

Enclosure C

Relay Evaluation Report for the Resolution of USI A-46

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# Boston Edison Company

## Pilgrim Nuclear Power Station

### Relay Evaluation Report for the Resolution of USI A-46



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1. Essential Relay List for the Resolution of USI A-46
2. Outlier Relays
3. Safety Implication of Outlier Relays
4. Essential Relay Walkdown Record
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# Relay Evaluation Report

## 1. Introduction

Unresolved Safety Issue (USI) A-46, "Seismic Qualification of Equipment in Operating Plants" (Reference 1) addresses issues associated with seismic adequacy of equipment in older nuclear operating power plants. The NRC request to the "older plants" to evaluate the seismic adequacy of their equipment and resolve the USI A-46 issue is found in Generic Letter (GL) 87-02 (Reference 2). To address this issue and to work with the NRC during the resolution process, a utility owners group, Seismic Qualification Utility Group (SQUG) was formed. As a result of research conducted by SQUG and its contractors and reviewed by the NRC staff, a detailed procedure called the "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Power Plant Equipment" (Reference 3) was developed. GIP Revision 2 and the clarifications, guidance and additional requirements provided by the NRC in SSER #2 were used in the seismic evaluation of equipment at Pilgrim Station for the resolution of USI A-46. Revision 2 of the GIP, referred to as GIP-2 by the NRC, is referred to as the GIP in this report.

As a part of GL 87-02 resolution, a relay seismic functionality review is required. The components requiring this relay review are identified in Boston Edison Company's Safe Shutdown Equipment List Report for PNPS (Reference 4). The overall purpose of the relay seismic functionality review is to verify that the safe shutdown functions will not be adversely affected by relay malfunction in the event of a Safe Shutdown Earthquake (SSE).

## 2. Summary and Report Organization

Boston Edison evaluated relays associated with electrically controlled or powered safe shutdown equipment whose function could be affected by relay malfunction and identified 622 essential relays that require seismic capacity versus demand screening. Section 3 of this report outlines the relay evaluation process used to identify the essential relays. Section 4 outlines the capacity versus demand screening process and current status of outliers. Seismic capacity versus demand screening is complete on 512 out of the 622 essential relays. 110 relays are still undergoing review and for the purpose of this report are identified as interim outliers. Boston Edison intends to continue to pursue seismic verification of these relays using the options identified in the GIP.

Attachment 1 is the "Essential Relay List for the Resolution of USI A-46". This is a list of the 622 essential relays, with their seismic verification bases or outlier status, sorted by relay number and panel location. The safe shutdown equipment for which character of the listed relay is considered unacceptable is identified in the column titled "Equip ID".

Attachment 2 is the list of 110 "Outlier Relays". Section 6 of this report contains a discussion relative to outlier relays.

Attachment 3 details the " Safety Implication of Outlier Relays". This attachment discusses Pilgrim Station's operability with outlier relays.

Attachment 4 is the "Record of Essential Relay Walkdown for USI A-46 Project". Section 7 of this report contains a discussion relative to relay walkdown.

Attachment 5 provides the "Resumes of Lead Relay/Relay Reviewers".

### **3. Methodology for Relay Selection**

The methodology used for relay screening is consistent with Section 6 of the GIP (Reference 3) as modified by the SSER#2. This process consists of three basic parts: (1) identification of electrical equipment for relay review, (2) identification of relays associated with the electrical equipment, and (3) screening of relays.

Electrical equipment is identified on the "Relay Review Safe Shutdown Equipment List", hereafter referred to as the Relay Review SSEL, which lists the active electrical equipment identified in each of the safe shutdown paths, and passive electrical equipment whose inadvertent change of state due to relay chatter could adversely affect safe shutdown function(s). For the complete "Relay Review SSEL", please refer to Section 4 of Attachment A to the Safe Shutdown Equipment List Report (Reference 4).

As part of the relay review effort, criteria was established for the performance of each item of equipment on the Relay Review SSEL during the strong shaking period of the seismic event. This criteria identified unacceptable equipment behavior(s) or changes of state, that were in turn used by the relay reviewers performing circuit analysis, relay identification, and relay screening. For each component on the Relay Review SSEL, associated relays were identified and screened into one of the following four categories based on its physical characteristics and susceptibility to chatter:

1. Essential - the established criteria for the equipment is violated. This relay requires capacity versus demand screening.
2. Chatter Acceptable - relay is susceptible to chatter, but chatter is acceptable for the associated equipment because the criteria is not violated.
3. Not Vulnerable - relay is mechanically actuated or solid state and, therefore, not susceptible to chatter.
4. Operator Action - chatter is acceptable because operator action to reset or correct the resulting change of state is feasible.

The relays screened "Essential" and therefore subject to seismic screening are listed in Attachment 1, "Essential Relay List for the Resolution of USI A-46".

### **4. Methodology for Relay Seismic Evaluation**

This section describes the methodology utilized for seismic evaluation (capacity versus demand screening) of essential relays at Pilgrim Station. For the purpose of seismic evaluation, the essential relays were divided into the following 4 categories:

Category 1: Capacity versus demand comparison could be performed based on available GERS.

- Category 2: Relays in low voltage switchgear and capacity versus demand comparison could be performed based on switchgear GERS
- Category 3: Capacity versus demand comparison could be performed based on other available documentation.
- Category 4: Relays mounted on diesel generator skid or engine and routinely subject to high vibration during operation.

A seismic capacity versus demand comparison is performed for relays in Categories 1 through 3. The location and mounting of relays in Category 4 on the diesel generator was verified by walkdown. The relay seismic capacity was compared to the demand based on panel location and amplification characteristics consistent with Reference 5. If a relay met the verification criteria for a particular category, it was determined to be acceptable. These relays were subsequently designated SQ1 through SQ4, as appropriate. Relays that could not be determined acceptable were designated OL1 through OL4. An explanation of SQ1 through SQ4 and OL1 through OL4 follows:

- SQ1 Relay seismically verified. Relay GERS available and GERS exceeds panel seismic demand.
- SQ2 Relay seismically verified. Relay in low voltage switchgear and where the GERS exceeds floor seismic demand.
- SQ3 Relay seismically verified. Relay seismic capacity exceeds seismic demand based on available documentation.
- SQ4 Relay seismically verified. Relay mounted on diesel generator skid or engine and routinely experiences high vibration during operation.
- OL1 Relay an outlier. Relay make and/or model number currently unknown.
- OL2 Relay an outlier. Relay seismic capacity currently unknown.
- OL3 Relay an outlier. Relay seismic capacity less than seismic demand.
- OL4 Relay an outlier. Time delay pickup outside the normal timing range as defined in the applicable GERS.

## 5. Utilization of Switchgear Screening Data

Screening techniques provided by EPRI GERS-MVS/LVS.7, "Generic Equipment Ruggedness Spectra for Switchgear (Medium Voltage, Metal Clad) (Low Voltage, Metal Enclosed)", dated 2/91 were not utilized for completed relay capacity/demand evaluations in this report. However, this methodology may be utilized for verification of some of the outlier relays which are located in and directly control switchgear.

## **6. Outlier Resolution**

110 relays out of a total of 622 essential relays are classified as "Outlier Relays". The number of relays associated with each category are as follows:

- OL1 - 11 Relays
- OL2 - 89 Relays
- OL3 - 7 Relays
- OL4 - 3 Relays

Attachment 2 of this report provides a complete list of all outlier relays at Pilgrim Station sorted by the above categories and describes the most probable method to be employed for resolution. This attachment provides Relay ID, Panel Number, Relay Manufacturer and Relay Model Number relative to each outlier. Safety implication of outlier relays is discussed in Attachment 3 of this report.

Outlier relays at Pilgrim Station will be resolved utilizing one or more of the following methods:

- Equipment performance criteria revision
- Circuit Analysis
- Outlier relay comparison with similar seismically verified relays
- Seismic Testing

## **7. Relay Walkdown and Mounting Spot Check**

A walkdown of ninety (90) relays on the Essential Relay List was performed in support of the relay evaluation portion of the USI A-46 Project. These ninety relays, housed in five different panels, located in the main control room (2), cable spreading room (2), and "A" emergency diesel generator room (1), were examined with regards to:

1. Confirmation of make and model number of the relays; and,
2. Adequacy of relay mounting within the panel.

Attachment 4 provides documentation for relay walkdowns and mounting spot checks. No anomalies were found.

## 8. References

1. USNRC Unresolved Safety Issue A-46, " Seismic Qualification of Equipment in Operating Nuclear Power Plants".
2. NRC Generic Letter 87-02, " Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46", February 19, 1987 and Supplement No. 1 dated May 1987
3. Seismic Qualification Utility Group, " Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Power Plant Equipment", Revision 2.
4. Boston Edison Company, " Safe Shutdown Equipment List Report for Pilgrim Nuclear Power Station", Revision 0, 9/96
5. Electric Power Research Institute Report NP-7146-SL R1, " Guidelines for Development of In-Cabinet Seismic Demand for Devices Mounted in Electrical Cabinets", dated 6/95



ATTACHMENT 1

ESSENTIAL RELAY LIST FOR THE RESOLUTION OF USI A-46

# Boston Edison Company

## Pilgrim Nuclear Power Station

### Essential Relay List for the Resolution of USI A-46



Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
1	102-504	A504		ES	SQ1	TB	37' 0"	Agastat	2412PBL	1	E38/E6	A504	NC	No
2	102-604	A604		ES	SQ1	TB	23' 0"	Agastat	7012PA	2	E38/E6	A604	NC	No
3	103A	C6		ES	OL3	RW	37' 0"	General Electric	12HFA151A2F	3	E173/E1	B106	NC	No
4	103B	C6	4	ES	OL3	RW	37' 0"	General Electric	12HFA151A2F	4	E173/E1	B206	NC	No
5	103C	C6		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	5	M6-22-14 SH.1/E20	B106	NO	No
										6	M6-22-14 SH.1/E20	SV4569A	NO	No
										7	M6-22-14 SH.1/E20	SV4570A	NO	No
										8	M6-22-14 SH.1/E20	SV4587A	NO	No
										9	M6-22-14 SH.1/E20	SV4587B	NO	No
6	103D	C6		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	10	M6-22-14 SH.2/E18	B206	NO	No
										11	M6-22-14 SH.2/E18	SV4569B	NO	No
										12	M6-22-14 SH.2/E18	SV4570B	NO	No
										13	M6-22-14 SH.2/E18	SV4589A	NO	No
										14	M6-22-14 SH.2/E18	SV4589B	NO	No
7	104C	C6		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	15	E18/E8	VAC205A-1	NO	No
										16	E18/E8	VAC205B-1	NO	No
										17	E18/E8	VAC205C-1	NO	No
										18	E18/E8	VAC205D-1	NO	No
										19	E18/E8	VAC205E-1	NO	No
										20	E18/E8	VAC205F-1	NO	No
										21	E18/E8	VAC206A-1	NO	No
										22	E18/E8	VAC206B-1	NO	No
8	104D	C6		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	23	E18/E8	VAC205A-2	NO	No
										24	E18/E8	VAC205B-2	NO	No
										25	E18/E8	VAC205C-2	NO	No
										26	E18/E8	VAC205D-2	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									27	E18/E8	VAC205E-2	NO	No
									28	E18/E8	VAC205F-2	NO	No
									29	E18/E8	VAC206A-2	NO	No
									30	E18/E8	VAC206B-2	NO	No
9	104E		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	31	E18/E7	B106	NO	No
									32	E18/E7	SV4569A	NO	No
									33	E18/E7	SV4570A	NO	No
									34	E18/E7	SV4587A	NO	No
									35	E18/E7	SV4587B	NO	No
10	104F		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	36	E18/E7	B206	NO	No
									37	E18/E7	SV4569B	NO	No
									38	E18/E7	SV4570B	NO	No
									39	E18/E7	SV4589A	NO	No
									40	E18/E7	SV4589B	NO	No
11	104G		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	41	E18/E7	B106	NO	No
									42	E18/E7	B206	NO	No
									43	E18/E7	SV4569A	NO	No
									44	E18/E7	SV4569B	NO	No
									45	E18/E7	SV4570A	NO	No
									46	E18/E7	SV4570B	NO	No
									47	E18/E7	SV4587A	NO	No
									48	E18/E7	SV4587B	NO	No
									49	E18/E7	SV4589A	NO	No
									50	E18/E7	SV4589B	NO	No
12	105E		ES	OL2	RW	37' 0"	General Electric	HFA54J	51	E18/E8	VAC205A-1	NO	No
									52	E18/E8	VAC205B-1	NO	No
									53	E18/E8	VAC205C-1	NO	No
									54	E18/E8	VAC205D-1	NO	No
									55	E18/E8	VAC205E-1	NO	No
									56	E18/E8	VAC205F-1	NO	No
									57	E18/E8	VAC206A-1	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									58	E18/E8	VAC206B-1	NO	No
See previous page for relay number													
13	105F	C6	ES	OL2	RW	37' 0"	General Electric	HFA54J	59	E18/E8	VAC205A-2	NO	No
									60	E18/E8	VAC205B-2	NO	No
									61	E18/E8	VAC205C-2	NO	No
									62	E18/E8	VAC205D-2	NO	No
									63	E18/E8	VAC205E-2	NO	No
									64	E18/E8	VAC205F-2	NO	No
									65	E18/E8	VAC206A-2	NO	No
									66	E18/E8	VAC206B-2	NO	No
14	105XA1	C208	ES	SQ1	RB	23' 0"	General Electric	CR120BD	67	E189/Sh2/E4	VAC205A-1	NC	No
									68	E189/S1.2/E4	VAC205B-1	NC	No
									69	E189/Sh2/E4	VAC205C-1	NC	No
									70	E189/Sh2/E4	VAC205D-1	NC	No
									71	E189/Sh2/E4	VAC205E-1	NC	No
									72	E189/Sh2/E4	VAC205F-1	NC	No
									73	E189/Sh2/E4	VAC206A-1	NC	No
									74	E189/Sh2/E4	VAC206B-1	NC	No
15	105XB1	C209	ES	SQ1	RB	23' 0"	General Electric	CR120BD	75	E189/Sh2/E4	VAC205A-2	NC	No
									76	E189/Sh2/E4	VAC205B-2	NC	No
									77	E189/Sh2/E4	VAC205C-2	NC	No
									78	E189/Sh2/E4	VAC205D-2	NC	No
									79	E189/Sh2/E4	VAC205E-2	NC	No
									80	E189/Sh2/E4	VAC205F-2	NC	No
									81	E189/Sh2/E4	VAC206A-2	NC	No
									82	E189/Sh2/E4	VAC206B-2	NC	No
16	10A-K1001-43A	C903	ES	SQ3	RW	37' 0"	Agastat	EGPI	83	M1H39/E11	MO1001-7A	NO	No
17	10A-K1001-43B	C903	ES	SQ3	RW	37' 0"	Agastat	EGPI	84	M1H40/E9	MO1001-7B	NO	No
18	10A-K1001-43C	C903	ES	SQ3	RW	37' 0"	Agastat	EGPI	85	M1H16-5/E8	MO1001-7C	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
19	10A-K1001-43D	C903		ES	SQ3	RW	37' 0"	Agastat	EGPI	86	M1H17-5/E6	MO1001-7D	NO	No
20	10A-K102A	C932		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	87	M1H7-12/E18	SV203-3A	NO	No
										88	M1H7-12/E18	SV203-3B	NO	No
										89	M1H7-12/E18	SV203-3C	NO	No
										90	M1H7-12/E18	SV203-3D	NO	No
21	10A-K102B	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	91	M1H9-12/E17	SV203-3A	NO	No
										92	M1H9-12/E17	SV203-3B	NO	No
										93	M1H9-12/E17	SV203-3C	NO	No
										94	M1H9-12/E17	SV203-3D	NO	No
22	10A-K105A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	95	M1H8-10/E19	MO1001-28A	NO	No
										96	M1H8-10/E19	MO1001-28B	NO	No
										97	M1H8-10/E19	MO202-5A	NO	No
										98	M1H8-10/E19	MO202-5B	NO	No
23	10A-K105B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	99	M1H10-10/E16	MO1001-28A	NO	No
										100	M1H10-10/E16	MO1001-28B	NO	No
										101	M1H10-10/E16	MO202-5A	NO	No
										102	M1H10-10/E16	MO202-5B	NO	No
24	10A-K10A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	103	E18/E7	B106	NO	No
										104	M1H8-10/E19	MO1001-28A	NO	No
										105	M1H8-10/E19	MO1001-28B	NO	No
										106	M1H8-10/E19	MO202-5A	NO	No
										107	M1H8-10/E19	MO202-5B	NO	No
										108	E18/E7	SV4569A	NO	No
										109	E18/E7	SV4570A	NO	No
										110	E18/E7	SV4587A	NO	No
										111	E18/E7	SV4587B	NO	No
										112	E18/E8	VAC205A-1	NO	No
										113	E18/E8	VAC205B-1	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts							Contact States						
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									114	E18/E8	VAC205C-1	NO	No
									115	E18/E8	VAC205D-1	NO	No
									116	E18/E8	VAC205E-1	NO	No
									117	E18/E8	VAC205F-1	NO	No
									118	E18/E8	VAC206A-1	NO	No
									119	E18/E8	VAC206B-1	NO	No
25	10A-K10B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									120	E18/E7	B206	NO	No
									121	M1H10-10/E16	MO1001-28A	NO	No
									122	M1H10-10/E16	MO1001-28B	NO	No
									123	M1H10-10/E16	MO202-5A	NO	No
									124	M1H10-10/E16	MO202-5B	NO	No
									125	E18/E7	SV4569B	NO	No
									126	E18/E7	SV4570B	NO	No
									127	E18/E7	SV4589A	NO	No
									128	E18/E7	SV4589B	NO	No
									129	E18/E8	VAC205A-2	NO	No
									130	E18/E8	VAC205B-2	NO	No
									131	E18/E8	VAC205C-2	NO	No
									132	E18/E8	VAC205D-2	NO	No
									133	E18/E8	VAC205E-2	NO	No
									134	E18/E8	VAC205F-2	NO	No
									135	E18/E8	VAC206A-2	NO	No
									136	E18/E8	VAC206B-2	NO	No
26	10A-K152A	C2233A	4	ES	SQ3	RW	23' 0"	Agatal	EGPB002				
									137	M1H7-12/E18	MO1001-28A	NO	No
									138	M1H7-12/E18	MO1001-28B	NO	No
									139	M1H7-12/E18	MO202-5A	NO	No
									140	M1H7-12/E18	MO202-5B	NO	No
									141	M1H7-12/E18	VAC205A-1	NO	No
									142	M1H7-12/E18	VAC205A-2	NO	No
									143	M1H7-12/E18	VAC205B-1	NO	No
									144	M1H7-12/E18	VAC205B-2	NO	No
									145	M1H7-12/E18	VAC205C-1	NO	No
									146	M1H7-12/E18	VAC205C-2	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
See previous page for relay number									147	M1H7-12/E18	VAC205D-1	NO	No
See previous page for relay number									148	M1H7-12/E18	VAC205D-2	NO	No
See previous page for relay number									149	M1H7-12/E18	VAC205E-1	NO	No
See previous page for relay number									150	M1H7-12/E18	VAC205E-2	NO	No
See previous page for relay number									151	M1H7-12/E18	VAC205F-1	NO	No
See previous page for relay number									152	M1H7-12/E18	VAC205F-2	NO	No
See previous page for relay number									153	M1H7-12/E18	VAC206A-1	NO	No
See previous page for relay number									154	M1H7-12/E18	VAC206A-2	NO	No
See previous page for relay number									155	M1H7-12/E18	VAC206B-1	NO	No
See previous page for relay number									156	M1H7-12/E18	VAC206B-2	NO	No
27	10A-K152B	C2233B	4	ES	SQ3	RW	23' 0"	Agastat	EGPB002				
									157	M1H7-12/E18	MO1001-28A	NO	No
									158	M1H7-12/E18	MO1001-28B	NO	No
									159	M1H7-12/E18	MO202-5A	NO	No
									160	M1H7-12/E18	MO202-5B	NO	No
									161	M1H7-12/E18	VAC205A-1	NO	No
									162	M1H7-12/E18	VAC205A-2	NO	No
									163	M1H7-12/E18	VAC205B-1	NO	No
									164	M1H7-12/E18	VAC205B-2	NO	No
									165	M1H7-12/E18	VAC205C-1	NC	No
									166	M1H7-12/E18	VAC205C-2	NO	No
									167	M1H7-12/E18	VAC205D-1	NO	No
									168	M1H7-12/E18	VAC205D-2	NO	No
									169	M1H7-12/E18	VAC205E-1	NO	No
									170	M1H7-12/E18	VAC205E-2	NO	No
									171	M1H7-12/E18	VAC205F-1	NO	No
									172	M1H7-12/E18	VAC205F-2	NO	No
									173	M1H7-12/E18	VAC206A-1	NO	No
									174	M1H7-12/E18	VAC206A-2	NO	No
									175	M1H7-12/E18	VAC206B-1	NO	No
									176	M1H7-12/E18	VAC206B-2	NO	No
28	10A-K152C	C2233A		ES	SQ3	RW	23' 0"	Agastat	EGPB002				
									177	M1H7-12/E15	B106	NO	No
									178	M1H7-12/E15	B206	NO	No
									179	M1H7-12/E15	SV4569A	NO	No



Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
See previous page for relay number									180	M1H7-12/E15	SV4569B	NO	No
See previous page for relay number									181	M1H7-12/E15	SV4570A	NO	No
See previous page for relay number									182	M1H7-12/E15	SV4570B	NO	No
See previous page for relay number									183	M1H7-12/E15	SV4587A	NO	No
See previous page for relay number									184	M1H7-12/E15	SV4587B	NO	No
See previous page for relay number									185	M1H7-12/E15	SV4589A	NO	No
See previous page for relay number									186	M1H7-12/E15	SV4589B	NO	No
29	10A-K152D	C2233B		ES	SQ3	RW	23' 0"	Agastat	EGPB002				
									187	M1H9-12/E14	B106	NO	No
									188	M1H9-12/E14	B206	NO	No
									189	M1H9-12/E14	SV4569A	NO	No
									190	M1H9-12/E14	SV4569B	NO	No
									191	M1H9-12/E14	SV4570A	NO	No
									192	M1H9-12/E14	SV4570B	NO	No
									193	M1H9-12/E14	SV4587A	NO	No
									194	M1H9-12/E14	SV4587B	NO	No
									195	M1H9-12/E14	SV4589A	NO	No
									196	M1H9-12/E14	SV4589B	NO	No
30	10A-K153A	C2233A	4	ES	SQ3	RW	23' 0"	Agastat	EGPB002				
									197	M1H7-12/E18	MO1001-28A	NO	No
									198	M1H7-12/E18	MO1001-28B	NO	No
									199	M1H7-12/E18	MO202-5A	NO	No
									200	M1H7-12/E18	MO202-5B	NO	No
									201	M1H7-12/E18	VAC205A-1	NO	No
									202	M1H7-12/E18	VAC205A-2	NO	No
									203	M1H7-12/E18	VAC205B-1	NO	No
									204	M1H7-12/E18	VAC205B-2	NO	No
									205	M1H7-12/E18	VAC205C-1	NO	No
									206	M1H7-12/E18	VAC205C-2	NO	No
									207	M1H7-12/E18	VAC205D-1	NO	No
									208	M1H7-12/E18	VAC205D-2	NO	No
									209	M1H7-12/E18	VAC205E-1	NO	No
									210	M1H7-12/E18	VAC205E-2	NO	No
									211	M1H7-12/E18	VAC205F-1	NO	No
									212	M1H7-12/E18	VAC205F-2	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									213	M1H7-12/E18	VAC206A-1	NO	No
									214	M1H7-12/E18	VAC206A-2	NO	No
									215	M1H7-12/E18	VAC206B-1	NO	No
									216	M1H7-12/E18	VAC206B-2	NO	No
31	10A-K153B	C2233B	4	ES	SQ3	RW	23' 0"	Agastat	EGPB002				
									217	M1H7-12/E18	MO1001-28A	NO	No
									218	M1H7-12/E18	MO1001-28B	NO	No
									219	M1H7-12/E18	MO202-5A	NO	No
									220	M1H7-12/E18	MO202-5B	NO	No
									221	M1H7-12/E18	VAC205A-1	NO	No
									222	M1H7-12/E18	VAC205A-2	NO	No
									223	M1H7-12/E18	VAC205B-1	NO	No
									224	M1H7-12/E18	VAC205B-2	NO	No
									225	M1H7-12/E18	VAC205C-1	NO	No
									226	M1H7-12/E18	VAC205C-2	NO	No
									227	M1H7-12/E18	VAC205D-1	NO	No
									228	M1H7-12/E18	VAC205D-2	NO	No
									229	M1H7-12/E18	VAC205E-1	NO	No
									230	M1H7-12/E18	VAC205E-2	NO	No
									231	M1H7-12/E18	VAC205F-1	NO	No
									232	M1H7-12/E18	VAC205F-2	NO	No
									233	M1H7-12/E18	VAC206A-1	NO	No
									234	M1H7-12/E18	VAC206A-2	NO	No
									235	M1H7-12/E18	VAC206B-1	NO	No
									236	M1H7-12/E18	VAC206B-2	NO	No
32	10A-K153C	C2233A		ES	SQ3	RW	23' 0"	Agastat	EGPB002				
									237	M1H7-12/E15	B106	NO	No
									238	M1H7-12/E15	B206	NO	No
									239	M1H7-12/E15	MO2301-14	NO	No
									240	M1H7-12/E15	MO2301-8	NO	No
									241	M1H7-12/E15	SV4569A	NO	No
									242	M1H7-12/E15	SV4569B	NO	No
									243	M1H7-12/E15	SV4570A	NO	No
									244	M1H7-12/E15	SV4570B	NO	No
									245	M1H7-12/E15	SV4587A	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									246	M1H7-12/E15	SV4587B	NO	No
									247	M1H7-12/E15	SV4589A	NO	No
									248	M1H7-12/E15	SV4589B	NO	No
33	10A-K153D	C2233B		ES	SQ3	RW	23' 0"	Agastal	EGPB002				
									249	M1H9-12/E14	B106	NO	No
									250	M1H9-12/E14	B206	NO	No
									251	M1H9-12/E14	MO2301-14	NO	No
									252	M1H9-12/E14	MO2301-8	NO	No
									253	M1H9-12/E14	SV4569A	NO	No
									254	M1H9-12/E14	SV4569B	NO	No
									255	M1H9-12/E14	SV4570A	NO	No
									256	M1H9-12/E14	SV4570B	NO	No
									257	M1H9-12/E14	SV4587A	NO	No
									258	M1H9-12/E14	SV4587B	NO	No
									259	M1H9-12/E14	SV4589A	NO	No
									260	M1H9-12/E14	SV4589B	NO	No
34	10A-K156A	C2233A	4	ES	SQ3	RW	23' 0"	Agastal	EGPB002				
									261	M1H7-12/E18	MO1001-29A	NO	No
									262	M1H8-10/E19	MO1001-29B	NO	No
35	10A-K156B	C2233B	4	ES	SQ3	RW	23' 0"	Agastal	EGPB002				
									263	M1H10-10/E16	MO1001-29A	NO	No
									264	M1H10-10/E16	MO1001-29B	NO	No
36	10A-K18A	C932		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									265	M1H20-4/E7	P203A	NO	No
37	10A-K18B	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									266	M1H20-4/E7	P203B	NO	No
38	10A-K21A	C932		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									267	M1H20-4/E7	P203C	NO	No
39	10A-K21B	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									268	M1H20-4/E7	P203D	NO	No
40	10A-K27A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									269	M1H8-10/E19	MO1001-28A	NO	No
									270	M1H8-10/E19	MO1001-28B	NO	No
									271	M1H8-10/E19	MO202-5A	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
									272	M1H8-10/E19	MO202-5B	NO	No	
41	10A-K27B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	273	M1H10-10/E16	MO1001-28A	NO	No
									274	M1H10-10/E16	MO1001-28B	NO	No	
									275	M1H10-10/E16	MO202-5A	NO	No	
									276	M1H10-10/E16	MO202-5B	NO	No	
42	10A-K28A	C932		ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	277	M1H8-10/E19	MO1001-28A	NO	No
									278	M1H8-10/E19	MO1001-28B	NO	No	
									279	M1H8-10/E19	MO202-5A	NO	No	
									280	M1H8-10/E19	MO202-5B	NO	No	
43	10A-K28B	C933		ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	281	M1H10-10/E16	MO1001-28A	NO	No
									282	M1H10-10/E16	MO1001-28B	NO	No	
									283	M1H10-10/E16	MO202-5A	NO	No	
									284	M1H10-10/E16	MO202-5B	NO	No	
44	10A-K33A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	285	M1H8-10/E19	MO1001-28A	NO	No
									286	M1H8-10/E19	MO1001-28B	NO	No	
									287	M1H8-10/E19	MO202-5A	NO	No	
									288	M1H8-10/E19	MO202-5B	NO	No	
45	10A-K33B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	289	M1H10-10/E16	MO1001-28A	NO	No
									290	M1H10-10/E16	MO1001-28B	NO	No	
									291	M1H10-10/E16	MO202-5A	NO	No	
									292	M1H10-10/E16	MO202-5B	NO	No	
46	10A-K34A	C932		ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	293	M1H8-10/E19	MO1001-28A	NO	No
									294	M1H8-10/E19	MO1001-28B	NO	No	
									295	M1H8-10/E19	MO202-5B	NO	No	
47	10A-K34B	C933		ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	296	M1H10-10/E16	MO1001-28A	NO	No
									297	M1H10-10/E16	MO1001-28B	NO	No	
									298	M1H10-10/E16	MO202-5B	NO	No	

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
48	10A-K37A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	299	M1H8-10/E19	MO202-5A	NO	No
49	10A-K37B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	300	M1H10-10/E16	MO202-5A	NO	No
50	10A-K38A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	301	E410/E10	MO202-5A	NO	No
51	10A-K38B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	302	E410/E10	MO202-5A	NO	No
52	10A-K39A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	303	M1H8-10/E19	MO202-5A	NO	No
53	10A-K39B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	304	M1H10-10/E15	MO202-5A	NO	No
54	10A-K40A	C932		ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	305	M1H8-10/E19	MO1001-28A	NO	No
										306	M1H8-10/E19	MO1001-28B	NO	No
										307	M1H8-10/E19	MO202-5B	NO	No
55	10A-K40B	C933		ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	308	M1H8-10/E19	MO1001-28A	NO	No
										309	M1H8-10/E19	MO1001-28B	NO	No
										310	M1H10-10/E16	MO202-5B	NO	No
56	10A-K42A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	311	E410/E10	MO202-5B	NO	No
57	10A-K42B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	312	E410/E10	MO202-5B	NO	No
58	10A-K43A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	313	M1H10-10/E16	MO1001-28A	NO	No
										314	M1H10-10/E16	MO1001-28B	NO	No
										315	M1H8-10/E19	MO202-5B	NO	No
59	10A-K43B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	316	M1H8-10/E19	MO1001-28A	NO	No
										317	M1H8-10/E19	MO1001-28B	NO	No
										318	M1H10-10/E16	MO202-5B	NO	No
60	10A-K44A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F					

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
										319	M1H7-12/E18	MO1001-29A	NO	No
										320	M1H7-12/E18	MO1001-29B	NO	No
See previous page for relay number														
See previous page for relay number														
61	10A-K44B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	321	M1H9-12/E17	MO1001-29A	NO	No
										322	M1H9-12/E17	MO1001-29B	NO	No
See previous page for relay number														
62	10A-K5A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	323	M1H7-12/E18	MO1001-28A	NO	No
										324	M1H7-12/E18	MO1001-28B	NO	No
										325	M1H7-12/E18	MO202-5A	NO	No
										326	M1H7-12/E18	MO202-5B	NO	No
										327	M1H7-12/E18	VAC205A-1	NO	No
										328	M1H7-12/E18	VAC205A-2	NO	No
										329	M1H7-12/E18	VAC205B-1	NO	No
										330	M1H7-12/E18	VAC205B-2	NO	No
										331	M1H7-12/E18	VAC205C-1	NO	No
										332	M1H7-12/E18	VAC205C-2	NO	No
										333	M1H7-12/E18	VAC205D-1	NO	No
										334	M1H7-12/E18	VAC205D-2	NO	No
										335	M1H7-12/E18	VAC205E-1	NO	No
										336	M1H7-12/E18	VAC205E-2	NO	No
										337	M1H7-12/E18	VAC205F-1	NO	No
										338	M1H7-12/E18	VAC205F-2	NO	No
										339	M1H7-12/E18	VAC206A-1	NO	No
										340	M1H7-12/E18	VAC206A-2	NO	No
										341	M1H7-12/E18	VAC206B-1	NO	No
										342	M1H7-12/E18	VAC206B-2	NO	No
See previous page for relay number														
63	10A-K5B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	343	M1H7-12/E18	MO1001-28A	NO	No
										344	M1H7-12/E18	MO1001-28B	NO	No
										345	M1H7-12/E18	MO202-5A	NO	No
										346	M1H7-12/E18	MO202-5B	NO	No
										347	M1H7-12/E18	VAC205A-1	NO	No
										348	M1H7-12/E18	VAC205A-2	NO	No
										349	M1H7-12/E18	VAC205B-1	NO	No
										350	M1H7-12/E18	VAC205B-2	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
									351	M1H7-12/E18	VAC205C-1	NO	No	
									352	M1H7-12/E18	VAC205C-2	NO	No	
									353	M1H7-12/E18	VAC205D-1	NO	No	
									354	M1H7-12/E18	VAC205D-2	NO	No	
									355	M1H7-12/E18	VAC205E-1	NO	No	
									356	M1H7-12/E18	VAC205E-2	NO	No	
									357	M1H7-12/E18	VAC205F-1	NO	No	
									358	M1H7-12/E18	VAC205F-2	NO	No	
									359	M1H7-12/E18	VAC206A-1	NO	No	
									360	M1H7-12/E18	VAC206A-2	NO	No	
									361	M1H7-12/E18	VAC206B-1	NO	No	
									362	M1H7-12/E18	VAC206B-2	NO	No	
64	10A-K66A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	363	M1H16-5/E8	MO1001-29A	NO	No
65	10A-K66B	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	364	M1H16-5/E8	MO1001-29A	NO	No
66	10A-K67A	C932		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	365	M1H17-5/E7	MO1001-29B	NO	No
67	10A-K67B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	366	M1H17-5/E7	MO1001-29B	NO	No
68	10A-K6A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	367	M1H7-12/E15	B106	NO	No
									368	M1H9-12/E14	B206	NO	No	
									369	M1H7-12/E15	SV4569A	NO	No	
									370	M1H9-12/E14	SV4569B	NO	No	
									371	M1H7-12/E15	SV4570A	NO	No	
									372	M1H9-12/E14	SV4570B	NO	No	
									373	M1H7-12/E15	SV4587A	NO	No	
									374	M1H7-12/E15	SV4587B	NO	No	
									375	M1H9-12/E14	SV4589A	NO	No	
									376	M1H9-12/E14	SV4589B	NO	No	
69	10A-K6B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	377	M1H7-12/E15	B106	NO	No
									378	M1H9-12/E14	B206	NO	No	

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number		Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
										379	M1H7-12/E15	SV4569A	NO	No
										380	M1H9-12/E14	SV4569B	NO	No
										381	M1H7-12/E15	SV4570A	NO	No
										382	M1H9-12/E14	SV4570B	NO	No
										383	M1H7-12/E15	SV4587A	NO	No
										384	M1H7-12/E15	SV4587B	NO	No
										385	M1H9-12/E14	SV4589A	NO	No
										386	M1H9-12/E14	SV4589B	NO	No
70	10A-K70A	C932		ES	SQ3	RW	23' 0"	Agastat	ETR	387	M1H7-12/E15	P203A	NO	No
71	10A-K70B	C933		ES	SQ3	RW	23' 0"	Agastat	ETR	388	M1H9-12/E13	P203B	NO	No
72	10A-K75A	C932		ES	SQ3	RW	23' 0"	Agastat	ETR	389	M1H7-12/E15	P203C	NO	No
73	10A-K75B	C933		ES	SQ3	RW	23' 0"	Agastat	ETR	390	M1H9-12/E13	P203D	NO	No
74	10A-K7A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	391	M1H7-12/E18	MO1001-28A	NO	No
										392	M1H7-12/E18	MO1001-28B	NO	No
										393	M1H7-12/E18	MO202-5A	NO	No
										394	M1H7-12/E18	MO202-5B	NO	No
										395	M1H7-12/E18	VAC205A-1	NO	No
										396	M1H7-12/E18	VAC205A-2	NO	No
										397	M1H7-12/E18	VAC205B-1	NO	No
										398	M1H7-12/E18	VAC205B-2	NO	No
										399	M1H7-12/E18	VAC205C-1	NO	No
										400	M1H7-12/E18	VAC205C-2	NO	No
										401	M1H7-12/E18	VAC205D-1	NO	No
										402	M1H7-12/E18	VAC205D-2	NO	No
										403	M1H7-12/E18	VAC205E-1	NO	No
										404	M1H7-12/E18	VAC205E-2	NO	No
										405	M1H7-12/E18	VAC205F-1	NO	No
										406	M1H7-12/E18	VAC205F-2	NO	No
										407	M1H7-12/E18	VAC206A-1	NO	No



Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									408	M1H7-12/E18	VAC206A-2	NO	No
									409	M1H7-12/E18	VAC206B-1	NO	No
									410	M1H7-12/E18	VAC206B-2	NO	No
75	10A-K7B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									411	M1H7-12/E18	MO1001-28A	NO	No
									412	M1H7-12/E18	MO1001-28B	NO	No
									413	M1H7-12/E18	MO202-5A	NO	No
									414	M1H7-12/E18	MO202-5B	NO	No
									415	M1H7-12/E18	VAC205A-1	NO	No
									416	M1H7-12/E18	VAC205A-2	NO	No
									417	M1H7-12/E18	VAC205B-1	NO	No
									418	M1H7-12/E18	VAC205B-2	NO	No
									419	M1H7-12/E18	VAC205C-1	NO	No
									420	M1H7-12/E18	VAC205C-2	NO	No
									421	M1H7-12/E18	VAC205D-1	NO	No
									422	M1H7-12/E18	VAC205D-2	NO	No
									423	M1H7-12/E18	VAC205E-1	NO	No
									424	M1H7-12/E18	VAC205E-2	NO	No
									425	M1H7-12/E18	VAC205F-1	NO	No
									426	M1H7-12/E18	VAC205F-2	NO	No
									427	M1H7-12/E18	VAC206A-1	NO	No
									428	M1H7-12/E18	VAC206A-2	NO	No
									429	M1H7-12/E18	VAC206B-1	NO	No
									430	M1H7-12/E18	VAC206B-2	NO	No
76	10A-K87A	C932		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									431	E5010/E10	MO1001-28A	NO	No
77	10A-K87B	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									432	E5010/E10	MO1001-28A	NO	No
78	10A-K88A	C932		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									433	E5010/E10	MO1001-28B	NO	No
79	10A-K88B	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									434	E5010/E10	MO1001-28B	NO	No
80	10A-K8A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									435	M1H7-12/E15	B106	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
See previous page for relay number									436	M1H9-12/E14	B206	NO	No	
See previous page for relay number									437	M1J16-10/E22	MO2301-14	NO	No	
See previous page for relay number									438	M1J16-10/E22	MO2301-8	NO	No	
See previous page for relay number									439	M1H7-12/E15	SV4569A	NO	No	
See previous page for relay number									440	M1H9-12/E14	SV4569B	NO	No	
See previous page for relay number									441	M1H7-12/E15	SV4570A	NO	No	
See previous page for relay number									442	M1H9-12/E14	SV4570B	NO	No	
See previous page for relay number									443	M1H7-12/E15	SV4587A	NO	No	
See previous page for relay number									444	M1H7-12/E15	SV4587B	NO	No	
See previous page for relay number									445	M1H9-12/E14	SV4589A	NO	No	
See previous page for relay number									446	M1H9-12/E14	SV4589B	NO	No	
81	10A-K8B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	447	M1H7-12/E15	B106	NO	No
										448	M1H9-12/E14	B206	NO	No
										449	M1J16-10/E22	MO2301-14	NO	No
										450	M1J16-10/E22	MO2301-8	NO	No
										451	M1H7-12/E15	SV4569A	NO	No
										452	M1H9-12/E14	SV4569B	NO	No
										453	M1H7-12/E15	SV4570A	NO	No
										454	M1H9-12/E14	SV4570B	NO	No
										455	M1H7-12/E15	SV4587A	NO	No
										456	M1H7-12/E15	SV4587B	NO	No
										457	M1H9-12/E14	SV4589A	NO	No
										458	M1H9-12/E14	SV4589B	NO	No
82	10A-K90A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	459	M1H7-12/E18	MO1001-29A	NO	No
										460	M1H8-10/E19	MO1001-29B	NO	No
83	10A-K90B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	461	M1H7-12/E18	MO1001-29A	NO	No
										462	M1H8-10/E19	MO1001-29B	NO	No
84	10A-K92A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	463	M1H8-10/E19	MO1001-28A	NO	No
										464	M1H8-10/E19	MO1001-28B	NO	No
										465	M1H8-10/E19	MO202-5A	NO	No
										466	M1H8-10/E19	MO202-5B	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
85	10A-K92B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	467	M1H10-10/E16	MO1001-29A	NO	No
										468	M1H10-10/E16	MO1001-28B	NO	No
										469	M1H10-10/E16	MO202-5A	NO	No
										470	M1H10-10/E16	MO202-5B	NO	No
86	10A-K9A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	471	E18/E7	B106	NO	No
										472	E18/E7	SV4569A	NO	No
										473	E18/E7	SV4570A	NO	No
										474	E18/E7	SV4587A	NO	No
										475	E18/E7	SV4587B	NO	No
										476	E18/E8	VAC205A-1	NO	No
										477	E18/E8	VAC205B-1	NO	No
										478	E18/E8	VAC205C-1	NO	No
										479	E18/E8	VAC205D-1	NO	No
										480	E18/E8	VAC205E-1	NO	No
										481	E18/E8	VAC205F-1	NO	No
										482	E18/E8	VAC206A-1	NO	No
										483	E18/E8	VAC206B-1	NO	No
87	10A-K9B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	484	E18/E7	B206	NO	No
										485	E18/E7	SV4569B	NO	No
										486	E18/E7	SV4570B	NO	No
										487	E18/E7	SV4589A	NO	No
										488	E18/E7	SV4589B	NO	No
										489	E18/E8	VAC205A-2	NO	No
										490	E18/E8	VAC205B-2	NO	No
										491	E18/E8	VAC205C-2	NO	No
										492	E18/E8	VAC205D-2	NO	No
										493	E18/E8	VAC205E-2	NO	No
										494	E18/E8	VAC205F-2	NO	No
										495	E18/E8	VAC206A-2	NO	No
496	E18/E8	VAC206B-2	NO	No										
88	127-504/1	A504		ES	OL2	TB	37' 0"	General Electric	12IAV53B1A	497	E38/E6	A504	NC	Yes

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									498	E5-122-8BC/E1	B106	NC	Yes
									499	E5-122-8BC/E1	SV4569A	NC	Yes
									500	E5-122-8BC/E1	SV4570A	NC	Yes
									501	E5-122-8BC/E1	SV4587A	NC	Yes
									502	E5-122-8BC/E1	SV4587B	NC	Yes
89	127-504/2	A504	ES	OL2	TB	37' 0"	General Electric	12IAV53B1A	503	E38/E6	A504	NC	Yes
									504	E5-122-8BC/E1	B106	NC	Yes
									505	E5-122-8BC/E1	SV4569A	NC	Yes
									506	E5-122-8BC/E1	SV4570A	NC	Yes
									507	E5-122-8BC/E1	SV4587A	NC	Yes
									508	E5-122-8BC/E1	SV4587B	NC	Yes
90	127-504X	A504	ES	OL3	TB	37' 0"	General Electric	12HFA51A42H	509	E38/E6	A504	NO/NC	No
									510	E18/E7	B106	NO	No
									511	E18/E7	SV4569A	NO	No
									512	E18/E7	SV4570A	NO	No
									513	E18/E7	SV4587A	NO	No
									514	E18/E7	SV4587B	NO	No
91	127-604/1	A604	ES	OL2	TB	23' 0"	General Electric	12IAV53B1A	515	E38/E6	A604	NC	Yes
									516	E5-146-8BC/E1	B206	NC	Yes
									517	E5-146-8BC/E1	SV4569B	NC	Yes
									518	E5-146-8BC/E1	SV4570B	NC	Yes
									519	E5-146-8BC/E1	SV4589A	NC	Yes
									520	E5-146-8BC/E1	SV4589B	NC	Yes
92	127-604/2	A604	ES	OL2	TB	23' 0"	General Electric	12IAV53B1A	521	E38/E6	A604	NC	Yes
									522	E5-146-8BC/E1	B206	NC	Yes
									523	E5-146-8BC/E1	SV4569B	NC	Yes
									524	E5-146-8BC/E1	SV4570B	NC	Yes
									525	E5-146-8BC/E1	SV4589A	NC	Yes
									526	E5-146-8BC/E1	SV4589B	NC	Yes
93	127-604X	A604	ES	OL3	TB	23' 0"	General Electric	12HFA51A42H					

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									527	E38/E6	A604	NO/NC	No
									528	E18/E7	B206	NO	No
									529	E18/E7	SV4569B	NO	No
									530	E18/E7	SV4570B	NO	No
									531	E18/E7	SV4589A	NO	No
									532	E18/E7	SV4589B	NO	No
94	127A-504/1	AA504	ES	SQ3	TB	37' 0"	ITE Electrical	211T4375	533	E35/E4	A504	NC	Yes
95	127A-504/2	AA504	ES	SQ3	TB	37' 0"	ITE Electrical	211T4375	534	E35/E4	A504	NC	Yes
96	127A-504/3	AA504	ES	SQ3	TB	37' 0"	ITE Electrical	211T4375	535	E38/E6	A504	NC	Yes
97	127A-504/4	AA504	ES	SQ3	TB	37' 0"	ITE Electrical	211T4375	536	E35/E4	A504	NC	Yes
98	127A-604/1	AA604	ES	SQ3	TB	23' 0"	ITE Electrical	211T4375	537	E35/E4	A604	NC	Yes
99	127A-604/2	AA604	ES	SQ3	TB	23' 0"	ITE Electrical	211T4375	538	E35/E4	A604	NC	Yes
100	127A-604/3	AA604	ES	SQ3	TB	23' 0"	ITE Electrical	211T4375	539	E35/E4	A604	NC	Yes
101	127A-604/4	AA604	ES	SQ3	TB	23' 0"	ITE Electrical	211T4375	540	E35/E4	A604	NC	Yes
102	127A-A5/1	AA504	ES	SQ3	TB	37' 0"	ITE Electrical	211T4375	541	E35/E4	B106	NO	No
									542	E35/E4	SV4569A	NO	No
									543	E35/E4	SV4570A	NO	No
									544	E35/E4	SV4587A	NO	No
									545	E35/E4	SV4587B	NO	No
103	127A-A5/2	AA504	ES	SQ3	TB	37' 0"	ITE Electrical	211T4375	546	E35/E4	B106	NO	No
									547	E35/E4	SV4569A	NO	No
									548	E35/E4	SV4570A	NO	No
									549	E35/E4	SV4587A	NO	No

**Pilgrim Nuclear Power Station Essential Relay Contacts**

Relay ID		Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Contact States			
										Schematic Number	Group ID	Contact State (NO/NC)	Energized (Yes/No)
104	127A-A6/1	AA604		ES	SQ3	TB	23' 0"	ITE Electrical	211T4375	550 E35/E4	SV4587B	NO	No
										551 E35/E4	B206	NO	No
										552 E35/E4	SV4569B	NO	No
										553 E35/E4	SV4570B	NO	No
										554 E35/E4	SV4589A	NO	No
										555 E35/E4	SV4589B	NO	No
105	127A-A6/2	AA604		ES	SQ3	TB	23' 0"	ITE Electrical	211T4375	556 E35/E4	B206	NO	No
										557 E35/E4	SV4569B	NO	No
										558 E35/E4	SV4570B	NO	No
										559 E35/E4	SV4589A	NO	No
										560 E35/E4	SV4589B	NO	No
106	127AX-504/1	AA504		ES	SQ1	TB	37' 0"	Agastat	7012PA	561 E38/E6	A504	NO	No
107	127AX-504/2	AA504		ES	SQ1	TB	37' 0"	Agastat	7012PA	562 E38/E6	A504	NO	No
108	127AX-504/3	AA504		ES	SQ1	TB	37' 0"	Agastat	7012PA	563 E38/E6	A504	NO	No
109	127AX-504/4	AA504		ES	SQ1	TB	37' 0"	Agastat	7012PA	564 E38/E6	A504	NO	No
110	127AX-604/1	AA604		ES	SQ1	TB	23' 0"	Agastat	7012PA	565 E38/E6	A604	NO	No
111	127AX-604/2	AA604		ES	SQ1	TB	23' 0"	Agastat	7012PA	566 E38/E6	A604	NO	No
112	127AX-604/3	AA604		ES	SQ1	TB	23' 0"	Agastat	7012PA	567 E38/E6	A604	NO	No
113	127AX-604/4	AA604		ES	SQ1	TB	23' 0"	Agastat	7012PA	568 E38/E6	A604	NO	No
114	127AX-A5/1	AA504		ES	SQ1	TE	37' 0"	Agastat	7012PA	569 E18/E7	B106	NO	No
										570 E18/E7	SV4569A	NO	No
										571 E18/E7	SV4570A	NO	No

See previous page for relay number

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									572	E18/E7	SV4587A	NO	No
									573	E18/E7	SV4587B	NO	No
115	127AX-A5/2	AA504	ES	SQ1	TB	37' 0"	Agastat	7012PA	574	E18/E7	B106	NO	No
									575	E18/E7	SV4569A	NO	No
									576	E18/E7	SV4570A	NO	No
									577	E18/E7	SV4587A	NO	No
									578	E18/E7	SV4587B	NO	No
116	127AX-A6/1	AA604	ES	SQ1	TB	23' 0"	Agastat	7012PA	579	E18/E7	B206	NO	No
									580	E18/E7	SV4569B	NO	No
									581	E18/E7	SV4570B	NO	No
									582	E18/E7	SV4589A	NO	No
									583	E18/E7	SV4589B	NO	No
117	127AX-A6/2	AA604	ES	SQ1	TB	23' 0"	Agastat	7012PA	584	E18/E7	B206	NO	No
									585	E18/E7	SV4569B	NO	No
									586	E18/E7	SV4570B	NO	No
									587	E18/E7	SV4589A	NO	No
									588	E18/E7	SV4589B	NO	No
118	132-509	C101	ES	OL2	DG A	23' 0"	Westinghouse	CRN-1	589	E40/E7	A509	NO	No
119	132-609	C102	ES	OL2	DG B	23' 0"	Westinghouse	CRN-1	590	E40/E7	A609	NO	No
120	13A-K1	C930	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	591	M1G27/E5	MO1301-49	NO	No
									592	M1G16-7/E5	MO1301-61	NO	No
121	13A-K10	C930	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	593	M1G12-12/E11	MO1301-16	NO	No
									594	M1G12-12/E11	MO1301-17	NO	No
									595	M1G12-12/E11	SV1301-1	NO	No
122	13A-K11	C930	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	596	M1G14-9/E8	SV1301-1	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
123	13A-K13	C930		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	597	M1G16-7/E5	MO1301-60	NO	No
124	13A-K14	C930		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	598	M1G12-12/E11	SV1301-1	NO	No
125	13A-K17	C930		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	599	M1G12-12/E11	SV1301-1	NO	No
126	13A-K18	C930	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	600	M1G15-9/E9	MO1301-22	NO	No
127	13A-K2	C930		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	601	M1G16-7/E5	MO1301-60	NO	No
128	13A-K22	C930		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	602	M1G15-9/E9	MO1301-16	NO	No
										603	M1G15-9/E9	MO1301-17	NO	No
										604	M1G12-12/E11	SV1301-1	NO	No
129	13A-K3	C930		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	605	M1G12-12/E11	MO1301-16	NO	No
										606	M1G12-12/E11	MO1301-17	NO	No
										607	M1G12-12/E11	SV1301-1	NO	No
130	13A-K31	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	608	M1G12-12/E11	MO1301-16	NO	No
										609	M1G12-12/E11	MO1301-17	NO	No
										610	M1G12-12/E11	SV1301-1	NO	No
131	13A-K32	C933		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	611	M1G12-12/E11	MO1301-16	NO	No
										612	M1G12-12/E11	MO1301-17	NO	No
										613	M1G12-12/E11	SV1301-1	NO	No
132	13A-K33	C933		ES	SQ1	RW	23' 0"	Agastat	7014PB	614	M1G12-12/E11	MO1301-16	NO	No
										615	M1G12-12/E11	MO1301-17	NO	No
										616	M1G12-12/E11	SV1301-1	NO	No
133	13A-K34	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	617	M1G15-9/E9	MO1301-16	NO	No
										618	M1G15-9/E9	MO1301-17	NO	No



Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States						
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
134	13A-K5	C930		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	619	M1G12-12/E11	MO1301-16	NO	No
										620	M1G12-12/E11	MO1301-17	NO	No
										621	M1G12-12/E11	SV1301-1	NO	No
135	13A-K7	C930		ES	SQ1	RW	23' 0"	Agastat	7014PB	522	M1G12-12/E11	MO1301-16	NO	No
										622	M1G12-12/E11	MO1301-17	NO	No
										623	M1G12-12/E11	SV1301-1	NO	No
136	14A-K10A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	625	E18/E7	B106	NO	No
										626	E18/E7	SV4569A	NO	No
										627	E18/E7	SV4570A	NO	No
										628	E18/E7	SV4587A	NO	No
										629	E18/E7	SV4587B	NO	No
										630	E18/E8	VAC205A-1	NO	No
										631	E18/E8	VAC205B-1	NO	No
										632	E18/E8	VAC205C-1	NO	No
										633	E18/E8	VAC205D-1	NO	No
										634	E18/E8	VAC205E-1	NO	No
										635	E18/E8	VAC205F-1	NO	No
										636	E18/E8	VAC206A-1	NO	No
										637	E18/E8	VAC206B-1	NO	No
137	14A-K10B	C933		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	638	E18/E7	B206	NO	No
										639	E18/E7	SV4569B	NO	No
										640	E18/E7	SV4570B	NO	No
										641	E18/E7	SV4589A	NO	No
										642	E18/E7	SV4589B	NO	No
										643	E18/E8	VAC205A-2	NO	No
										644	E18/E8	VAC205B-2	NO	No
										645	E18/E8	VAC205C-2	NO	No
										646	E18/E8	VAC205D-2	NO	No
										647	E18/E8	VAC205E-2	NO	No
										648	E18/E8	VAC205F-2	NO	No
										649	E18/E8	VAC206A-2	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NOVNC)	Energized (Yes/No)		
									650	E1B/E8	VAC206B-2	NO	No	
138	14A-K12A			ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	651	M1K7-7/E3	P215A	NO	No
139	14A-K12B			ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	652	M1K7-7/E3	P215B	NO	No
140	14A-K13A			ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	653	M1K16/E6	MO1400-25A	NO	No
141	14A-K13B			ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	654	M1K16/E6	MO1400-25B	NO	No
142	14A-K14A		4	ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	655	M1K4-11/E15	P215A	NC	No
143	14A-K14B		4	ES	SQ3	RW	23' 0"	Agastat	ETR14D3A003	656	M1K4-11/E15	P215B	NO	No
144	14A-K23A			ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	657	M1K4-11/E15	SV203-3A	NO	No
									658	M1K4-11/E15	SV203-3B	NO	No	
									659	M1K4-11/E15	SV203-3C	NO	No	
									660	M1K4-11/E15	SV203-3D	NO	No	
145	14A-K23B			ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	661	M1K4-11/E15	SV203-3A	NO	No
									662	M1K4-11/E15	SV203-3B	NO	No	
									663	M1K4-11/E15	SV203-3C	NO	No	
									664	M1K4-11/E15	SV203-3D	NO	No	
146	14A-K50C			ES	SQ3	RW	23' 0"	Agastat	EGPB002	665	M1K4-11/E15	B106	NO	No
									666	M1K4-11/E15	B206	NO	No	
									667	M1K4-11/E15	MO2301-14	NO	No	
									668	M1K4-11/E15	MO2301-33	NO	No	
									669	M1K4-11/E15	MO2301-34	NO	No	
									670	M1K4-11/E15	MO2301-8	NO	No	
									671	M1K4-11/E15	SV4569A	NO	No	
									672	M1K4-11/E15	SV4569B	NO	No	
									673	M1K4-11/E15	SV4570A	NO	No	

Pilgrim Nuclear Power Station Essential Relay Contacts							Contact States						
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
See previous page for relay number									674	M1K4-11/E15	SV4570B	NO	No
See previous page for relay number									675	M1K4-11/E15	SV4587A	NO	No
See previous page for relay number									676	M1K4-11/E15	SV4587B	NO	No
See previous page for relay number									677	M1K4-11/E15	SV4589A	NO	No
See previous page for relay number									678	M1K4-11/E15	SV4589B	NO	No
See previous page for relay number									679	M1K4-11/E15	VAC205A-1	NO	No
See previous page for relay number									680	M1K4-11/E15	VAC205A-2	NO	No
See previous page for relay number									681	M1K4-11/E15	VAC205B-1	NO	No
See previous page for relay number									682	M1K4-11/E15	VAC205B-2	NO	No
See previous page for relay number									683	M1K4-11/E15	VAC205C-1	NO	No
See previous page for relay number									684	M1K4-11/E15	VAC205C-2	NO	No
See previous page for relay number									685	M1K4-11/E15	VAC205D-1	NO	No
See previous page for relay number									686	M1K4-11/E15	VAC205D-2	NO	No
See previous page for relay number									687	M1K4-11/E15	VAC205E-1	NO	No
See previous page for relay number									688	M1K4-11/E15	VAC205E-2	NO	No
See previous page for relay number									689	M1K4-11/E15	VAC205F-1	NO	No
See previous page for relay number									690	M1K4-11/E15	VAC205F-2	NO	No
See previous page for relay number									691	M1K4-11/E15	VAC206A-1	NO	No
See previous page for relay number									692	M1K4-11/E15	VAC206A-2	NO	No
See previous page for relay number									693	M1K4-11/E15	VAC206B-1	NO	No
See previous page for relay number									694	M1K4-11/E15	VAC206B-2	NO	No
147	14A-K50D	C2233B	ES	SQ3	RW	23' 0"	Agastal	EGPB002	695	M1K4-11/E15	B106	NO	No
									696	M1K4-11/E15	B206	NO	No
									697	M1K4-11/E15	MO2301-14	NO	No
									698	M1K4-11/E15	MO2301-33	NO	No
									699	M1K4-11/E15	MO2301-34	NO	No
									700	M1K4-11/E15	MO2301-8	NO	No
									701	M1K4-11/E15	SV4569A	NO	No
									702	M1K4-11/E15	SV4569B	NO	No
									703	M1K4-11/E15	SV4570A	NO	No
									704	M1K4-11/E15	SV4570B	NO	No
									705	M1K4-11/E15	SV4587A	NO	No
									706	M1K4-11/E15	SV4587B	NO	No
									707	M1K4-11/E15	SV4589A	NO	No
									708	M1K4-11/E15	SV4589B	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts							Contact States						
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
See previous page for relay number									709	M1K4-11/E15	VAC205A-1	NO	No
See previous page for relay number									710	M1K4-11/E15	VAC205A-2	NO	No
See previous page for relay number									711	M1K4-11/E15	VAC205B-1	NO	No
See previous page for relay number									712	M1K4-11/E15	VAC205B-2	NO	No
See previous page for relay number									713	M1K4-11/E15	VAC205C-1	NO	No
See previous page for relay number									714	M1K4-11/E15	VAC205C-2	NO	No
See previous page for relay number									715	M1K4-11/E15	VAC205D-1	NO	No
See previous page for relay number									716	M1K4-11/E15	VAC205D-2	NO	No
See previous page for relay number									717	M1K4-11/E15	VAC205E-1	NO	No
See previous page for relay number									718	M1K4-11/E15	VAC205E-2	NO	No
See previous page for relay number									719	M1K4-11/E15	VAC205F-1	NO	No
See previous page for relay number									720	M1K4-11/E15	VAC205F-2	NO	No
See previous page for relay number									721	M1K4-11/E15	VAC206A-1	NO	No
See previous page for relay number									722	M1K4-11/E15	VAC206A-2	NO	No
See previous page for relay number									723	M1K4-11/E15	VAC206B-1	NO	No
See previous page for relay number									724	M1K4-11/E15	VAC206B-2	NO	No
148	14A-K51A		ES	SQ3	RW	23' 0"	Agastat	EGPB002	725	M1K4-11/E15	VAC205A-1	NO	No
									726	M1K4-11/E15	VAC205A-2	NO	No
									727	M1K4-11/E15	VAC205B-1	NO	No
									728	M1K4-11/E15	VAC205B-2	NO	No
									729	M1K4-11/E15	VAC205C-1	NO	No
									730	M1K4-11/E15	VAC205C-2	NO	No
									731	M1K4-11/E15	VAC205D-1	NO	No
									732	M1K4-11/E15	VAC205D-2	NO	No
									733	M1K4-11/E15	VAC205E-1	NO	No
									734	M1K4-11/E15	VAC205E-2	NO	No
									735	M1K4-11/E15	VAC205F-1	NO	No
									736	M1K4-11/E15	VAC205F-2	NO	No
									737	M1K4-11/E15	VAC206A-1	NO	No
									738	M1K4-11/E15	VAC206A-2	NO	No
									739	M1K4-11/E15	VAC206B-1	NO	No
									740	M1K4-11/E15	VAC206B-2	NO	No
149	14A-K51B		ES	SQ3	RW	23' 0"	Agastat	EGPB002	741	M1K4-11/E15	VAC205A-1	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bidg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
See previous page for relay number									742	M1K4-11/E15	VAC205A-2	NO	No
See previous page for relay number									743	M1K4-11/E15	VAC205B-1	NO	No
See previous page for relay number									744	M1K4-11/E15	VAC205B-2	NO	No
See previous page for relay number									745	M1K4-11/E15	VAC205C-1	NO	No
See previous page for relay number									746	M1K4-11/E15	VAC205C-2	NO	No
See previous page for relay number									747	M1K4-11/E15	VAC205D-1	NO	No
See previous page for relay number									748	M1K4-11/E15	VAC205D-2	NO	No
See previous page for relay number									749	M1K4-11/E15	VAC205E-1	NO	No
See previous page for relay number									750	M1K4-11/E15	VAC205E-2	NO	No
See previous page for relay number									751	M1K4-11/E15	VAC205F-1	NO	No
See previous page for relay number									752	M1K4-11/E15	VAC205F-2	NO	No
See previous page for relay number									753	M1K4-11/E15	VAC206A-1	NO	No
See previous page for relay number									754	M1K4-11/E15	VAC206A-2	NO	No
See previous page for relay number									755	M1K4-11/E15	VAC206B-1	NO	No
See previous page for relay number									756	M1K4-11/E15	VAC206B-2	NO	No
150	14A-K51C	C2233A	ES	SQ3	RW	23' 0"	Agastal	EGPB002	757	M1K4-11/E15	B106	NO	No
									758	M1K4-11/E15	B206	NO	No
									759	M1K4-11/E15	MO1301-49	NO	No
									760	M1K4-11/E15	MC1301-60	NO	No
									761	M1K4-11/E15	MO1301-61	NO	No
									762	M1K4-11/E15	SV4569A	NO	No
									763	M1K4-11/E15	SV4569B	NO	No
									764	M1K4-11/E15	SV4570A	NO	No
									765	M1K4-11/E15	SV4570B	NO	No
									766	M1K4-11/E15	SV4587A	NO	No
									767	M1K4-11/E15	SV4587B	NO	No
									768	M1K4-11/E15	SV4589A	NO	No
									769	M1K4-11/E15	SV4589B	NO	No
151	14A-K51D	C2233B	ES	SQ3	RW	23' 0"	Agastal	EGPB002	770	M1K4-11/E15	B106	NO	No
									771	M1K4-11/E15	B206	NO	No
									772	M1K4-11/E15	MO1301-49	NO	No
									773	M1K4-11/E15	MO1301-60	NO	No
									774	M1K4-11/E15	MO1301-61	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									775	M1K4-11/E15	SV4569A	NO	No
									776	M1K4-11/E15	SV4569B	NO	No
									777	M1K4-11/E15	SV4570A	NO	No
									778	M1K4-11/E15	SV4570B	NO	No
									779	M1K4-11/E15	SV4587A	NO	No
									780	M1K4-11/E15	SV4587B	NO	No
									781	M1K4-11/E15	SV4589A	NO	No
									782	M1K4-11/E15	SV4589B	NO	No
152	14A-K52A	C2233A		ES	SQ3	RW	23' 0"	Agestat	EGPB002				
									783	M1K4-11/E15	MO1400-25A	NO	No
									784	M1K4-11/E15	MO1400-25B	NO	No
153	14A-K52B	C2233B		ES	SQ3	RW	23' 0"	Agestat	EGPB002				
									785	M1K4-11/E15	MO1400-25A	NO	No
									786	M1K4-11/E15	MO1400-25B	NO	No
154	14A-K6A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									787	M1K4-11/E15	B106	NO	No
									788	M1K4-11/E15	B206	NO	No
									789	M1J16-10/E22	MO2301-14	NO	No
									790	M1J15-10/E16	MO2301-33	NO	No
									791	M1J15-10/E16	MO2301-34	NO	No
									792	M1J16-10/E22	MO2301-8	NO	No
									793	M1K4-11/E15	SV4569A	NO	No
									794	M1K4-11/E15	SV4569B	NO	No
									795	M1K4-11/E15	SV4570A	NO	No
									796	M1K4-11/E15	SV4570B	NO	No
									797	M1K4-11/E15	SV4587A	NO	No
									798	M1K4-11/E15	SV4587B	NO	No
									799	M1K4-11/E15	SV4589A	NO	No
									800	M1K4-11/E15	SV4589B	NO	No
									801	M1K4-11/E15	VAC205A-1	NO	No
									802	M1K4-11/E15	VAC205A-2	NO	No
									803	M1K4-11/E15	VAC205B-1	NO	No
									804	M1K4-11/E15	VAC205B-2	NO	No
									805	M1K4-11/E15	VAC205C-1	NO	No
									806	M1K4-11/E15	VAC205C-2	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
See previous page for relay number									807	M1K4-11/E15	VAC205D-1	NO	No
See previous page for relay number									808	M1K4-11/E15	VAC205D-2	NO	No
See previous page for relay number									809	M1K4-11/E15	VAC205E-1	NO	No
See previous page for relay number									810	M1K4-11/E15	VAC205E-2	NO	No
See previous page for relay number									811	M1K4-11/E15	VAC205F-1	NO	No
See previous page for relay number									812	M1K4-11/E15	VAC205F-2	NO	No
See previous page for relay number									813	M1K4-11/E15	VAC206A-1	NO	No
See previous page for relay number									814	M1K4-11/E15	VAC206A-2	NO	No
See previous page for relay number									815	M1K4-11/E15	VAC206B-1	NO	No
See previous page for relay number									816	M1K4-11/E15	VAC206B-2	NO	No
155	14A-K6B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									817	M1K4-11/E15	B106	NO	No
									818	M1K4-11/E15	B206	NO	No
									819	M1J16-10/E22	MO2301-14	NO	No
									820	M1J18-10/E22	MO2301-33	NO	No
									821	M1J16-10/E22	MO2301-34	NO	No
									822	M1J16-10/E22	MO2301-8	NO	No
									823	M1K4-11/E15	SV4569A	NO	No
									824	M1K4-11/E15	SV4569B	NO	No
									825	M1K4-11/E15	SV4570A	NO	No
									826	M1K4-11/E15	SV4570B	NO	No
									827	M1K4-11/E15	SV4587A	NO	No
									828	M1K4-11/E15	SV4587B	NO	No
									829	M1K4-11/E15	SV4589A	NO	No
									830	M1K4-11/E15	SV4589B	NO	No
									831	M1K4-11/E15	VAC205A-1	NO	No
									832	M1K4-11/E15	VAC205A-2	NO	No
									833	M1K4-11/E15	VAC205B-1	NO	No
									834	M1K4-11/E15	VAC205B-2	NO	No
									835	M1K4-11/E15	VAC205C-1	NO	No
									836	M1K4-11/E15	VAC205C-2	NO	No
									837	M1K4-11/E15	VAC205D-1	NO	No
									838	M1K4-11/E15	VAC205D-2	NO	No
									839	M1K4-11/E15	VAC205E-1	NO	No
									840	M1K4-11/E15	VAC205E-2	NO	No
									841	M1K4-11/E15	VAC205F-1	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									842	M1K4-11/E15	VAC205F-2	NO	No
									843	M1K4-11_15	VAC206A-1	NO	No
									844	M1K4-11/E15	VAC206A-2	NO	No
									845	M1K4-11/E15	VAC206B-1	NO	No
									846	M1K4-11/E15	VAC206B-2	NO	No
156	14A-K8A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									847	M1K4-11/E15	B106	NO	No
									848	M1K4-11/E15	B206	NO	No
									849	M1G12-12/E11	MO1301-49	NO	No
									850	M1G12-12/E11	MO1301-60	NO	No
									851	M1K4-11/E15	MO1301-61	NO	No
									852	M1K4-11/E15	SV4569A	NO	No
									853	M1K4-11/E15	SV4569B	NO	No
									854	M1K4-11/E15	SV4570A	NO	No
									855	M1K4-11/E15	SV4570B	NO	No
									856	M1K4-11/E15	SV4587A	NO	No
									857	M1K4-11/E15	SV4587B	NO	No
									858	M1K4-11/E15	SV4589A	NO	No
									859	M1K4-11/E15	SV4589B	NO	No
									860	M1K4-11/E15	VAC205A-1	NO	No
									861	M1K4-11/E15	VAC205A-2	NO	No
									862	M1K4-11/E15	VAC205B-1	NO	No
									863	M1K4-11/E15	VAC205B-2	NO	No
									864	M1K4-11/E15	VAC205C-1	NO	No
									865	M1K4-11/E15	VAC205C-2	NO	No
									866	M1K4-11/E15	VAC205D-1	NO	No
									867	M1K4-11/E15	VAC205D-2	NO	No
									868	M1K4-11/E15	VAC205E-1	NO	No
									869	M1K4-11/E15	VAC205E-2	NO	No
									870	M1K4-11/E15	VAC205F-1	NO	No
									871	M1K4-11/E15	VAC205F-2	NO	No
									872	M1K4-11/E15	VAC206A-1	NO	No
									873	M1K4-11/E15	VAC206A-2	NO	No
									874	M1K4-11/E15	VAC206B-1	NO	No
									875	M1K4-11/E15	VAC206B-2	NO	No



Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
157 14A-K8B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	876	M1K4-11/E15	B106	NO	No
									877	M1K4-11/E15	B206	NO	No
									878	M1G12-12/E11	MO1301-49	NO	No
									879	M1G12-12/E11	MO1301-60	NO	No
									880	M1K4-11/E15	MO1301-61	NO	No
									881	M1K4-11/E15	SV4569A	NO	No
									882	M1K4-11/E15	SV4569B	NO	No
									883	M1K4-11/E15	SV4570A	NO	No
									884	M1K4-11/E15	SV4570B	NO	No
									885	M1K4-11/E15	SV4587A	NO	No
									886	M1K4-11/E15	SV4587B	NO	No
									887	M1K4-11/E15	SV4589A	NO	No
									888	M1K4-11/E15	SV4589B	NO	No
									889	M1K4-11/E15	VAC205A-1	NO	No
									890	M1K4-11/E15	VAC205A-2	NO	No
									891	M1K4-11/E15	VAC205B-1	NO	No
									892	M1K4-11/E15	VAC205B-2	NO	No
									893	M1K4-11/E15	VAC205C-1	NO	No
									894	M1K4-11/E15	VAC205C-2	NO	No
									895	M1K4-11/E15	VAC205D-1	NO	No
									896	M1K4-11/E15	VAC205D-2	NO	No
									897	M1K4-11/E15	VAC205E-1	NO	No
									898	M1K4-11/E15	VAC205E-2	NO	No
									899	M1K4-11/E15	VAC205F-1	NO	No
900	M1K4-11/E15	VAC205F-2	NO	No									
901	M1K4-11/E15	VAC206A-1	NO	No									
902	M1K4-11/E15	VAC206A-2	NO	No									
903	M1K4-11/E15	VAC206B-1	NO	No									
904	M1K4-11/E15	VAC206B-2	NO	No									
158 14A-K9A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	905	M1K16/E6	MO1400-25A	NO	No
									906	M1K16/E6	MO1400-25B	NO	No
159 14A-K9B	C933	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	907	M1K16/E6	MO1400-25A	NO	No

**Pilgrim Nuclear Power Station Essential Relay Contacts**

Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Contact States			
									Schematic Number	Equip ID	Contract State (Yes/No)	Energized (Yes/No)
160 150/151A	A508		ES	SQ1	TB	37' 0"	Westinghouse	CO-11	908 M1K16/E6	MO1400-25B	NO	No
161 150/151A	A608		ES	SQ1	TB	23' 0"	Westinghouse	CO-11	909 E36/E1	A508	NO	No
162 150/151C	A508		ES	SQ1	TB	37' 0"	Westinghouse	CO-11	910 E36/E1	A608	NO	No
163 150/151C	A608		ES	SQ1	TB	23' 0"	Westinghouse	CO-11	911 E36/E1	A508	NO	No
164 150N	A508		ES	SQ1	TB	37' 0"	General Electric	12PJC11AV1A	912 E36/E1	A608	NO	No
165 150N	A608		ES	SQ1	TB	23' 0"	General Electric	12PJC11AV1A	913 E36/E1	A508	NO	No
166 151-4A	C5		ES	OL2	RW	37' 0"	Westinghouse	CO-8	914 E36/E1	A608	NO	No
167 151-4B	C5		ES	OL2	RW	37' 0"	Westinghouse	CO-8	915 E19/6	A504	NO	No
168 151-4C	C5		ES	OL2	RW	37' 0"	Westinghouse	CO-8	916 E19/6	A604	NO	No
169 151-501A	A501		ES	OL2	TB	37' 0"	General Electric	12IAC77A12A	917 E19/6	A504	NO	No
170 151-501B	A501		ES	OL2	TB	37' 0"	General Electric	12IAC77A12A	918 E19/6	A604	NO	No
171 151-501C	A501		ES	OL2	TB	37' 0"	General Electric	12IAC77A12A	919 E19/6	A504	NO	No
172 151-504A	A504		ES	SO3	TB	37' 0"	General Electric	12IAC51A2A	920 E19/6	A604	NO	No
									921 E34/E1	A504	NO	No
									922 E34/E1	A509	NO	No
									923 E34/E1	A504	NO	No
									924 E34/E1	A509	NO	No
									925 E34/E1	A504	NO	No
									926 E34/E1	A509	NO	No

See previous page for relay number

Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States					
								Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number					
									927	E34/E1	A504	NO	No
									928	E34/E1	A509	NO	No
									929	E34/E1	A504	NO	No
									930	E34/E1	A509	NO	No
173	151-504B	A504		ES	SQ3	TB	37' 0"	General Electric	12IAC51A2A				
									931	E34/E1	A504	NO	No
									932	E34/E1	A509	NO	No
174	151-504C	A504		ES	SQ3	TB	37' 0"	General Electric	12IAC51A2A				
									933	E34/E1	A504	NO	No
									934	E34/E1	A509	NO	No
175	151-505A	A505		ES	SQ3	TB	37' 0"	General Electric	12IAC51A2A				
									935	E34/E1	A504	NO	No
									936	E34/E1	A509	NO	No
176	151-505B	A505		ES	SQ3	TB	37' 0"	General Electric	12IAC51A2A				
									937	E34/E1	A504	NO	No
									938	E34/E1	A509	NO	No
177	151-505C	A505		ES	SQ3	TB	37' 0"	General Electric	12IAC51A2A				
									939	E34/E1	A604	NO	No
									940	E34/E1	A609	NO	No
178	151-601A	A601		ES	OL2	TB	23' 0"	General Electric	12IAC77A12A				
									941	E34/E1	A604	NO	No
									942	E34/E1	A609	NO	No
179	151-601B	A601		ES	OL2	TB	23' 0"	General Electric	12IAC77A12A				
									943	E34/E1	A604	NO	No
									944	E34/E1	A609	NO	No
180	151-601C	A601		ES	OL2	TB	23' 0"	General Electric	12IAC77A12A				
									945	E34/E1	A604	NO	No
									946	E34/E1	A609	NO	No
181	151-604A	A604		ES	SQ3	TB	23' 0"	General Electric	12IAC51A2A				
									947	E34/E1	A604	NO	No
									948	E34/E1	A609	NO	No
182	151-604B	A604		ES	SQ3	TB	23' 0"	General Electric	12IAC51A2A				
									949	E34/E1	A604	NO	No
									950	E34/E1	A609	NO	No
183	151-604C	A604		ES	SQ3	TB	23' 0"	General Electric	12IAC51A2A				

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
										Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number						
									949	E34/E1	A604	NO	No	
									950	E34/E1	A609	NO	No	
See previous page for relay number														
See previous page for relay number														
184	151-605A	A605		ES	SQ3	TB	23' 0"	General Electric	12IAC51A2A	951	E34/E1	A604	NO	No
										952	E34/E1	A609	NO	No
185	151-605B	A605		ES	SQ3	TB	23' 0"	General Electric	12IAC51A2A	953	E34/E1	A604	NO	No
										954	E34/E1	A609	NO	No
186	151-605C	A605		ES	SQ3	TB	23' 0"	General Electric	12IAC51A2A	955	E34/E1	A604	NO	No
										956	E34/E1	A609	NO	No
187	151N-501	A501		ES	SQ1	TB	37' 0"	General Electric	12IAC53A3A	957	E34/E1	A504	NO	No
										958	E34/E1	A509	NO	No
188	151N-504	A504		ES	SQ1	TB	37' 0"	General Electric	12IAC53A3A	959	E34/E1	A504	NO	No
										960	E34/E1	A509	NO	No
189	151N-505	A505		ES	SQ1	TB	37' 0"	General Electric	12IAC53A3A	961	E34/E1	A504	NO	No
										962	E34/E1	A509	NO	No
190	151N-601	A601		ES	SQ1	TB	23' 0"	General Electric	12IAC53A3A	963	E34/E1	A604	NO	No
										964	E34/E1	A609	NO	No
191	151N-604	A604		ES	SQ1	TB	23' 0"	General Electric	12IAC53A3A	965	E34/E1	A604	NO	No
										966	E34/E1	A609	NO	No
192	151N-605	A605		ES	SQ1	TB	23' 0"	General Electric	12IAC53A3A	967	E34/E1	A604	NO	No
										968	E34/E1	A609	NO	No
193	151V/509A	A509		ES	SQ3	TB	37' 0"	General Electric	12IJC52A9A	969	E5-128-5BC/E2	A509	NO	Yes
										970	E5-128-5BC/E2	X107A-ER	NO	Yes
194	151V/509B	A509		ES	SQ3	TB	37' 0"	General Electric	12IJC52A9A					

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									971	E5-128-5BC/E2	A509	NO	Yes
									972	E5-128-5BC/E2	X107A-ER	NO	Yes
195	151V/509C			ES	SQ3	TB	37' 0"	General Electric	12JCV52A9A				
									973	E5-128-5BC/E2	A509	NO	Yes
									974	E5-128-5BC/E2	X107A-ER	NO	Yes
196	151V/609A			ES	SQ3	TB	23' 0"	General Electric	12JCV52A9A				
									975	E33/E2	A609	NO	Yes
									976	E33/E2	X107B-ER	NO	Yes
197	151V/609B			ES	SQ3	TB	23' 0"	General Electric	12JCV52A9A				
									977	E33/E2	A609	NO	Yes
									978	E33/E2	X107B-ER	NO	Yes
198	151V/609C			ES	SQ3	TB	23' 0"	General Electric	12JCV52A9A				
									979	E33/E2	A609	NO	Yes
									980	E33/E2	X107B-ER	NO	Yes
199	152Y		21	ES	OL2	TB	37' 0"	General Electric	AM-4 16-250-8H				
									981	E28 SH 1/E8	A501		
200	152Y		21	ES	OL2	TB	37' 0"	General Electric	AM-4 16-250-8H				
									982	E28 SH 1/E8	A502		
201	152Y		21	ES	OL2	TB	37' 0"	General Electric	AM-4 16-250-8H				
									983	E28 SH 1/E8	A504		
202	152Y		21	ES	OL2	TB	37' 0"	General Electric	AM-4 16-250-8H				
									984	E28 SH 1/E8	A505		
203	152Y		21	ES	OL2	TB	37' 0"	General Electric	AM-4 16-250-8H				
									985	E5-127-6BC/1	A509		
204	152Y		21	ES	OL2	TB	23' 0"	General Electric	AM-4 16-250-8H				
									986	E28 SH 1/E8	A601		
205	152Y		21	ES	OL2	TB	23' 0"	General Electric	AM-4 16-250-8H				
									987	E28 SH 1/E8	A602		
206	152Y		21	ES	OL2	TB	23' 0"	General Electric	AM-4 16-250-8H				
									988	E28 SH 1/E8	A604		
207	152Y		21	ES	OL2	TB	23' 0"	General Electric	AM-4 16-250-8H				
									989	E28 SH 1/E8	A605		

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
208	152Y	A609	21	ES	OL2	TB	23' 0"	General Electric	AM-4 16-250-8H	990	E28 SH 1/E8	A609		
209	159-509/1	C101		ES	OL2	DG A	23' 0"	General Electric	SV	991	E40/E7	A509	NO	No
210	159-509/2	C101		ES	OL2	DG A	23' 0"	General Electric	SV	992	E40/E7	A509	NO	No
211	159-609/1	C102		ES	OL2	DG B	23' 0"	General Electric	SV	993	E40/E7	A609	NO	No
212	159-609/2	C102		ES	OL2	DG B	23' 0"	General Electric	SV	994	E40/E7	A609	NO	No
213	162-501	A501		ES	SQ1	TB	37' 0"	Agastat	2412PCL	995	E39/E2	A501	NO	No
214	162-509	A509		ES	SQ3	TB	37' 0"	Agastat	DSCXX012XSPAXAA	996	E40/E7	A509	NO	No
215	162-601	A601		ES	SQ3	TB	23' 0"	Agastat	DSCXX012XSPAXAA	997	E39/E2	A601	NO	No
216	162-609	A609		ES	SQ3	TB	23' 0"	Agastat	DSCXX012XSPAXAA	998	E40/E7	A609	NO	No
217	16A-K10	C942	4	ES	SQ1	RW	37' 0"	General Electric	CR120A	999	M1N37-6/E11	SV203-2A-AC	NO	No
										1000	M1N37-6/E11	SV203-2A-DC	NO	No
										1001	M1N37-6/E11	SV203-2B-AC	NO	No
										1002	M1N37-6/E11	SV203-2B-DC	NO	No
										1003	M1N37-6/E11	SV203-2C-AC	NO	No
										1004	M1N37-6/E11	SV203-2C-DC	NO	No
										1005	M1N37-6/E11	SV203-2D-AC	NO	No
										1006	M1N37-6/E11	SV203-2D-DC	NO	No
218	16A-K13	C941		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2H	1007	M1N36-7/E11	SV203-1A-DC	NO	Yes
										1008	M1N36-7/E11	SV203-1B-DC	NO	Yes
										1009	M1N36-7/E11	SV203-1C-DC	NO	Yes
										1010	M1N36-7/E11	SV203-1D-DC	NO	Yes
219	16A-K14	C941		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2H					

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
									1011	M1N36-7/E11	SV203-1A-AC	NO	Yes	
									1012	M1N36-7/E11	SV203-1B-AC	NO	Yes	
									1013	M1N36-7/E11	SV203-1C-AC	NO	Yes	
									1014	M1N36-7/E11	SV203-1D-AC	NO	Yes	
220	16A-K15	C942		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2H	1015	M1N37-6/E11	SV203-2A-DC	NO	Yes
									1016	M1N37-6/E11	SV203-2B-DC	NO	Yes	
									1017	M1N37-6/E11	SV203-2C-DC	NO	Yes	
									1018	M1N37-6/E11	SV203-2D-DC	NO	Yes	
221	16A-K16	C942		ES	SQ1	RW	37' 0"	General Electric	12HFA151A9H	1019	M1N37-6/E11	SV203-2A-AC	NO	Yes
									1020	M1N37-6/E11	SV203-2B-AC	NO	Yes	
									1021	M1N37-6/E11	SV203-2C-AC	NO	Yes	
									1022	M1N37-6/E11	SV203-2D-AC	NO	Yes	
222	16A-K51	C941		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2H	1023	M1N36-7/E11	SV203-1A-DC	NO	Yes
									1024	M1N36-7/E11	SV203-1B-DC	NO	Yes	
									1025	M1N36-7/E11	SV203-1C-DC	NO	Yes	
									1026	M1N36-7/E11	SV203-1D-DC	NO	Yes	
223	16A-K52	C942		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2H	1027	M1N37-6/E11	SV203-2A-DC	NO	Yes
									1028	M1N37-6/E11	SV203-2B-DC	NO	Yes	
									1029	M1N37-6/E11	SV203-2C-DC	NO	Yes	
									1030	M1N37-6/E11	SV203-2D-DC	NO	Yes	
224	16A-K9	C941	4	ES	SQ1	RW	37' 0"	General Electric	CR120A	1031	M1N36-7/E11	SV203-1A-AC	NO	No
									1032	M1N36-7/E11	SV203-1A-DC	NO	No	
									1033	M1N36-7/E11	SV203-1B-AC	NO	No	
									1034	M1N36-7/E11	SV203-1B-DC	NO	No	
									1035	M1N36-7/E11	SV203-1C-AC	NO	No	
									1036	M1N36-7/E11	SV203-1C-DC	NO	No	
									1037	M1N36-7/E11	SV203-1D-AC	NO	No	
									1038	M1N36-7/E11	SV203-1D-DC	NO	No	
225	16A-4	C5		ES	SQ1	RW	37' 0"	General Electric	HEA-61					

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1039 E38/E6	A504	NO/NC	No	
									1040 E38/E6	A604	NO/NC	No	
226	186-509		ES	SQ1	TB	37' 0"	General Electric	12HEA61A223	1041 E40/E7	A509	NO/NC	No	
									1042 M6-46-6 SH.1/E4	X107A-ER	NO/NC	No	
227	186-609		ES	SQ1	TB	23' 0"	General Electric	12HEA61A223	1043 E40/E7	A609	NO/NC	No	
									1044 M6-46-6 SH 2/E4	X107B-ER	NO/NC	No	
228	186-A5		ES	SQ1	TB	37' 0"	General Electric	12HEA61B235	1045 E38/E6	A504	NO/NC	No	
									1046 E40/E7	A509	NC	No	
229	186-A6		ES	SQ1	TB	23' 0"	General Electric	12HEA61B236	1047 E38/E6	A604	NO/NC	No	
									1048 E40/E7	A609	NC	No	
230	187-4A		ES	OL2	RW	37' 0"	Westinghouse	HU-1	1049 E19/6	A504	NO	No	
									1050 E19/6	A604	NO	No	
231	187-4B		ES	OL2	RW	37' 0"	Westinghouse	HU-1	1051 E19/6	A504	NO	No	
									1052 E19/6	A604	NO	No	
232	187-4C		ES	OL2	RW	37' 0"	Westinghouse	HU-1	1053 E19/6	A504	NO	No	
									1054 E19/6	A604	NO	No	
233	187-509		ES	OL2	TB	37' 0"	Westinghouse	SA-1	1055 E5-128-5BC/E2	A509	NO	Yes	
									1056 E5-128-5BC/E2	X107A-ER	NO	Yes	
234	187-609		ES	OL2	TB	23' 0"	Westinghouse	SA-1	1057 E33/E2	A609	NO	Yes	
									1058 E33/E2	X107B-ER	NO	Yes	
235	187N-4		ES	OL2	RW	37' 0"	Westinghouse	CWC	1059 E19/6	A504	NO	No	
									1060 E19/6	A604	NO	No	
236	1V		ES	OL2	TB	37' 0"	Automatic Switch Co	214A120					



Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1061 E534/E1	D32	NO	Yes
									1062 E534/E1	D33	NO	Yes
237 1V	Y10		ES	OL2	RW	23' 0"	Automatic Switch Co	214B120	1063 E45A-6-5/E1	Y10	NC	Yes
238 1V	Y11		ES	OL2	TB	23' 0"	Automatic Switch Co	214B69	1064 E16B-1-3	Y11	NC	Yes
239 1V	Y12		ES	OL2	RW	23' 0"	Automatic Switch Co	214A69	1065 E16B-2-3	Y12	NC	Yes
240 23A-K1	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1066 M1J19-9/E11	MO2301-8	NO	No
241 23A-K14	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1067 M1J18-11/E14	SV2300-9	NO	No
242 23A-K17	C939		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	1068 M1J16-10/E22	SV2300-9	NO	No
243 23A-K2	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1069 M1J32/E4	MO2301-14	NO	No
244 23A-K20	C939		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F	1070 M1J16-10/E22	SV2300-9	NO	No
245 23A-K21	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1071 M1J19-9/E11	MO2301-6	NO	No
246 23A-K22	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1072 M1J19-9/E11	MO2301-6	NO	No
247 23A-K27	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1073 M1J16-10/E22	CV9068B	NO	No
									1074 M1J20-5/E10	MO2301-35	NO	No
									1075 M1J20-5/E10	MO2301-36	NO	No
									1076 M1J19-9/E11	MO2301-4	NO	No
									1077 M1J19-9/E11	MO2301-5	NO	No
									1078 M1J16-10/E22	SV2300-9	NO	No
248 23A-K28	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1079 M1J16-10/E22	SV2300-9	NO	No
249 23A-K3	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
									1080	M1J19-9/E11	MO2301-8	NO	No	
250	23A-K34	C941		ES	SQ1	RW	23' 0"	General Electric	CR120A	1081	M1J15-10/E16	CV9068A	NO	No
									1082	M1J16-10/E22	CV9068B	NO	No	
									1083	M1J16-10/E22	MO2301-35	NO	No	
									1084	M1J16-10/E22	MO2301-36	NO	No	
									1085	M1J16-10/E22	MO2301-4	NO	No	
									1086	M1J16-10/E22	MO2301-5	NO	No	
									1087	M1J16-10/E22	SV2300-9	NO	No	
251	23A-K35	C941		ES	SQ1	RW	23' 0"	General Electric	CR120A	1088	M1J15-10/E16	CV9068A	NO	No
									1089	M1J16-10/E22	CV9068B	NO	No	
									1090	M1J16-10/E22	MO2301-35	NO	No	
									1091	M1J16-10/E22	MO2301-36	NO	No	
									1092	M1J16-10/E22	MO2301-4	NO	No	
									1093	M1J16-10/E22	MO2301-5	NO	No	
									1094	M1J16-10/E22	SV2300-9	NO	No	
252	23A-K36	C941		ES	SQ1	RW	23' 0"	Agastal	7014PB	1095	M1J15-10/E16	CV9068A	NO	No
									1096	M1J16-10/E22	CV9068B	NO	No	
									1097	M1J16-10/E22	MO2301-35	NO	No	
									1098	M1J16-10/E22	MO2301-36	NO	No	
									1099	M1J16-10/E22	MO2301-4	NO	No	
									1100	M1J16-10/E22	MO2301-5	NO	No	
									1101	M1J16-10/E22	SV2300-9	NO	No	
253	23A-K37	C941		ES	SQ1	RW	23' 0"	General Electric	CR120A	1102	M1J15-10/E16	CV9068A	NO	No
									1103	M1J19-9/E11	MO2301-4	NO	No	
									1104	M1J19-9/E11	MO2301-5	NO	No	
254	23A-K38	C941		ES	SQ1	RW	37' 0"	General Electric	CR120A	1105	M1J16-10/E22	SV2300-9	NO	No
255	23A-K4	C939		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1106	M1J32/E4	MO2301-14	NO	No
256	23A-K42	C939		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F					

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1107 M1J21-7/E11	SV2301-64	NC	Yes
257	23A-K5		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F	1108 M1J16-10/E22	SV2300-9	NO	No
258	23A-K50A	C2233A	ES	SQ3	RW	23' 0"	Agastat	EGPB002	1109 M1J16-10/E22	SV2300-9	NO	No
259	23A-K51A	C2233A	ES	SQ3	RW	23' 0"	Agastat	EGPB002	1110 M1J15-10/E16	CV9068A	NO	No
									1111 M1J15-10/E16	CV9068B	NO	No
									1112 M1J15-10/E16	MO2301-35	NO	No
									1113 M1J15-10/E16	MO2301-36	NO	No
									1114 M1J15-10/E16	MO2301-4	NO	No
									1115 M1J15-10/E16	MO2301-5	NO	No
									1116 M1J15-10/E16	SV2300-9	NO	No
260	23A-K51B	C2233B	ES	SQ3	RW	23' 0"	Agastat	EGPB002	1117 M1J16-10/E22	CV9068A	NO	No
									1118 M1J16-10/E22	CV9068B	NO	No
									1119 M1J16-10/E22	MO2301-35	NO	No
									1120 M1J16-10/E22	MO2301-36	NO	No
									1121 M1J16-10/E22	MO2301-4	NO	No
									1122 M1J16-10/E22	MO2301-5	NO	No
									1123 M1J16-10/E22	SV2300-9	NO	No
261	23A-K52A	C941	ES	SQ3	RW	23' 0"	Agastat	EGPD002	1124 M1J15-10/E16	CV9068A	NO	No
									1125 M1J16-10/E22	CV9068B	NO	No
									1126 M1J16-10/E22	MO2301-35	NO	No
									1127 M1J16-10/E22	MO2301-36	NO	No
									1128 M1J16-10/E22	MO2301-4	NO	No
									1129 M1J16-10/E22	MO2301-5	NO	No
									1130 M1J16-10/E22	SV2300-9	NO	No
262	23A-K52B	C939	ES	SQ3	RW	23' 0"	Agastat	EGPD002	1131 M1J15-10/E16	CV9068A	NO	No
									1132 M1J16-10/E22	CV9068B	NO	No
									1133 M1J16-10/E22	MO2301-35	NO	No
									1134 M1J16-10/E22	MO2301-36	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1135	M1J16-10/E22	MO2301-4	NO	No
									1136	M1J16-10/E22	MO2301-5	NO	No
									1137	M1J16-10/E22	SV2300-9	NO	No
263	23A-K53A	C941	4	ES	SQ3	RW	37' 0"	Agastat	EGPD002				
									1138	M1J15-10/E16	MO2301-33	NO	No
									1139	M1J15-10/E16	MO2301-34	NO	No
264	23A-K53B	C939	4	ES	SQ3	RW	23' 0"	Agastat	EGPD002				
									1140	M1J16-10/E22	MO2301-33	NO	No
									1141	M1J16-10/E22	MO2301-34	NO	No
265	23A-K54A	C941		ES	SQ3	RW	37' 0"	Agastat	EGPD002				
									1142	M1J-33/E1	MO2301-33	NO	No
									1143	M1J-33/E1	MO2301-34	NO	No
266	23A-K54B	C939		ES	SQ3	RW	23' 0"	Agastat	EGPD002				
									1144	M1J-33/E1	MO2301-33	NO	No
									1145	M1J-33/E1	MO2301-34	NO	No
267	23A-K6	C939		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									1146	M1J15-10/E16	CV9068A	NO	No
									1147	M1J16-10/E22	CV9068B	NO	No
									1148	M1J16-10/E22	MO2301-35	NO	No
									1149	M1J16-10/E22	MO2301-36	NO	No
									1150	M1J16-10/E22	MO2301-4	NO	No
									1151	M1J16-10/E22	MO2301-5	NO	No
									1152	M1J16-10/E22	SV2300-9	NO	No
268	23A-K8	C939		ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									1153	M1J15-10/E16	CV9068A	NO	No
									1154	M1J16-10/E22	CV9068B	NO	No
									1155	M1J16-10/E22	MO2301-35	NO	No
									1156	M1J16-10/E22	MO2301-36	NO	No
									1157	M1J16-10/E22	MO2301-4	NO	No
									1158	M1J16-10/E22	MO2301-5	NO	No
									1159	M1J16-10/E22	SV2300-9	NO	No
269	23A-K9	C939		ES	SQ1	RW	23' 0"	Agastat	7014PB				
									1160	M1J15-10/E16	CV9068A	NO	No
									1161	M1J16-10/E22	CV9068B	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1162 M1J16-10/E22	MO2301-35	NO	No
									1163 M1J16-10/E22	MO2301-36	NO	No
									1164 M1J16-10/E22	MO2301-4	NO	No
									1165 M1J16-10/E22	MO2301-5	NO	No
									1166 M1J16-10/E22	SV2300-9	NO	No
270	27-B1X			ES	OL3	RW	23' 0"	General Electric	12HFA51A42H			
									1167 E46/E4	B601	NO/NC	No
									1168 E46/E4	B602	NO	No
271	27-B1Y			ES	SQ1	TB	37' 0"	General Electric	12HFA51A42H			
									1169 E172/E3	MO3808	NO	No
272	27-B1Z			ES	OL3	TB	37' 0"	General Electric	12HFA51A42H			
									1170 E45/E4	B102	NO/NC	No
									1171 E47/E4	B202	NO	No
									1172 E45/11	MO3808	NO	No
273	27-B2X1			ES	SQ1	RW	23' 0"	General Electric	12HFA51A42H			
									1173 E46/E4	B601	NO	No
									1174 E46/E4	B602	NO	No
274	27-B2X2			ES	OL3	RW	23' 0"	General Electric	12HFA51A42H			
									1175 E46/E4	B601	NO	No
									1176 E46/E4	B602	NO/NC	No
275	27-B2Y			ES	SQ1	TB	23' 0"	General Electric	12HFA51A42H			
									1177 E172/E3	MO3813	NO	No
276	27-B2Z1			ES	SQ1	TB	23' 0"	Agastat	2412PB			
									1178 E46/E4	B102	NO	No
									1179 E46/E4	B202	NO	No
									1180 E46/E4	MO3813	NO	No
277	27-B2Z2			ES	OL2	TB	23' 0"	General Electric	12HFA65062H			
									1181 E46/E4	B102	NO	No
									1182 E46/E4	B202	NO/NC	No
									1183 E45/11	MO3813	NO	No
278	2AX			ES	SQ1	RW	23' 0"	Agastat	2412PE			
									1184 E45A-6-5/E1	Y10	NC	No
279	2E-K12A		4	ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F			

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Sldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1185	M1R4-10/E19	SV203-3A	NO	No
									1186	M1R4-10/E19	SV203-3B	NO	No
									1187	M1R4-10/E19	SV203-3C	NO	No
									1188	M1R4-10/E19	SV203-3D	NO	No
200	2E-K12B	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HGA11A52F				
									1189	M1R4-10/E19	SV203-3A	NO	No
									1190	M1R4-10/E19	SV203-3B	NO	No
									1191	M1R4-10/E19	SV203-3C	NO	No
									1192	M1R4-10/E19	SV203-3D	NO	No
281	2E-K13A	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									1193	M1R4-10/E19	SV203-3A	NC	Yes
282	2E-K13B	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									1194	M1R4-10/E19	SV203-3B	NC	Yes
283	2E-K13C	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									1195	M1R4-10/E19	SV203-3C	NC	Yes
284	2E-K13D	C932		ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									1196	M1R4-10/E19	SV203-3D	NC	Yes
285	2E-K7A	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									1197	M1R8-2/E8	SV203-3A	NO	No
									1198	M1R8-2/E8	SV203-3B	NO	No
									1199	M1R8-2/E8	SV203-3C	NO	No
									1200	M1R8-2/E8	SV203-3D	NO	No
286	2E-K7B	C932	4	ES	SQ1	RW	23' 0"	General Electric	12HFA151A2F				
									1201	M1R8-2/E8	SV203-3A	NO	No
									1202	M1R8-2/E8	SV203-3B	NO	No
									1203	M1R8-2/E8	SV203-3C	NO	No
									1204	M1R8-2/E8	SV203-3D	NO	No
287	3A	Y11		ES	OL1	TB	23' 0"	Cramer Timer	ToBeDetermined				
									1205	E16B-1-3	Y11	NC	No
288	3A-K32-XX-XX	C928	11	ES	OL2	RW	37' 0"	General Electric	CR120K				
									1206	M1V19-4/2	FCV302-120	NO	No
									1207	M1V19-4/2	FCV302-123	NO	No
									1208	M1V19-4/2	SV305-121	NO	No

**Pilgrim Nuclear Power Station Essential Relay Contacts**

Relay ID	Panel					Notes			Elevation	Manufacturer	Model Number	Contact States			
	SAT	SQ Basis	Bldg	Bldg	RW	ES	SQ3	RW				23'0"	Westinghouse	A200M4CX	Schematic Number
289 42-1061	B1061	ES	SQ3	RW	23'0"	Westinghouse	A200M4CX					1208 M1V19-4/2	SV305-122	NO	No
290 42-1423/C	B1423	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M1CAC					1210 E170/E8	P208C		
291 42-1431	B1431	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1211 M1J-33/E1	MO2301-34		
292 42-1431X	B1431	ES	SQ1	AXBAY	3'0"	General Electric	CR120B					1212 E176 SH 2/E7	P202D	NO	No
293 42-1433	B1433	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1213 E176 SH 2/E7	P2020	NO	No
294 42-1433X	B1433	ES	SQ1	AXBAY	3'0"	General Electric	CR120A					1214 E176 SH 2/E7	P202E	NO	No
295 42-1435	B1435	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1215 E176 SH 2/E7	P202E	NO	No
296 42-1441	B1441	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1216 E176 SH 1/E7	F202F	NO	No
297 42-1444	B1444	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1217 E170/E8	P208D		
298 42-1464/C	B1464	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M1CAC					1218 E170/E8	P208E		
299 42-1466/O	B1466	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M1CAC					1219 E171/2	MO3806		
300 42-1523/C	B1523	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M1CAC					1220 E171/E2	MO3805		
301 42-1531	B1531	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1221 M1J-33/E1	MO2301-33		
302 42-1533	B1533	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1222 E176 SH 1/E7	P202A	NO	No
303 42-1535	B1535	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1223 E176 SH 1/E7	P202B	NO	No
304 42-1541	B1541	ES	SQ3	AXBAY	3'0"	Westinghouse	A200M4CAC					1224 E176 SH 1/E7	P202C	NO	No

See previous page for relay number

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
									Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number				
									1225	E170/E8	P208A	
305	42-1544			ES	SQ3	AXBAY	3' 0"	Westinghouse	A200M4CAC	1226	E170/E8	P208B
306	42-1564/C			ES	SQ3	AXBAY	3' 0"	Westinghouse	A200M1CAC	1227	E171/E2	MO3800
307	42-1566/O			ES	SQ3	AXBAY	3' 0"	Westinghouse	A201K1CA	1228	E171/E2	MO3801
308	42-1714			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1229	E210 SH 21/E2	VSF208A
309	42-1715			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1230	E210 SH 21/E2	VEX214A
310	42-1741/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1231	M1K3-15/E18	MO1400-3A
311	42-1743/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1232	M1K3-15/E18	MO1400-4A
312	42-1744/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1233	M1K3-15/E18	MO1400-24A
313	42-1746/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1234	M1K3-15/E18	MO1400-25A
314	42-1751/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CACM	1235	M1H5-1-15/E16	MO1001-7A
315	42-1753/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CACM	1236	M1H5-1-15/E16	MO1001-7C
316	42-1754/C		8	ES	SQ3	RB	23' 0"	Westinghouse	A200M1CACM	1237	M1H5-1-15/E16	MO1001-18A
317	42-1756/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1238	M1H5-1-15/E16	MO1001-23A
318	42-1763/C		8	ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1239	M1H5-1-15/E16	MO1001-16A
319	42-1764/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CACM	1240	M1J19-9/E11	MO2301-4
320	42-1766/O		8	ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA			



Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States		
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact Stat: (NO/NC)	Energized (Yes/No)
									1241	M1H5-1-15/E16		MO1001-34A
321	42-1771/O	B1771	8	ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1242	M1H5-1-15/E16	MO1001-36A
322	42-1773/O	B1773		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1243	M1H5-1-15/E16	MO1001-37A
323	42-1774/O	B1774		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1244	M1H5-1-15/E16	MO1001-43A
324	42-1776/O	B1776		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1245	M1H5-1-15/E16	MO1001-43C
325	42-1783/O	B1783	8	ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1246	E178/E8	MO4060A
326	42-1784/O	B1784	8	ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1247	E178/E8	MO4060B
327	42-1786/C	B1786		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1248	E178/E8	MO4065
328	42-1791/C	B1791		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1249	E177/E4	MO4085A
329	42-1793/C	B1793		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1250	E177/E4	MO4085B
330	42-1796/C	B1796	8	ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1251	E177/E4	MO4084
331	42-18116	B18116		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1252	E210 SH 21/E2	VEX214B
332	42-1814	B1814		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1253	E210 SH 21/E2	VSF208B
333	42-1841/C	B1841		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CY	1254	M1K3-15/E18	MO1400-3B
334	42-1843/O	B1843		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CX	1255	M1K3-15/E18	MO1400-4B
335	42-1844/C	B1844		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CX	1256	M1K3-15/E18	MO1400-24B
336	42-1846/O	B1846		ES	SQ3	RB	23' 0"	Westinghouse	A201M1CA			

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1257 M1K3-15/E18	MO1400-25B		
337	42-1851/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAM	1258 M1H5-1-15/E16	MO1001-78	
338	42-1853/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAM	1259 M1H5-1-15/E16	MO1001-7D	
339	42-1854/C	B		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CACM	1260 M1H5-1-15/E16	MO1001-18B	
340	42-1856/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CX	1261 M1H5-1-15/E16	MO1001-23B	
341	42-1863/C	B		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CX	1262 M1H5-1-15/E16	MO1001-16B	
342	42-1864/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1263 M1G15-9/E9	MO1301-16	
343	42-1866/O	B		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1264 M1H5-1-15/E16	MO1001-34B	
344	42-1871/O	B		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1265 M1H5-1-15/E16	MO1001-36B	
345	42-1873/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1266 M1H5-1-15/E16	MO1001-37B	
346	42-1874/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1267 M1H5-1-15/E16	MO1001-43B	
347	42-1876/O			ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1268 M1H5-1-15/E16	MO1001-43D	
348	42-1883/O	B		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CX	1269 E178/E8	MO4010A	
349	42-1884/O	B		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1270 E178/E8	MO4010B	
350	42-1891/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CXM	1271 E177/E5	MO4009A	
351	42-1893/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CX	1272 E177/E5	MO4009B	
352	42-1894/C			ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC			

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
										Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number					
									1273 E178/E9	MO4002	NO	No	
353	42-1896/C	B1896	8	ES	SQ3	RB	23' 0"	Westinghouse	A200M1CX	1274 E177/E4	MO4083		
354	42-2024/O	B2024		ES	SQ3	RB	23' 0"	Westinghouse	A200M2CAC	1275 M1H5-1-15/E16	MO1001-29A		
355	42-2026/O	B2026		ES	SQ3	RB	23' 0"	Westinghouse	A200M2CAC	1276 M1H5-1-15/E16	MO1001-29B		
356	42-2031/C	B2031	8	ES	SQ3	RB	23' 0"	Westinghouse	A201K3CA	1277 M1H41/E6	MO1001-28A		
357	42-2031XR	B2031	4	ES	SQ1	RB	23' 0"	General Electric	CR120B022-22	1278 E5010/E10	MO1001-28A	NO No	
358	42-2034/C	B2034	8	ES	SQ3	RB	23' 0"	Westinghouse	A201K3CA	1279 M1H41/E6	MO1001-28B		
359	42-2034XR	B2034	4	ES	SQ1	RB	23' 0"	General Electric	CR120B022-22	1280 E5010/E10	MO1001-28B	NO No	
360	42-2043/O	B2043	8	ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1281 M1N28-12/E20	MO1001-32		
361	42-2046/O	B2046		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1282 M1N28-12/E20	MO1001-50		
362	42-2054/C	B2054		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1283 M1N28-12/E20	MO1201-2		
363	42-2054/O	B2054		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1284 M1N28-12/E20	MO1201-2		
364	42-2056/C	B2056		ES	SQ3	RB	23' 0"	Westinghouse	A200M1CAC	1285 M1N28-12/E20	MO1201-80		
365	42-2056/O	B2056		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1286 M1N28-12/E20	MO1201-80		
366	42-2074/O	B2074		ES	SQ3	RB	23' 0"	Westinghouse	A201K1CA	1287 M1N28-12/E20	MO220-1		
367	42-2083/C	B2083		ES	SQ3	RB	23' 0"	Westinghouse	A200M2CAC	1288 E410/E10	MO202-5A		
368	42-2096/C	B2096		ES	SQ3	RB	23' 0"	Westinghouse	A200M2CAC				

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1289	E410/E10		MO202-5B
See previous page for relay number												
369	42-731/1F			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1290	M1N28-12/E20	MO1201-5
370	42-731/1R			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1291	M1N28-12/E20	MO1201-5
371	42-741/C			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1292	E172/E3	MO3808
372	42-744/C			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1293	M1G11-11/E13	MO1301-17
373	42-751/O		8	ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1294	M1G11-11/E13	MO1301-61
374	42-754/C			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1295	M1G11-11/E13	MO1301-22
375	42-761/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1296	M1G11-11/E13	MO1301-25
376	42-764/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1297	M1G11-11/E13	MO1301-26
377	42-771/C			ES	SQ1	RB	23' 0"	Cutler Hammer	6002H485A	1298	M1G11-11/E13	MO1301-48
378	42-774/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1299	M1G11-11/E13	MO1301-49
379	42-781/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1300	M1G11-11/E13	MO1301-53
380	42-784/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1301	M1G11-11/E13	MO1301-60
381	42-794/O		8	ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1302	M1G11-11/E13	MO1301-62
382	42-814/C			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1303	M1J14-14/E19	MO2301-6
383	42-821/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1304	M1J14-14/E19	MO2301-14
384	42-824/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-50			

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States		
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1305	M1J14-14/E19		MO2301-35
385	42-831/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-50	1306	M1J14-14/E19	MO2301-36
386	42-834/C			ES	SQ3	RB	23' 0"	Westinghouse	MME20-25	1307	E172/E3	MO3813
387	42-941/O			ES	SQ1	RB	23' 0"	Cutler Hammer	6002H485A	1308	M1J14-14/E19	MO2301-15
388	42-944/C	8		ES	SQ3	RB	23' 0"	Westinghouse	MME20-50	1309	M1J14-14/E19	MO2301-3
389	42-951/C			ES	SQ3	RB	23' 0"	Westinghouse	MME20-50	1310	M1J14-14/E19	MO2301-5
390	42-954/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-50	1311	M1J14-14/E19	MO2301-8
391	42-961/1F	4		ES	SQ3	RB	23' 0"	Westinghouse	MME-20-50	1312	M1N28-12/E20	MO1001-47
392	42-964/C			ES	SQ1	RB	23' 0"	Cutler Hammer	6002H485A	1313	M1J14-14/E19	MO2301-9
393	42-971/O			ES	SQ3	RB	23' 0"	Westinghouse	MME20-50	1314	M1J14-14/E19	MO2301-10
394	42X-741/C			ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1315	E172/E3	MO3808
395	42X-744/C			ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1316	M1G11-11/E13	MO1301-17
396	42X-751/O	8		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1317	M1G11-11/E13	MO1301-61
397	42X-754/C			ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1318	M1G11-11/E13	MO1301-22
398	42X-761/O			ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1319	M1G11-11/E13	MO1301-25
399	42X-764/O			ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1320	M1G11-11/E13	MO1301-26
400	42X-771/C			ES	OL2	RB	23' 0"	Cutler Hammer	P/N 9575H2018A Type 626			

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1321 M1G11-11/E13	MO1301-48		
401	42X-774/O	D774		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1322 M1G11-11/E13	MO1301-49	
402	42X-781/O	D781		ES	OL2	RB	23' 0"	Cutler Hammer	P/N 9575H2018A Type 626	1323 M1G11-11/E13	MO1301-53	
403	42X-784/O	D784		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1324 M1G11-11/E13	MO1301-60	
404	42X-794/O	D794	8	ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1325 M1G11-11/E13	MO1301-62	
405	42X-814/C	D814		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1326 M1J14-14/E19	MO2301-6	
406	42X-821/O	D821		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1327 M1J14-14/E19	MO2301-14	
407	42X-824/O	D824		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1328 M1J14-14/E19	MO2301-35	
408	42X-831/O	D831		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1329 M1J14-14/E19	MO2301-36	
409	42X-834/C	D834		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1330 E172/E3	MO3813	
410	42X-941/O	D941		ES	OL2	RB	23' 0"	Cutler Hammer	P/N 9575H2018A Type 626	1331 M1J14-14/E19	MO2301-15	
411	42X-944/C	D944	8	ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1332 M1J14-14/E19	MO2301-3	
412	42X-951/C	D951		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1333 M1J14-14/E19	MO2301-5	
413	42X-954/O	D954		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1334 M1J14-14/E19	MO2301-8	
414	42X-961/O	D961		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S	1335 M1N28-12/E20	MO1001-47	
415	42X-964/C	D964		ES	OL2	RB	23' 0"	Cutler Hammer	P/N 9575H2018A Type 626	1336 M1J14-14/E19	MO2301-9	
416	42X-971/O	D971		ES	SQ1	RB	23' 0"	Westinghouse	BFD33S			

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1337 M1J14-14/E19	MO2301-10			
See previous page for relay number													
417	52X	B102	23	ES	OL2	TB	37' 0"	General Electric	AK-2A-50-1	1338 E46/E4	B102		
418	52X	B202	23	ES	OL2	TB	23' 0"	General Electric	AK-2A-50-1	1339 E46/E4	B202		
419	52X	B310	23	ES	OL2	TB	37' 0"	General Electric	AK-2A-25-1	1340 E43/E2	B310		
420	52X	B410	23	ES	OL2	TB	23' 0"	General Electric	AK-2A-25-1	1341 E43/E2	B410		
421	52X	B601	23	ES	OL2	RW	23' 0"	General Electric	AK-2A-50-1	1342 E46/E4	B601		
422	52X	B602	23	ES	OL2	RW	23' 0"	General Electric	AK-2A-50-1	1343 E46/E4	B602		
423	52X	B605	23	ES	OL2	RW	23' 0"	General Electric	AK-2A-25-1	1344 E43/E2	B605		
424	52X	B606	23	ES	OL2	RW	23' 0"	General Electric	AK-2A-25-1	1345 E43/E2	B606		
425	5A-K14A	C915		ES	SQ3	RW	37' 0"	General Electric	CR105D1	1346 M1N21-9/E3	SOV305-117-1/4	NO	No
									1347 M1N19-7/E3	SOV305-117-2/3	NO	No	
									1348 M1N21-9/E3	SV302-20A	NO	No	
									1349 M1N19-7/E3	SV302-20C	NO	No	
									1350 M1N21-9/E3	SV302-21A	NO	No	
									1351 M1N19-7/E3	SV302-21C	NO	No	
426	5A-K14B	C917		ES	SQ3	RW	37' 0"	General Electric	CR105D1	1352 M1N21-9/E3	SOV305-118-1/4	NO	No
									1353 M1N20-7/E2	SOV305-118-2/3	NO	No	
									1354 M1N21-9/E3	SV302-20B	NO	No	
									1355 M1N20-7/E2	SV302-20D	NO	No	
									1356 M1N21-9/E3	SV302-21B	NO	No	
									1357 M1N20-7/E2	SV302-21D	NO	No	
427	5A-K14C	C915		ES	SQ3	RW	37' 0"	General Electric	CR105	1358 M1N21-9/E3	SOV305-117-1/4	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
									1359	M1N19-7/E3	SOV305-117-2/3	NO	No	
									1360	M1N21-9/E3	SV302-20A	NO	No	
									1361	M1N19-7/E3	SV302-20C	NO	No	
									1362	M1N21-9/E3	SV302-21A	NO	No	
									1363	M1N19-7/E3	SV302-21C	NO	No	
428	5A-K14D			ES	SQ3	RW	37' 0"	General Electric	CR105D1	1364	M1N21-9/E3	SOV305-118-1/4	NO	No
									1365	M1N20-7/E2	SOV305-118-2/3	NO	No	
									1366	M1N21-9/E3	SV302-20B	NO	No	
									1367	M1N20-7/E2	SV302-20D	NO	No	
									1368	M1N21-9/E3	SV302-21B	NO	No	
									1369	M1N20-7/E2	SV302-21D	NO	No	
429	5A-K14E			ES	SQ3	RW	37' 0"	General Electric	CR305D	1370	M1N19-7/E3	SOV305-117-1/4	NO	No
									1371	M1N21-9/E3	SOV305-117-2/3	NO	No	
									1372	M1N19-7/E3	SV302-20A	NO	No	
									1373	M1N21-9/E3	SV302-20C	NO	No	
									1374	M1N19-7/E3	SV302-21A	NO	No	
									1375	M1N21-9/E3	SV302-21C	NO	No	
430	5A-K14F			ES	SQ3	RW	37' 0"	General Electric	CR105	1376	M1N20-7/E2	SOV305-118-1/4	NO	No
									1377	M1N21-9/E3	SOV305-118-2/3	NO	No	
									1378	M1N20-7/E2	SV302-20B	NO	No	
									1379	M1N19-7/E3	SV302-20D	NO	No	
									1380	M1N20-7/E2	SV302-21B	NO	No	
									1381	M1N19-7/E3	SV302-21D	NO	No	
431	5A-K14G			ES	SQ3	RW	37' 0"	General Electric	CR105	1382	M1N19-7/E3	SOV305-117-1/4	NO	No
									1383	M1N21-9/E3	SOV305-117-2/3	NO	No	
									1384	M1N19-7/E3	SV302-20A	NO	No	
									1385	M1N21-9/E3	SV302-20C	NO	No	
									1386	M1N19-7/E3	SV302-21A	NO	No	
									1387	M1N21-9/E3	SV302-21C	NO	No	
432	5A-K14H			ES	SQ3	RW	37' 0"	General Electric	CR305D					



Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1388	M1N20-7/E2	SOV305-118-1/4	NO	No
									1389	M1N21-9/E3	SOV305-118-2/3	NO	No
									1390	M1N20-7/E2	SV302-20B	NO	No
									1391	M1N19-7/E3	SV302-20D	NO	No
									1392	M1N20-7/E2	SV302-21B	NO	No
									1393	M1N19-7/E3	SV302-21D	NO	No
433	5A-K15A		ES	SQ3	RW	37' 0"	General Electric	CR105D1	1394	M1N21-9/E3	SOV305-117-1/4	NO	No
									1395	M1N19-7/E3	SOV305-117-2/3	NO	No
									1396	M1N21-9/E3	SV302-20A	NO	No
									1397	M1N19-7/E3	SV302-20C	NO	No
									1398	M1N21-9/E3	SV302-21A	NO	No
									1399	M1N19-7/E3	SV302-21C	NO	No
434	5A-K15B		ES	SQ3	RW	37' 0"	General Electric	CR105D1	1400	M1N21-9/E3	SOV305-118-1/4	NO	No
									1401	M1N20-7/E2	SOV305-118-2/3	NO	No
									1402	M1N21-9/E3	SV302-20B	NO	No
									1403	M1N20-7/E2	SV302-20D	NO	No
									1404	M1N21-9/E3	SV302-21B	NO	No
									1405	M1N20-7/E2	SV302-21D	NO	No
435	5A-K15C		ES	SQ3	RW	37' 0"	General Electric	CR105	1406	M1N19-7/E 1	SOV305-117 1/4	NO	No
									1407	M1N20-7/E2	SOV305-117-2/3	NO	No
									1408	M1N19-7/E3	SV302-20A	NO	No
									1409	M1N21-9/E3	SV302-20C	NO	No
									1410	M1N19-7/E3	SV302-21A	NO	No
									1411	M1N21-9/E3	SV302-21C	NO	No
436	5A-K15D		ES	SQ3	RW	37' 0"	General Electric	CR105	1412	M1N20-7/E2	SOV305-118-1/4	NO	No
									1413	M1N21-9/E3	SOV305-118-2/3	NO	No
									1414	M1N20-7/E2	SV302-20B	NO	No
									1415	M1N21-9/E3	SV302-20D	NO	No
									1416	M1N20-7/E2	SV302-21B	NO	No
									1417	M1N21-9/E3	SV302-21D	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States						
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
437	5A-K18A	C915		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1418	M1N19-7	LS302-83A	NO	No
										1419	M1N20-7	LS302-83B	NO	No
438	5A-K18C	C915		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1420	M1N19-7	LS302-82C	NO	No
										1421	M1N20-7	LS302-82D	NO	No
439	5A-K19A	C915		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1422	M1N19-7/E3	SOV305-117-1/4	NO	No
										1423	M1N19-7/E3	SOV305-117-2/3	NO	No
										1424	M1N19-7/E3	SV302-20A	NO	No
										1425	M1N19-7/E3	SV302-20C	NO	No
										1426	M1N19-7/E3	SV302-21A	NO	No
										1427	M1N19-7/E3	SV302-21C	NO	No
440	5A-K19B	C917		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1428	M1N20-7/E2	SOV305-118-1/4	NO	No
										1429	M1N20-7/E2	SOV305-118-2/3	NO	No
										1430	M1N20-7/E2	SV302-20B	NO	No
										1431	M1N20-7/E2	SV302-20D	NO	No
										1432	M1N20-7/E2	SV302-21B	NO	No
										1433	M1N20-7/E2	SV302-21D	NO	No
441	5A-K19C	C915		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1434	M1N19-7/E3	SOV305-117-1/4	NO	No
										1435	M1N19-7/E3	SOV305-117-2/3	NO	No
										1436	M1N19-7/E3	SV302-20A	NO	No
										1437	M1N19-7/E3	SV302-20C	NO	No
										1438	M1N19-7/E3	SV302-21A	NO	No
										1439	M1N19-7/E3	SV302-21C	NO	No
442	5A-K19D	C917		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1440	M1N20-7/E2	SOV305-118-1/4	NO	No
										1441	M1N20-7/E2	SOV305-118-2/3	NO	No
										1442	M1N20-7/E2	SV302-20B	NO	No
										1443	M1N20-7/E2	SV302-20D	NO	No
										1444	M1N20-7/E2	SV302-21B	NO	No
										1445	M1N20-7/E2	SV302-21D	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
									Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number				
443	5A-K1C		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1446 M1N17-8	LS302-82C	NO	No
444	5A-K1D		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1447 M1N18-8	LS302-82D	NO	No
445	5A-K28A		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1448 M1N17-8	LS302-83A	NO	No
446	5A-K28B		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1449 M1N18-8	LS302-83B	NO	No
447	5A-K53A		ES	OL2	RW	23' 0"	Agastat	GPBN	1450 M1N17-8	PS37	NO	No
448	5A-K53B		ES	OL2	RW	23' 0"	Agastat	GPBN	1451 M1N18-8	PS38	NO	No
449	5A-K53C		ES	OL2	RW	23' 0"	Agastat	GPBN	1452 M1N17-8	PS39	NO	No
450	5A-K53D		ES	OL2	RW	23' 0"	Agastat	GPBN	1453 M1N18-8	PS40	NO	No
451	5A-K74A		ES	OL2	RW	23' 0"	Agastat	GPBN	1454 E698/E11	LS302-83A	NO	No
452	5A-K74B		ES	OL2	RW	23' 0"	Agastat	GPBN	1455 E700/E10	LS302-83B	NO	No
453	5A-K74C		ES	OL2	RW	23' 0"	Agastat	GPBN	1456 E699/E7	LS302-82C	NO	No
454	5A-K74D		ES	OL2	RW	23' 0"	Agastat	GPBN	1457 E701/E8	LS302-82D	NO	No
455	5A-K8A		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1458 M1N19-7	PS37	NO	No
456	5A-K8B		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1459 M1N20-7	PS38	NO	No
457	5A-K8C		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1460 M1N19-7	PS39	NO	No
458	5A-K8D		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1461 M1N20-7	PS40	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
459	5A-K9A		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1462 M1N19-7	PS37	NO	No
460	5A-K9B		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1463 M1N20-7	PS38	NO	No
461	5A-K9C		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1464 M1N19-7	PS39	NO	No
462	5A-K9D		ES	SQ1	RW	37' 0"	General Electric	12HFA151A2F	1465 M1N20-7	PS40	NO	No
463	62-104A		ES	SQ1	RW	37' 0"	Agastat	2412PBL	1466 E18/E7	B106	NO/NC	No
									1467 E18/E7	SV4569A	NO/NC	No
									1468 E18/E7	SV4570A	NO/NC	No
									1469 E18/E7	SV4587A	NO/NC	No
									1470 E18/E7	SV4587B	NO/NC	No
464	62-104B		ES	SQ1	RW	37' 0"	Agastat	2412PBL	1471 E18/E7	B206	NO/NC	No
									1472 E18/E7	SV4569B	NO/NC	No
									1473 E18/E7	SV4570B	NO/NC	No
									1474 E18/E7	SV4589A	NO/NC	No
									1475 E18/E7	SV4589B	NO/NC	No
465	62-1061		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1476 E170/E8	P208C	NC	No
466	62-1431		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1477 E176 SH.2/E7	P202D	NO	No
467	62-1433		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1478 E176 SH.2/E7	P202E	NO	No
468	62-1435		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1479 E176 SH.1/E7	P202F	NO	No
469	62-1441		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1480 E170/E8	P208D	NO	No
470	62-1444		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1481 E170/E8	P208E	NO	No
471	62-1531		ES	SQ1	RW	37' 0"	Agastat	2412AE-T				

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1482 E176 SH 1/E7	P202A	NO	No
472 62-1533	C1		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1483 E176 SH 1/E7	P202B	NO	No
473 62-1535	C1		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1484 E176 SH 1/E7	P202C	NO	No
474 62-1541	C1		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1485 E170/E8	P208A	NO	No
475 62-1544	C1		ES	SQ1	RW	37' 0"	Agastat	2412AE-T	1486 E170/E8	P208B	NO	No
476 A44X	C904		ES	SQ1	RW	37' 0"	Agastat	EGP-I-750	1487 M1N35-7/E7	SV220-44	NO	Yes
477 A45X	C904		ES	SQ1	RW	37' 0"	Agastat	EGP-I-750	1488 M1N35-7/E7	SV220-45	NO	Yes
478 AR	D33		ES	OL1	TB	23' 0"	Automatic Switch Co	ToBeDetermined	1489 E534/E1	D32	NO/NC	Yes
									1490 E534/E1	D33	NO/NC	Yes
479 CKVR	C103B		ES	SQ1	DG A	23' 0"	Westinghouse	BFD30S	1491 M6-22-14 SH 1/E20	X107A	NO	No
480 CKVR	C104B		ES	SQ1	DG B	23' 0"	Westinghouse	BFD30S	1492 M6-22-14 SH 2/E18	X107B	NO	No
481 CKVS	X107A		ES	SQ4	DG A	23' 0"	Paxton Mitchell	PM-120	1493 M6-22-14 SH 1/E20	X107A		
482 CKVS	X107B		ES	SQ4	DG B	23' 0"	Paxton Mitchell	PM-120	1494 M6-22-14 SH 2/E18	X107B		
483 CR1	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD20S	1495 M6-22-14 SH 1/E20	SV4586A	NO	No
									1496 M6-22-14 SH 1/E20	SV4587B	NO	No
484 CR1	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD20S	1497 M6-22-14 SH 2/E18	SV4588A	NO	No
									1498 M6-22-14 SH 2/E18	SV4589B	NO	No
485 CR2	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD20S	1499 M6-22-14 SH 1/E20	SV4586B	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1500 M6-22-14 SH 1/E20	SV4587A	NO	No
486 CR2	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD20S	1501 M6-22-14 SH 2/E18	SV4588B	NO	No
									1502 M6-22-14 SH 2/E18	SV4589A	NO	No
487 DCFC	C101		ES	OL2	DG A	23' 0"	Westinghouse	MD110	1503 E40/E7	A509	NO	Yes
									1504 M6-46-6 SH 1/E4	X107A-ER	NO	Yes
488 DCFC	C102		ES	OL2	DG B	23' 0"	Westinghouse	MD110	1505 E40/E7	A609	NO	Yes
									1506 M6-46-6 SH 2/E4	X107B-ER	NO	Yes
489 DCFT1	C101		ES	OL4	DG A	23' 0"	Agastat	2412PD	1507 E40/E7	A509	NO	Yes
									1508 M6-46-6 SH 1/E4	X107A-ER	NO	Yes
490 DCFT1	C102		ES	SQ1	DG B	23' 0"	Agastat	7012PC	1509 E40/E7	A609	NO	Yes
									1510 M6-46-6 SH 2/E4	X107B-ER	NO	Yes
491 DCFT2	C103B	19	ES	OL4	DG A	23' 0"	Agastat	2412PD	1511 E422/E6	SVL22	NO	No
									1512 M6-22-14 SH 1/E20	X107A	NC	Yes
492 DCFT2	C104B	19	ES	OL4	DG B	23' 0"	Agastat	2412PD	1513 E422/E6	SVL23	NO	No
									1514 M6-22-14 SH 2/E18	X107B	NC	Yes
493 DGSR-1	C89	4,19	ES	SQ1	DG A	23' 0"	Agastat	2422AC	1515 E454/E4	VEX214A	NC	Yes
									1516 E454/E4	VSF208A	NC	Yes
494 DGSR-2	C90	4,19	ES	SQ1	DG B	23' 0"	Agastat	2422AC	1517 E454/E4	VEX214B	NC	Yes
									1518 E454/E4	VSF208B	NC	Yes
495 dPIS-2353	C2257A		ES	SQ3	RB	-17' 6"	Barton	288	1519 M1J16-10/E22	CV9068A		
									1520 M1J16-10/E22	CV9068B		
									1521 M1J16-10/E22	MO2301-35		
									1522 M1J16-10/E22	MO2301-36		

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1523 M1J16-10/E22	MO2301-4		
									1524 M1J16-10/E22	MO2301-5		
									1525 M1J16-10/E22	SV2300-9		
496	dPIS2352			ES	SQ3	RB	-17' 6"	Barton	288			
	C2257A								1526 M1J15-10/E16	CV9068A		
									1527 M1J15-10/E16	CV9068B		
									1528 M1J15-10/E16	MO2301-35		
									1529 M1J15-10/E16	MO2301-36		
									1530 M1J15-10/E16	MO2301-4		
									1531 M1J15-10/E16	MO2301-5		
									1532 M1J15-10/E16	SV2300-9		
497	DR			ES	SQ1	DG A	23' 0"	Westinghouse	BFD66S			
	C101								1533 E37/E3	A505		
									1534 E40/E7	A509	NC	No
									1535 M6-46-6 SH 1/E4	X107A-ER	NO/NC	No
498	DR			ES	SQ1	DG B	23' 0"	Westinghouse	BFD66S			
	C102								1536 E37/E3	A605		
									1537 E40/E7	A609	NC	No
									1538 M6-46-6 SH 2/E4	X107B-ER	NO/NC	No
499	DRX			ES	SQ1	DG A	23' 0"	Westinghouse	BFD22S			
	C101								1539 E40/E7	A509	NO	No
500	DRX			ES	SQ1	DG B	23' 0"	Westinghouse	BFD22S			
	C102								1540 E40/E7	A609	NO	No
501	EMSR		19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD66S			
	C103B								1541 M6-46-6 SH 1/E4	A505	NC	No
									1542 M6-22-14 SH 1/E20	A509	NC	No
									1543 M6-22-14 SH 1/E20	SV4586A	NO	No
									1544 M6-22-14 SH 1/E20	SV4586B	NO	No
									1545 M6-22-14 SH 1/E20	SV4587A	NO	No
									1546 M6-22-14 SH 1/E20	SV4587B	NO	No
									1547 M6-22-14 SH 1/E20	X107A	NO/NC	No
									1548 M6-46-6 SH 1/E4	X107A-ER	NC	No
502	EMSR		19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD66S			
	C104B								1549 M6-22-14 SH 2/E21	A605	NC	No

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1550	M6-22-14 SH 2/E21	A609	NC	No
									1551	M6-22-14 SH 2/E18	SV4588A	NO	No
									1552	M6-22-14 SH 2/E18	SV4588B	NO	No
									1553	M6-22-14 SH 2/E18	SV4589A	NO	No
									1554	M6-22-14 SH 2/E18	SV4589B	NO	No
									1555	M6-22-14 SH 2/E18	X107B	NO/NC	No
									1556	M6-46-6 SH 2/E4	X107B-ER	NC	No
503	ESR1	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD84S				
									1557	M6-22-14 SH 1/E20	A509	NC	No
									1558	M6-22-14 SH 1/E20	SV4569A	NO	No
									1559	M6-22-14 SH 1/E20	SV4570A	NO	No
									1560	M6-22-14 SH 1/E20	SV4587A	NO	No
									1561	M6-22-14 SH 1/E20	SV4587B	NO	No
									1562	M6-22-14 SH 1/E20	X107A	NO	No
									1563	M6-46-6 SH 1/E4	X107A-ER	NC	No
504	ESR1	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD84S				
									1564	M6-22-14 SH 2/E21	A609	NC	No
									1565	M6-22-14 SH 2/E18	SV4569B	NO	No
									1566	M6-22-14 SH 2/E18	SV4570B	NO	No
									1567	M6-22-14 SH 2/E18	SV4589A	NO	No
									1568	M6-22-14 SH 2/E18	SV4589B	NO	No
									1569	M6-22-14 SH 2/E18	X107B	NO	No
									1570	M6-46-6 SH 2/E4	X107B-ER	NC	No
505	ESR2	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD84S				
									1571	E40/E7	A509	NC	No
									1572	M6-22-14 SH 1/E20	SV4569A	NO	No
									1573	M6-22-14 SH 1/E20	SV4570A	NO	No
									1574	M6-22-14 SH 1/E20	SV4587A	NO	No
									1575	M6-22-14 SH 1/E20	SV4587B	NO	No
									1576	E422/E6	SVL22	NC	Yes
									1577	M6-22-14 SH 1/E20	X107A	NO	No
									1578	M6-46-6 SH 1/E4	X107A-ER	NC	No
506	ESR2	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD84S				
									1579	E40/E7	A609	NC	No
									1580	M6-22-14 SH 2/E18	SV4569B	NO	No



Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1581 M6-22-14 SH 2/E18	SV4570B	NO	No
									1582 M6-22-14 SH 2/E18	SV4589A	NO	No
									1583 M6-22-14 SH 2/E18	SV4589B	NO	No
									1584 E422/E6	SVL23	NC	Yes
									1585 M6-22-14 SH 2/E18	X107B	NO	No
									1586 M6-46-6 SH 2/E4	X107B-ER	NC	No
507 ESR3	C103B	19	ES	SQ1	DG A	23' 0"	Agastat	7022PB	1587 E40/E7	A509	NC	No
508 ESR3	C104B	19	ES	SQ1	DG B	23' 0"	Agastat	7022PB	1588 E40/E7	A609	NC	No
509 FSL1360-7	C225B		ES	SQ3	RB	2' 9"	Barton	289	1589 M1G12-12/E11	MO1301-60	NO/NC	Yes/No
510 JWPR1	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD71S	1590 M6-22-14 SH 1/E20	A509	NO	No
									1591 M6-22-14 SH 1/E20	X107A	NO/NC	No
									1592 M6-46-6 SH 1/E4	X107A-ER		
511 JWPR1	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD71S	1593 M6-22-14 SH 2/E21	A609	NO	No
									1594 M6-22-14 SH 2/E18	X107B	NO/NC	No
									1595 M6-46-6 SH 2/E4	X107B-ER		
512 JWPR2	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD71S	1596 M6-22-14 SH 1/E20	A509	NO	No
									1597 M6-22-14 SH 1/E20	X107A	NO/NC	No
									1598 M6-46-6 SH 1/E4	X107A-ER		
513 JWPR2	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD71S	1599 M6-22-14 SH 2/E21	A609	NO	No
									1600 M6-22-14 SH 2/E18	X107B	NO/NC	No
									1601 M6-46-6 SH 2/E4	X107B-ER		
514 JWPS1	X107A		ES	SQ4	DG A	23' 0"	United Electric Control	Type J6 Model 156	1602 M6-22-14 SH 1/E20	X107A		
515 JWPS1	X107B		ES	SQ4	DG B	23' 0"	United Electric Control	Type J6 Model 156	1603 M6-22-14 SH 2/E18	X107B		
516 JWPS2	X107A		ES	SQ4	DG A	23' 0"	United Electric Control	Type J6 Model 156				

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States		
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1604 M6-22-14 SH 1/E20	X107A		
517 JWPS2	X107B		ES	SQ4	DG B	23' 0"	United Electric Control	Type J6 Model 156	1605 M6-22-14 SH 2/E18	X107B		
518 JWTRH	C103B		ES	SQ1	DG A	23' 0"	Westinghouse	BFD40S	1606 M6-22-14 SH 1/E20	X107A	NO	No
519 JWTRH	C104B		ES	SQ1	DG B	23' 0"	Westinghouse	BFD40S	1607 M6-22-14 SH 2/E18	X107B	NO	No
520 JWTSH	X107A		ES	SQ4	DG A	23' 0"	United Electric Control	Type C11 Model 102	1608 M6-22-14 SH 1/E20	X107A		
521 JWTSH	X107B		ES	SQ4	DG B	23' 0"	United Electric Control	Type C11 Model 102	1609 M6-22-14 SH 2/E18	X107B		
522 K1	C101		ES	OL2	DG A	23' 0"	Westinghouse	MD101	1610 E40/E7	A509	NC	No
									1611 M6-46-6 SH 1/E4	X107A-ER	NO/NC	No
523 K1	C102		ES	OL2	DG B	23' 0"	Westinghouse	MD101	1612 E40/E7	A609	NC	No
									1613 M6-46-6 SH 2/E4	X107B-ER	NO/NC	No
524 K2	C101		ES	OL2	DG A	23' 0"	Westinghouse	MD120	1614 M6-46-6 SH 1/E4	X107A-ER	NO	No
525 K2	C102		ES	OL2	DG B	23' 0"	Westinghouse	MD120	1615 M6-46-6 SH 2/E4	X107B-ER	NO	No
526 K3	C101		ES	OL2	DG A	23' 0"	Potter & Brumfield	PR11AY	1616 M6-46-6 SH 1/E4	X107A-ER	NC	No
527 K3	C102		ES	OL2	DG B	23' 0"	Potter & Brumfield	PR11AY	1617 M6-46-6 SH 2/E4	X107B-ER	NC	No
528 K4	C101		ES	OL2	DG A	23' 0"	Potter & Brumfield	PR11DY	1618 M6-22-14 SH 1/E20	A509	NO/NC	No
									1619 M6-46-6 SH 1/E4	X107A-ER	NO/NC	No
529 K4	C102		ES	OL2	DG B	23' 0"	Potter & Brumfield	PR11DY	1620 M6-22-14 SH 2/E21	A609	NO/NC	No
									1621 M6-46-6 SH 2/E4	X107B-ER	NO/NC	No
530 KWR	C103B		ES	SQ1	DG A	23' 0"	Westinghouse	BFD30S				

See previous page for relay number

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (HO/NC)	Energized (Yes/No)	
									1622	M6-22-14 SH 1/E20	SV4569A	NO	No
									1623	M6-22-14 SH 1/E20	SV4570A	NO	No
									1624	M6-22-14 SH 1/E20	SV4587A	NO	No
									1625	M6-22-14 SH 1/E20	SV4587B	NO	No
531	KWR		ES	SQ1	DG B	23' 0"	Westinghouse	BFD30S	1626	M6-22-14 SH 2/E18	SV4569B	NO	No
									1627	M6-22-14 SH 2/E18	SV4570B	NO	No
									1628	M6-22-14 SH 2/E18	SV4589A	NO	No
									1629	M6-22-14 SH 2/E18	SV4589B	NO	No
532	KWS		ES	SQ1	DG A	23' 0"	Agastat	2412PD	1630	M6-22-14 SH 1/E20	SV4569A		
									1631	M6-22-14 SH 1/E20	SV4570A		
									1632	M6-22-14 SH 1/E20	SV4587A		
									1633	M6-22-14 SH 1/E20	SV4587B		
533	KWS		ES	SQ1	DG B	23' 0"	Agastat	2412PD	1634	M6-22-14 SH 2/E18	SV4569B		
									1635	M6-22-14 SH 2/E18	SV4570B		
									1636	M6-22-14 SH 2/E18	SV4589A		
									1637	M6-22-14 SH 2/E18	SV4589B		
534	KWT		ES	SQ1	DG A	23' 0"	Agastat	2412PD	1638	M6-22-14 SH 1/E20	SV4569A	NC	No
									1639	M6-22-14 SH 1/E20	SV4570A	NC	No
									1640	M6-22-14 SH 1/E20	SV4587A	NC	No
									1641	M6-22-14 SH 1/E20	SV4587B	NC	No
535	KWT		ES	SQ1	DG B	23' 0"	Agastat	2412PD	1642	M6-22-14 SH 2/E18	SV4569B	NC	No
									1643	M6-22-14 SH 2/E18	SV4570B	NC	No
									1644	M6-22-14 SH 2/E18	SV4589A	NC	No
									1645	M6-22-14 SH 2/E18	SV4589B	NC	No
536	KXA-XX-XX	4,11	ES	OL1	RW	37' 0"	TBD	ToBeDetermined	1646	M1V17-4/E0	FCV302-120	NO	No
									1647	M1V17-4/E0	FCV302-123	NO	No
									1648	M1V17-4/E0	SV305-121	NO	No
									1649	M1V17-4/E0	SV305-122	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
537	LO		ES	OL2	TB	23' 0"	Automatic Switch Co	24A120	1650 E534/E1	D32	NO	Yes
									1651 E534/E1	D33	NO	Yes
538	LO		ES	OL1	RW	23' 0"	Automatic Switch Co	ToBeDetermined	1652 E45A-6-5/E1	Y10	NO/NC	No
539	LO		ES	OL1	TB	23' 0"	Automatic Switch Co	ToBeDetermined	1653 E16B-1-3	Y11	NO/NC	No
540	LO		ES	OL1	RW	23' 0"	Automatic Switch Co	ToBeDetermined	1654 E16B-2-3	Y12	NO	No
541	LOLR		ES	SQ1	DG A	23' 0"	Westinghouse	BF20F	1655 M6-22-14 SH 1/E20	X107A	NO	No
542	LOLR		ES	SQ1	DG B	23' 0"	Westinghouse	BF20F	1656 M6-22-14 SH 2/E18	X107B	NO	No
543	LOLS		ES	SQ4	DG A	23' 0"	GEMS	LS-1800	1657 M6-20-9 SH 1/E9	X107A		
544	LOLS		ES	SQ4	DG B	23' 0"	GEMS	LS-1800	1658 M6-20-9 SH 2/E9	X107B		
545	LOTRH		ES	SQ1	DG A	23' 0"	Westinghouse	BFD30S	1659 M6-22-14 SH 1/E20	X107A	N( )	No
546	LOTRH		ES	SQ1	DG B	23' 0"	Westinghouse	BFD30S	1660 M6-22-14 SH 2/E18	X107B	NO	No
547	LOTSH		ES	SQ4	DG A	23' 0"	United Electric Control	Type C100 Model 120	1661 M6-22-14 SH 1/E20	X107A		
548	LOTSH		ES	SQ4	DG B	23' 0"	United Electric Control	Type C100 Model 120	1662 M6-22-14 SH 2/E18	X107B		
549	OCR		ES	SQ1	DG A	23' 0"	Westinghouse	BFD30S	1663 M6-22-14 SH 1/E20	X107A	NO	No
550	OCR		ES	SQ1	DG B	23' 0"	Westinghouse	BFD30S	1664 M6-22-14 SH 2/E18	X107B	NO	No
551	OCT1		ES	SQ1	DG A	23' 0"	Agastat	2412PD	1665 M6-22-14 SH 1/E20	X107A	NO	No
552	OCT1		ES	SQ1	DG B	23' 0"	Agastat	2412PD				

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1666 M6-22-14 SH 2/E18	X107B	NO	No
553	OCT2		ES	SQ1	DG A	23' 0"	Agastal	2412PD	1667 M6-22-14 SH 1/E20	X107A	NO	No
554	OCT2		ES	SQ1	DG B	23' 0"	Agastal	2412PD	1668 M6-22-14 SH 2/E18	X107B	NO	No
555	OPR1		ES	SQ1	DG A	23' 0"	Westinghouse	BFD30S	1669 M6-22-14 SH 1/E20	X107A	NO	No
556	OPR1		ES	SQ1	DG B	23' 0"	Westinghouse	BFD30S	1670 M6-22-14 SH 2/E18	X107B	NO	No
557	OPS1		ES	OL2	DG A	23' 0"	United Electric Control	Type J6 - 1156	1671 M6-22-14 SH 1/E20	X107A		
558	OPS1		ES	OL2	DG B	23' 0"	United Electric Control	Type J6 - 1156	1672 M6-22-14 SH 2/E18	X107B		
559	OPS2		ES	OL2	DG A	23' 0"	United Electric Control	Type J6 - 1156	1673 M6-22-14 SH 1/E20	X107A		
560	OPS2		ES	OL2	DG B	23' 0"	United Electric Control	Type J6 - 1156	1674 M6-22-14 SH 2/E18	X107B		
561	OPT1		ES	SQ1	DG A	23' 0"	Agastal	2412PD	1675 M6-22-14 SH 1/E20	X107A	NO	No
562	OPT1		ES	SQ1	DG B	23' 0"	Agastal	2412PD	1676 M6-22-14 SH 2/E18	X107B	NO	No
563	OPT2		ES	SQ1	DG A	23' 0"	Agastal	2412PD	1677 M6-22-14 SH 1/E20	X107A	NO	No
564	OPT2		ES	SQ1	DG B	23' 0"	Agastal	2412PD	1678 M6-22-14 SH 2/E18	X107B	NO	No
565	OSR		ES	SQ1	DG A	23' 0"	Westinghouse	BFD30S	1679 M6-22-14 SH 1/E20	X107A	NO	No
566	OSR		ES	SQ1	DG B	23' 0"	Westinghouse	BFD30S	1680 M6-22-14 SH 2/E18	X107B	NO	No
567	OSS		ES	SQ4	DG A	23' 0"	ALCO	P/N 2362113	1681 M6-22-14 SH 1/E20	X107A		
568	OSS		ES	SQ4	DG B	23' 0"	ALCO	P/N 2362113				

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States		
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1682 M6-22-14 SH 2/E18	X107B		
See previous page for relay number												
569	PB	Y12		ES	OL1	RW	23' 0"	Automatic Switch Co	ToBeDetermined	1683 E16B-2-3	Y12	
570	PS1001-93A	LOCAL		ES	SQ3	RB	-17' 6"	Static-O-Ring	6TA-BB45-NX-C1A-JJTTX12	1684 M1H7-12/E18	SV203-3A	NO No
										1685 M1H7-12/E18	SV203-3B	NO No
										1686 M1H7-12/E18	SV203-3C	NO No
										1687 M1H7-12/E18	SV203-3D	NO No
571	PS1001-93B	LOCAL		ES	SQ3	RB	-17' 6"	Static-O-Ring	6TA-BB45-NX-C1A-JJTTX12	1688 M1H9-12/E17	SV203-3A	NO No
										1689 M1H9-12/E17	SV203-3B	NO No
										1690 M1H9-12/E17	SV203-3C	NO No
										1691 M1H9-12/E17	SV203-3D	NO No
572	PS1001-93C	LOCAL		ES	SQ3	RB	-17' 6"	Static-O-Ring	6TA-BB45-NX-C1A-JJTTX12	1692 M1H7-12/E18	SV203-3A	NO No
										1693 M1H7-12/E18	SV203-3B	NO No
										1694 M1H7-12/E18	SV203-3C	NO No
										1695 M1H7-12/E18	SV203-3D	NO No
573	PS1001-93D	LOCAL		ES	SQ3	RB	-17' 6"	Static-O-Ring	6TA-BB45-NX-C1A-JJTTX12	1696 M1H9-12/E17	SV203-3A	NO No
										1697 M1H9-12/E17	SV203-3B	NO No
										1698 M1H9-12/E17	SV203-3C	NO No
										1699 M1H9-12/E17	SV203-3D	NO No
574	PS1360-21A	LOCAL		ES	SQ3	RB	-17' 6"	Static-O-Ring	45N6-B118-NX-C1A-JJTTX13	1700 M1G12-12/E11	SV1301-1	
575	PS1360-9C	C2257B	4	ES	OL2	RB	-17' 6"	Barksdale	PIH-M85SSV	1701 M1G12-12/E11	MO1301-16	
										1702 M1G12-12/E11	MO1301-17	
										1703 M1G12-12/E11	SV1301-1	
576	PS1360-9D	C2257B	4	ES	OL2	RB	-17' 6"	Barksdale	PIH-M85SSV	1704 M1G12-12/E11	MO1301-16	
										1705 M1G12-12/E11	MO1301-17	
										1706 M1G12-12/E11	SV1301-1	

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States				
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)		
577	PS1464A		ES	SQ3	RB	-17' 6"	Static-O-Ring	6TA-BB45-NX-C1A-JJTTX12	1707	M1K4-11/E15	SV203-3A	NO	No	
									1708	M1K4-11/E15	SV203-3B	NO	No	
									1709	M1K4-11/E15	SV203-3C	NO	No	
									1710	M1K4-11/E15	SV203-3D	NO	No	
578	PS1464B		ES	SQ3	RB	-17' 6"	Static-O-Ring	6TA-BB45-NX-C1A-JJTTX12	1711	M1K4-11/E15	SV203-3A	NO	No	
									1712	M1K4-11/E15	SV203-3B	NO	No	
									1713	M1K4-11/E15	SV203-3C	NO	No	
									1714	M1K4-11/E15	SV203-3D	NO	No	
579	PS37	LOCAL	ES	SQ3	TB	51' 0"	Static-O-Ring	5N6-BB5-NX-C1A-JJTTX12	1715	M1N17-8	PS37	NO	No	
580	PS38	LOCAL	ES	SQ3	TB	51' 0"	Static-O-Ring	5N6-BB5-NX-C1A-JJTTX12	1716	M1N18-8	PS38	NO	No	
581	PS39	LOCAL	ES	SQ3	TB	51' 0"	Static-O-Ring	5N6-BB5-NX-C1A-JJTTX12	1717	M1N17-8	PS39	NO	No	
582	PS40	LOCAL	ES	SQ3	TB	51' 0"	Static-O-Ring	5N6-BB5-NX-C1A-JJTTX12	1718	M1N18-8	PS40	NO	No	
583	PSH2368A	C2250A	ES	OL2	RB	-17' 6"	Barksdale	B2T-M12SS	1719	M1J16-10/E22	SV2300-9	NO	No	
584	PSH2368B	C2250A	ES	OL2	RB	-17' 6"	Barksdale	B2T-M12SS	1720	M1J16-10/E22	SV2300-9	NO	No	
585	PSL2360-1	C2250B	ES	SQ3	RB	-17' 6"	Static-O-Ring	54TA-BB118-NX-C1A-JJTTX6	1721	M1J16-10/E22	SV2300-9	NO	No	
586	RPM	X107A	ES	SQ4	DG A	23' 0"	Syncho Start	ToBeDetermined	1722	M6-21-11 SH 1/E8	A509			
587	RPM	X107B	ES	SQ4	DG B	23' 0"	Syncho Start	ToBeDetermined	1723	M6-21-11 SH 2/E7	A609			
588	SDR	C103B	19	ES	SQ1	DG A	23' 0"	Westinghouse	BFD33S	1724	E40/E7	A509	NO	No
										1725	M6-22-14 SH 1/E20	X107A	NC	No
										1726	M6-46-6 SH 1/E4	X107A-ER	NO	No
589	SDR	C104B	19	ES	SQ1	DG B	23' 0"	Westinghouse	BFD33S					

Pilgrim Nuclear Power Station Essential Relay Contacts							Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)
									1727 E40/E7	A609	NO	No
									1728 M6-22-14 SH 2/E18	X107B	NC	No
									1729 M6-46-6 SH 2/E4	X107B-ER	NO	No
590 SE	D32		ES	OL1	TB	37' 0"	Automatic Switch Co	ToBeDetermined	1730 E534/E1	D32	NO/NC	Yes
									1731 E534/E1	D33	NO/NC	Yes
591 SE	Y10		ES	OL1	RW	23' 0"	Automatic Switch Co	ToBeDetermined	1732 E45A-8-5/E1	Y10	NO/NC	No
592 SE	Y11		ES	OL1	TB	23' 0"	Automatic Switch Co	ToBeDetermined	1733 E16B-1-3	Y11	NO/NC	No
593 SE	Y12		ES	OL1	RW	23' 0"	Automatic Switch Co	ToBeDetermined	1734 E16B-2-3	Y12	NO/NC	No
594 SPR	C103B		ES	SQ1	DG A	23' 0"	Westinghouse	BFD33S	1735 M6-21-11 SH 1/E8	A509	NO	No
									1736 M6-22-14 SH 1/E20	SV4569A	NC	No
									1737 M6-22-14 SH 1/E20	SV4570A	NC	No
									1738 M6-22-14 SH 1/E20	SV4587A	NC	No
									1739 M6-22-14 SH 1/E20	SV4587B	NC	No
595 SPR	C104B		ES	SQ1	DG B	23' 0"	Westinghouse	BFD33S	1740 M6-21-11 SH 2/E7	A609	NO	No
									1741 M6-22-14 SH 2/E18	SV4589B	NC	No
									1742 M6-22-14 SH 2/E18	SV4570B	NC	No
									1743 M6-22-14 SH 2/E18	SV4589A	NC	No
									1744 M6-22-14 SH 2/E18	SV4589B	NC	No
596 TD	D32		ES	SQ1	TB	37' 0"	Agastal	2412PH	1745 E534/E1	D32	NO	Yes
									1746 E534/E1	D33	NO	Yes
597 TP	C103B		ES	OL2	DG A	23' 0"	TechPak	FSS653	1747 M6-22-14 SH 1/E20	A509		
									1748 M6-22-14 SH 1/E20	SV4569A		
									1749 M6-22-14 SH 1/E20	SV4570A		
									1750 M6-22-14 SH 1/E20	SV4587A		
									1751 M6-22-14 SH 1/E20	SV4587B		
									1752 M6-22-14 SH 1/E20	X107A		



Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	

See previous page for relay number

598	TP	C104B		ES	OL2	DG B	23' 0"	TechPak	FSS653	1753 M6-21-11 SH 1/E8	X107A-ER		
										1754 M6-22-14 SH 2/E21	A609		
										1755 M6-22-14 SH 2/E18	SV4569B		
										1756 M6-22-14 SH 2/E18	SV4570B		
										1757 M6-22-14 SH 2/E18	SV4589A		
										1758 M6-22-14 SH 2/E18	SV4589B		
										1759 M6-22-14 SH 2/E18	X107B		
										1760 M6-21-11 SH 2/E7	X107B-ER		
599	TS	Y10		ES	OL2	RW	23' 0"	Automatic Switch Co	X906126CL1A	1761 E45A-6-5/E1	Y10	NO/NC	No
600	TS	Y11		ES	OL2	TB	23' 0"	Automatic Switch Co	906126CL1A	1762 E16B-1-3	Y11	NO/NC	No
601	TS	Y12		ES	OL2	RW	23' 0"	Automatic Switch Co	906126CL1A	1763 E16B-2-3	Y12	NO/NC	No
602	TS-1	D32		ES	OL2	TB	37' 0"	Automatic Switch Co	163A195C12	1764 E534/E1	D32	NO/NC	No
										1765 E534/E1	D33	NO/NC	No
603	TS-2	D33		ES	OL2	TB	23' 0"	Automatic Switch Co	163A195AC12	1766 E534/E1	D32	NO/NC	No
										1767 E534/E1	D33	NO/NC	No
604	TS1360-14C	J599		ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1768 M1G12-12/E11	MO1301-16		
										1769 M1G12-12/E11	MO1301-17		
										1770 M1G12-12/E11	SV1301-1		
605	TS1360-15A	J315		ES	SQ3	RB	-9' 0"	EGS/Patel	01-170230-090	1771 M1G12-12/E11	MO1301-16		
										1772 M1G12-12/E11	MO1301-17		
										1773 M1G12-12/E11	SV1301-1		
606	TS1360-15C	J600		ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1774 M1G12-12/E11	MO1301-16		
										1775 M1G12-12/E11	MO1301-17		
										1776 M1G12-12/E11	SV1301-1		

Pilgrim Nuclear Power Station Essential Relay Contacts										Contact States			
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
607	TS1360-16C	J599		ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1777 M1G12-12/E11	MO1301-16		
										1778 M1G12-12/E11	MO1301-17		
										1779 M1G12-12/E11	SV1301-1		
608	TS1360-16D	J601	4	ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1780 M1G20-9/E8	MO1301-16		
										1781 M1G20-9/E8	MO1301-17		
										1782 M1G20-9/E8	SV1301-1		
609	TS1360-17A	J315		ES	SQ3	RB	-9' 0"	EGS/Patel	01-170230-090	1783 M1G12-12/E11	MO1301-16		
										1784 M1G12-12/E11	MO1301-17		
										1785 M1G12-12/E11	SV1301-1		
610	TS1360-17B	J317	4	ES	SQ3	RB	-9' 0"	EGS/Patel	01-170230-090	1786 M1G20-9/E8	MO1301-16		
										1787 M1G20-9/E8	MO1301-17		
										1788 M1G20-9/E8	SV1301-1		
611	TS1360-17C	J600		ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1789 M1G12-12/E11	MO1301-16		
										1790 M1G12-12/E11	MO1301-17		
										1791 M1G12-12/E11	SV1301-1		
612	TS1360-17D	J602	4	ES	SQ3	RB	-9' 0"	EGS/Patel	01-170230-090	1792 M1G20-9/E8	MO1301-16		
										1793 M1G20-9/E8	MO1301-17		
										1794 M1G20-9/E8	SV1301-1		
613	TS2370C	J603		ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1795 M1J15-10/E16	CV9068A	NO	No
										1796 M1J15-10/E16	CV9068B	NO	No
										1797 M1J15-10/E16	MO2301-35	NO	No
										1798 M1J15-10/E16	MO2301-36	NO	No
										1799 M1J15-10/E16	MO2301-4	NO	No
										1800 M1J15-10/E16	MO2301-5	NO	No
										1801 M1J15-10/E16	SV2300-9	NO	No
614	TS2370D	J604		ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1802 M1J16-10/E22	CV9068A	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts								Contact States					
Relay ID	Panel	Notes	SAT	SQ Basis	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1803	M1J16-10/E22	CV9068B	NO	No
									1804	M1J16-10/E22	MO2301-35	NO	No
									1805	M1J16-10/E22	MO2301-36	NO	No
									1806	M1J16-10/E22	MO2301-4	NO	No
									1807	M1J16-10/E22	MO2301-5	NO	No
									1808	M1J16-10/E22	SV2300-9	NO	No
615	TS2371A	LOCAL	ES	SQ3	RB	-17' 6"	EGS/Patel	01-170230-090	1809	M1J15-10/E16	CV9068A	NO	No
									1810	M1J15-10/E16	CV9068B	NO	No
									1811	M1J15-10/E16	MO2301-35	NO	No
									1812	M1J15-10/E16	MO2301-36	NO	No
									1813	M1J15-10/E16	MO2301-4	NO	No
									1814	M1J15-10/E16	MO2301-5	NO	No
									1815	M1J15-10/E16	SV2300-9	NO	No
616	TS2371B	LOCAL	ES	SQ3	RB	-17' 6"	EGS/Patel	01-170230-090	1816	M1J16-10/E22	CV9068A	NO	No
									1817	M1J16-10/E22	CV9068B	NO	No
									1818	M1J16-10/E22	MO2301-35	NO	No
									1819	M1J16-10/E22	MO2301-36	NO	No
									1820	M1J16-10/E22	MO2301-4	NO	No
									1821	M1J16-10/E22	MO2301-5	NO	No
									1822	M1J16-10/E22	SV2300-9	NO	No
617	TS2371C	J605	ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1823	M1J15-10/E16	CV9068A	NO	No
									1824	M1J15-10/E16	CV9068B	NO	No
									1825	M1J15-10/E16	MO2301-35	NO	No
									1826	M1J15-10/E16	MO2301-36	NO	No
									1827	M1J15-10/E16	MO2301-4	NO	No
									1828	M1J15-10/E16	MO2301-5	NO	No
									1829	M1J15-10/E16	SV2300-9	NO	No
618	TS2371D	J606	ES	SQ3	RB	23' 0"	EGS/Patel	01-170230-090	1830	M1J16-10/E22	CV9068A	NO	No
									1831	M1J16-10/E22	CV9068B	NO	No
									1832	M1J16-10/E22	MO2301-35	NO	No
									1833	M1J16-10/E22	MO2301-36	NO	No

Pilgrim Nuclear Power Station Essential Relay Contacts									Contact States					
Relay ID	Panel	Notes	SAT	SQ	Cons	Bldg	Elevation	Manufacturer	Model Number	Schematic Number	Equip ID	Contact State (NO/NC)	Energized (Yes/No)	
									1834	M1J16-10/E22	MO2301-4	NO	No	
									1835	M1J16-10/E22	MO2301-5	NO	No	
									1836	M1J16-10/E22	SV2300-9	NO	No	
619	TVT1		ES	SQ1		L A	23' 0"	Agastat	2412PD	1837	M6-22-14 SH 1/E20	SV4569A	NC	No
									1838	M6-22-14 SH 1/E20	SV4587B	NC	No	
620	TVT1		ES	SQ1		DG B	23' 0"	Agastat	2412PD	1839	M6-22-14 SH 2/E18	SV4569B	NC	No
									1840	M6-22-14 SH 2/E18	SV4589B	NC	No	
621	TVT2		ES	SQ1		DG A	23' 0"	Agastat	2412PD	1841	M6-22-14 SH 1/E20	SV4570A	NC	No
									1842	M6-22-14 SH 1/E20	SV4587A	NC	No	
622	TVT2		ES	SQ1		DG B	23' 0"	Agastat	2412PD	1843	M6-22-14 SH 2/E18	SV4570B	NC	No
									1844	M6-22-14 SH 2/E18	SV4589A	NC	No	

See previous page for relay number

See previous page for relay number

See previous page for relay number

## Notes for PNPS Essential Relay List

Note ID Note Text

- 01 Contact chatter is acceptable because the component is not required to operate until after the earthquake.
- 02 Contact chatter is acceptable because there is another contact in series that is not vulnerable to chatter.
- 03 Contact chatter is acceptable because there is another contact in series that is seismically adequate.
- 04 Other contacts were designated chatter acceptable (CA) because of this contact being considered seismically adequate.
- 05 Contact chatter is acceptable because it will not change the state of the equipment.
- 06 Contact chatter could cause an alarm in the control room which would require operator action to acknowledge and reset.
- 07 Contact chatter is acceptable because it will change the position of the component to the required state.
- 08 Simultaneous chatter of the motor contactors may have an adverse effect on the equipment, therefore one of the contactors is being considered essential.
- 09 Contact chatter is acceptable because it will not prevent the component from changing state on demand.
- 10 The component is not required to operate until after the earthquake. Spurious actuation of component will not have any adverse effect on the safe shutdown.
- 11 This contact is typical for 145 control rods. For rod identification see drawing M1V10-4.
- 12 Contact chatter is acceptable because chatter will not energize the time delay relay long enough for the timer to complete its cycle.
- 13 Contact chatter could seal in the control circuit. If this occurs operator action would be required to reset the control circuit at panel C903 using the LPCI loop select logic reset pushbutton (10A-S1A).
- 14 Contact chatter could seal in the control circuit. If this occurs operator action would be required to reset the control circuit at panel C903 using the LPCI loop select logic reset pushbutton (10A-S1B).
- 15 Contact chatter could seal in the control circuit. If this occurs operator action would be required to reset the control circuit at panel C903 using the containment spray signal reset pushbutton (16A-S33A).
- 16 Contact chatter could seal in the control circuit. If this occurs operator action would be required to reset the control circuit at panel C903 using the containment spray signal reset pushbutton (16A-S33B).
- 17 Contact chatter could seal in the control circuit. If this occurs operator action would be required to reset the control circuit at panel C905 using the isolation valve reset switch (16A-S33).
- 18 Contact chatter could trip a running pump. If this occurs a pump would start automatically on low header pressure which would not have an adverse effect on the safe shutdown.
- 19 Additional relays associated with this relay are evaluated and included under the corresponding diesel equipment ID. These relays are considered essential.
- 20 Contact chatter could momentarily open the circuit. This would not have an adverse effect on the safe shutdown.
- 21 152Y is the anti-pump relay supplied with the General Electric Magne-Blast Circuit Breaker Model No. AM-4 16-250-8H. This relay directly controls operation of the switchgear and does not control other plant equipment.
- 22 Solid state relay per Power Systems Division walkdown and Vendor Manual V0366.

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## Notes for PNPS Essential Relay List

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Note ID    Note Text

- 23    52X is the closing relay for GE Power Circuit Breaker AK-2A-25-1 or AK-2A-50-1. This relay directly controls operation of the breaker and does not control other plant equipment.
- 24    Relay is not seismically fragile and will be functional after the seismic event. Contact chatter could momentarily cause the valve to change position. The valve stroke time is 30 seconds in duration; therefore a valve could reach mid position during the event. However, the relay is part of the Honeywell controller which uses actual valve position as input, and would return valve to its original position following the event.
- 25    Contact chatter could momentarily cause a change of state. This would not have an adverse effect on the safe shutdown.
- 26    Low ruggedness relay listed in Appendix E to EPRI NP-7148. Operator action to reset trip of the RCIC turbine will be required.

ATTACHMENT 2  
OUTLIER RELAYS

## "OUTLIERS"

### LIST OF OUTLIERS - OL1

<u>Relay ID</u>	<u>Panel Number</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Potential Resolution Method</u>
3A	Y11	CT	TBD	S
AR	D33	ASC	TBD	S
KXA-XX-XX	C905	TBD	TBD	S
LO	Y10	ASC	TBD	S
LO	Y11	ASC	TBD	S
LO	Y12	ASC	TBD	S
PB	Y12	ASC	TBD	S
SE	Y10	ASC	TBD	S
SE	Y11	ASC	TBD	S
SE	Y12	ASC	TBD	S
SE	D32	ASC	TBD	S

Total Number of OL1 Relays=11

#### Legend

OL1=Relay an outlier. Relay make and/or model number unknown  
CT = Cramer Timer                      ASC = Automatic Switch Company

#### POTENTIAL RESOLUTION METHOD

- S = Outlier relays to be verified by **REVIEW AND COMPARISON** with similar rugged components.
- C = Outlier relays to be verified by **CIRCUIT ANALYSIS**.



## "OUTLIERS"

### LIST OF OUTLIERS - OL2

Relay ID	Panel No	Manufacturer	Model Number	Potential Resolution Method
127-504/1	A504	GE	121AV53B1A	S
127-604/1	A604	GE	121AV53B1A	S
151-4A	C5	W	CO-8	S
151-4C	C5	W	CO-8	S
151-501B	A501	GE	121AC77A12A	S
151-601A	A601	GE	121AC77A12A	S
152Y	A501	GE	AM-4.16-250-8H	S
152Y	A504	GE	AM-4.16-250-8H	S
152Y	A509	GE	AM-4.16-250-8H	S
152Y	A602	GE	AM-4.16-250-8H	S
152Y	A605	GE	AM-4.16-250-8H	S
151-601C	A601	GE	121AC77A12A	S
159-609/1	C102	GE	SV	S
159-609/2	C102	GE	SV	S
187-4B	C5	W	HU-1	C
187N-4	C5	W	CWC	C
1V	Y10	ASC	214B120	S
1V	Y12	ASC	214A69	S
3A-K32-XX-XX	C928	GE	CR120K	C
42X-781/0	D781	CH	PN9575H2018A Type 626	S
42X-964/C	D964	CH	PN9575H2018A Type 626	S
52X	B102	GE	AK-2A-50-1	S
52X	B310	GE	AK-2A-25-1	S
52X	B601	GE	AK-2A-50-1	S
52X	B605	GE	AK-2A-25-1	S
5A-K53A	C2228-A1	Agastat	GPBN	S
5A-K53C	C2228-A2	Agastat	GPBN	S
5A-K74A	C2228-A1	Agastat	GPBN	S
5A-K74C	C2228-A1	Agastat	GPBN	S
DCFC	C102	W	MD101	S
K1	C102	W	MD101	S
K2	C102	W	MD120	S
K3	C102	PB	PR11AY	S
K4	C102	PB	PR11DY	S
OPS1	C103C	UEC	Type J6-1156	S
OPS2	C103C	UEC	Type J6-1156	S
PS1360-9C	C2257B	Barksdale	PIH-M85SSV	S
PSH2368A	C2250A	Barksdale	B2T-M12SS	S
TP	C103B	Tach Pak	FSS653	S
TS	Y10	ASC	X906126CL1A	S
TS	Y12	ASC	X906126CL1A	S
TS-2	D33	ASC	163A195C12	S

#### Legend

OL2 = Relay an outlier. Relay seismic capacity unknown. GE = General Electric W = Westinghouse  
 ASC = Automatic Switch Company CH = Cutler Hammer PM = Paxton Mitchell  
 UEC = United Electric Control PB = Potter & Brumfield RS = Robert Shaw  
 MM = McDonnell and Miller

#### POTENTIAL RESOLUTION METHOD

- S = Outlier relays to be verified by **REVIEW AND COMPARISON** with similar rugged components.
- C = Outlier relays to be verified by **CIRCUIT ANALYSIS**.

## "OUTLIERS"

### LIST OF OUTLIERS - OL2

<u>Relay ID</u>	<u>Panel No.</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Potential Resolution Method</u>
127-504/2	A504	GE	12IAV53B1A	S
127-604/2	A604	GE	12IAV53B1A	S
151-4B	C5	W	CO-8	S
151-501A	A501	GE	12IAC77A12A	S
151-501C	A501	GE	12IAC77A12A	S
151-601B	A601	GE	12IAC77A12A	S
152Y	A502	GE	AM-4.16-250-8H	S
152Y	A505	GE	AM-4.16-250-8H	S
152Y	A601	GE	AM-4.16-250-8H	S
152Y	A604	GE	AM-4.16-250-8H	S
152Y	A609	GE	AM-4.16-250-8H	S
159-509/1	C101	GE	SV	S
159-509/2	C101	GE	SV	S
187-4A	C5	W	HU-1	C
187-4C	C5	W	HU-1	C
1V	D32	ASC	214A120	S
1V	Y11	ASC	214B69	S
27-B2Z2	B2	GE	12HFA65062H	S
42X-771/C	D771	CH	PN9575H2018A Type 626	S
42X-941/0	D941	CH	PN9575H2018A Type 626	S
52X	B202	GE	AK-2A-50-1	S
52X	B410	GE	AK-2A-25-1	S
52X	B602	GE	AK-2A-50-1	S
52X	B606	GE	AK-2A-25-1	S
5A-K53B	C2229-B1	Agastat	GPBN	S
5A-K53D	C2229-B2	Agastat	GPBN	S
5A-K74B	C2229-B1	Agastat	GPBN	S
5A-K74D	C2229-B2	Agastat	GPBN	S
DCFC	C101	W	MD101	S
K1	C101	W	MD101	S
K2	C101	W	MD120	S
K3	C101	PB	PR11AY	S
K4	C101	PB	PR11DY	S
LO	D33	ASC	24A/120	S
OPS1	C104C	UEC	Type J6-1156	S
OPS2	C104C	UEC	Type J6-1156	S
PS1360-9D	C2257B	Barksdale	PIH-M85SSV	C
PSH2368B	C2250A	Barksdale	B2T-M12SS	C
TP	C104B	Tach Pak	FSS653	S
TS	Y11	ASC	X906126CL1A	S
TS-1	D32	ASC	163A195C12	S
105E	C6	GE	HFA54J	S
105F	C6	GE	HFA54J	S
187-509	A509	W	SA-1	S
187-609	A609	W	SA-1	S
132-509	C101	W	CRN-1	C
132-609	C102	W	CRN-1	C

Total Number of OL2 Relays = 89

#### POTENTIAL RESOLUTION METHOD

S = Outlier relays to be verified by **REVIEW AND COMPARISON** with similar rugged components.

C = Outlier relays to be verified by **CIRCUIT ANALYSIS**.

## "OUTLIERS"

### LIST OF OUTLIERS - OL3

<u>Relay ID</u>	<u>Panel Number</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Potential Resolution Method</u>
103A	C6	GE	12HFA151A2F	C
103B	C6	GE	12HFA151A2F	C
127-504X	A504	GE	12HFA151A2H	C
127-604X	A604	GE	12HFA151A2H	C
27-B1X	B6	GE	12HFA151A2H	C
27-B1Z	B1	GE	12HFA151A2H	C
27-B2X2	B6	GE	12HFA151A2H	C

Total Number of OL3 Relays = 7

#### Legend

OL3 = Relay an outlier. Relay seismic capacity less than seismic demand  
 GE = General Electric

### LIST OF OUTLIERS - OL4

<u>Relay ID</u>	<u>Panel Number</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Potential Resolution Method</u>
DCFT1	C101	A	241PD	C
DCFT2	C103B	A	241PD	C
DCFT2	C104B	A	241PD	C

Total Number of OL5 Relays = 3

#### Legend

OL4 = Relay an outlier. Time delay pickup outside the normal timing range  
 A = Agastat

### POTENTIAL RESOLUTION METHOD

- S = Outlier relays to be verified by **REVIEW AND COMPARISON** with similar rugged components.
- C = Outlier relays to be verified by **CIRCUIT ANALYSIS**.

ATTACHMENT 3

SAFETY IMPLICATION OF OUTLIER RELAYS

ATTACHMENT 3  
SAFETY IMPLICATION OF OUTLIER RELAYS

This section contains an assessment of the safety implications of the current population of outlier relays.

Part II, Section 5, of the GIP (Rev. 2A) defines an "outlier" as "an item of equipment which does not comply with all the screening guidelines provided in this Generic Implementation Procedure (GIP)." Outliers, of course, can be resolved under the guidance of the GIP. When an outlier cannot be resolved using this guidance, it is considered an "unresolved outlier".

At the time of this report, there are no "unresolved" outlier relays. There are outliers for which the GIP resolution process has yet to be completed.

The relays are grouped by equipment category. The table lists associated equipment, the function of the equipment, the outlier concern, a basis for why an operability concern does not exist, and the expected resolution.

Compensatory Measures/Conditions Recommended: In synopsis, the following systems are credited in the safe shutdown paths. A summary of system status is noted while individual components and concerns are addressed in the following pages:

Reactivity Control	RPS/CRDM	
Pressure Control	S/RVs	No OL's
	HPCI	No OL's
	RCIC	Credit Operator Action (OA), Reset system, swap suction path
	RHR	No OL's
Inventory Control	HPCI	*
	RCIC	Credit OA, Reset system, swap suction path
	CSA/B	*
Decay Heat Removal	RHR	*
	RBCCW	*
	SSW	*
	EDGs	*
Support Systems	H&V	*
	Elect. Dist.	*

\* = No required actions, resolve outliers (OL) in accordance with GIP.

<u>Category</u>	<u>Equipment ID</u>	<u>Function</u>	<u>Concern</u>
Transfer Switches	D32/33, Y10,11,12	Power seeking transfer switches that <u>upon</u> LOOP, <u>with</u> failure of preferred source, would automatically connect a secondary source to the vital/instrument AC or alternating DC controls.	<ul style="list-style-type: none"> <li>•Transfer switches are rugged, but internal relays (ASCO) have been identified as outliers due to documentation lacking.</li> <li>•Operator action would be required to diagnose and provide switching.</li> </ul>

Operability Concern:  YES  NO

Basis: Further review IAW GIP is expected to demonstrate qualification under "Rule Of the Box" and GERs for Automatic Transfer Switches.

<u>Category</u>	<u>Equipment ID</u>	<u>Function</u>	<u>Concern</u>
EDG H&V Dampers	SVL22, 23	Open dampers allowing air inlet to EDGs while running for combustion and cooling.	<ul style="list-style-type: none"> <li>•Present relay review identified outlier relay due to demand exceeding capacity.</li> <li>•LOOP results in loss of air, dampers fail open.</li> <li>•Even if relay fails, the only affect would be the damper opening from loss of air, the resulting time delay would have an inconsequential effect on ambient air temperature.</li> <li>Combustion would not be affected.</li> <li>•E422, M6-22-14</li> </ul>

Operability Concern:  YES  NO

Basis: Review of circuit identified qualifiable relay in circuit that would open dampers upon initiation.

Category  
EDGs

Equipment ID  
X107A/B

Function  
Upon loss of offsite power, recognize condition and provide power to Safety Busses A5/A6.

Concern  
•EDG protective sensors/relays are outliers due to GERs data not being available and circuit under review would require operator action to reset prior to EDG providing power to bus.  
•Time delay and operator distraction would have to be addressed.

Operability Concern:  YES  NO

Basis: Review identified alternate circuit (LOOP) with qualifiable switch that would provide EDG power to bus without operator action.

---

Category  
Exciter Regulator For EDG

Equipment ID  
X107A/B-ER

Function  
The EDG exciter regulator provides and controls voltage at generator terminals to allow load changes within limitation/design of equipment being supplied.

Concern  
•Present relay review identified outliers whose qualification is unknown.  
•Should relay fail, operator action would be required.  
•Present procedures recognize and provide direction for failure.

Operability Concern:  YES  NO

Basis: Review is expected that O.L. relays are defacto contactors (Ref. GERs CON.3) whose capacity exceeds demand.

---

Category  
RMCS Solenoids

Equipment ID  
FCV302-120,  
121,  
122,  
123

Function  
Provide pressure boundary at HCU during scram such that  $\Delta P$  is available at CRD piston and SDV header is not prematurely filled.

Concern  
•Seismic capacity data is not available for relay Model CR120K24002AB, while system descriptions from vendor credit system boundary integrity and inability by design for RMCS to degrade RPS function.

Operability Concern:  YES  NO

Basis: CR120K Relays are seismically rugged; documentation to that effect is being pursued.

Category  
4160V Breaker

Equipment ID  
A504, A604

Function  
4160V Breaker which connects the Startup Transformer to the A5/A6 Bus.

Concern

- Circuit Breaker is seismically rugged.
- The seismic qualification of the differential overcurrent relay is unknown.
- The seismic qualification of the differential ground current relay is unknown.
- The seismic qualification of the overcurrent relay is unknown.
- Failure of these relays could cause a lockout of the Startup Transformer.
- Operator action would be required to manually reset the lockout relay.
- The undervoltage relay is classified as an outlier.

Operability Concern:  YES  NO

Basis: Should relays fail, the S/U Transformer would not supply power to A5/A6, the EDG would. Operator action would be needed to restore the S/U as the source; this would not affect any of the credited shutdown paths. Furthermore, it is expected review will qualify relays under GERS for medium voltage switchgear (LVS/MVS.7).

---

Category  
4160V Breaker

Equipment ID  
A505, A605

Function  
4160V Breaker which connects Unit Auxiliary Transformer to the A5/A6 Bus.

Concern

- Circuit breaker is seismically rugged.
- There are outlier relays in the control circuit.

Operability Concern:  YES  NO

Basis: Review of circuit; outlier contacts are expected to be seismically qualified by Switchgear GERS MVS/LVS.7.



<u>Category</u>	<u>Equipment ID</u>	<u>Function</u>	<u>Concern</u>
4160V Breaker	A501, A601	4160V Breaker which connects Shutdown Transformer to the A5/A6 Bus.	<ul style="list-style-type: none"> <li>•Circuit breaker is seismically rugged.</li> <li>•There are outlier relays in the control circuit.</li> </ul>

Operability Concern:  YES  NO

Basis: Review of circuit; outlier contacts required to prevent unacceptable action are expected to be seismically qualifiable by Switchgear GERS MVS/LVS.7.

<u>Category</u>	<u>Equipment ID</u>	<u>Function</u>	<u>Concern</u>
4160V Breaker	A502, A602	4160V Breaker which provides power to the Control Rod Drive Pump.	<ul style="list-style-type: none"> <li>•Circuit breaker is seismically rugged.</li> <li>•There are outlier relays in the control circuit.</li> </ul>

Operability Concern:  YES  NO

Basis: Review of control circuit; outlier contacts required to prevent unacceptable action are expected to be seismically qualifiable by Switchgear GERS MVS/LVS.7.

<u>Category</u>	<u>Equipment ID</u>	<u>Function</u>	<u>Concern</u>
4160V Breaker	A509, A609	4160V Breaker which connects the Diesel Generator to the A5/A6 Bus.	<ul style="list-style-type: none"> <li>•Circuit Breaker is seismically rugged.</li> <li>•The protective relays are classified as outliers.</li> <li>•Operator action to restart the Diesel Generator is available should relays fail.</li> </ul>

Operability Concern:  YES  NO

Basis: Initial review has identified OL's due to qualification documentation lacking for specific relays. Further review IAW GIP is expected to demonstrate qualification by similarity, use of contactor GERS CON.3, application of "Rule Of the Box" with GERS MVS/LVS.7, and analysis considering chatter acceptable.

Category  
480V Breaker

Equipment ID  
B601, B602, 102, 202,  
310, 410

Function  
480V Breaker which  
connects and/or isolates  
safety busses.

Concern  
•Circuit breaker is  
seismically rugged.  
•Outlier relays in the  
breaker control circuit.

Operability Concern:  YES  NO

Basis: Review of control circuit; all contacts required to prevent unacceptable action are expected to be seismically qualifiable by Switchgear GERS MVS/LVS.7.

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Category  
Drywell Cooler Fans

Equipment ID  
VAC205A-1  
VAC205B-1  
VAC205C-1  
VAC205D-1  
VAC205E-1  
VAC205F-1  
VAC206A-1  
VAC206B-1  
VAC205A-2  
VAC205B-2  
VAC205C-2  
VAC205D-2  
VAC205E-2  
VAC205F-2  
VAC206A-2  
VAC206B-1

Function  
Provide drywell  
environmental cooling.

Concern  
•Outlier relay in control  
circuit.  
•Operator action to  
restart the drywell  
cooler fans may be  
required should these  
relays fail.

Operability Concern:  YES  NO

Basis: HFA54J Relays are seismically rugged; documentation to this effect is being pursued.

ATTACHMENT 4

RECORD OF ESSENTIAL RELAY WALKDOWN FOR USI A-46  
PROJECT

## RECORD OF ESSENTIAL RELAY WALKDOWN FOR USI A-46 PROJECT

A walkdown of ninety (90) relays on Essential Relay List was performed on March 15, 1996, in support of USI A-46 Project. Ninety different relays housed in five different panels located in Control Room (2), Cable Spreading Room (2) and "A" Diesel Generator Room (1), were looked at with regards to:

- (1) Confirmation of make and model number of the relays; and,
- (2) Adequacy of relay mounting within the panel.


A summary of the walkdown is attached. No anomalies were found.

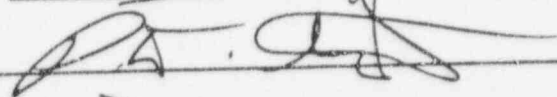
Walkdown Team:


Subhash C. Chugh

Paul D. Smith

Denise T. Thomas

  
3/19/96

  
3/17/96

  
3/19/96

**SUMMARY OF RELAY WALKDOWN FOR USI A-46 PROJECT**

Panel Number: C103B				
Panel Name: DG "A" Diesel Engine Control				
RELAY ID	MAKE/MODEL NUMBER	MAKE/MODEL NUMBER VERIFIED & O.K. (Y/N)	RELAY MOUNTING VERIFIED & O.K. (Y/N)	COMMENTS
CKVR	W/BFD 30S	Y	Y	
CR1	W/BFD 20S	Y	Y	
CR2	W/BFD 20S	Y	Y	
DCFT2	A/2412 PD	Y	Y	
EMSR	W/BFD 66S	Y	Y	
ESR 1	W/BFD 84S	Y	Y	
ESR 2	W/BFD 84S	Y	Y	
ESR 3	A/7022 PB	Y	Y	
JWPR 1	W/BFD 71S	Y	Y	
JWPR 2	W/BFD 71S	Y	Y	
JWTRH	W/BFD 40S	Y	Y	
KWR	W/BFD 30S	Y	Y	
KWT	A/2412 PD	Y	Y	
LOLR	W/BF 20F	Y	Y	
LOTHR	W/BFD 30S	Y	Y	
OCR	W/BFD 30S	Y	Y	
OCT 1	A/2412 PD	Y	Y	
OCT 2	A/2412 PD	Y	Y	
OPR 1	W/BFD 30S	Y	Y	
OPT 1	A/2412 PD	Y	Y	
OPT 2	A/2412 PD	Y	Y	
OSR	W/BFD 30S	Y	Y	
SDR	W/BFD 33S	Y	Y	
SPR	W/BFD 33S	Y	Y	
TP	T/FSS 653	Y	Y	
TVT 1	A/2412 PD	Y	Y	
TVT 2	A/2412 PD	Y	Y	
Legend				
W = Westinghouse				
A = Agastat				
T = TachPak				

**SUMMARY OF RELAY WALKDOWN FOR USI A-46 PROJECT**

Panel Number: C6				
Panel Name: Load Shedding Panel				
RELAY ID	MAKE/MODEL NUMBER	MAKE/MODEL NUMBER VERIFIED & O.K. (Y/N)	RELAY MOUNTING VERIFIED & O.K. (Y/N)	COMMENTS
103A	GE/12HFA151A2F	Y	Y	
103B	GE/12HFA151A2F	Y	Y	
103C	GE/12HFA151A2F	Y	Y	
103D	GE/12HFA151A2F	Y	Y	
104E	GE/12HFA151A2F	Y	Y	
104F	GE/12HFA151A2F	Y	Y	
104G	GE/12HFA151A2F	Y	Y	
62-104A	A/2412 PBL	Y	Y	
62-104B	A/2412 PBL	Y	Y	
Legend				
GE = General Electric				
A = Agastat				

## SUMMARY OF RELAY WALKDOWN FOR USI A-46 PROJECT

Panel Number: C917				
Panel Name: Channel B Primary Isolation and Rx Protection				
RELAY ID	MAKE/MODEL NUMBER	MAKE/MODEL NUMBER VERIFIED & O.K. (Y/N)	RELAY MOUNTING VERIFIED & O.K. (Y/N)	COMMENTS
5A-K14B	GE/CR105D1	Y	Y	
5A-K14D	GE/CR105D1	Y	Y	
5A-K14F	GE/CR105	Y	Y	
5A-K14H	GE/CR105	Y	Y	
5A-K15B	GE/CR105D1	Y	Y	
5A-K15D	GE/CR105	Y	Y	
5A-K19B	GE/12HFA151A2F	Y	Y	
5A-K19D	GE/12HFA151A2F	Y	Y	
Legend				
GE = General Electric				

**SUMMARY OF RELAY WALKDOWN FOR USI A-46 PROJECT**

Panel Number: C932				
Panel Name: Channel "A" Vertical Board				
RELAY ID	MAKE/MODEL NUMBER	MAKE/MODEL NUMBER VERIFIED & O.K. (Y/N)	RELAY MOUNTING VERIFIED & O.K. (Y/N)	COMMENTS
10A-K10A	GE/HFA	Y	Y	
10A-K18A	GE/12HGA11A52F	Y	Y	
10A-K21A	GE/12HGA11A52F	Y	Y	
10A-K44A	GE/12HFA151A2F	Y	Y	
10A-K63A	GE/12HFA151A2F	Y	Y	
10A-K65A	GE/12HGA11A52F	Y	Y	
10A-K66A	GE/12HFA151A2F	Y	Y	
10A-K67A	GE/12HGA11A52F	Y	Y	
10A-K6A	GE/12HFA151A2F	Y	Y	
10A-K70A	A/ETR	Y	Y	
10A-K75A	A/ETR	Y	Y	
10A-K8A	GE/12HFA151A2F	Y	Y	
10A-K90A	GE/12HFA151A2F	Y	Y	
10A-K9A	GE/12HFA151A2F	Y	Y	
14A-K10A	GE/12HFA151A2F	Y	Y	
14A-K12A	GE/12HFA151A2F	Y	Y	
14A-K13A	GE/12HFA151A2F	Y	Y	
14A-K14A	A/ETR14D3A003	Y	Y	
14A-K6A	GE/12HFA151A2F	Y	Y	
14A-K7A	GE/12HFA151A2F	Y	Y	
14A-K8A	GE/12HFA151A2F	Y	Y	
14A-K9A	GE/12HFA151A2F	Y	Y	
2E-K13A	GE/12HFA151A2F	Y	Y	
2E-K13B	GE/12HFA151A2F	Y	Y	
2E-K13C	GE/12HFA151A2F	Y	Y	
2E-K13D	GE/12HFA151A2F	Y	Y	
2E-K15A	GE/12HFA151A2F	Y	Y	
2E-K15B	GE/12HFA151A2F	Y	Y	
2E-K22A	A/GP	Y	Y	
2E-K22B	A/GP	Y	Y	
2E-K23A	A/GP	Y	Y	
2E-K23B	A/GP	Y	Y	
2E-K6A	GE/12HFA151A2F	Y	Y	
2E-K6B	GE/12HFA151A2F	Y	Y	
2E-K7A	GE/12HFA151A2F	Y	Y	
2E-K7B	GE/12HFA151A2F	Y	Y	

Legend  
 GE = General Electric  
 A = Agastat



SUMMARY OF RELAY WALKDOWN FOR USI A-46 PROJECT

Panel Number: C941				
Panel Name: Primary Containment Isolation Relay Cabinet Inboard				
RELAY ID	MAKE/MODEL NUMBER	MAKE/MODEL NUMBER VERIFIED & O.K. (Y/N)	RELAY MOUNTING VERIFIED & O.K. (Y/N)	COMMENTS
16A-K13A	GE/12HFA151A2H	Y	Y	
16A-K14A	GE/12HFA151A2H	Y	Y	
16A-K51	GE/12HFA151A2H	Y	Y	
16A-K9	GE/CR120A	Y	Y	
23A-K37	GE/CR120	Y	Y	
23A-K37X	GE/CR120	Y	Y	
23A-K38	GE/CR120	Y	Y	
23A-K53A	A/EGPD002	Y	Y	
23A-K54A	A/EGPD002	Y	Y	
Legend				
GE = General Electric				
A = Agastat				

ATTACHMENT 5

RESUMES OF LEAD RELAY/RELAY REVIEWERS

PAUL D. SMITH  
127 ELLISVILLE ROAD  
PLYMOUTH, MA 02360  
(508) 833-1429(H)  
(508) 747-8404(w)

OBJECTIVE: A position of influence, utilizing my technical skills and experience to forward the efforts of an environmentally conscious and socially responsible company.

EDUCATION:

1974 Northeastern University, Boston, MA  
Bachelor of Science Degree in Engineering Technology  
Major in Electrical Engineering  
Additional courses in Control Systems and Nuclear  
Technology

1966 Wentworth Institute, Boston, MA  
Associate Degree in Electrical Engineering

LICENSES:

NRC Senior Reactor Operator License #10260 (BWR) - 1985

State of Massachusetts License, Nuclear Power Plant  
Operating Engineer #00287 - 1984

Federal Communications Commission, Second Class 1970

TRAINING:

MPR Associates, GIP/SQUG Relay Evaluation Course

G.E. Nuclear Instrumentation Course, San Jose, CA - 13  
weeks. Theory and maintenance of Instrumentation and  
Controls

Foxboro Electronic Consotrol Course - 2 weeks. Introduction  
to Foxboro Instrumentation

Motorola Communications Course - 2 weeks. Maintenance of  
Solid State Devices

Attended the following schools for approximately 1 week each:

- Hydro-Products Underwater TV Seminar
- Hammel-Dahl Valve School
- Radiation Protection Course
- Emergency Medical Technician Course

EXPERIENCE:

1967 TO PRESENT Boston Edison Company, Boston, MA  
Pilgrim Nuclear Power Station, Plymouth, MA

(1/95 TO PRESENT) Senior System's and Safety Analysis Engineer  
Providing/supporting root cause analysis, design/procedure reviews on Analog Trip System failures, AOG premature recombination, N<sub>2</sub> system seismic capability, Bistable vortexing accommodation, SFP Boron depletion, Ultimate Heat Sink and USI-A46 safe shutdown issues.

Nuclear Watch Engineer/Acting Operations Support Division Manager  
(1992 - 1994)

Provide Operations input to planning/scheduling of Refueling Outage; Direct Critical Path Outage activities; Augment Fuel Pool Cooling, Core offload/reload, CRD System Window, RPV Reference Leg Modification and Test Director for Power Ascension Program. Ops Support includes management of STAs, ALARA, and Computer Interfaces; Administration of Operating Procedures. PDC, Technical Specification Technical Review and impact assessment.

Nuclear Operations Supervisor (1990 - 1992)

Supervised/directed on-shift activities in the operation and maintenance of Pilgrim Nuclear Power Station

Chief Technical Engineer (1980 - 1989)

Managed group of Senior Level Engineers including Mechanical, Electrical, I&C and Health Physics disciplines; Reviewed, revised Design Changes and Technical Specification Changes for operability, testability and maintenance; Provided investigations for root causes of operational problems and authored temporary procedures or modifications to rectify; Managed Onsite Reactor Engineering effort; Managed Radwaste Improvement Program.

Acting Chief Maintenance Engineer (1979 - 1981)

Acted on behalf of and assumed all responsibilities of the Chief Maintenance Engineer in his absence. Managed the efforts of a 40-man Maintenance Crew including Mechanical and Electrical disciplines providing repairs and implementation of modifications to Pilgrim Nuclear Power Station during operating cycle and included 200-man Contractor crew during refueling.

Maintenance Staff Engineer/I&C (1975 - 1978)

Responsible for the overall direction and supervision of the maintenance of station Instrumentation Controls and associated equipment and the performance of surveillance tests in accordance with regulatory agencies and Company general orders. Analyzed Control, Instrumentation and Computer Systems and determined adjustments and modifications to ensure that equipment functioned in a proper manner and full Safeguard Protection was maintained.

Instrument & Control Supervisor (1974 - 1975)

As a front-line supervisor, directed the efforts of nine Nuclear Control Technicians in coordinating System calibration with the Operations Section. Devised and implemented Field Design Changes related to instrumentation measurement and control, specifically Neutron Monitoring and Nuclear Steam Supply Systems.

## OTHER EXPERIENCE:

- |                 |  |
|-----------------|--|
| 1980 TO 1995    | Operations Review Committee Member   |
| 1986 TO PRESENT | Technical Support Center Supervisor in Emergency Plan  |
| 1986 TO PRESENT | Manage Multidisciplined Analysis Teams determining root cause/corrective actions for events such as: RPV Level Anomalies, Dropped Fuel Bundle, Feedwater Control Valve Failure, HPCI/RCIC/RHR System Failures, MSIV Pilot Poppet Disassociation, Halon Discharge, 345KV Switchyard Misoperation, S/RV Overpressure Event, Lead Relay Reviewer for A46 Project. |
| 1989            | Power Ascension Program: As Test Coordinator, provided interface with Operations Section by scheduling and directing tests following extended CAL mandated outage.   |

REFERENCES: Available upon request.

DENISE E. THOMAS  
90 Myrtle Avenue, Apt. 211  
Whitman, MA 02382  
Tel. 617-447-7840

**Career Objectives:** A position in electrical engineering which will allow me to develop my professional skills and provide personal growth.

**Employment:**

4/93-Present  
BOSTON EDISON COMPANY, Pilgrim Nuclear Power Station-  
Plymouth, MA  
Provide technical support on electrical systems and equipment at Pilgrim Nuclear Power Station. Responsibilities include preparing and issuing design modification packages, procuring equipment, preparing calculations; Specific projects include installation of Variable Frequency Drive on Turbine Building Crane Bridge motor, installation of Turbine Performance Monitoring equipment; Relay screening for the USI A-46 Program.

6/88-4/93  
GENERAL DYNAMICS/Electric Boat Division-Groton, CT  
Submarine Reactor Plant Planning Yard Electrical Engineer  
Provided technical support for the design and development of instrumentation and control systems on commissioned submarines through ship alteration work packages. Also provided resolution of various problems associated with the installation of systems through liaison correspondence. Responsible for the issuance of system modification instructions which provided installation, test, drawing, and procurement information. Provided resolution to problems associated with radiation monitoring and temperature monitoring equipment.

6/86-8/86  
and  
8/85-12/85  
and  
1/85-5/85  
GEORGIA POWER COMPANY-Atlanta, GA  
Transmission Line Group - Electrical Engineering Dept.  
Cooperative Education Student  
Cooperative Education assignment in the Transmission Section to support installation of 500, 230, and 115KV transmission lines.  
Compiled sag and tension data, modified drawings, maintained specification manuals.

**Education:** RENSSELAER POLYTECHNIC INSTITUTE, Troy, NY  
Pursuing Master Of Science in Electrical Engineering

TUSKEGEE UNIVERSITY, Tuskegee, AL  
Bachelor Of Science in Electrical Engineering  
Graduation Date: May 1988

**Special Training:** Submarine Reactor Plant School  
Radiation Control  
Safe Shutdown Equipment Selection Course  
Relay Screening and Evaluation Course  
Engineering In Training Certificate

**References:** Available Upon Request

## RESUME

Name Subhash C. Chugh  
Position Senior Engineer  
Department Mechanical/Civil/Structural

### EDUCATION

MBA, Kellogg Graduate School of Management, Northwestern University, Evanston, IL  
BS, Civil Engineering, Osmania University, Hyderabad, India

### SPECIALTIES/EXPERTISE

Structural Engineering  
Project Management  
Field Construction Management  
SQUG Walkdown Screening and Seismic Evaluation Certification  
Relay Seismic Qualification

### EXPERIENCE PROFILE

Total Engineering Experience	26 Years
Nuclear Industry Experience	20 Years
Fossil Industry Experience	1 Year
Petroleum/Refining Industry Experience	3 Years
Commercial Eng./Architectural Industry Experience	2 Years

Dated 8/13/96

## RESUME

Name: John G. Dyckman  
Position: Principal Engineer  
Department: Civil/Structural/Mechanical  
Group: Nuclear Engineering

### EDUCATION

M.S., Civil Engineering, Northeastern University, Boston, MA  
B.S., Civil Engineering, Worcester Polytechnic Institute

### PROFESSIONAL REGISTRATION

Registered Professional Engineer #27157 - Massachusetts

### PROFESSIONAL MEMBERSHIPS

American Society Of Civil Engineers, Member

### SPECIALTIES/EXPERTISE

SQUG Certification: SQUG Walkdown Screening and Seismic Evaluation  
Training Course

### EXPERIENCE PROFILE

Total Years Engineering Experience: 30

<u>Employer</u>	<u>Position</u>	<u>Function</u>
BECo	Principal Engineer	Civil/Structural engineering and staff assignments
Cygna	Engineering Manager	Engineering consulting
Stone & Webster	Sr. Structural Engineer	Power plant engineering and design

Dated 5/28/96





VECTRA

BORIS LOKSHIN  
SUPERVISING ENGINEER

### PROFESSIONAL EXPERIENCE

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Dr. Lokshin is a Supervising Engineer in the Systems Engineering Section in VECTRA's Boston office with over 18 years of experience in the engineering, and design of instrumentation and electrical control systems with strong theoretical background in modeling and systems testing with technical management experience at project level.

Dr. Lokshin is presently Project Manager and Project Engineer for Boston Edison Company's Setpoint Control Program project. Major tasks of this project include: 1) development of conceptual design for Setpoint Control Program (SCP); 2) preparation of setpoint calculations, and 3) preparation of Technical Specification Change Packages. The calculations are being performed using the instrument as-found/as-left statistically analyzed calibration data. This approach is consistent with recommendations of NRC Generic Letter 91-04 "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle". Dr. Lokshin is personally involved in specific loop analysis, development of SCP, and Technical Specification change Packages. In addition, he is responsible for the day-to-day operation of the project by maintaining control of technical work, tracking project production, commitments and the completion of project deliverables.

Prior to this assignment, Dr. Lokshin served as Project Manager for BECo's Reg. Guide 1.97 project. In this capacity, he provided technical direction in circuit analysis and instrument loop accuracy/uncertainty calculations.

Recently, Dr. Lokshin was assigned as a Project Engineer on the Hydrogen Water Chemistry Project at Pilgrim Nuclear Power Station for Boston Edison Company where he is responsible for developing I&C documents related to the project, evaluating technical data provided by General Electric and preparing Design Change Packages.

While assigned to Boston Edison Company's engineering office, Dr. Lokshin supported the VECTRA project team which assisted BECo with the initial "pilot" I&C Safety Functional Inspection by the NRC.



VECTRA

BORIS LOKSHIN

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### PROFESSIONAL EXPERIENCE (Cont')

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In a recent assignment, Dr. Lokshin was involved in the PSE&G - Salem Unit 2 Station DCRDR modification project, where he was responsible for reviewing Alarm Response Procedures, Operating, Maintenance, I&C and other procedures affected by DCRDR modification, and identifying design discrepancies in Annunciator Window Arrangement drawings.

Previously, he was assigned to the Peach Bottom Atomic Power Station Configuration Management Assessment Project for Philadelphia Electric Company (PECO), where he participated in functional area assessments for design basis and training.

Dr. Lokshin was also involved in analyzing PECO setpoint calculation methodology, including algorithm review.

Earlier, he worked on the Watts Bar Nuclear Plant Design Review Project for TVA where he was responsible for developing a design criteria for Loose Parts/Vibration Monitoring System and involved in developing a design criteria for instrumentation and controls for the Watts Bar Plant.

Prior to this assignment, Dr. Lokshin worked on the Millstone 1 Appendix "R" circuit failure analysis project for Northeast Utilities, where he was responsible for performing a circuit failure analysis of the control and power circuits for instrumentation and other equipment required for safe shutdown. On this project, he reviewed elementary and loop diagrams to determine the effects on equipment due to fire induced cable failures, and documented the analysis on the drawings.

While assigned to the Miramichi Pulp & Paper Recovery Boiler Project for C-E Canada, Dr. Lokshin was responsible for the engineering and specification of Process Instrumentation and developing Instrument Loop Diagrams.

In previous assignments, Dr. Lokshin has been responsible for developing and approval of Test Loop Diagrams, reviewing engineering and design documents, including elementary and wiring diagrams, and resolving discrepancies of various electrical control systems for nuclear power plant design projects, including Beaver Valley Unit 2 for Duquesne Light Company and Millstone Unit 3 for Northeast Utilities while working for a large architect-engineering firm in the Boston area.



VECTRA

BORIS LOKSHIN

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### PROFESSIONAL EXPERIENCE (Cont'd)

Dr. Lokshin has supervised a staff of 12 test engineers and directed engineering field support activities in the calibration and maintenance of a broad range of devices (digital and analog), including various types of sensors, converters, programmable controllers and other instruments. He was also responsible for developing and approval of Loop Calibration reports, and gathering and analyzing data for various automatic control systems.

Previously, as a project leader, Dr. Lokshin was responsible for development of methods for measuring open loop response of various control system elements, processing of experimental data using methods of random function theory, deriving mathematical models, optimization of parameters, formulating recommendations for implementation of control systems, analyzing process stability, accuracy and deviation. These efforts culminated in the publication of his dissertation, "Research and Development of Control System for Mobile Object".

He has also participated in developing and operating automatic control system prototypes and debugging and testing in the field.

### EDUCATION

Ph.D., Control System Engineering, Department of Engineering, Leningrad Institute of Technology and Agriculture, 1978

M.S.E.E., Leningrad Polytechnic Institute, Leningrad, USSR, 1973

### PROFESSIONAL LICENSES AND REGISTRATIONS

Certified as a Level III Test Engineer per ANSI N45.2.2



VECTRA

STEPHEN P. REICHLE

## PROFESSIONAL EXPERIENCE

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Mr. Reichle has over 20 years of power plant engineering, design, maintenance, and operations experience. As Technical Services Consultant for Mechanical Systems in VECTRA's Boston office he is currently assigned as the Project Manager for the Fire Hazards Analysis (FHA) project for the New York Power Authority. This project consists of updating the FHAs for both the James A. FitzPatrick and Indian Point 3 nuclear plants. The project also includes the preparation of an analysis that assesses the effects of pipe rupture, inadvertent actuation and manual use of fire protection systems on safety-related equipment at JAF and IP3.

Mr. Reichle is also currently serving as the Systems Project Engineer on the NRC's Unresolved Safety Issue (USI) A-46 projects for: Northeast Utilities (Millstone 1, 2 and Connecticut Yankee), Philadelphia Electric (Peach Bottom and Limerick) and Public Service Electric & Gas (Salem). In this role, he is responsible for the identification of safe shutdown paths and the development of a Success Path Component List for each unit. These NRC programs deal with the seismic adequacy, or margin of equipment in operating plants.

Previously, Mr. Reichle served as the Project Manager for the Appendix R Compliance Program and Fire Barrier Upgrade Projects at the Pilgrim Station. Mr. Reichle managed these programs for over two years, with tasks including the development of Appendix R shutdown analyses, the development of associated operating procedures, the review and upgrade of all Appendix R fire barriers, and the design of various electrical and mechanical system modifications. This project was staffed with approximately 25 engineers and technicians:

Mr. Reichle served as the Project Engineer, and managed the engineering resources, during the update of the J. A. FitzPatrick Fire Protection Reference Manual, and supported the update of the Fire Protection Program Manual for Indian Point Unit 3. Both of these projects involved the update of fire protection and Appendix R programs to include the changes made by modifications, and the preparation of a new manual that included both programs.

Mr. Reichle also served as the Project Engineer for an Appendix R project for Northeast Utilities Millstone 3 Nuclear Power Plant. This project consisted of four major tasks: 1) review the plant's safe shutdown methodology and equipment list to ensure completeness 2) identify which components might be affected for each fire area, 3) identify the worst case fire scenario (in terms of equipment loss) for each fire area, and 4) identify and prioritize the operator actions that need to be taken in each fire area.



VECTRA

STEPHEN P. REICHLER

Page Two

### EXPERIENCE (Cont'd)

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Prior to this assignment, Mr. Reichle performed a design baseline verification of the Emergency Operating Procedures (EOP) for Nine Mile Point 1, and determined the impact of operating safety related systems with normally open manual valves at the system's interface with non-safety related portions of the system. His responsibilities on these projects included the preparation of verification packages to document design basis of input parameters to EOP flowcharts, preparation of various design calculations, and preparation of a report on the boundary valves. Also included within this project was a review of the plant's Service Water System and the effect of increased lake water temperature.

Mr. Reichle has also served as a technical specialist in support of triennial fire protection audits at the H.B. Robinson, Brunswick and Shearon Harris nuclear power plants. During these audits, he served as the Systems Engineer reviewing station operating practices, programs and procedures used to ensure safe shutdown of the plants in the event of a fire.

Mr. Reichle has prepared Design Baseline Documents (DBDs) for the feedwater and fire protection systems at the PECO Peach Bottom and Limerick nuclear plants. This project consisted of conducting the necessary research to identify the boundaries, interfaces and requirements of the individual systems. The documents also describe how each of the systems satisfies their design input and output requirements, and what modifications have impacted the system's original design basis. Mr. Reichle also participated in the Appendix R update project for the Limerick Nuclear Station by reviewing the new and updated shutdown methods identified for each fire area, and assisting in the resolution of shutdown concerns identified during the review process.

Mr. Reichle has also served as the Project Manager for the single failure analysis of the ECCS sub-systems, and their support systems, for the Connecticut Yankee plant. This project included the identification and review of potential equipment failures for each of the systems, including mechanical, electrical and instrumentation, during injection and recirculation modes in response to a LOCA.

In conjunction with the above single-failure analyses, a review of the CY surveillance procedures was performed. This review was conducted to ensure that all ECCS redundant or required components were included in the appropriate procedure, and that proper surveillances were being performed to assure operability of the systems.



VECTRA

STEPHEN P. REICHLE

Page Three

### EXPERIENCE (Cont'd)

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Prior to joining VECTRA, Mr. Reichle was a Senior Engineer at Cygna Energy Services and assisted in the preparation of the Appendix "R" review for NUSCo's Millstone 1, 2 and Connecticut Yankee generating stations. As a member of this project, he was assigned tasks such as developing safe shutdown scenarios and identifying equipment which needed to be protected, establishing safe shutdown fire areas, performing walkdowns of fire areas to verify the adequacy of existing barriers (including doors, dampers, and penetration seals), identifying barrier deficiencies, preparing justifications for exemption requests, and making recommendations for upgrading fire barriers or their penetrations to the required fire resistance rating.

Mr. Reichle also participated in preparing a conceptual design of a seismic hot shutdown system for the Yankee Rowe Nuclear Plant. This project reviewed the feasibility of providing a standby, portable pumping system made up of standard commercial grade components, that would deliver water to the steam generators and/or main coolant system in the event no other method was available. Included in this project was the identification system demands, sizing of components, identification of water sources, and providing an estimated cost to install the system.

In a previous assignment, Mr. Reichle served as Lead Engineer for the development of surveillance and maintenance procedures for the Shoreham Power Station. His responsibilities included the identification of maintenance and inspection requirements for all mechanical balance of plant equipment. He established the parts requirements, special tools, rigging and handling instructions for those procedures. Mr. Reichle also supervised additional tasks for the Shoreham Station including:

- Development of Fire Protection Program Description and Associated Procedures
- Development of Maintenance Program Description
- NUREG-0612 Heavy Loads Analysis, and Procedure Preparation
- Preparation of Refueling Procedures
- Design, Analysis, and Fabrication of Fuel Handling and Reactor Head Strongback

Before joining Cygna, Mr. Reichle held the position of Lead Applications Engineer for the Jamesbury Corp., a manufacturer of fluid control equipment. His responsibilities included supervising technical analysis, sizing equipment, selecting material and accessories, and resolving field installation and operational problems of motor-operated valves.



VECTRA

STEPHEN P. REICHLE

Page Four

### EXPERIENCE (Cont'd)

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Mr. Reichle was responsible for sizing valve actuators (both pneumatic and electric) given the system operating conditions. For motor operated valves this task included determining the necessary torque output, then selecting the appropriate gear train configuration and motor size. For nuclear projects, motor sizing included considerations of both normal and degraded voltage conditions.

Earlier in his career, Mr. Reichle worked with Stone & Webster Engineering Corporation where he was the responsible engineer for liquid and solid radioactive waste systems. Responsibilities associated with this position included: development of system design and flow diagrams, engineering, selection of equipment and layout, preparation of equipment specifications and purchase requisitions. Other duties included review of system piping diagrams, and resolution of field installation problems. Mr. Reichle also assisted in the development of a spare parts program and database for Millstone Unit 3.

In his initial assignment at Stone and Webster, Mr. Reichle assisted in the preparation of a system operations manual for Connecticut Yankee. This work included the writing of system descriptions and operating procedures for the waste evaporator degasifier, aerated drains, and steam generator blowoff.

Before Mr. Reichle's employment with Stone & Webster, he spent six years in the U. S. Navy Nuclear Submarine Program where he qualified as an Engineering Watch Supervisor.

### EDUCATION

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B.S., Mechanical Engineering, Central New England College  
A.S., Mechanical Engineering, Worcester Junior College  
U.S. Navy Nuclear Power School and Prototype Training

Graduate Work, Fire Protection Engineering,  
Worcester Polytechnic Institute

### PROFESSIONAL ACTIVITIES

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Member, American Society of Mechanical Engineers  
Member, Society of Fire Protection Engineers



VECTRA

STEPHEN P. REICHLÉ  
TECHNICAL SERVICES CONSULTANT

### EXPERIENCE HIGHLIGHTS

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Twenty (20) years of experience in nuclear systems design, analysis, fire protection, 10CFR50 Appendix R safe shutdown analysis and related areas of the nuclear power industry.

VECTRA	1985 to present	Technical Services Consultant
CYGNA Energy Services	1981 to 1985	Lead Engineer
Jamesbury Valve	1979 to 1981	Lead Applications Engineer
Stone and Webster Eng.	1974 to 1979	Operations Services Engineer
U.S. Navy	1968 to 1973	Nuclear Power Program

### EXPERIENCE SUMMARY

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- Project Manager for NYPA (JAF and IP3) Fire Hazards Analysis update and Suppression Effects Analysis (1993 - present)
- Project Manager for NUSCO (Conn. Yankee) Single Failure Analysis of ECCS Sub-systems (1988 - 1989).
- Project Manager or Project Engineer for several 10CFR50 Appendix R Analysis and fire protection projects:
  - BECo (Pilgrim Station) Appendix R Analysis and Fire Barrier Upgrade (1985 - 1988)
  - NYPA (JAF and IP3) Fire Protection Reference Manual and FHA (1990 - 1992)
  - NUSCO (MP3) Appendix R Shutdown Methodology Review (1989)
- Project Engineer (System) for several USI A-46 and seismic IPEEE projects:
  - NUSCO (Conn. Yankee, Millstone 1 and 2) 1992 - present
  - PECO (Peach Bottom 1 and 2, Limerick 1 and 2) (1992 - present)
  - PSE&G (Salem 1 and 2) (1993 - present)
- Project Engineer for NMPC (NMP2) Design Basis Document project (1992 - 1993).
- Lead Engineer for radwaste systems design for new construction BWR.
- Preparation of conceptual designs and design change packages for various nuclear systems and components.
- Applications Engineer for the section of valves and actuators to meet client specifications.





VECTRA

JAMES J. BUCKLEY

## SPECIALTIES

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ELECTRICAL ENGINEERING AND DESIGN

## PROFESSIONAL EXPERIENCE

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Mr. Buckley is the Supervisor of Design and Drafting for VECTRA's Boston office Design/Engineering Section of the Electrical Systems Division. He has over 24 years of experience in the engineering, design and installation of electrical systems for power generation and various industrial facilities including pulp and paper projects and water/sewerage treatment plants.

Mr. Buckley has attended the SQUG training course for Safe Shutdown Equipment Selection and Relay Screening and Evaluation which qualifies him as a Lead Relay Reviewer. Presently, Mr. Buckley is the Lead Relay Reviewer for the identification of USI A-46 and IPEEE Safe Shutdown Equipment and Relays for Philadelphia Electric Company (PECo) Peach Bottom Atomic Power Station Units 2 and 3. The overall project scope is to retrieve each electrical component from the Safe Shutdown List for Relay Evaluation and review schematics, wiring diagrams and loop diagrams associated with each component to identify relays required to be verified as seismically adequate per the requirements of the SQUG Generic Implementation Procedure (GIP). He has also been the Lead Relay Reviewer for the Public Service Electric and Gas Company (PSE&G) Salem Generating Station Units 1 and 2, Northeast Utilities Service Company (NUSCO) for Connecticut Yankee and Millstone Units 1 and 2 and the Boston Edison Company Pilgrim Nuclear Power Station.

Prior to this assignment, he was the Project Engineer for the Boston Edison Pilgrim Station Annunciator Project, which performed a complete redesign of the existing system including the preparation of three Plant Design Change (PDC) packages. The project scope was to rearrange the Control Room annunciator windows and revise the associated electrical schematics, wiring diagrams, cable block diagram, cable and raceway schedules, process and instrumentation diagrams and functional control diagrams.

Previously, Mr. Buckley served as Lead Engineer for the Electric Load Management System project, a data collection effort for NUSCO's Millstone Unit 1 Station. He also held the same position for an identical project at NUSCO's Connecticut Yankee Station.



VECTRA

JAMES J. BUCKLEY

Page Two

### EXPERIENCE (Cont.)

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Prior to this assignment, Mr. Buckley was assigned to the Carolina Power and Light, Brunswick Plant, Appendix R separation analysis documentation review. He also supported the Niagara Mohawk, Nine Mile Unit 1, project which consisted of 125VDC system modifications, fuse and molded-case switch additions to the 125VDC distribution boards and addition of battery monitoring systems for 125VDC batteries. In a previous assignment, he was a Project Engineer on the Commonwealth Edison, Dresden Unit 2 Annunciator Modifications Project. This modification addressed the human engineering deficiencies associated with the plant annunciator system. Changes to the system included auditory coding, ringback and flashrate adjustment and reflash. These changes resulted in extensive revisions to the plant's wiring and schematic drawings.

Previously, he was the Lead Electrical Design/Engineer for the No. 4 Chemical Recovery Boiler Project for Miramichi Pulp and Paper. His responsibilities included checking electrical specifications and calculations, development of the wiring design for connection of field cables as well as the design of raceways, grounding, lighting, etc.

His earlier assignments at VECTRA included experience in an as-built verification of wiring diagrams for control panels and the development of design change packages required to resolve any deficiencies and updating all affected drawings for Boston Edison's Pilgrim Station. Other activities at Pilgrim Station included lighting design of the Computer Room, answering Engineering Service Requests (ESR), issuing and resolving Potential Conditions Adverse to Quality (PCAQ), writing and implementing Maintenance Work Request (MWR), evaluating plant conditions for circuit isolations and the preparing Appendix R Plant Design Change Packages. These packages included cable rerouting, and the installation of fire detection and suppression systems.

His previous assignments include a staff position on the Equipment Qualification Program team for Northeast Utilities and at the Seabrook Station which also included walkdown assignments. Earlier assignments with VECTRA include the electrical design of the Appendix R Emergency Lighting System for Connecticut Yankee.

In an assignment at the NYPA Fitzpatrick plant, Mr. Buckley was responsible for coordinating the installation of electrical modifications in accordance with 10 CFR 50, Appendix R. His responsibilities included the layout of equipment, conduit routing and design of conduit supports.



VECTRA

JAMES J. BUCKLEY

Page Three

### EXPERIENCE (Cont)

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Mr. Buckley previously worked with the C.T. Main Corporation Pulp and Paper Division where he was responsible for the electrical design of recovery boiler systems including precipitators, evaporators, and air compressors for the Ngodwana Mill Expansion Program in South Africa. In connection with this work, he was also responsible for raceway layout and design, and field engineering support. He prepared the secondary electrical power drawings, motor control center arrangements, computerized cable schedules, and related PLC drawings. He was assigned to the site for four months for the checkout and start-up of the recovery boiler, and the review of the electrical subcontractor's work. Other projects included the design of paper machines, power boilers, coal and wood yards and turbine generators.

With Metcalf & Eddy, Mr. Buckley was involved in the electrical design of various water and sewerage treatment plants. His work included a three month field assignment to determine the sources of computer analog and digital inputs associated with the computerization of an existing sewage treatment plant in St. Paul, Minnesota. In an earlier assignment, he spent three months overseas providing engineering support for the construction of military air base facilities in the Kingdom of Saudi Arabia.

### EDUCATION

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Attended Northeastern University's Lincoln College



VECTRA

DAVID ROSSETTI

## SPECIALTIES

Electrical Engineering and Design/CAD

## PROFESSIONAL EXPERIENCE

Mr. Rossetti is a Designer in VECTRA's Boston office with over six years of experience in electrical design engineering. His skills include Engineering Drawing, Computer Aided Design, Technical Writing, and various computer applications.

He is presently assigned to the US1 A-4G relay review project for Commonwealth Edison Company (CECo) Quad Cities Station, Units 1 and 2. The overall project scope is to retrieve each electrical component from the Safe Shutdown List for Relay Evaluation and review schematics, wiring diagrams and loop diagrams associated with each component to identify relays required to be verified as seismically adequate per the requirements of the SQUG Generic Implementation Procedure (GIP). He has also been involved with relay reviews for Northeast Utilities Service Company (NUSCO) Connecticut Yankee and Millstone Units 1 and 2 Stations, Philadelphia Electric Company (PECo) Peach Bottom Atomic Power Station Units 2 and 3 and the Public Service Electric & Gas Company (PSE&G) Salem Generating Station Units 1 and 2.

For James River Corporation, Mr. Rossetti performed the electrical design for the continuous emissions monitoring systems installed by ABB Environmental Systems, Inc. at James River's Berlin and Cascade Paper Mill boilers.

For the Boston Edison's Pilgrim Station annunciator replacement project, Mr. Rossetti was involved in the redesign of electrical schematics, wiring diagrams and layout drawings.

Mr. Rossetti recently created new, and revised existing, electrical schematic and wiring diagrams for the Control Room annunciation modification project at PSE&G's Salem Units 1 and 2. For Carolina Power & Light, Mr. Rossetti reviewed electrical systems drawings and documentation in order to assist in developing safe shutdown functional block diagrams. He also reviewed cable separation in fire zones to insure Appendix R compliance.

For CECo's Dresden 2 Control Room annunciation modification project, Mr. Rossetti created new, and revised existing plant electrical schematic and wiring diagrams.



VECTRA

DAVID ROSSETTI

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### PROFESSIONAL EXPERIENCE (Cont'd)

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For an earlier project to the No. 4 Chemical Recovery Boiler Project for Miramichi Pulp and Paper Company, Mr. Rossetti was responsible for developing wiring diagrams, revising cable tray drawings, scheduling and routing cables and inputting raceway and equipment information into a computerized database.

Previously, Mr. Rossetti was assigned to the BECo, E203 Phase III Project at the Pilgrim Nuclear Power Station. In this assignment, he assisted in performing walkdowns of selected control panels where the internal and external wiring of the control panels was verified. Mr. Rossetti utilized the information obtained in the walkdowns to prepare new drawings of the same control panels, both internal and external wiring diagrams. Mr. Rossetti also prepared new station drawings such as elementary diagrams, relay lists and internal and external wiring diagrams of other control panels from information supplied to him from other engineers and designers assigned to the project.

Prior to his employment at VECTRA, Mr. Rossetti attended North Shore Community College where he was trained in Engineering, Computer-Aided Design and Technical Writing.

### EDUCATION

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Associates in Engineering Science  
Certificate in Computer Aided Design  
North Shore Community College, Beverly, Massachusetts

Currently attending Northeastern University in B.S.E.E. Evening program