~	~~15~~	~~0-BATB-254-0000A~~	~~125V DC DSL BATT A~~	~~U1/2 DG~~	~~565~~
~~19543 *~~	~~15~~	~~0-BATB-254-0000B~~	~~125V DC DSL BATT B~~	~~U1/2 DG~~	~~565~~
~~19544 *~~	~~15~~	~~0-BATB-254-0000C~~	~~125V DC DSL BATT C~~	~~U1/2 DG~~	~~565~~
~~19545 *~~	~~15~~	~~0-BATB-254-0000D~~	~~125V DC DSL BATT D~~	~~U1/2 DG~~	~~565~~
19546 *	14	0-BDGG-254-0000A	125V DC DSL BATT BD A	U1/2 DG	565
19547 *	14	0-BDGG-254-0000B	125V DC DSL BATT BD B	U1/2 DG	565
19548 *	14	0-BDGG-254-0000C	125V DC DSL BATT BD C	U1/2 DG	565

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
19549 *	14	0-BDGG-254-0000D	125V DC DSL BATT BD D	U1/2 DG	565
19550 *	16	0-CHGB-254-0000AA	125V DSL GEN A BATT CHGR A	U1/2 DG	565
19551 *	16	0-CHGB-254-0000BA	125V DSL GEN B BATT CHGR A	U1/2 DG	565
19552 *	16	0-CHGB-254-0000CB	125V DSL GEN C BATT CHGR B	U1/2 DG	565
19553 *	16	0-CHGB-254-0000DB	125V DSL GEN D BATT CHGR B	U1/2 DG	565
19560 *	04	0-XFA-082-000AA	DG-A NEUTRAL GRN XFMR	DGB 1/2	565
19561 *	04	0-XFA-082-000BA	DG-B NEUTRAL GRN XFMR	DGB 1/2	565
19562 *	04	0-XFA-082-000CA	DG-C NEUTRAL GRN XFMR	DGB 1/2	565
19563 *	04	0-XFA-082-000DA	DG-D NEUTRAL GRN XFMR	DGB 1/2	565
19594 *	04	1-XFA-231-TS1A	4KV/480V TRANSFORMER TS1A	U1 RB	621
19595 *	04	1-XFA-231-TS1B	4KV/480V TRANSFORMER TS1B	U1 RB	621
19643 *	18	0-HS-23-5B	LOCAL HS STATION - RHRSW PUMP A2	INTAKE	565
19644 *	18	0-HS-23-85B	LOCAL HS STATION - RHRSW PUMP A3	INTAKE	565
19645 *	18	0-HS-23-19B	LOCAL HS STATION - RHRSW PUMP B2	INTAKE	565
19646 *	18	0-HS-23-88B	LOCAL HS STATION - RHRSW PUMP B3	INTAKE	565
19647 *	18	0-HS-23-12B	LOCAL HS STATION - RHRSW PUMP C2	INTAKE	565
19648 *	18	0-HS-23-91B	LOCAL HS STATION - RHRSW PUMP C3	INTAKE	565
19649 *	18	0-HS-23-27B	LOCAL HS STATION - RHRSW PUMP D2	INTAKE	565
19650 *	18	0-HS-23-94B	LOCAL HS STATION - RHRSW PUMP D3	INTAKE	565
~~19655 *~~	~~14~~	~~0-JBOX-30-0640~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19656 *	18	0-HS-30-64	LOCAL HS STATION - DG A EXH FAN A	U1/2 DG	583
~~19657 *~~	~~14~~	~~0-JBOX-30-1817~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19658 *	18	0-HS-30-65	LOCAL HS STATION - DG A EXH FAN B	U1/2 DG	583
~~19659 *~~	~~14~~	~~0-JBOX-30-1825~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19660 *	18	0-HS-30-66	LOCAL HS STATION - DG B EXH FAN A	U1/2 DG	583
~~19661 *~~	~~14~~	~~0-JBOX-30-1826~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19662 *	18	0-HS-30-67	LOCAL HS STATION - DG B EXH FAN B	U1/2 DG	583
~~19663 *~~	~~14~~	~~0-JBOX-30-1828~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19664 *	18	0-HS-30-69	LOCAL HS STATION - DG C EXH FAN B	U1/2 DG	583
~~19665 *~~	~~14~~	~~0-JBOX-30-1827~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19666 *	18	0-HS-30-68	LOCAL HS STATION - DG C EXH FAN A	U1/2 DG	583
~~19667 *~~	~~14~~	~~0-JBOX-30-1830~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19668 *	18	0-HS-30-71	LOCAL HS STATION - DG D EXH FAN B	U1/2 DG	583
~~19669 *~~	~~14~~	~~0-JBOX-30-1829~~	~~JUNCTION BOX (TERM BLOCK)~~	~~U1/2 DG~~	~~583~~
19670 *	18	0-HS-30-70	LOCAL HS STATION - DG D EXH FAN A	U1/2 DG	583
~~19691 *~~	~~20~~	~~0-ECAB-067-0925~~	~~EECW PUMP DISCHARGE STRAINER A CONTROL PANEL~~	~~INTAKE~~	~~565~~
~~19692 *~~	~~20~~	~~0-ECAB-067-0926~~	~~EECW PUMP DISCHARGE STRAINER B CONTROL PANEL~~	~~INTAKE~~	~~565~~
~~19693 *~~	~~20~~	~~0-ECAB-067-0927~~	~~EECW PUMP DISCHARGE STRAINER C CONTROL PANEL~~	~~INTAKE~~	~~565~~
~~19694 *~~	~~20~~	~~0-ECAB-067-0928~~	~~EECW PUMP DISCHARGE STRAINER D CONTROL PANEL~~	~~INTAKE~~	~~565~~
~~19703 *~~	~~20~~	~~0-LPNL-925-0246A~~	~~PANEL 25-246A (CAD N2 SUPPLY PNL A)~~	~~YARD~~	~~565~~

TABLE 4-2, Continued: RELAY SSEL FOR USI A-46 & SEISMIC IPEEE – ELECTRICAL EQUIPMENT ITEMS

SSEL NUMBER	CLASS	EQUIPMENT I.D.	DESCRIPTION	BUILDING	ELEV.
~~19704 *~~	~~20~~	~~0-LPNL-925-0246B~~	~~PANEL 25-246B (CAD N2 SUPPLY PNL B)~~	~~YARD~~	~~565~~
~~19709 *~~	~~20~~	~~1-PNLA-009-0020~~	~~PANEL 1-9-20~~	~~U1 CB~~	~~617~~
~~19711 *~~	~~20~~	~~NONE~~	~~CO2 RELAY PNL FOR 39-10~~	~~U1/2 DG~~	~~565~~
~~19712 *~~	~~20~~	~~NONE~~	~~CO2 RELAY PNL FOR 39-7~~	~~U1/2 DG~~	~~565~~
~~19713 *~~	~~20~~	~~NONE~~	~~CO2 RELAY PNL FOR 39-8~~	~~U1/2 DG~~	~~565~~
~~19714 *~~	~~20~~	~~NONE~~	~~CO2 RELAY PNL FOR 39-9~~	~~U1/2 DG~~	~~565~~
~~19715 *~~	~~20~~	~~1-LPNL-925-0032~~	~~LOCAL PANEL 1-25-32~~	~~U1 RB~~	~~621~~
~~19716 *~~	~~18~~	~~1-LPNL-925-0223~~	~~LOCAL PANEL 1-25-233~~	~~U1 RB~~	~~593~~
~~19717 *~~	~~20~~	~~2-PNLA-009-0008~~	~~PANEL 2-9-8~~	~~U2 CB~~	~~617~~
~~19719 *~~	~~18~~	~~2-LPNL-925-0223~~	~~LOCAL PANEL 2-25-223~~	~~U2 RB~~	~~593~~
~~19720 *~~	~~18~~	~~2-LPNL-925-0007A~~	~~LOCAL PANEL 2-25-7A~~	~~U2 RB~~	~~541~~
~~19721 *~~	~~18~~	~~2-LPNL-925-0007B~~	~~LOCAL PANEL 2-25-7B~~	~~U2 RB~~	~~541~~
19722 *	18	0-HS-67-48B	HANDSWITCH FOR 0-FCV-67-48	INTAKE	565
19723 *	18	0-HS-67-49B	HANDSWITCH FOR 0-FCV-67-49	INTAKE	565
19724 *	18	2-HS-73-81B	HANDSWITCH FOR 2-FCV-73-81	U2 RB	519
19729 *	14	1-HS-23-57B	HANDSWITCH FOR 1-FCV-23-57	U1 RB	565
~~19791 *~~	~~20~~	~~1-PNLA-009-0008~~	~~PANEL 1-9-8~~	~~U1 CB~~	~~617~~
~~19792~~	~~18~~	~~1-LPNL-925-006B~~	~~LOCAL PANEL 25-6B~~	~~U1 RB~~	~~593~~
19794	04	1-XFA-099-0010	RPS REGULATING TRANSFORMER TRP-1	U1 CB	593
19795	14	1-FUDS-099-0001CA	RPS REG XFMR DISC SW FROM 480 V RMOV BD 1B	U1 CB	593
19796	04	TUP1	UNIT PREFERRED XFMR	U1 CB	593
19797	14	1-FUDS-099-0001CB	RPS BUS XFMR DISC SW	U1 CB	593

* Note that these equipment items are either common to or shared by both Units 1 & 2, and have previously been evaluated under the Unit 2 USI A-46 program. These items are included here in the Unit 1 Safe Shutdown Equipment List for completeness.

** DCN 51216, Stages 3 and 4, will remove all four U1 LPCI M/G Sets and associated automatic transfer capability for the 480V RMOV Boards 1D and 1E respectively. New cable feeds will be installed directly between the 480V Shutdown Boards 1A & 1B and the 480V RMOV Boards 1D & 1E replacing the LPCI M/G Set feeds.

5. RELAY SCREENING AND EVALUATION RESULTS (G.4 FORMS)

Relay screening and evaluation for the Chapter 4 safe shutdown system components are documented on the G.4 forms of this Chapter. See Table 5-1, sheets 1 through 32, as follows:

1.	Nomenclature and Conventions	17.	RHR Valves
2.	Not Vulnerable Components	18.	RHR Valves
3.	Handswitches	19.	RHR Valves
4.	Temperature Switches	20.	I & C Power
5.	Instrumentation	21.	Power Supplies
6.	Reactor Protection	22.	Undervoltage & Degraded Voltage
7.	Components Common to Unit 2 or 3	23.	Emergency Equipment Cooling Water
8.	125 VDC	24.	4KV & 480 VAC
9.	250 VDC	25.	LPCI MG SETS
10.	Control Rod Drive	26.	Main Steam Valves
11.	24 VDC	27.	Containment Atmospheric Dilution Valves
12.	Core Spray Pumps	28.	Containment Atmospheric Dilution Valves
13.	Core Spray Valves	29.	Various Valves
14.	Core Spray Valves	30.	Various Valves
15.	RHR Pumps	31.	Various Valves
16.	RHR Valves	32.	Various Valves

System: Various – Nomenclature and Conventions				Sheet 1
Subsystem/component	Ref Dwg(s)	Contact / Contact Group	Relay Type / Location	SAT*

The following nomenclature and conventions are used in the G.4 forms:

1 HS and XS contacts satisfy the not vulnerable (NV) criteria defined in EPRI NP-7148-SL, Section 3.3.1 and will not be footnoted on other G.4 Sheets.
2 TS & LS contacts on the standard Limitorque operators used at BFN-1 satisfy the not vulnerable (NV) criteria as discussed in Section C.3.6 of EPRI NP-7148-SL and will not be footnoted on other G.4 Sheets.
3 Breaker 52 auxiliary and limit contacts are mechanically actuated and are not vulnerable (NV) as discussed in Section C.3.1 of EPRI NP-7148-SL.
4 General Electric (GE) is the relay manufacturer unless otherwise noted.
5 HFA relays are GE HFA51 unless otherwise noted.
6 HGA relays are GE HGA11 unless otherwise noted.
7 AGA will denote Agastat relays
8 1E note in the G.4 SAT column indicates the relay was purchased qualified to current standards
9 DWG Rev, when not noted, is the Revision in effect on 3/30/03.
10 The notation used for seismic capacity and demand in the 4-16 HZ region, peak spectral acceleration(PSA), and in the 33HZ and higher region, zero period acceleration(ZPA) will be PSA/ZPA.
11 Chatter is acceptable (CA) for contacts feeding the alarm system as discussed in EPRI NP-7148 Section 3.5.3 and will not be noted on other G4 Sheets.
12 RMOV BDs are 480V unless otherwise noted

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jean Betlach /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Zilici /Date01/13/2004
-	No entry necessary	

System: Various—Not Vulnerable Components				Sheet 2
Subsystem/component	Ref Dwg(s)	Contact / Contact Group	Relay Type / Location	SAT*

The following components are not affected by relays. Any contact devices in these components will be addressed as part of the component control circuits they affect.

0-BDBB-219-0000A, B

1-ECAB-231-000A, B

1-BDBB-265-0001B

1-BDBB-268-0001A, B, D, E

1-BDBB-281-0001A, B, C

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	Prepared by Jess Betlack /Date01/07/2004
NA	Component not affected by relays	
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Zilini /Date01/13/2004
-	No entry necessary	

System: Various - Handswitches				Sheet 3
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***

The following handswitches are large manual switches which require the application of reasonable force to change state and are considered not seismically vulnerable(NV); EPRI-NP-7148-SL, Section 3.3.1.

0-HS-23-5B, 12B, 19B, 27B, 85B, 88B, 91B, 94B
0-HS-30-64, 65, 66, 67, 68, 69, 70, 71
0-HS-67-48B, 49B
1-HS-1-56B
1-HS-23-34B, 40B, 46B, 52B, 57B
1-HS-32-62B
1-HS-64-18B, 19B, 68, 69, 70, 71, 72 , 73
1-HS-69-2B
1-HS-70-47B
1-HS-71-2B, 17B, 18B
1-HS-73-3B, 26B, 27B, 81B
1-HS-74-1B, 2B, 5B, 7B, 12B, 13B, 16B, 24B, 25B, 28B, 30B, 35B, 36B, 39B, 52B, 53B, 57B, 58B, 59B, 60B, 61B, 66B, 67B, 71B, 72B, 73B, 75B, 97B, 100B, 101B
1-HS-75-2B, 5B, 9B,11B,14B, 22B, 23B, 25B, 30B, 33B, 37B, 39B, 42B, 50B, 51B, 53B
1-HS-76-18B, 19B
1-HS-77-2B, 15B
1-HS-78-61B
2-HS-73-81B
2-HS-74-96B

Typical drawings include:
0-730E930-10 R11 1-730E927-1A R02 1-730E920-2 R02 1-730E929-1 R02

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
	CA	Chatter acceptable
	NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
	GERS	Seismically adequate based on GERS_____; include GERS number
	NA	Component not affected by relays
	CR	Corrective action required
	OA	Operator action
	-	No entry necessary

Prepared by Jean Bethke /Date01/07/2004
Reviewed by Marc D. Zulini /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various - Temperature Switches				Sheet 4
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-TS-1-17A, B, C, D 1-TS-1-29A, B, C, D 1-TS-1-40A, B, C, D 1-TS-1-54A, B, C, D	VTD-F081-0060	-	-	NV(1)
1-TS-64-68, 69, 70, 71, 72, 73	VTD-H260-2060	-	-	CA(2)

1 The temperature switches are mechanically actuated, do not have relay dynamics, are not electromechanical and are not small microswitches. Accordingly, they are considered not seismically vulnerable; EPRI NP-7148, Section 3.3.1

2 Chatter during the 30 seconds of strong motion would have little or no effect on the pump room cooling.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jess Bethick /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Zulisi /Date01/13/2004
-	No entry necessary	

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various - Instrumentation				Sheet 5
Subsystem/component	Ref Dwg(s)	Contact / Contact Group	Relay Type / Location	SAT*

There are no contact devices with seal-in or lockout features in the following instrumentation loops. Accordingly, any contact chatter would be acceptable during strong motion when levels, pressures, etc could be varying as a result of the strong motion.

0-EI-23-85/3, 88/3, 91/3, 94/3
1-LI-3-58A, B
1-PI-3-74A, B
1-FI-23-36, 42, 48, 54
1-LI-64-159A
1-PI-64-67B, 160A
1-TI-64-161, 162, 52AB
1-XR-64-50, 156, 159
1-FI-74-50, 56, 64, 70
1-FI-75-21, 49
1-PI-85-88, 89, 90
1-NM-92-7/41A, B, C, D

Typical drawings include:

1-730E920 SH10 REV8
0-730E930 SH29 REV13
0-730E921 SH5 REV2
1-730E928 SH5 REV3

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS_____; include GERS number	
NA	Component not affected by relays	Prepared by Jess Bethay /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc S. Lilia /Date01/13/2004
-	No entry necessary	

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Reactor Protection				Sheet 6
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-HS-99-5A/S1A, B, C, D	730E915-6 R28	HS	-	NV(1,2)
1-HS-99-5A/S3A&B	730E915 series, Rev effective 3/21/03	HS	-	NV(1,2)

1 See G4 Sheet 3 discussion on handswitches.
2 Also CA—chatter of these contacts and associated logic could cause a trip but not prevent a demanded trip. This is the desired safe shutdown state. See EPRI NP-7148, C.3.2 discussion

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jess Bettinger /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Tilli /Date01/13/2004
-	No entry necessary	

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various - Components Common To Unit 2 or 3				Sheet 7
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
Diesel Generators A, B, C, D and support equipment	-	-	-	(1)
0-PMP-23-5, 12, 19, 27, 85, 88, 91, 94	-	-	-	(1)
0-FCV-67-1, 5, 8, 11, 48, 49, 53	-	-	-	(1)
0-FSV & FCV-84-5, 16	-	-	-	(1)
0-HTR-84-5, 16	-	-	-	(1)
0-XFA-082-AA, BA, CA, DA	-	-	-	(1)

1 These components are common to Unit 2 or 3 and were evaluated as part of the BFN-2&3 relay evaluation. See Reference 7 for the evaluation and Reference 8 for the NRC SER acceptance of that evaluation.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jean Bethke /Date01/07/2004 Reviewed by Marc D. Dulini /Date01/13/2004

System: 125V DC				Sheet 8
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
0-BDGG-254-0000A, B, C, D (DSL BATT BD A, B, C, D)	0-761E580 SH1 RES13, 0-731E700 SH1 REV2	-	-	NV(1)
0-CHGB-254-0000AA, BA, CB, DB (DSL BATT CHGR)	0-761E580 SH1 RES13, 0-731E700 SH1 REV2	-	-	NV(1)

1 Fuses, manual breakers and manual switches provide interconnection and control

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jon Betlach /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc S. Rubin /Date01/13/2004
-	No entry necessary	

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: 250V DC				Sheet 9
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
0-BDDD-280-0001, 2, 3 (RMOV BOARD 1A, B, C)	0-731E700-1 R02 0-731E722-1 R02 (typical) 0-45E702-1 (3-23-88) (typical)	HS	-	NV(1)
0-PNLA-248-0000A, B, C, D (Distribution Panel SB-A, B, C, D)		HS	-	NV(1)
0-CHGA-248-0000A, B, C, D (Battery charger SB-A, B, C, D)		HS	-	NV(1)
		27,59	-	CA(2)
0-CHGA-248-0001, 2A, 3 (Battery charger 1, 2A, 3)		HS	-	NV(1)
		27,59	-	CA(2)
0-BATA-248-0001, 2, 3 (Main battery)		-	-	NA
0-BATA-248-0000A, B, C, D (Battery SB-A, B, C, D)		-	-	NA
0-XSW-248-0001, 2A, 3 (Main battery charger output XFR SW)		-	-	NA

1 Fuses, manual breakers and manual switches provide interconnection and control
2 A 30 second interruption in output would be acceptable. There are no seal-in or lockout features

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory

CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jon Bethke /Date01/07/2004
Reviewed by Marc D. Lubin /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Control Rod Drive				Sheet 10
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-HCU-85-1-185	0-730E915-14 R03 (typical)	All	-	CA(1)
1-FSV-85-35A&B, 39A&B, 70A&B				
1-FCV-85-37A, B, C, D, E, F				
1-FCV-85-82, 82A, 83, 83A				

1 Automatic or manual scram will take place during the 30 second strong motion. Chatter of contacts controlling these valves causing the scram will support the scram since the system is a fail safe design (BFN-50-7085) in which loss of power will lead to a scram. A reset of the Mode switch, see G.4 Sheet 6, is required (FSAR 7.2.2) prior to any rod movement. Operating procedures (0-AOI-100-5 REV 25) do not allow reset and rod withdrawal during an earthquake.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory	
CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jim Betbeh /Date01/07/2004
Reviewed by Marc D. Lilie /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: 24V DC				Sheet 11
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-BATD-283-0000A1, B1 (Battery)	GE 731E717(8-28-69)	-	-	NA
1-CHGD-283-0000A1-1, A2-1, B1-1, B2-1 (Battery Charger)		-	-	NV(1)

1 Fuses, manual breakers and manual switches provide interconnection and control

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jess Betlayle /Date01/07/2004 Reviewed by Marc D. Lulici /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Core Spray - Pumps **Sheet 12**

Subsystem/component	Ref Dwg(s)	Contact / Contact Group	Relay Type / Location	SAT*
1-PMP-75-5,14,33,42 (Pumps 1A,1C,1B,1D)	1-45E765-7(12-2-70) 0-223R0379-7 R00 0-730E930-3 R00 0-730E930-4 R03 0-730E930-13 R16 0-730E930-14 R15 0-730E930-18 R15	HS		NV
		NVA,DGVA		CA(1)
		14A-K10A&B, 11A&B, 12A&B, 14A&B, 24A&B, 25A&B, 26A&B, 29B, 31B	HFA	CA(1) & GERS(2)
		14A-K21A&B, 22A&B, 29A, 30A&B, 31A, 32A&B	HGA	CA(1) & GERS(2)
		14A-K123A&B, 124A&B, 125A&B, 126A&B, 14A-K127B, 128B, 129B, 130B	AGA 7012/Panels 9-32&33 4KV SHDN BD A,B,C,D	GERS(3)
		52X&Y		GERS(4)
		52(other)		NV(4)
		50/51/83	IAC66	GERS(4)
		50G	PJC11	GERS(4)
		27	ITE27&HFA	GERS(4)

1 Contact chatter leading to the start of any or all four pumps is acceptable. Per DCD BFN-5007075, " ---the four core spray pumps shall start approximately seven seconds after its respective standby power (diesel generator) becomes available to avoid overloading the source of standby power. "Each pump discharge shall be provided with a low flow bypass line to protect the pump from overheating during operation against a closed discharge .
2 Trip signals to the pumps would require chatter of HFA NO, HGA NO or protective relay contacts, which are seismically adequate; see App. B.1.1, App. B.1.4 and App. B.3.1
3 See App. B.1.2
4 See App. B.3.1

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
	CA	Chatter acceptable
	NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
	GERS	Seismically adequate based on GERS____; include GERS number
	NA	Component not affected by relays
	CR	Corrective action required
	OA	Operator action
	-	No entry necessary

Prepared by Jon Bethesh /Date 01/07/2004
Reviewed by Marc D. Lilie /Date 01/13/2004

System: Core Spray – Valves – 1				Sheet 13
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-75-26,54	0-730E930-5 R03	HS	-	NV
1-FCV-75-25,53	0-730E930-4 R03 0-730E930-17 (8/15/88) 0-730E930-13 R16 0-730E930-14 R14	HS, TS, LS	-	NV
		42	RMOV BD 1A&B	CA(1)
		14A-K4A&B, 9A&B, 13A&B, 23A&B, 25A&B, 26A&B	HFA/Panel 9-32 & 33	GERS(2&3), CA(2)
1-FCV-75-9,22,37,50	0-730E930-17 (8/15/88)	HS, TS, LS	-	NV
		FS & 42; (valves 9 & 37)	-	CA(1)
		42	RMOV BD 1A&B	CA(1)
		14A-10A&B, 13A&B, 23A&B	HFA/Panels 9-32 & 33	GERS(2&3), CA(2)

1 MOV is throttling valve with no seal-in feature. Brief periods of chatter would result in little, if any, valve movement because of the slow response and movement (in order of 100ms) of the valve relative to relay chatter pulses in the order of 10-30ms duration.
2 See App. B.1.1.
3 Other relays associated with pump control which affect these relays are covered on G4 Sheet 12.
4 Chatter during 30 second strong motion, though unlikely, would have little effect on slow moving valve. FS has no seal-in feature and valve would go to demanded position after strong motion.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jesse Bethke /Date01/07/2004 Reviewed by Marc D. Lilie /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Core Spray – Valves – 2				Sheet 14
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-75-2, 11, 23, 30, 39, 51	0-730E930-6 R01	HS,TS,LS	-	NV
		42	RMOV BD 1A&B	GERS(1), CA(1)
		14A-K13A&B	HFA/ Panels 9-32&33	GERS(2&4), CA(2)
1-FCV-75-57, 58	0-730E930-8 R01	HS,LS	-	NV
		86-75-57, 58	CR120A/ Panels 9-42&43	GERS(2)
		16A-K17, 18	Panels 9-42&43	CA(3)

1 See App. B.2
2 See App. B.1
3 Valve operation requires manual action of HS or chatter of 86 NO contact which is seismically adequate; see App. B.1.The 86 NO contact blocks the effect of any chatter of the 16A contact.
4 Other relays associated with pump control which affect these relays are covered on G4 Sheet 12

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jean Bettish /Date01/07/2004 Reviewed by Marc D. Zuilini /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Residual Heat Removal - Pumps — **Sheet** 15

Subsystem/component	Ref Dwg(s)	Contact / Contact Group	Relay Type / Location	SAT*
1-PMP-74-5,16,28,39 (Pumps 1A,1C,1B,1D)	0-223R0379-7 R00 0-730E920-4 R04 0-730E920-5 R02 0-730E920-4 R04 0-730E920-7 R04 0-730E920-8 R26 0-730E920-14 R06 0-730E920-26 R02	HS, XS, LS	-	NV
		PS, LITS	-	CA(1)
		10A-K23A&B, 24A&B, 72A&B, 76A&B, 97A&B, 104A-D, 105A-D	HGA	GERS(2), CA(1)
		10A-K9A&B, 11A&B, 14A&B,15A&B, 16A&B, 18A&B, 19A&B, 21A&B, 22A&B, 25A&B, 65A&B, 74A&B, 98A&B, 102A&B, 103A&B	HFA	GERS(2), CA(1)
		10A-K110A&B, 111A&B, 112A&B, 113A&B, 114A&B, 115A&B, 116A&B, 117A&B, 118A&B, 119A&B	AGA 7012/Panels 9-32&33	GERS(3)
		52X&Y	4KV SHDN BD A,B,C,D	GERS(4)
		52(other)		NV(4)
		50/51/83	IAC66	GERS(4)
		50G	PJC11	GERS(4)
		27	ITE27,HFA	GERS(4)

1 Contact chatter leading to the start of any or all four pumps is acceptable. Per DCD BFN-50-7074 Section 3.9.6.2, the pump start sequence is coordinated (using seismically adequate delay relays, see note 3) to prevent overloading the diesel generators. Also, pump control circuitry (using rugged LS contacts) prevents pump start unless suction path is lined up and each pump discharge has a flow bypass line to prevent pump overheating if operating against a closed discharge.
2 Trip signals to the pumps would require chatter of HFA NO, HGA NO or protective relay contacts, which are seismically adequate; see App. B.1.1, App. B.1.4, and App.B.3.1
3 See App. B.1.2
4 See App. B.3.1

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory

CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS_____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jean Bethke /Date 01/07/2004
Reviewed by Marc D. Lilie /Date 01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Residual Heat Removal – Valves – 1				Sheet 16
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-74-1, 2, 12, 13, 24, 25, 35, 36	1-730E920-15 R26 1-730E920-17 R03	HS,XS,TS,LS	-	NV
		42	MOV BD 1A&B	GERS(1), CA(1)
1-FCV-74-7, 30	1-730E920-2 R03 1-730E920-8 R02 1-730E920-20 R03 1-730E920-21 R03	HS,XS,TS,LS,52	-	NV
		42	MOV BD 1D&E	GERS(1), CA(1)
		10A-K108A&B	HFA/ Panels 9-32&33	GERS(2), CA(2)
		10-124B, TDC	Panels 9-32&33	CA(3)
1-FCV-74-54, 68	1-730E920-24 R00 1-730E920-25 R03	HS	-	NV

1 See App. B.2
2 See App. B.1.1
3 Chatter might briefly delay valve operation during the 30 sec strong motion, which would be acceptable. There is no seal-in feature so the valve would go to its demanded state after the strong motion.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jim Bethel /Date01/07/2004 Reviewed by Marc D. Zulis /Date01/13/2004

System: Residual Heat Removal – Valves – 2				Sheet 17
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-74-52, 57, 58, 59, 61	1-730E920-1 R02 1-730E920-5 R02 1-730E920-6 R26 1-730E920-16 R01	HS,XS,TS,LS	-	NV
		42	MOV BD 1A&D	GERS(1), CA(1)
		10A-K14A, 35A&B, 36A&B, 50A&B, 51B, 58A, 59A, 60A&B, 61A, 68A, 100A&B, 106A&B,46A	HFA/ Panels 9-32&33	GERS(2&5), CA(2)
		10A-K89A&B, 69A	HGA	GERS(2)
		10A-K45A	AGA 7012/Panel 9-32	GERS(3)
1-FCV-74-53, 60	1-730E920-1 R02 1-730E920-5 R02 1-730E920-15 R26	HS,XS,TS,LS	-	NV
		42	MOV BD 1A&D	GERS(1), CA(1)
		10A-K14A, 27A, 35A, 59A, 60A&B, 61A, 63A, 65A&B, 67A&B, 69A&B, 100A&B, 106B, 108A	HFA/ Panels 9-32&33	GERS(2&5), CA(2)
		16A-K29,PS	-	CA(4)

1 See App. B.2
2 See App. B.1.1 and B.1.4
3 See App. B.1.2
4 See note 3, Sheet 16
5 Other relays associated with pump control which affect these relays are covered on G4 Sheet 15

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory	
CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS_____: include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jess Bethurk /Date 01/07/2004
Reviewed by Marc D. Zurbiri /Date 01/13/2004

System: Residual Heat Removal – Valves – 3				Sheet 18
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-74-66, 101	1-730E920-9 R02 1-730E920-18 R03 1-730E920-22 R04	HS, XS, TS, LS	-	NV
		42	RMOV BD 1B	GERS(1)
		10A-K35B, 36B,46B	HFA	GERS(2&5), CA(2)
		10A-K45B	AGA 7012/ Panel 9-33	GERS(3)
1-FCV-74-67, 74	0-730E920-1 R02 0-730E920-5 R02 0-730E920-8 R02 0-730E920-17 R03	HS, XS, TS, LS	-	NV
		42	RMOV BD 1B&E	GERS(1), CA(1)
		10-K27B, 65A&B, 66A&B	HGA/Panels 9-32&33	GERS(2&5), CA(2)
		10-K35A&B, 36A&B, 59B, 61B, 63A&B, 99A	HFA/Panels 9-32&33	GERS(2&5), CA(2)
		16A-K30	-	CA(4)

1 See App. B.2
2 See App. B.1.1 and B.1.4
3 See App. B.1.2
4 See note 3, G4 Sheet 16
5 See note 5, G4 Sheet 17

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory

CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jean Betlach /Date 01/07/2004
Reviewed by Marc D. Zubin /Date 01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Residual Heat Removal – Valves – 4				Sheet 19
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-74-71, 72, 73, 75	1-730E920-8 R02 1-730E920-18 R03	HS, XS, TS, LS, 52	-	NV
		42	RMOV BD 1B&1E	GERS(1), CA(1)
		10A-K14B, 50A, 51A, 58B, 59B, 60A&B, 61B, 68B, 99A, 100A&B	HFA/Panels 9-32&33	GERS(2&3), CA(2)
		10A-K69B, 89A&B	HGA/Panels 9-32&33	GERS(2&3), CA(2)
		PS, FIS	-	CA(4)
2-FCV-74-96, 97, 100 1-FCV-23-57	1-45E779-10 (9-17-70) 2-45E779-10 R030	HS, XS, TS, LS	-	NV
		C, O, OL	RMOV BD 1&2B	GERS(1)
1-FCV-23-034, 040, 046, 052	1-45E779-49 (9-17-70)	HS, XS, TS, LS	-	NV
		52a,b,z	-	NV
		C, O, OL	-	CA(4)

1 See App. B.2
2 See App. B.1.1 and B.1.4
3 Other relays associated with pump control which affect these relays are covered on G4 Sheet15
4 Chatter might briefly delay valve operation during the 30 sec strong motion, which would be acceptable. There is no seal-in feature so the valve would go to its demanded state after the strong motion.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS_____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jean Bethuck /Date01/07/2004 Reviewed by Marc D. Lilin /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various—I&C Power				Sheet 20
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-INVT-256-0001, 2 (Inverters)	BFN-VTD-S625-0050	all	-	CA(1)
1-XFA-253-0001A1, A2, B1, B2 (I&C Transformers)	0-731E752-1 R27	-	-	NA
1-AMP-092-0007/41A, B, C, D (IRM CH PREAMP)	BFN-VTD-G080-3770	-	-	NA

1 UPS operation could be briefly interrupted during the 30 second strong motion. This would be acceptable since there is no seal-in or lockout feature and the UPS would then resume normal operation. See EPRI NP-7148, Section 3.5.3 for a discussion on the acceptability of spurious indications during the 30 second strong motion.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory

CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jon Bethke /Date01/07/2004

Reviewed by Marc D. Durlin /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various--Power Supplies				Sheet 21
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-PX-64-50, 67B, 159A&B, 160A&B, 161, 162	1-730E920-10 R08 (typical) 0-730E930-29 R13 (typical)	-	-	NV(1)
1-PX-71-60-1, 1A, 2, 2A		-	-	NV(1)
1-PX-74-56, 70		-	-	NV(1)
1-PXMC-23-114, 115A&B		-	-	NV(1)

1 The power supplies are not controlled by relays

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jean Bettlache /Date01/07/2004 Reviewed by Marc D. Pulini /Date01/13/2004

System: Various—Undervoltage & Degraded Voltage				Sheet 22
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
Various	0-731E761-1 (10-7-88) 0-45E765-8 (4-22-88) 1-45E779-1 (2-13-88) (Above drawings for Board A) (Typical for others) 0-45E724-1,2,3,4(2-23-68) 1-45E749-1,2 (6-27-68)	27_& associated logic	-	CA(1)

1 Load shedding from 4160V Shutdown Boards A, B, C& D and 480 Shutdown Boards A & B, accompanied by start of diesel generators A, B, C & D, and time sequenced reconnection of selected loads is likely to result from loss of off-site power caused by the earthquake. Contact chatter in the undervoltage or degraded voltage circuits could cause the same result. This would be acceptable since load shedding, diesel start and selected load reconnection is desired in the event of an earthquake. If off-site power is not lost, chatter caused load shedding and load reconnection could occur but the diesel generators would not be needed. If the load shedding were initiated by contact chatter after the diesel generators were started, the diesels would continue to run and any stripped and reconnected loads would again be stripped and reconnected. See EPRI NP-7148 Section C.3.12 for further discussion.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jesse Bethesh /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Lilli /Date01/13/2004
-	No entry necessary	

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Emergency Equipment Cooling Water				Sheet 23
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-CLR-67-917, 918, 921, 922 (RHR Pump Room Coolers)	1-47E610-67-1 (7-10-69)	-	-	NA(1)
1-CLR-67-919, 920 (Core Spray Pump Room Coolers)	1-47E610-67-1 (7-10-69)	-	-	NA(1)
Cooler Fans	1-45E779-16 (10-27-71)	HS,52A	-	NV
		TS,OL	-	CA(2)

1 Relays affecting flow control valves will be addressed for valves
2 A brief delay in operation during the 30 second strong motion would be acceptable. There are no seal-in or lockout features.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jon Betlach /Date01/07/2004 Reviewed by Marc D. Zuliani /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: 4KV & 480V AC Boards				Sheet 24
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
0-BDAA-211-0000A, B, C, D (4KV SHDN BD 1A, B, C, D) (Breakers, e. g. 5 & 21 to 4KV/480V transformers)	0-45E724-1, 2, 3, 4 (2-23-68) 0-223R0379 R01	HS		NV
		52x,y		GERS(1)
		52 (other)		NV(1)
		50/51	IAC51,53,66	GERS(1)
		50g	PJC11/ SHDN BD 1A,B,C,D	GERS(1)
1-BDBB-231-0001A, B (480V SHDN BD-A, B) (Breakers, e. g. 52A&B, 3A&B to bus and MOV boards; also see note 2)	1-45E749-1, 2 (6-27-68) 1-45E779-1 (2-12-88)	HS, 43		NV
		52x,y		GERS(1)
		52 (other)		NV(1)
		50/51	IAC53	GERS(3)
		86	HEA61/ SHDN BD 1A&B	GERS(3)
1-XFA-231-TS1 A, B 0-OXF-219-TDA & TDB (4KV/480V transformers)	0-45E749 (6-27-68) 0-45E724-1, 2 & 3 (2-23-68)	-	-	NA(4)

1 See App.B.3
2 Feeder breakers are manual with current sensors and trip devices
3 SHDN BD A demand is (2.15/0.38 see APP.A)x2.6(see Ref.7, Sect. 3.4.2) = 5.6/1.0g and SHDN BD B demand is (1.35/0.32)x2.6 = 3.6/0.83g. IAC53 capacity is 7/2.8g (see GERS-RLY-PP1 of EPRI NP-7147) and HEA61 capacity is 14/5.6 (see Ref. 13)
4 Relays affecting power to the transformers are addressed for the breakers they affect

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
	CA	Chatter acceptable
	NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
	GERS	Seismically adequate based on GERS____; include GERS number
	NA	Component not affected by relays
	CR	Corrective action required
	OA	Operator action
	-	No entry necessary

Prepared by Jess Betlack /Date 01/07/2004
Reviewed by Marc D. Zulizi /Date 01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: LPCI – MG SETS				Sheet 25
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-MGEN-268-0001DA, EA, DN, EN	1-45E779-24, 25, 26, 27 (10-10-79) 1-45E749-1, 2 (6-27-68)	HS, 26RS, 52A, 52CS	-	NV
		52PS, 52TEST	-	NV
		52T	AGA 7022	GERS(1)
		26XX	HFA51A	GERS(1)
		50/51/83	IAC53/SHDN BDs 1A&1B	GERS(1)
		26X	HGA11/JBOX5947,48,49, 50	GERS(1)
		27	-	CA(2)
Voltage Regulator Box	-	-	-	NA

1 See App. B.3 for MVS/LVS GERS and 480V SHDN BD 1A&B discussion
2 Alarm indication

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory	
CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jean Bettinger /Date 01/07/2004
Reviewed by Marc D. Pulici /Date 01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Main Steam – Valves				Sheet 26
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-PSV-1-4, 5, 18, 19, 22, 23, 30, 31, 34, 41, 42, 179, 180 (SRVs)	1-730E929-1 R02 1-730E929-2 R04 1-730E929-3 R00 1-730E929-4 R01	HS, XS, 2E-S_, PS	-	NV(1)
		2E-K32, 33	-	CA(2)
1-FCV-1-14, 15, 26, 27, 37, 38, 51, 52, 55, 56 (MSIV & Drain)	1-730E927-1A R02 1-730E927-10 R01 1-730E927-11 R00 1-730E927-12 R02	HS (16A-S_), XS, LS, TS	-	NV
		O, C, OL	-	CA(3)
		16A-K_(all)	-	CA(3)

1 HS, XS, 2E-S contacts are rugged manual switch contacts. The PS switch is a spring mechanism in the pilot valve and is not vulnerable to chatter.
2 Chatter of these contacts could briefly delay, during the 30 second strong motion, operator demanded opening of valves 22 and 30. This would be acceptable since the other 11 valves would open if demanded. The PS switch would not be affected and all valves would open on overpressure.
3 Chatter could cause valve closure, but not reopening. This would be acceptable since the desired shutdown state is closed.
4 Note the PSVs identified in the above list are the solenoid control valves associated with the Safety Relief Valves which are designated as PCVs. The PCVs themselves have no associated relays.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory CA Chatter acceptable NV Not vulnerable(mechanically-actuated contacts and solid state relays) GERS Seismically adequate based on GERS____; include GERS number NA Component not affected by relays CR Corrective action required OA Operator action - No entry necessary	Prepared by Jean Bettacke /Date01/07/2004 Reviewed by Marc D. Lilicis /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Containment Atmospheric Dilution – Valves				Sheet 27
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-64-17, 30, 33 (Misc Valves)	1-730E927-17A R07 1-730E927-18 R08 1-730E927-17 R13	HS,LS	-	NV
		86-64-17, 30, 33	CR120A/Panel 9-43	GERS(1)
		16A-K65A	-	CA(2)
1-FCV-64-28A, B, C, D, E, F, G, H, J, K, L, M (Vacuum Breakers)	1-730E927-20 R01	HS(16A-S_)	-	NV
1-FCV-64-20, 21 (Torus Vacuum Relief)	1-730E927-19 R02	HS(16A-S_)	-	NV
		16-19-32A&B	-	CA(3)

1 See App. B.1
2 Actuation or chatter of relay could cause valve to close but not open. Closed is an acceptable safe shutdown position.
3 Chatter during the 30 second strong motion could, though not likely due to slow valve movement, cause brief valve openings. This would be acceptable since there is no seal-in feature and valve would return to its prior state.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory

CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jim Betlack /Date 01/07/2004
Reviewed by Marc D. Lilici /Date 01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Containment Atmospheric Dilution – Valves				Sheet 28
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-64-18, 19 (Air purge)	3-730E927-16 R11	HS	-	NV
		86-64-18,19	CR120A/Panel 9-42	GERS(1)
		16A-K23, 66B	-	CA(2)
1-FCV-64-222 (Wetwell Vent)	DCN 51205 & 51094	HS	-	NV(3)
1-FCV-64-139, 140 (Containment Isol.)	1-730E927-17A R07 1-45E777-21 (5-21-76)	HS, LS	-	NV
		86-64-139, 140	CR120A/Panel 9-43	GERS(1)
		16A-K24,K_, M, PS	-	CA(2)

1 See App. B.1
2 Actuation or chatter of relays could cause valve to close but not open. Closed is an acceptable safe shutdown position.
3 Valve control logic is being modified per DCNs. Design criteria of Reference 14 require compliance with USI A-46 or current methods.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS_____; include GERS number	
NA	Component not affected by relays	Prepared by Jean Bethke /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Lulici /Date01/13/2004
-	No entry necessary	

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various – Valves				Sheet 29
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-69-1, 2 (RCWU)	1-730E927-13 R03	HS, LS, TS, 16A-S15&16, 11A-S1	-	NV
		42, 72, OL	RMOV BD 1B	GERS(1)
		COM		CA(2)
		16A-25, 26, 27, 47, 48	CR120A/Panels 9-42&43	GERS(3)
		16A-K6A-D, 59A-D,60A-D		CA(2)
1-FCV-70-47 (RBCCW)	1-45E779-8(9-21-70)	HS, XS, LS, TS	-	NV
		C, O, OL	RMOV BD 1B	GERS(1)
1-FCV-76-17, 18, 19, 24 (Prim. Cont. Isol.)	3-730E927-16 R11 1-730E927-17A R07	HS,LS	-	NV
		86-76-17, 18, 19, 24	CR120A/Panels 42&43	GERS(3)
		16A-K23, 24, 34, 35, 42, 43, 65B		CA(2)

1 See App. B.2 (480V RMOV BD 1B & 250VDC RMOV BD 1B)
2 Actuation or chatter of relay could cause valve to close but not open. Closed is an acceptable safe shutdown position.
3 See App. B.1

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory	
CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jean Bethke /Date01/07/2004
Reviewed by Marc D. Zulli /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various – Valves				Sheet 30
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-78-61 (Fuel Pool X-Tie to RHR)	1-45E779-6 (9-21-70)	HS, LS, TS	-	NV
		O, C, OL	RMOV BD 1B	GERS(1)
1-FCV-32-62, 63 (Drywell Cont. Air Suction Valve)	1-45E614-9(2-15-72)	HS	-	NV
		86-32-62, 63		CA(2)
		16A-K37,38		CA(2)
1-FCV-67-50, 51 (& 1-PS-67-50, 51)	1-45E614-3(10-14-88)	HS	-	NV
		PS		CA(3)

1 See App. B.2
2 If HS is in the close position, chatter or operation will not open valve. If HS is in the open position, chatter causing valve closure would be acceptable, since closed is an acceptable safe shutdown position.
3 Chatter during the 30 second strong motion could, though not likely due to slow valve movement, cause brief valve openings. This would be acceptable since there is no seal-in feature and valve would return to its prior state.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jan Betlach /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Tilini /Date01/13/2004
-	No entry necessary	

System: Various – Valves				Sheet 31
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-71-2, 3, 17, 18, 40 (RCIC)	1-45E779-12 (9-6-88) 1-45E714-5 (12-18-70) 1-45E626-3 (3-8-71)	HS, XS, LS, TS, PB		NV
		C, O, OL		CA(1)
		13A-K2, 3, 4, 14, 15, 16, 33		CA(1)
1-FCV-73-2, 3, 26, 27, 81 (HPIC)	1-45E779-13 (9-21-70) 1-45E779-43 (9-26-80) 1-45E714-2 (4-8-03)	HS, LS, TS		NV
		C, O, OL, 1CX, 10X, 63		CA(3)
		23A-K1, 2, 3, 12, 13, 15, 25, 27, 28, 37		CA(3)

1 The RCIC is not selected as a safe shutdown system, so its isolation through valve closure is acceptable. However, RCIC actuation would be acceptable since it would relieve some steam that the SRVs would otherwise relieve and would assist in core cooling. Its pump is protected with a minimum-flow bypass line, see FSAR Section 4.7.5, in the event of valve misalignment. Failure of this system to operate would be acceptable since it is not credited as a safe shutdown system

2 The HPIC is not selected as a safe shutdown system, so its isolation through valve closure is acceptable. However, HPIC actuation would be acceptable since it would assist in core cooling and not hinder maintenance of reactor inventory or pressure. Its pump is protected with a minimum-flow bypass line, see FSAR Section 6.4.1, in the event of valve misalignment. Failure of this system to operate would be acceptable since it is not credited as a safe shutdown system

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory

CA	Chatter acceptable
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)
GERS	Seismically adequate based on GERS____; include GERS number
NA	Component not affected by relays
CR	Corrective action required
OA	Operator action
-	No entry necessary

Prepared by Jess Bottach /Date01/07/2004

Reviewed by Marc A. Zulli /Date01/13/2004

TABLE 5-1: A-46 RELAY SCREENING AND EVALUATION FORM G.4 – RELAY TABULATION
PLANT: BROWN'S FERRY NUCLEAR PLANT UNIT 1

System: Various – Valves				Sheet 32
Subsystem/component	**Ref Dwg(s)**	**Contact / Contact Group**	**Relay Type / Location**	**SAT***
1-FCV-77-2A&B, 15A&B (Drywell Isol.)	1-730E927-15 R17	HS, LS		NV
		86-77-2A&B, 15A&B	CR120A/Panels 9-42&43	GERS(1)
		16A-K5A-D, 7A-D, 17, 18, 47, 48		CA(2)
1-FSV-84-8A, 8B, 8C, 8D, 48, 49	1-45E684-1 (11-6-73)	HS		NV
1-FCV-84-19, 20 (Vent valves)	1-730E927-17A R07 1-45E684-1&2 (11-6-73)	HS, LS		NV
		LR, PS, 16A-K34&35, 84-K2B&3B		CA(3)
		86-84-20	CR120A/Panel 9-43	GERS(1)
1-PREG-84-52, 54	2-47E862-1 (6-7-73)			NA

1 See App. B.1
2 Actuation or chatter of relay could cause valve to close but not open. Closed is an acceptable safe shutdown position.
3 Chatter during the 30 second strong motion could briefly delay operator demanded vent valve opening. This would not occur during the strong motion. Chatter of the PS or the 16A-K34 or 35 could cause the valve to close briefly. This would be acceptable since there is no seal-in or lockout and the valve would return to its demanded position.

* Identify reason for Contact/Contact Group being satisfactory or unsatisfactory		
CA	Chatter acceptable	
NV	Not vulnerable(mechanically-actuated contacts and solid state relays)	
GERS	Seismically adequate based on GERS____; include GERS number	
NA	Component not affected by relays	Prepared by Jon Bettcher /Date01/07/2004
CR	Corrective action required	
OA	Operator action	Reviewed by Marc D. Lilicci /Date01/13/2004
-	No entry necessary	

6. REFERENCES

6-1. Generic Letter 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46, U. S. Nuclear Regulatory Commission, Washington D. C., February 19, 1987.

6-2. SQUG report entitled, "Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment, Revision 2," June, 1990.

6-3. Electric Power Research Institute report EPRI NP-7148-SL entitled, "Procedure for Evaluating Nuclear Power Plant Relay Seismic Functionality," dated December, 1990.

6-4. EPRI NP-7148-SL Volume 2 entitled "Procedure for Evaluating Nuclear Power Plant Relay Seismic Functionality Volume 2: Addendum," Electric Power Research Institute, dated September 1993.

6-5. Generic Letter 88-20, "Individual Plant Examination of External Events for Severe Accident Vulnerabilities," dated September 21, 1992.

6-6. NUREG 1407, Procedural and Submittal Guidance for Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," dated June 1991.

6-7. Letter from TVA to NRC entitled "Browns Ferry Nuclear Plant – Units 2&3 – Generic Letter 87-02, Supplement 1, Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue A-46 and Generic Letter 88-20 Supplement 4, Individual Plant Examination of External Events for Severe Accident Vulnerabilities," – Submittal of Seismic Evaluation Reports, dated June 28, 1996.

6-8. Letter from NRC to TVA entitled, "Browns Ferry, Units 1, 2 and 3 Re: Completion of Licensing Action for Generic Letter 87-02(TAC Nos. M69430, M69431 and M69432), dated March 21, 2000.

6-9. TVA Calculation CDQ1 999 2003 1199, Rev. 1, "Relay Safe Shutdown Equipment List (SSEL) for USI A-46 and IPEEE Seismic Programs."

6-10. TVA Calculation CD-Q0000-940339, "Calculation of Basic Parameters for A-46 and Individual Plant Examination of External Events (IPEEE) Seismic Program," dated October 16, 1995.

6-11. Browns Ferry Nuclear Plant Final Safety Analysis Report (FSAR), effective March 30, 2003.

6-12. EPRI NP-7147-SL, "Seismic Ruggedness of Relays," and Addendums, Electric Power Research Institute, August 1991.

6-13. Merz, Kelly, "SQURTS-TO-GERS Conversion," SQUG Newsletter, Volume 3, Issue 3, October, 1995.

6-14. General Design Criteria Document BFN-50-C-7105, titled "Pipe Rupture, Internal Missiles, Internal Flooding, Seismic Qualification and Vibration of Pipes," dated March 2, 2001.

6-15. EPRI NP-5223 Rev.1, "Generic Seismic Ruggedness of Power Plant Equipment," Electric Power Research Institute, February 1991.

6-16. WDP-BFN1-CEB-A46-IPEEE, "USI A-46 and Seismic IPEEE Screening Evaluation Documentation for Browns Ferry Unit 1."

APPENDIX A: FLOOR SPECTRA

Floor spectra and the safe shutdown earthquake(SSE) spectrum used in the relay evaluation seismic capacity versus demand comparisons are described in TVA Calculation CD-Q0000-940339 titled, "Calculation of Basic Parameters for A46 and Individual Plant Examination of External Events(IPEEE) Seismic Program," dated October 16, 1995. The calculation applies to all three units. Effective grade differs for the three units but the floor response spectra apply to all three units.

Evaluation of relay seismic capacity versus demand requires comparison of both the peak spectral acceleration (PSA) and the zero period acceleration (ZPA). The PSA is the highest value in the 4 to 16 Hertz (HZ) frequency region of the spectra. The ZPA is the highest value in the 33 HZ and higher region. These values are calculated using either the SSE ground spectrum or a floor response spectrum with appropriate amplification factor and required multipliers for conservatism in some cases. Sample calculations are provided in Appendix B.

The PSA and ZPA values applied in demand calculations using the SSE ground spectrum and floor response spectra listed are taken from tables on pages 17, 20 and 43 of the calculation CD-Q0000-940339.

TABLE A-1: PSA AND ZPA VALUES FOR SEISMIC DEMAND CALCULATIONS

Building	Floor Elevation (ft)	Peak Spectral Acceleration (g)	Zero Period Acceleration (g)
Reactor & Control Bay	561 (effective grade)	0.31	0.20
	565	0.72	0.24
	593	1.34	0.32
	621	2.15	0.38
	639	2.48	0.44
Diesel Generator	573 (effective grade)	0.31	0.20
	561	1.58	0.38
	583	2.08	0.46
	594	2.23	0.50
	607	2.41	0.48

APPENDIX B: SYSTEM, CIRCUIT AND COMPONENT DISCUSSIONS

B.1 Common Relays

Some relay types occur numerous times in safe shutdown system control circuits. The seismic capacity of these common relays and other components discussed in this Appendix will be referenced on G.4 forms where they occur to simplify documentation. Seismic demands and capacity versus demand comparisons will also be discussed for some common locations and levels. Relay contacts with a seismic capacity of 8g or more and located below plant levels of about Elevation 600 feet satisfy the Level 1 seismic adequacy screen of EPRI NP-7148, Section 3.6. These include high capacity relays on panels 9-15, 16, 17, 18, 19, 28, 30, 32, 33, 36A, 39, 42 and 43, 4KV SHDN Boards 1B & D, 480V SHDN BD B and RMOV Boards 1B & D. Moderate capacity relays with at least a 5g seismic capacity also satisfy the Level 1 screen for cabinets such as 9-30, 32 and 33 which were determined during walkdowns by seismic capability engineers to be low amplification cabinets with an amplification factor of 3 or less.

B.1.1 HFA

GE HFA relays are widely used in the BFN-1 control circuits. These are mostly model HFA51A which has a seismic capacity of 6g for the NO contacts and 1g for the NC contacts in the deenergized state; see GERS ARH in EPRI NP-7147. Both NO and NC contacts have a 7g capacity in the energized state. The HFA151 has higher capacities. Accordingly, all but the NC contacts pass the 5g Level 1 seismic capacity screen for low amplification cabinets, including those noted above in Section B.1.0. The de-energized NC contact is normally used only as a permissive for which chatter is acceptable, because the chatter in most cases, would only cause a brief delay in the component operation during the 30 second strong motion. A possible 20-30 second delay in valve operation or pump operation would be acceptable since no LOCA is assumed to occur. If contact chatter is unacceptable, the G.4 form will specifically address the chatter effect.

B.1.2 Agastat

Agastat relays are commonly used for timed logic operation, including load sequencing, at BFN-1. The model 7012 is the most common. Both the 7012 and 2412

have a seismic capacity of 12.5g for both the NO and NC contacts in both the de-energized and energized states; see GERS PNT in EPRI NP-7147. These high capacities make the 7012 and 2412 relays seismically adequate for most plant locations, including the panels listed in Section B.1.0. The model ETR14 has a 9g NO and 3.8g NC seismic capacity in the non-operate state and 10g capacity for both NO and NC contacts in the operate state; see Addendum 2 to EPRI NP-7147. Section 1.1 above discusses possible chatter of a low capacity NC contact. The model 7022 has a seismic capacity of 6g for deenergized NO and NC contacts and 10g when energized.

B.1.3 CR120A

GE CR120A relays are also widely used in the BFN-1 control circuits. The model CR120A has a seismic capacity of 10g for the NO and 9g for the NC contacts in the de-energized state; see GERS AI2 in EPRI NP-7147. Both NO and NC contacts have a 10g capacity in the energized state. Accordingly, all of the CR120A contacts pass the Level 1 seismic capacity screen for most standard cabinets, including those listed above in Section B.1.0.

B.1.4 HGA

GE HGA relays are another common relay used in the BFN-1 control circuits. These are mostly model HGA11 which has a seismic capacity of 8.8g for the NO contacts and 0g for the NC contacts in the de-energized state; see GERS ARH in EPRI NP-7147. The NC contacts have a 10g capacity in the energized state and the NO contacts have a 4.4g capacity in the energized state. Accordingly, the de-energized NO and energized NC contacts pass the Level 1 seismic capacity screen for many common cabinets, including those listed above in Section B.1.0. The de-energized NC contact is a "bad actor," see Appendix E of EPRI NP-7148, and must be dealt with as a special case if its chatter is unacceptable. However, the de-energized NC contact is normally used only as a permissive for which chatter is acceptable, because the chatter in most cases would only cause a brief delay in the component operation during the 30 second strong motion. A possible 20-30 second delay in valve operation or pump operation would be acceptable since no LOCA is assumed to occur. If contact chatter is unacceptable, the G.4 form will specifically address the chatter effect.

B.2 Motor Control Centers (MCCs)

Most MCCs, commonly referred to as RMOV Boards at BFN-1, have a standard GE 7700 frame with cubicles or "buckets" which contain a molded case circuit breaker, 480V/120V transformer, contactors and wiring. A few standard ITE MCCs are also used.

The contactors are typically GE CR105, 106 or 109. EPRI NP-7148, Section C.3.1 provides additional discussion of this type GE MCC and contactors. 250VDC RMOV boards have similar components. GERS MCC in EPRI NP-5223 show a floor capacity of 1.5g PSA and 1.0g ZPA (denoted 1.5/1.0). 480V RMOV BDs 1B & 1D and 250VDC BD 1B are at Elevation 593 ft. of the RB (denoted RB593), which has a floor demand (see Appendix A) of 1.345/0.32. 250VDC RMOV BD 1C is at level RB565. Accordingly, contactors in these MCCs are seismically adequate. 480V RMOV BDs 1A & 1E and 250VDC RMOV BD 1A, located at level RB621 with a floor demand of 2.15/0.38, are seismically adequate if the 0.6 narrow peak reduction factor is applied; see EPRI NP-7148 Section 3.6 and Section 1.2 of EPRI NP-7148 Vol. 2 for discussions of the 0.6 narrow peak reduction factor. Reference 6-10, Figure B.1 shows the narrow peak which meets the criteria provided in EPRI NP-7148. For the Core Spray, RHR and RHRSW pumps and their associated valves, two pumps provide 100% maximum system flow as discussed in FSAR Sections 4.8, 6.3 and 10.9.

Without a LOCA this is more than adequate flow. This capability is provided by pump switchgear and valve MCCs located on RB593 level or lower for which the equipment is seismically adequate without the 0.6 narrow peak reduction. If the pumps powered and controlled by equipment on RB621 did not start or their associated valves misaligned (circuit interlocks prevent pump start if a potentially damaging misalignment occurs), the valves could be aligned and pumps started from the main control room at a later time, if needed.

B.3 Switchgear

BFN-1 safe shutdown equipment pumps and valves are powered through 4160V (4KV) and 480V switchgear. Redundant trains of switchgear are used to satisfy single failure criteria and are located in different plant areas to reduce the chance of common mode failure. The 4KV switchgear is discussed in Section 3.1 and the 480V switchgear is

discussed in Section 3.2. Seismic capacities, demands and screening methods are provided to allow simple referencing on G.4 pages.

B.3.1 4KV Switchgear

The BFN-1 4KV switchgear breakers are mostly standard 1960's vintage GE 4KV Magne-Blast breakers or replacement Siemens breakers which satisfy form, fit, and function considerations and were procured qualified. EPRI NP-7148 Appendices B and C discuss the operation of and contact devices on these types of breakers. In particular, the auxiliary contacts on the breaker are mechanically-operated and are not vulnerable to chatter. Also, the use of SWGR GERS to screen 52x closing relays and 52y antipump relays which are special purpose relays provided with the breakers by the breaker manufacturer and are not low ruggedness relays, is discussed for both low and medium voltage breakers. The standard set of protective relays for the pump 4KV switchgear is a 50/51/83 (GE IAC) and 50g (PJC). The 4 KV switchgear shutdown boards 1B &1D are located at RB593 with a seismic demand of 1.345/0.32 and 1A & 1C at RB621 with a seismic demand of 2.15/0.38; see Appendix A. The relays and contact devices are seismically adequate based on SWGR GERS MVS/LVS in EPRI NP-5223. These GERS show capacities of 1.8/1.0 and 2.5/1.5 (with additional cabinet inspections for breaker vertical restraints and arc chute restraints). The additional inspections were made for the switchgear on RB621 and the vertical restraints were determined adequate. The second additional requirement does not apply since the Siemens breakers in SHDN BD 1A on RB621 are vacuum breakers which do not have arc chutes. Note also that the specific MVS/LVS criterion that the protective relays directly feed the trip coil, without an interposing lockout relay, is satisfied.

B.3.2 480V Switchgear

The BFN-1 480V breakers are standard GE type AK. Sections C.3.1 and C.3.13 of EPRI NP-7148 discuss AK breaker operation and contact devices on the breaker. The AK-15 and AK-25 are solenoid operated and the AK-50 is operated by charged springs. Both have mechanically-operated auxiliary contacts which are not vulnerable to chatter. Protective relays, when used, are of the same types as discussed in Section 3.1 above. 480V switchgear shutdown board B is located at RB593 and board A at RB621. The floor demands and MVS/LVS GERS discussed in Section 3.1 apply

and accordingly the relays and contact devices associated with the 480V switchgear are seismically adequate.

Feeder breakers to the buses have a lockout relay associated with the protective relays and screening methods other than the switchgear GERS are used for them as discussed in Table 5-1 (G4 form, sheet 24).

APPENDIX C: ESSENTIAL RELAY LIST

The following relays were determined to be essential relays, which are those relays which must pass a seismic capacity versus demand screen.

Relay	G.4 Page(s)
Agastat 7012	12, 15, 17, 18
Agastat 7022	25
GE HFA51,151	12, 13, 14, 15, 16, 17, 18, 19, 25
GE HGA11	12, 15, 17, 18, 19, 25
GE CR120A	14, 27, 28, 29, 32
GE IAC51	24
GE IAC53	24, 25
GE IAC66	12, 15, 24
GE PJC11	12, 15, 24
ITE 27	12, 15
GE HEA61	24
GE CR105/106/109	13, 14, 16, 17, 18, 19, 28, 29, 30, 31, 32

APPENDIX D: RELAYS SCREENED USING SWITCHGEAR GERS

The following relays were screened as seismically acceptable using switchgear GERS.

Relay	G.4 Pages(s)
GE HFA51,151	12, 15
GE IAC51	24
GE IAC53	24
GE IAC66	12, 15, 24
GE PJC11	12, 15, 24
ITE27	12, 15
4KV Breaker closing (52x) relay	12, 15, 24
4KV Breaker anti-pump (52y) relay	12, 15, 24
480V Breaker closing (52x) relay	24
480V Breaker anti-pump (52y) relay	24

APPENDIX E: WALKDOWN RESULTS

The relay walkdown to identify cabinet types which house essential relays, to spot check relay mountings, relay types and locations, and to verify the adequacy of the anchorage and structure of cabinets and panels was done as part of the anchorage and structural inspections by seismic capability engineers. Example relay mounting details for SSEL items are shown in Figures E-1 to E-17. Results of the seismic verification walkdowns are provided in the Screening Evaluation Work Sheets (SEWS) contained in WDP-BFN1-CEB-A46-IPEEE (Reference 6-16). Walkdown photographs and relay lists from the cabinet and panel inspections were used during the relay evaluation to confirm that the installed relays were consistent with control circuit drawing information. Any relay cabinet/panel anchorage or structural inadequacies identified are to be resolved as part of the corrective actions (outlier resolutions) resulting from the seismic capability engineers' evaluations as documented in Reference 6-16.

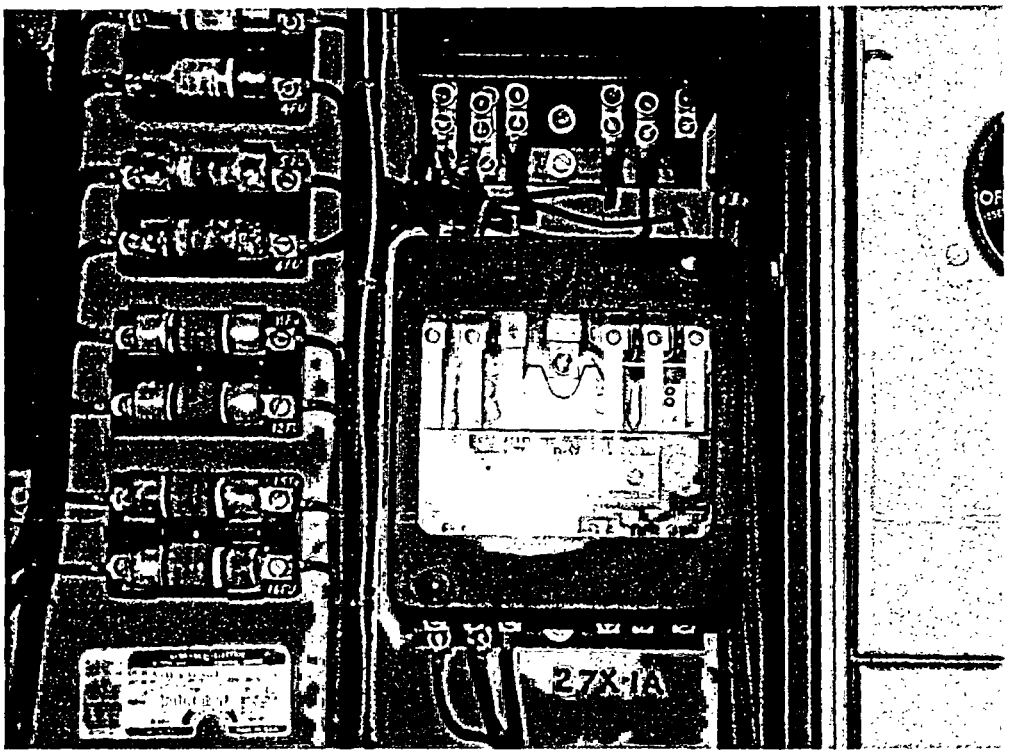

Figure E-1: Example relay mounting in 480V RB Vent Board 1B

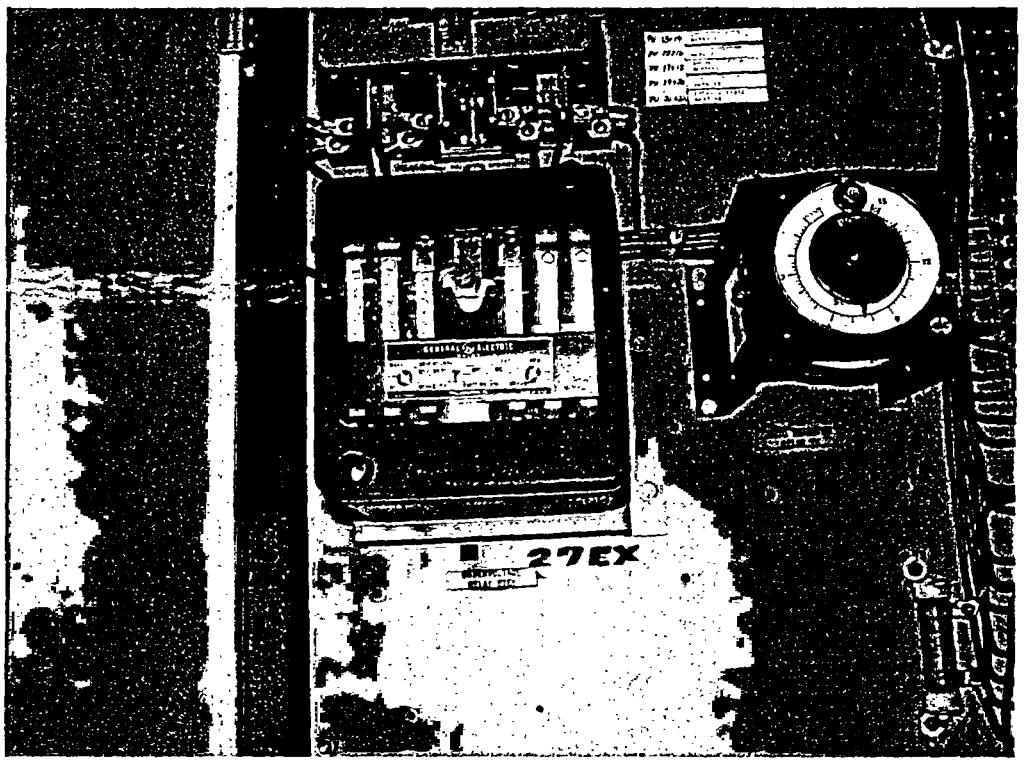

Figure E-2: Example relay mounting in 250V DC RMOV Board 1C

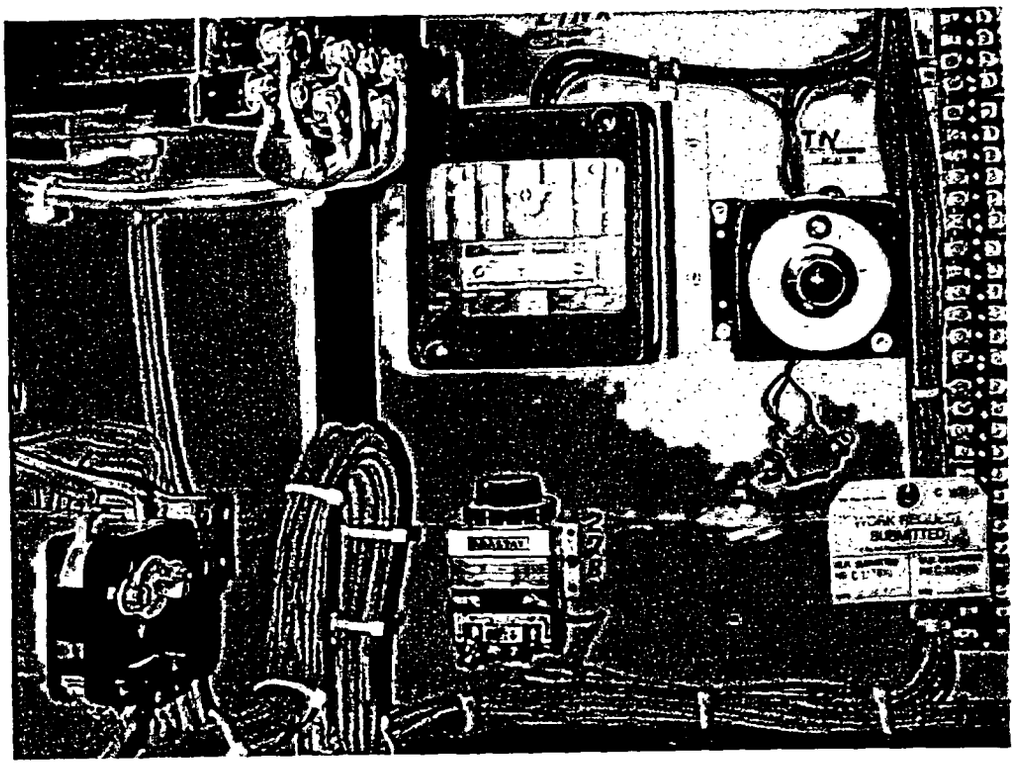

Figure E-3: Example relay mounting in 250V DC RMOV Board 1A

Figure E-4: Example relay mounting in 480V SD Board 1A

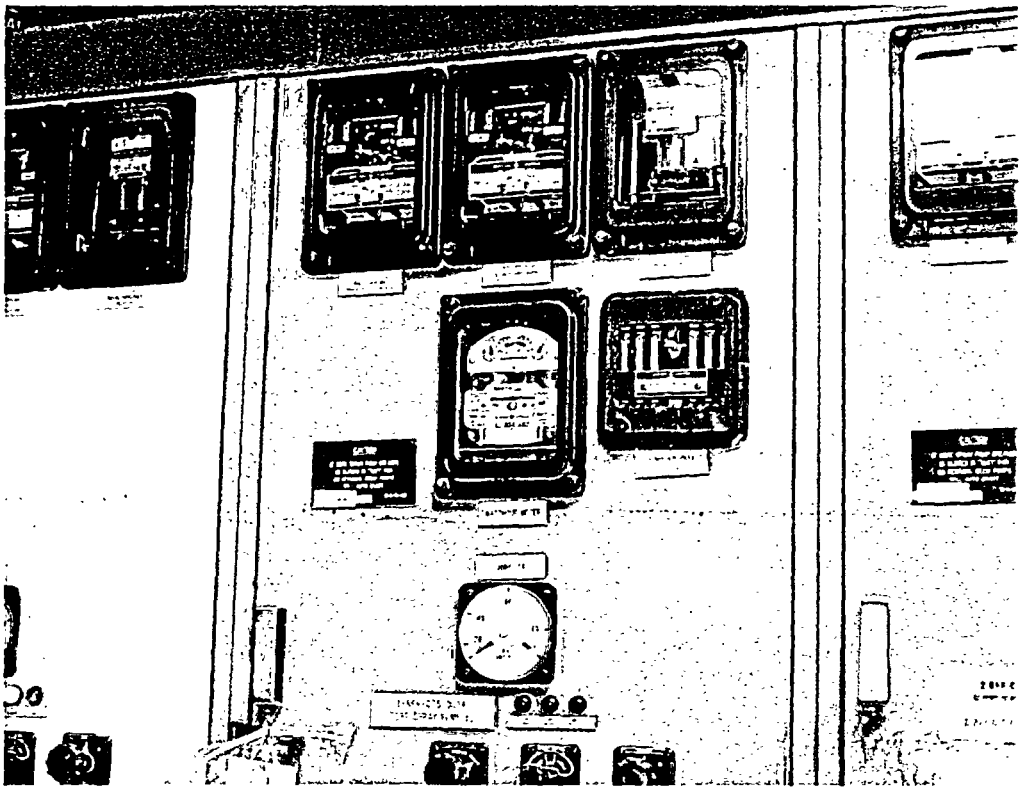

Figure E-5: Example relay mounting on face of 4KV SHDN BD B

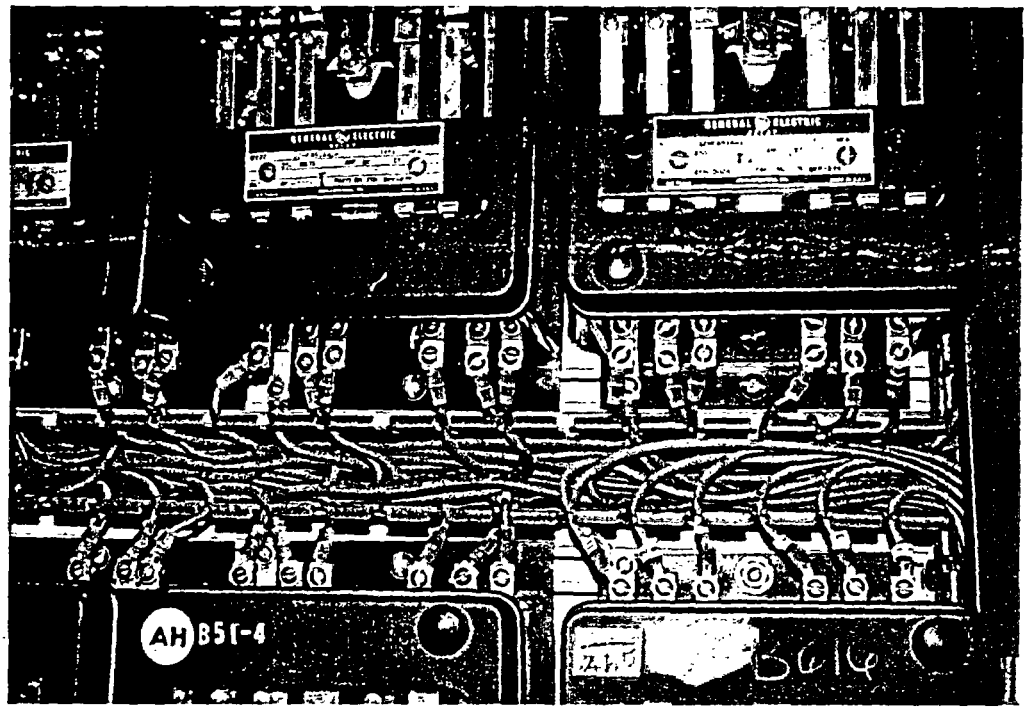

Figure E-6: Relay mounting in Common Board Logic Panel 25-44 B11

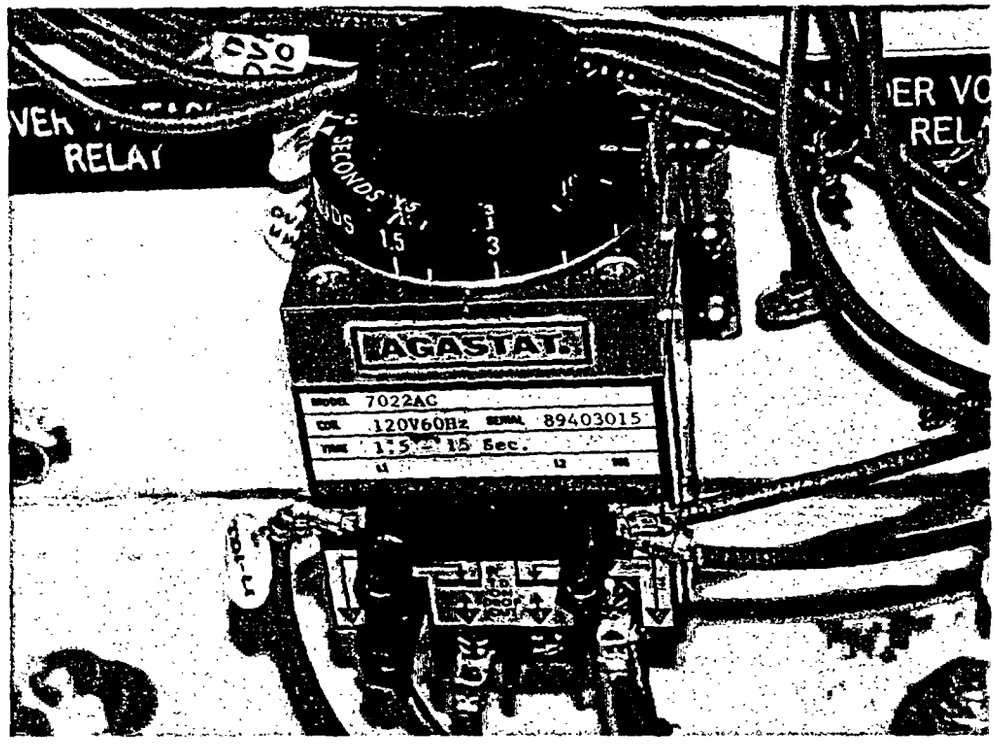

Figure E-7: Example relay mounting in RPS Circuit Protector Cabinet 1A1

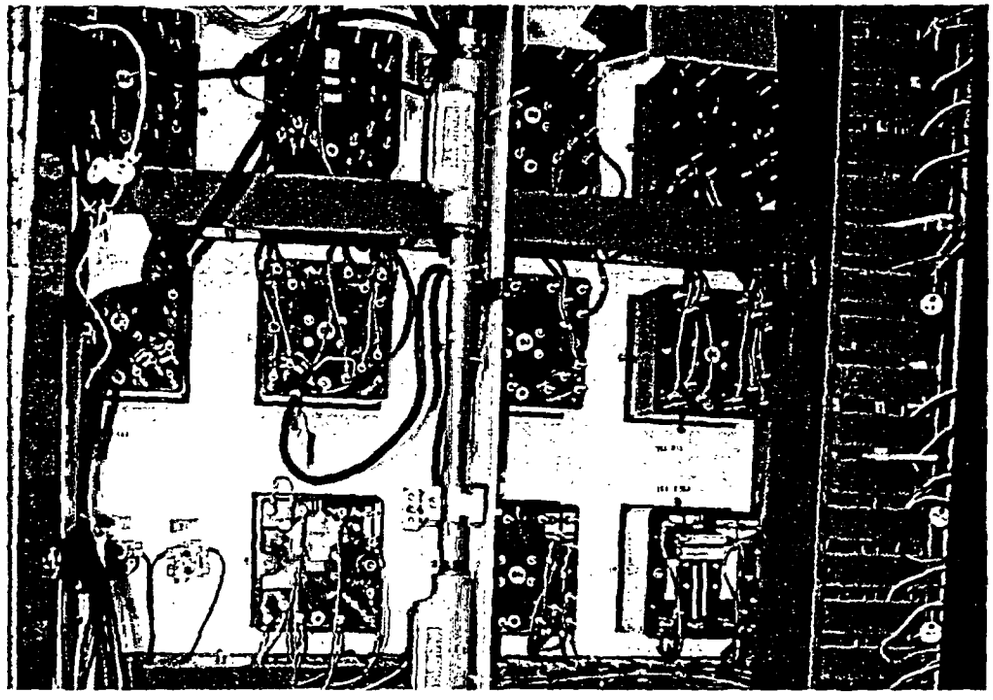

Figure E-8: Relay mounting and stiffeners in 1-PNLA-009-0015

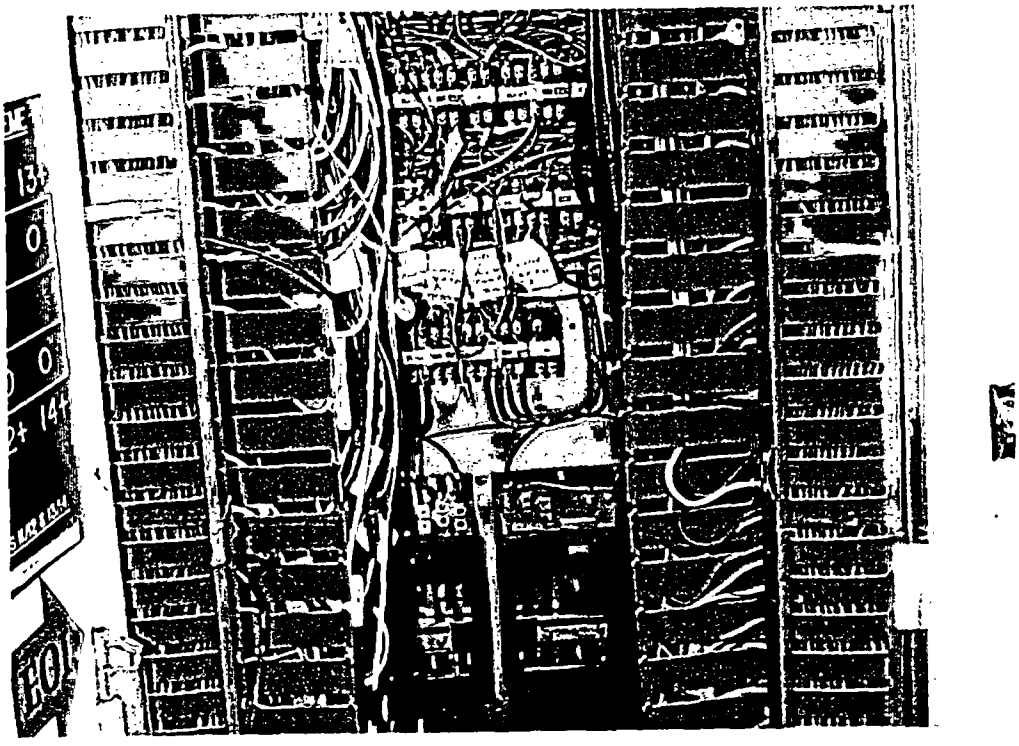

Figure E-9: Relay mounting (HFA's) in 1-PNLA-009-0042

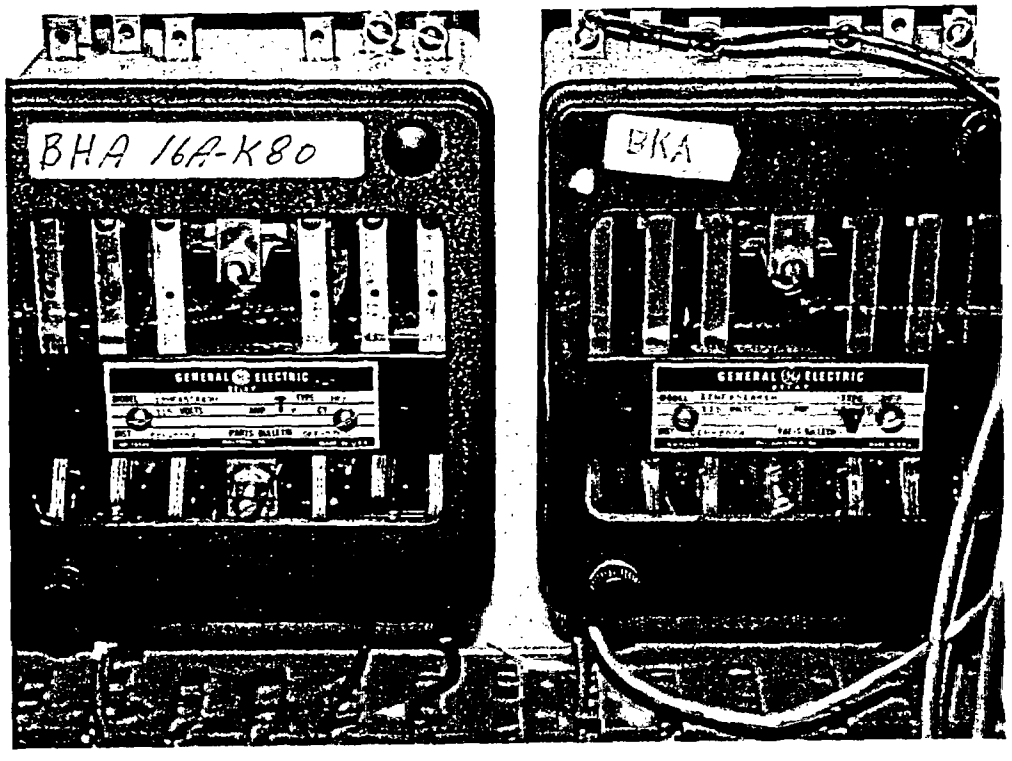

Figure E-10: Example HFA relay mounting in 1-PNLA-0043

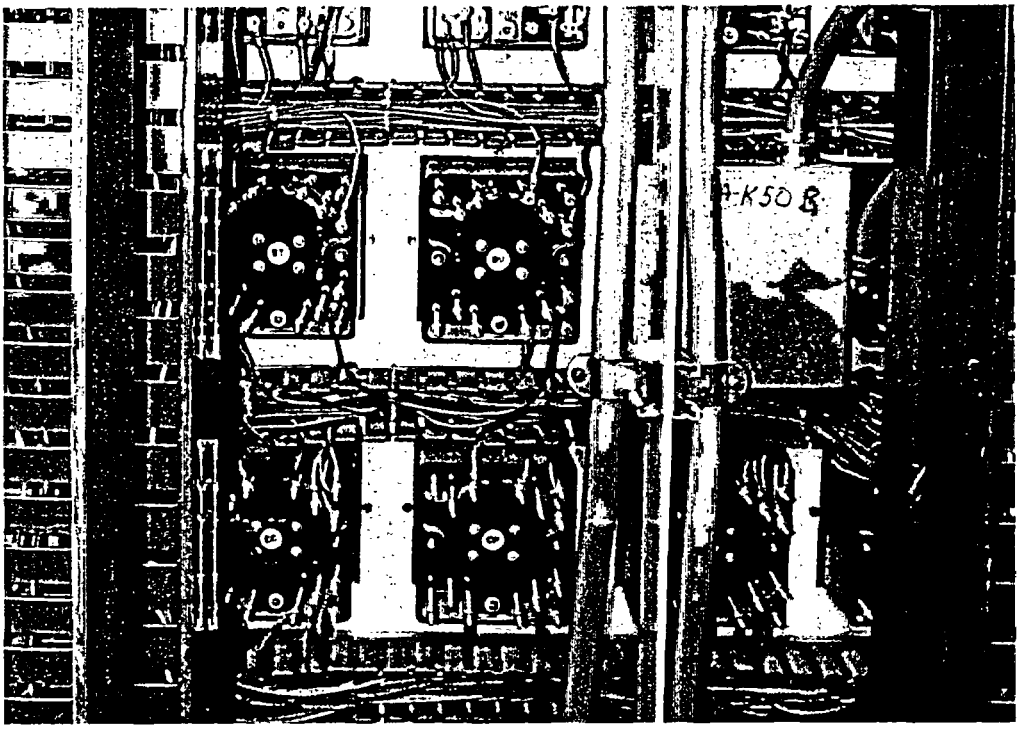

Figure E-11: Relay mounting (HFA's) in 1-PNLA-009-0033

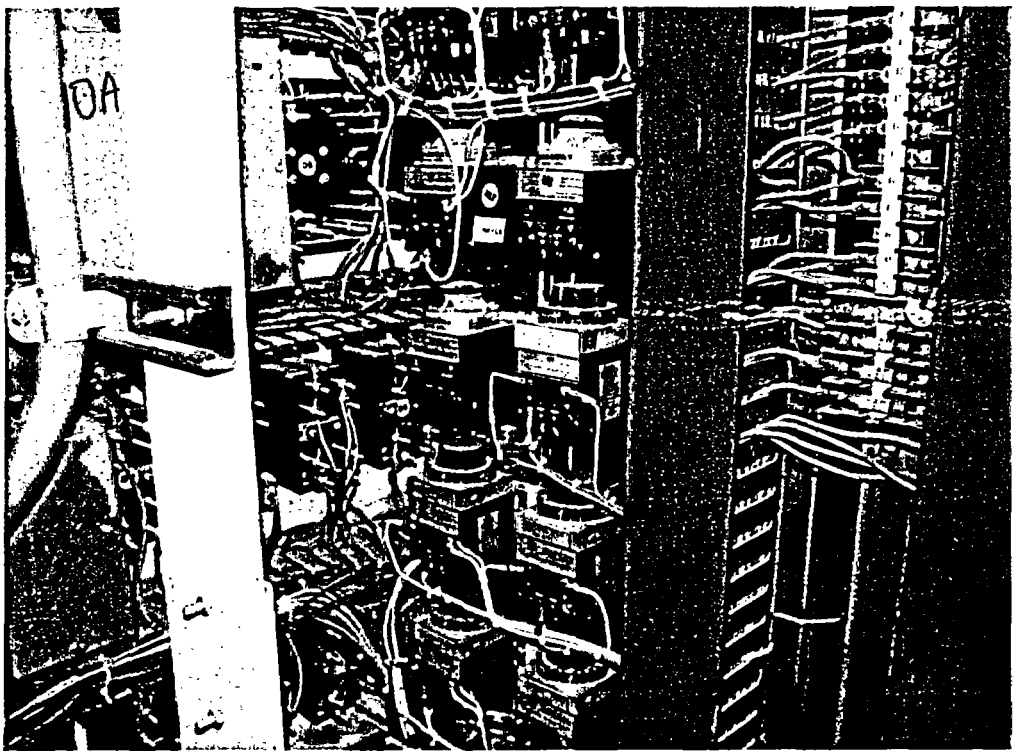

Figure E-12: Relay mounting (Agastats) in 1-PNLA-009-0033

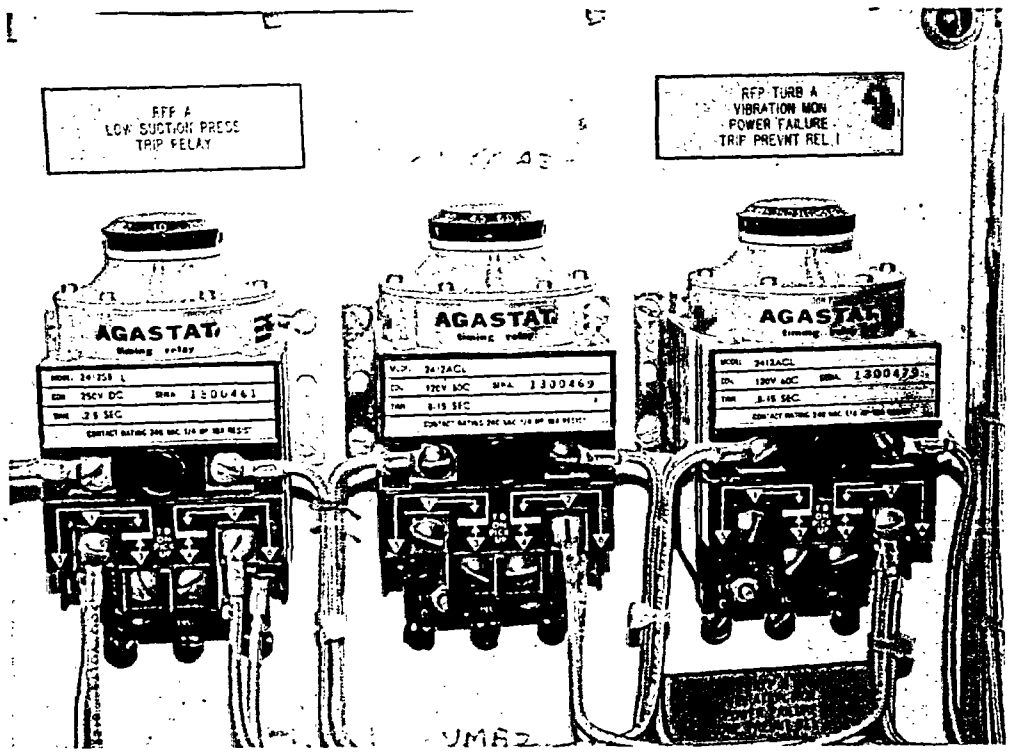

Figure E-13: Example Agastat relay mounting in RPS ATU Cabinet 9-86

Figure E-14: Relay mounting on face of 1-PNLA-009-0036A

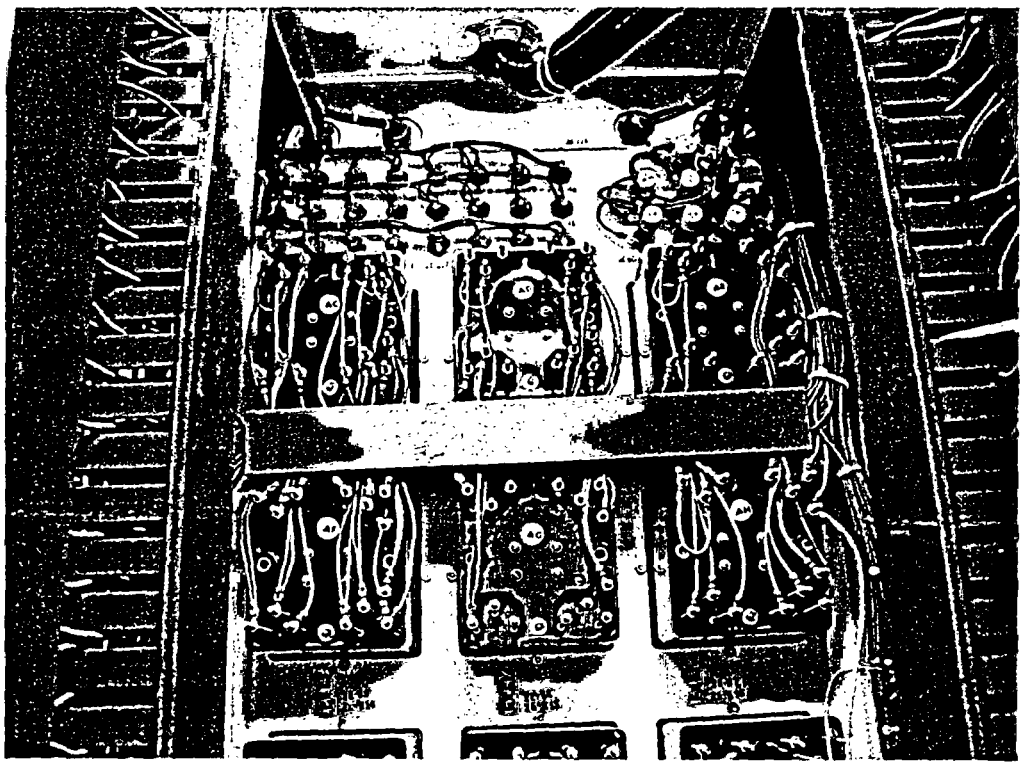

Figure E-15: Relay mounting in 1-PNLA-009-0030

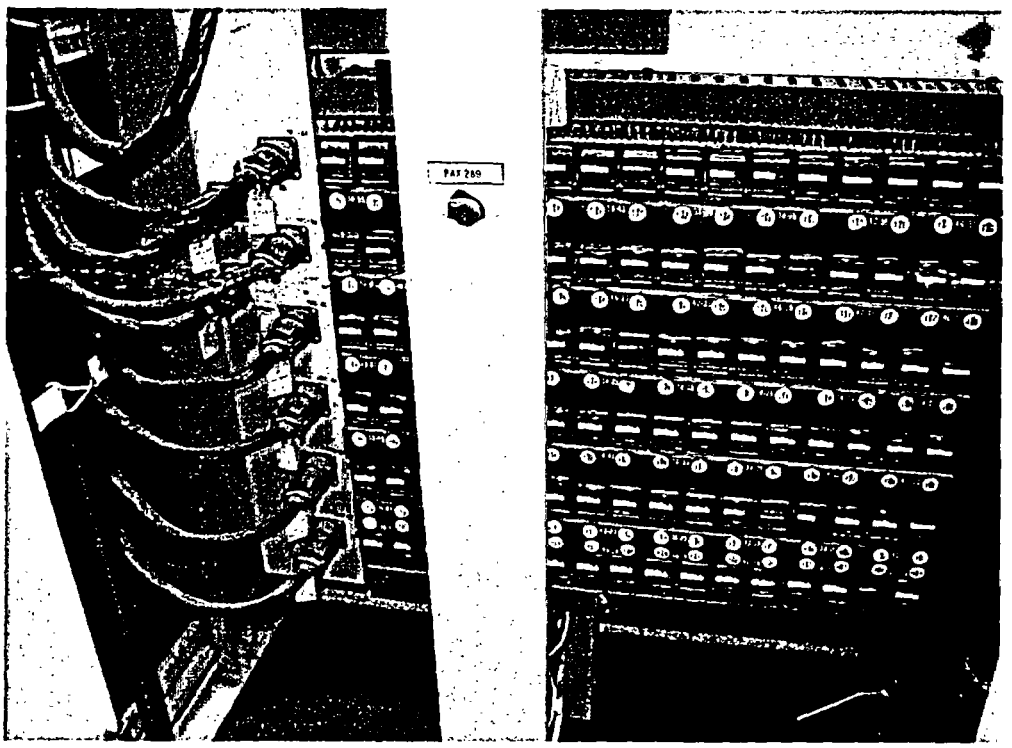

Figure E-16: Plug-in relays in 1-PNLA-009-0028

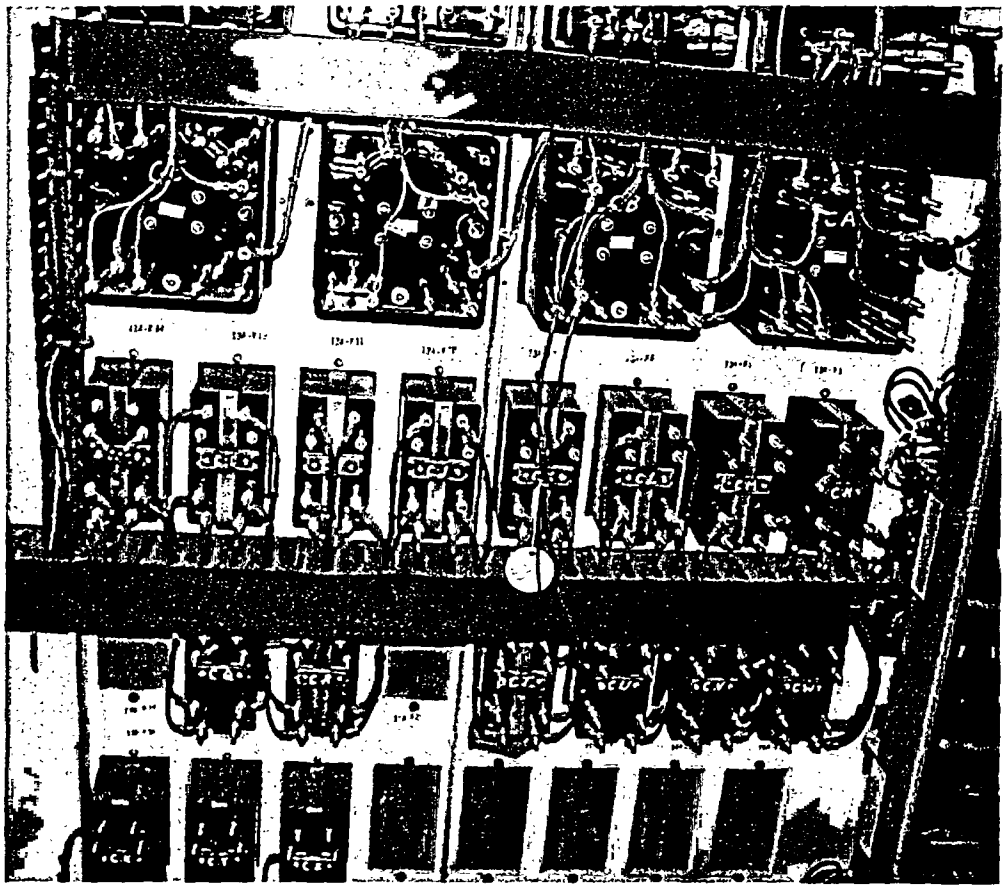

Figure E-17: HFA & HGA relay mounting and internal vertical stiffeners in 1-PNLA-925-0031

APPENDIX F: ESSENTIAL RELAY CABINETS

The cabinets and panels that house essential relays are listed in Table F-1. These are the panels whose relays which must pass a seismic capacity versus demand screen. Photographs of these panels are provided in Figures F-1 through F-7. Details of the seismic verification for these panels are contained in Reference 6-16.

TABLE F-1: LIST OF PANELS CONTAIING ESSENTIAL RELAYS

Component	SSEL Item No.	Comments
1-PNLA-009-0030	19127	See Figure F-1
1-PNLA-009-0032	19128	See Figure F-2
1-PNLA-009-0033	19129	See Figure F-3
1-PNLA-009-0042	19131	See Figure F-4
1-PNLA-009-0043	19132	See Figure F-5
0-BDAA-211-0000A	19412	4KV SHDN BD previously addressed by BFN-2 A-46 program
0-BDAA-211-0000B	19413	4KV SHDN BD previously addressed by BFN-2 A-46 program
0-BDAA-211-0000C	19414	4KV SHDN BD previously addressed by BFN-2 A-46 program
0-BDAA-211-0000D	19415	4KV SHDN BD previously addressed by BFN-2 A-46 program
1-BDBB-231-0001A	19418	480V SHDN BD previously addressed by BFN-2 A-46 program
1-BDBB-231-0001B	19419	480V SHDN BD previously addressed by BFN-2 A-46 program
1-BDBB-268-0001A	19423	480V RMOV BD previously addressed by BFN-2 A-46 program
1-BDBB-268-0001B	19424	480V RMOV BD previously addressed by BFN-2 A-46 program
1-BDBB-268-0002B	(9026)	480V RMOV BD, previously addressed by BFN-2 A-46 program (this item is not on the BFN-1 SSEL, only on the BFN-2 SSEL)
1-BDBB-268-0001D	19016	SSEL-related function will be performed by 1-BDBB-268-0001A per DCN 51216A which replaces the MG sets with the new variable frequency drive system
1-BDBB-268-0001E	19018	SSEL-related function will be performed by 1-BDBB-268-0001B per DCN 51216A which replaces the MG sets with the new variable frequency drive system
1-BDBB-268-0001A	19030	See Figure F-6
1-BDBB-268-0001B	19031	See Figure F-7

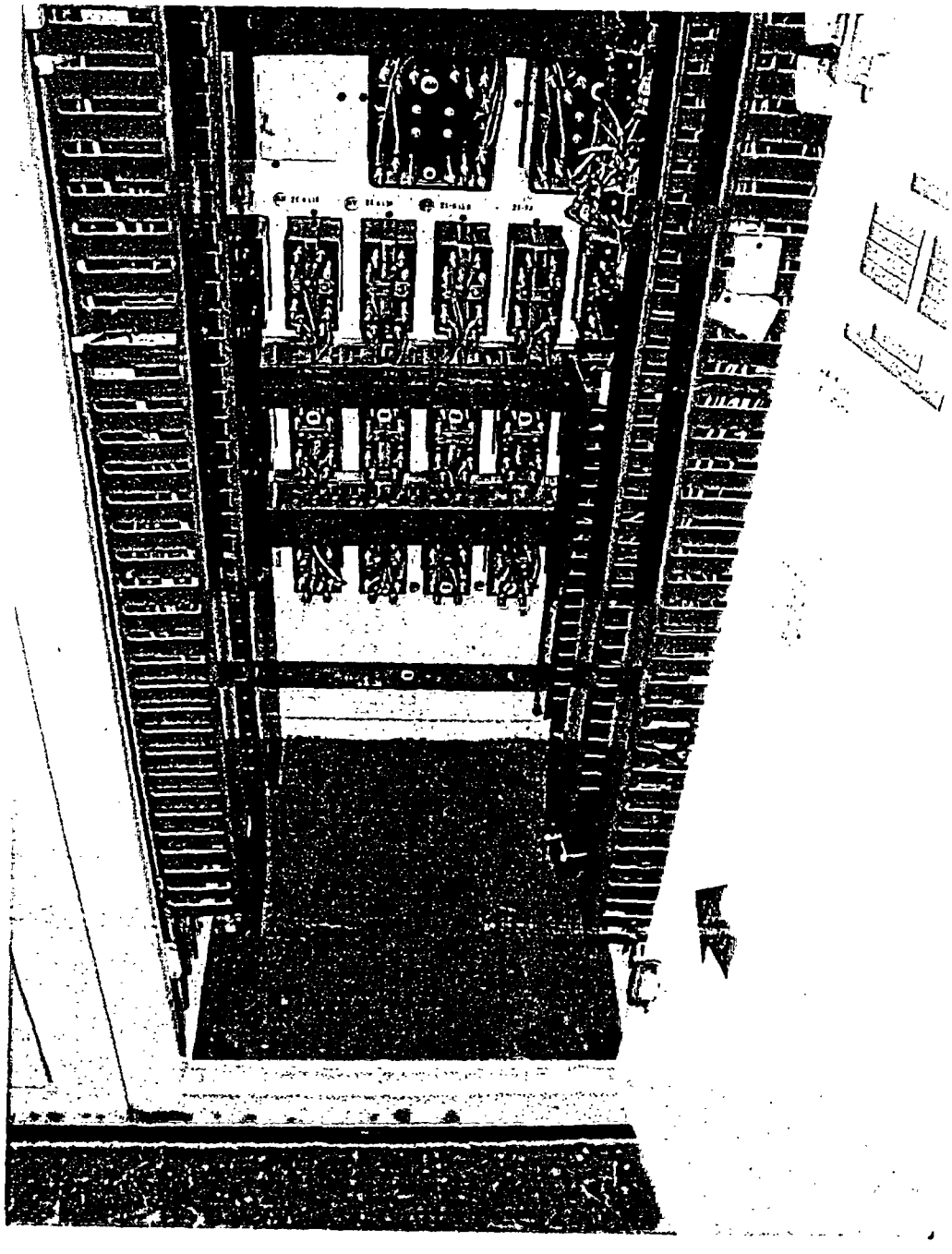

Figure F-1: Essential relay panel 1-PNLA-009-0030 (SSEL 19127)

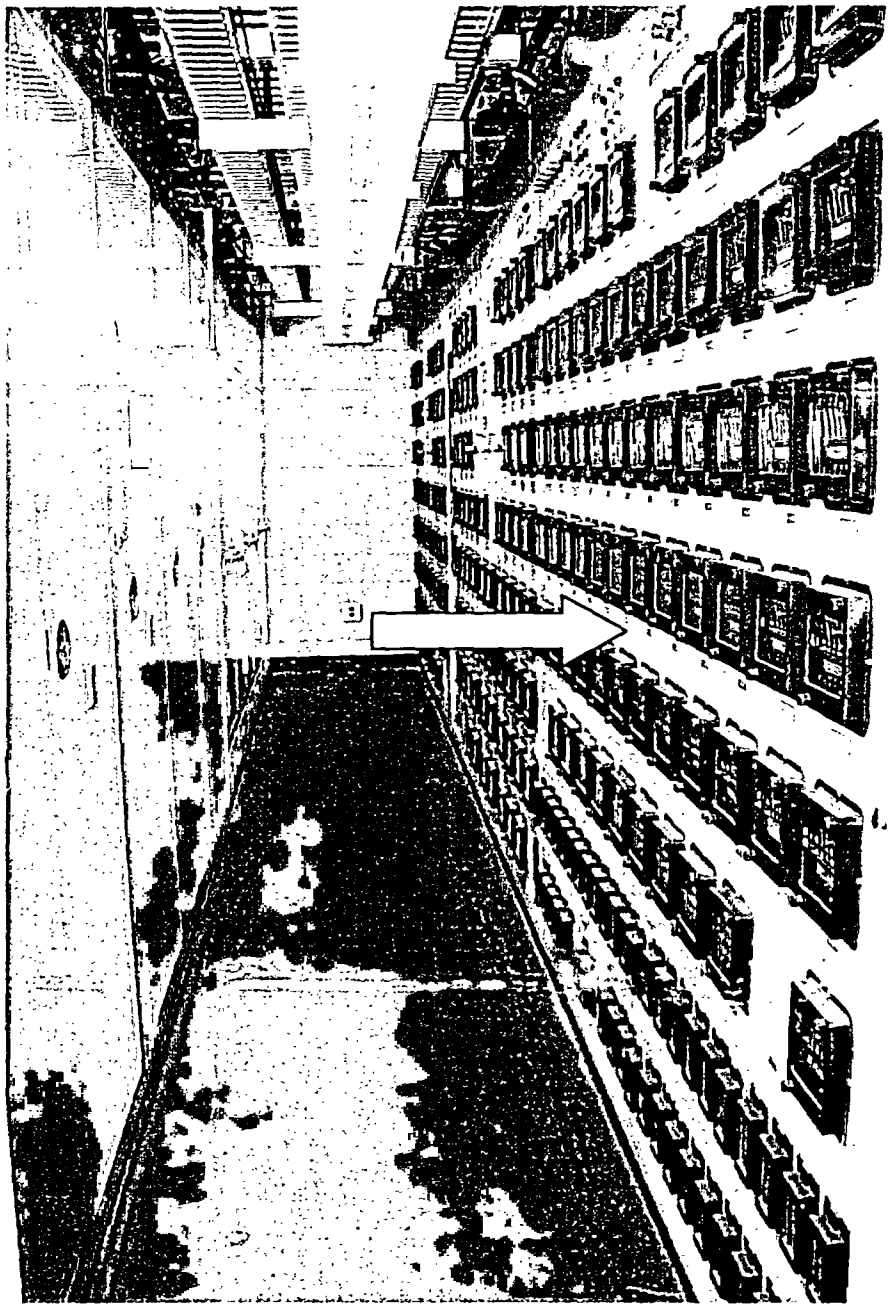

Figure F-2: Essential relay panel 1-PNLA-009-0032 (SSEL 19128)

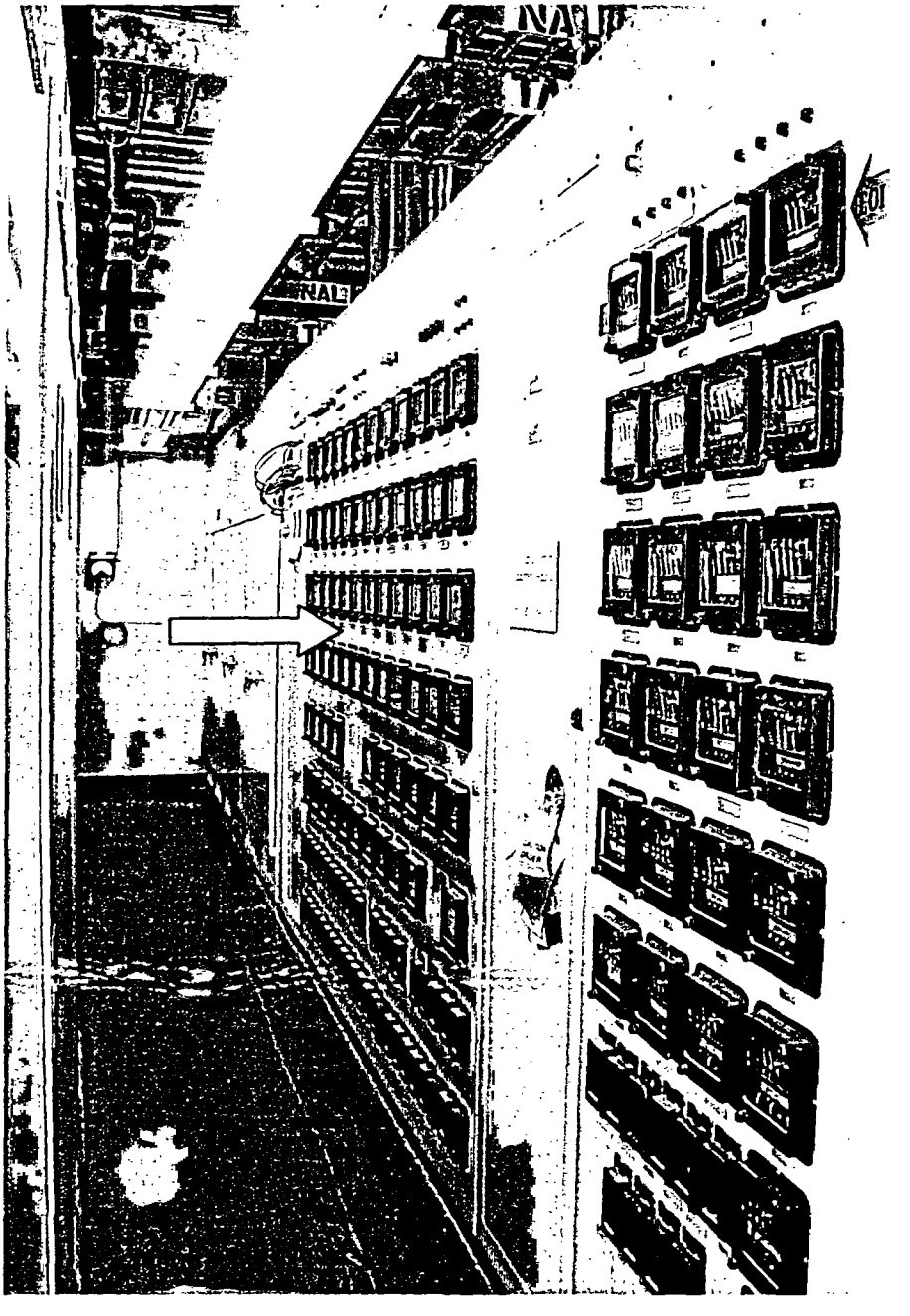

Figure F-3: Essential relay panel 1-PNLA-009-0033 (SSEL 19129)

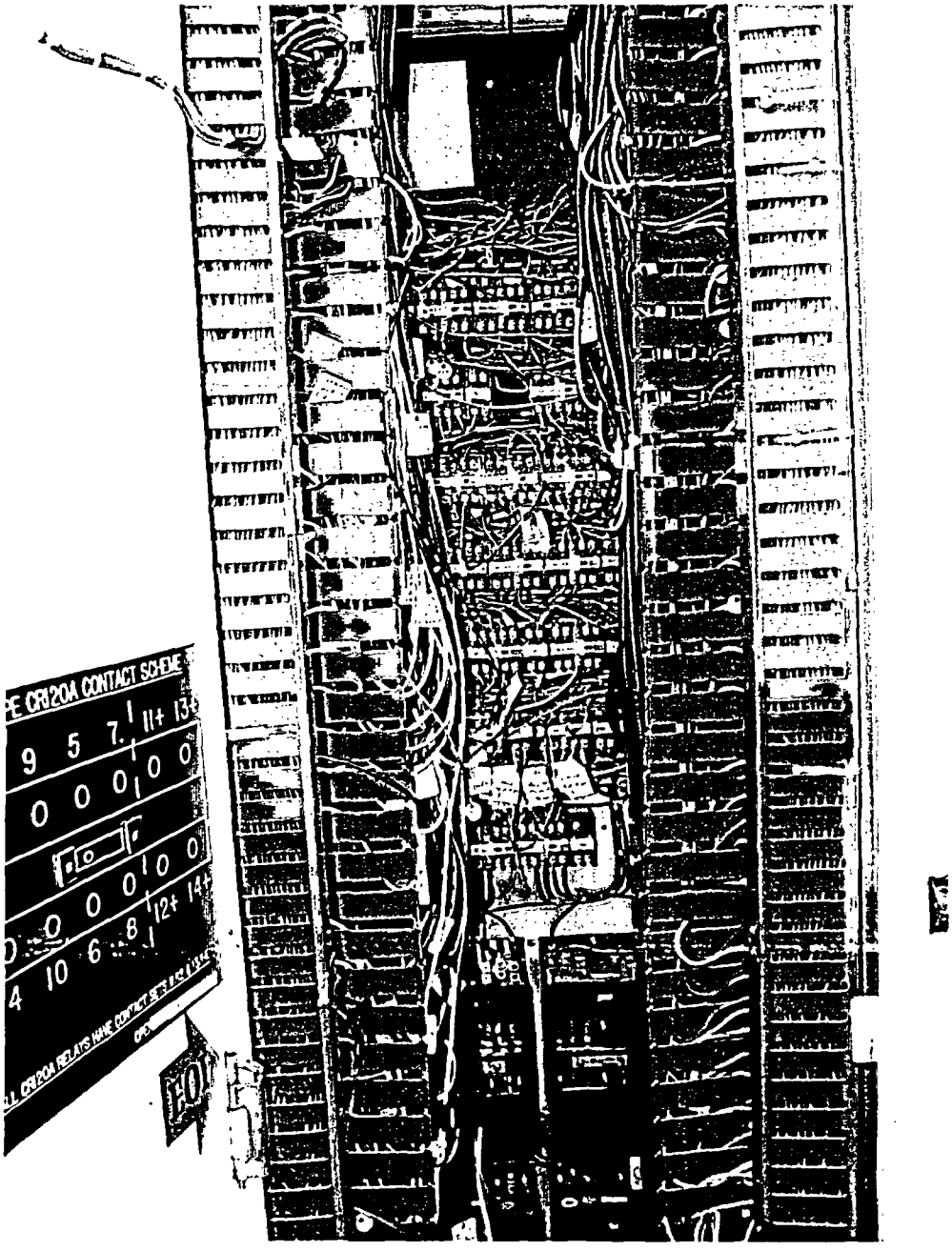

Figure F-4: Essential relay panel 1-PNLA-009-0042 (SSEL 19131)

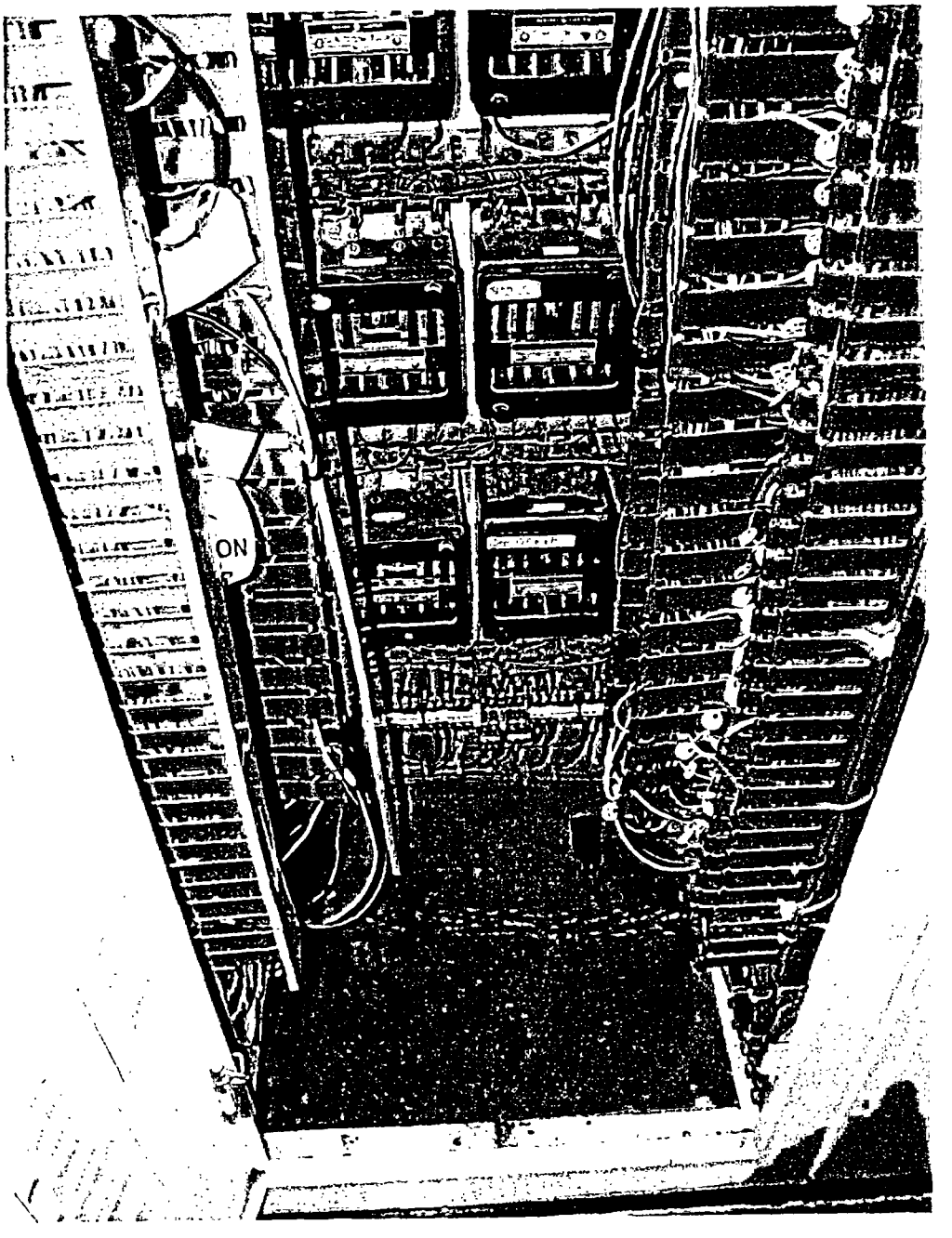

Figure F-5: Essential relay panel 1-PNLA-009-0043 (SSEL 19132)

Figure F-6: Essential relay panel 1-BDBB-268-0001A (SSEL 19030)

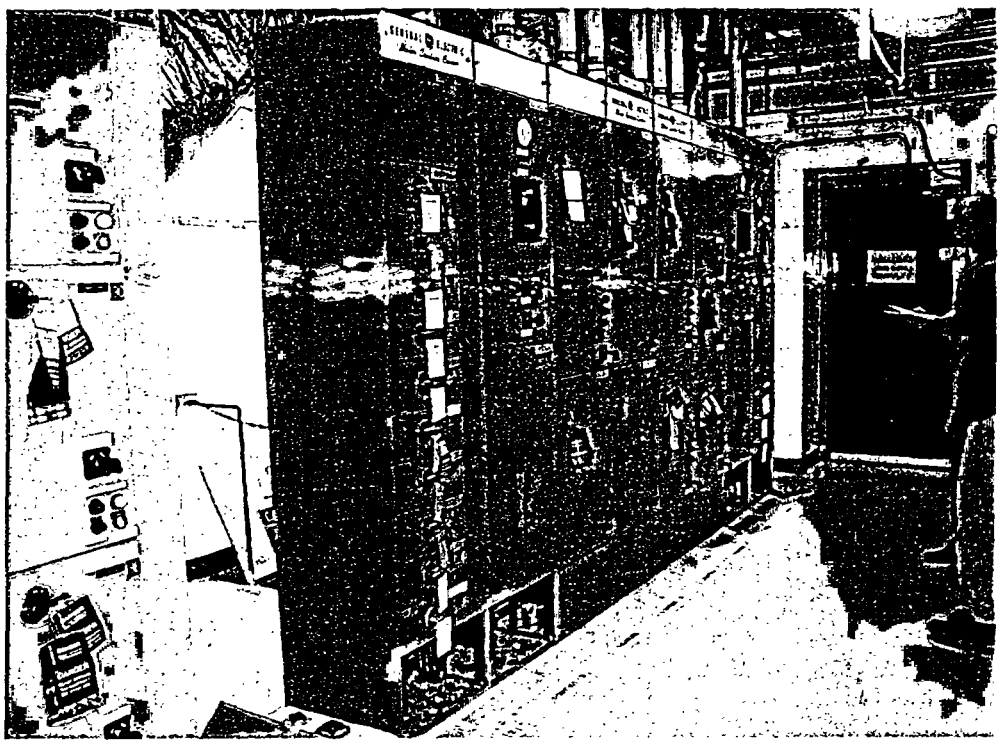

Figure F-7: Essential relay panel 1-BDBB-268-0001B (SSEL 19031)

ENCLOSURE 4

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 1

RESPONSE TO NRC GENERIC LETTER 87-02, SUPPLEMENT 1
TRANSMITTAL OF
SUPPLEMENTAL SAFETY EVALUATION REPORT NO. 2 (SSER No. 2)
ON SQUG GENERIC IMPLEMENTATION PROCEDURE, REVISION 2
AS CORRECTED ON FEBRUARY 14, 1992 (GIP-2)

SUMMARY OF COMMITMENTS

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1. BFN Unit 1 USI A-46 outliers will be resolved prior to restart of BFN Unit 1.

2. TVA will complete the Operations review of the BFN Unit 1 A-46 verification following approval of BFN Unit 1 procedures, and notify the NRC of the results of that review prior to restart of BFN Unit 1.