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AUTH.NAME AUTHOR AFFILIATION
VAN BRUNT,E.E. Arizona Public Service Co.
RECIP.NAME RECIPIENT AFFILIATION
KNIGHTON,G. Licensing Branch 3

SUBJECT: Forwards info supporting ESF actuation sys design compliance w/GDC 21,Reg Guides 1.22 & 1.118 & IEEE Std 338,per 840702 request. S66RAT

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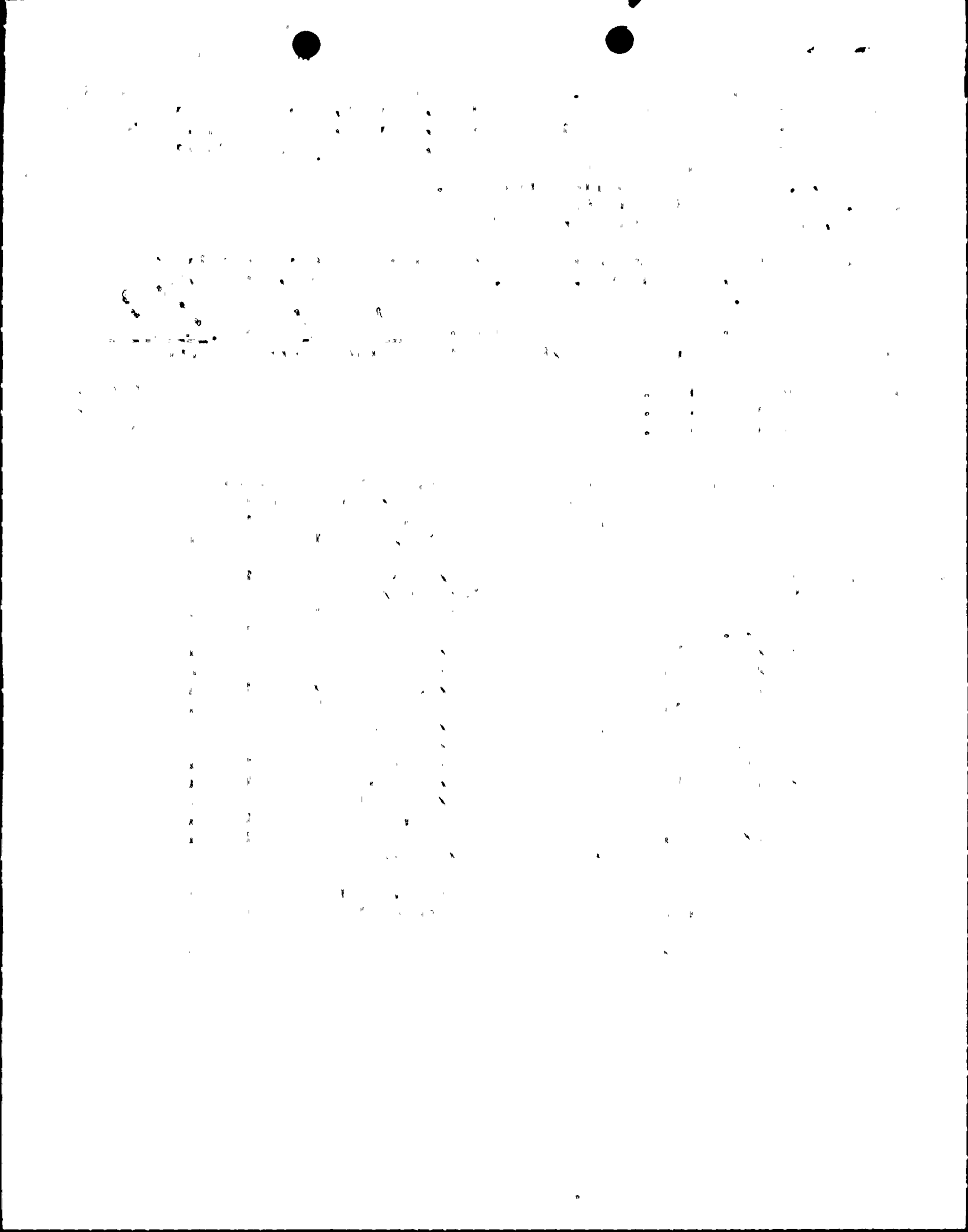

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Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

November 1, 1984
ANPP-31035 SRF/JRP

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN-50-528/529/530
Engineered Safety Features Actuation System (ESFAS)
File: 84-056-026; G.1.01.10

Reference: Letter dated July 2, 1984, from G.W. Knighton, (NRC)
to E.E. Van Brunt, Jr., (APS)

Dear Mr. Knighton:

In your referenced letter, you requested that we provide information in support of the PVNGS design as it relates to compliance with General Design Criterion 21 as supplemented by the provisions of Regulatory Guides 1.22 and 1.118, and IEEE Standard 338. Specifically, it is requested in part that we provide a list of ESFAS actuation devices and actuated equipment associated with each that should not be tested during plant operations and justification for why each actuation device identified cannot be tested at power should it be determined that various actuation devices cannot be tested in accordance with the design criteria.

The PPS/ESFAS at Palo Verde complies with General Design Criterion 21 in that the protection system as defined by IEEE Standard 279-1971 and Regulatory Guide 1.22 is designed to permit complete testing up to the input of the actuation devices with the reactor in operation. However, following our meeting on October 10 and 11, 1984, with Messrs, Jack Donohew, Bob Stevens and Jose Calvo of the NRC, it has been determined that of a total of 104 ESFAS cycling/subgroup relays (actuation devices per Regulatory Guide 1.22), 20 of these cannot be tested without adverse consequences for plant safety and/or operability, and therefore do not fully comply with the provisions of Regulatory Guide 1.22 and IEEE Standard 338. In accordance with Sections 7.1.2.7 and 7.1.2.15 of the Palo Verde CESSAR, which reference conformance to IEEE 338 and Regulatory Guide 1.22 respectively, those ESFAS actuated devices which could affect operations are not tested while the reactor is operating, but during reactor shutdown.

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Enclosed please find three attachments:

(1) Attachment 1: Palo Verde response to ICSB request for information.

(2) Attachment 2: List of ESFAS actuation devices and associated actuated equipment.

(3) Attachment 3: Characteristics of the Potter Brumfield relay types MDR-7033 and MDR-7034.

We request that the actuation devices listed in the table presented in Attachment (1), APS Response to NRC Question 1, be exempted from testing at power as required by Regulatory Guide 1.22.

Should you have any questions or comments, please feel free to call.

Very truly yours,

EEVanBrunt/JRP/K

E.E. Van Brunt, Jr.
APS Vice President
Nuclear Production
ANPP Project Director

EEVBJr/JRP/no
Attachment

cc: E.A. Licitra w/a
R.P. Zimmerman w/a
A.C. Gehr w/a

November 1, 1984
ANPP-31035

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Donald B. Karner, represent that I am Assistant Vice President, Nuclear Production of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Donald B. Karner

Sworn to before me this 2nd day of November, 1984.

Dora E. Meador
Notary Public

My Commission Expires:

My Commission Expires April 6, 1987

Attachment 1 - Palo Verde Response to ICSB Request for Information

NRC Question 1: A list of ESFAS actuation devices and actuated equipment associated with each that should not be tested during plant operation.

APS Response: Attachment 2 lists all ESFAS actuation devices (subgroup relays) and associated actuated equipment for Train A and Train B. For each train, the actuation devices and associated equipment are sequentially listed according to the ESF initiation function (SIAS, CIAS, etc.). The ACTUATION DEVICE column indicates whether the actuation device can or cannot be tested at power, based on whether the associated equipment can be tested as indicated in the ASSOCIATED EQUIPMENT column.

From Attachment 2, the actuation devices that cannot be tested at power may be summarized as follows:

ACTUATION DEVICES THAT CANNOT BE TESTED AT POWER			
TRAIN A		TRAIN B	
ESF FUNCTION	ACTUATION DEVICE	ESF FUNCTION	ACTUATION DEVICE
SIAS A	K108	SIAS B	K108
SIAS A	K409	SIAS B	K409
CIAS A	K202	CIAS B	K204
CIAS A	K204	CIAS B	K205
CIAS A	K205	CSAS B	K304
CSAS A	K304	MSIS B	K305
MSIS A	K305	MSIS B	K404
MSIS A	K404	AFAS 1B	K113
AFAS 1A	K211	AFAS 1B	K211
AFAS 2A	K112	AFAS 2B	K112

Thus a total of 10 actuation devices, and their associated actuated equipment, for each train A and train B (total of 20) cannot be tested at power. Additional information pertaining to each of these relays is contained in Attachment 2, including relay type (and associated actuated equipment).

NRC Question 2: Justification for why each actuation device identified in item (1) above cannot be tested at power.

APS Response: For each actuation device identified in (1) above, the COMMENTS column in Attachment 2 provides justification as to why certain actuated equipment cannot be tested at power without having adverse consequences for plant safety and/or operability. This applies to equipment where the MCC cannot be racked out or the equipment start function bypassed, etc. The following list of notes is referenced by Attachment 2 for each relay/associated equipment that cannot be tested at power.

Note 1. Loss of letdown will effect per level, causing unnecessary perturbation in the letdown sub-systems (Boronator, Purification, and Radmonitor).

Note 2. Equipment is in containment, increasing the start/stop on the equipment could result in increased maintenance on this equipment, which means increased exposure to radiation for maintenance personnel (ALARA).

Note 3. Testing of this relay results in excessive starting of equipment (large motors on HPSI, LPSI, CS) that is normally in standby to support safety. Also diesel will be tested under each relay resulting in several more starts each 61 days, this large number of starting and stopping, just for testing, could result in decreased reliability of diesel generator. Note is also made of the fact that the ESFAS BOP Load sequencer is to be run in the "Auto-Test" mode on at least a weekly basis. This feature performs a check of the ESFAS BOP processing circuitry, from the inputs up to and including the output relay coil(s) for continuity. An indirect check of Sequencer timing is also made.

Note 4. SIT Valve will open as soon as handswitch returns to normal after closing due to motor circuit, hence testing of this relay would require lifting of leads to be able to keep valves closed in order to test this relay.

Note 5. Starting/stopping equipment just to stop/start equipment for ST's can result in increased wear on the equipment and could result in down time for maintenance affecting reliability.

Note 6. Valves cannot be open due to system design. Resulting in loss of Nuclear Cooling Water to Essential Cooling Water (EW) and lifting relief in the EW surge tank.

Note 7. Securing Instrument Air to CNTMT will result in:

Normal spray valve fails to close.
Plant will not respond to pressure increases due to pressurizer insurges without manual operation of Auxiliary spray valves.

Note 8. Opening CNTMT refueling purge affects containment integrity. Containment integrity is not protected against single failure. Greater risk to public for off site release.

Note 9. Loss of RCP seal bleedoff. Lifting of bleedoff relief to RDT increase the risk of damage to the RCP seals.

Note 10. Remove cooling from CEDM coolers and loss of cooling to RCP's seal coolers which will result in seal damage.

Note 11. Shifting of MSIV or FW valves at power is not safe operational practices, possible "TRIP" could result.

Note 12. Could result in possible leakage in containment.

NRC Question 3: Verification that, for each actuation device and associated actuated equipment identified in item 1 above, there are comparable components which will be tested during reactor operation.

APS Response: Actuated equipment, including associated breakers and control circuitry, that is not tested at power by actuation of the subgroup relay is either (1) tested at power by applying a manual start to the control circuit/breaker under other established surveillance testing procedures as provided for by the Palo Verde Technical Specifications (this is to prevent excessive equipment starting), or (2) tested fully during an extended shutdown or refueling.

The COMMENTS column in Attachment 2 indicates which equipment is manually tested at power per other surveillance tests (normally ASME Section XI), and also which equipment, cannot be actuated at power, remains locked in its normal safety position during power operation. Comparable components which are tested at power are also identified for certain pieces of equipment in the COMMENTS column when the actuation device cannot be tested.

The following table indicates for each of the five actuation relay types utilized in the NSSS ESF system, the number of those that can be tested and those that cannot be tested at power.

ACTUATION RELAY	TRAIN B	TRAIN A	TOTAL	RELAY TESTING AT POWER
POTTER BRUMFIELD MDR-136-1 [AFAS cycling relays]	4	4	8	8 - can be tested 0 - cannot be tested
POTTER BRUMFIELD MDR-7032 [subgroup relays]	1	1	2	2 - can be tested 0 - cannot be tested
POTTER BRUMFIELD MDR-7033 [subgroup relays]	9	9	18	10 - can be tested 8 - cannot be tested
POTTER BRUMFIELD MDR-7034 [subgroup relays]	32	32	64	53 - can be tested 11 - cannot be tested
DEUTSCH 2BP36AF [subgroup relays]	6	6	12	11 - can be tested 1 - cannot be tested

It can be seen that:

(1) All of the MDR-136-1 and MDR-7032 relays are tested at power.

(2) Of a total of 18 MDR-7033 relays, 8 cannot be tested at power and 10 can be tested; and of a total of 64 MDR-7034 relays, 11 cannot be tested at power and 53 can be tested.

It is reasonable to treat the MDR-7033 and MDR-7034 relays as a common group since the design and operational characteristics are identical in all respects,(refer to specs included as Attachment 2), with the only difference being the number of contact wafers attached to the rotor shaft, i.e., a 24 pole for MDR-7033 vs. 16 pole for the MDR-7034. Note that an additional number of poles has no appreciable difference in power requirements or operational characteristics of the coil/rotor assembly.

Thus for the MDR-7033/7034 group, a total of 19 relays cannot be tested at power, while 63 can be tested.

It may be concluded with reasonable assurance that the on-line surveillance testing of those MDR-7033/7034 relays that can be operated at power, supplemented by the less frequent (extended cold shutdown or refueling) testing of the remaining relays will be sufficient to reveal any potential common mode failures.

(3) In the case of the 2BP36AF relays, 1 cannot be tested at power while 11 can be tested. Again, a reasonable assurance is provided as to any potential common mode failure.

NRC Question 4: Justification to show that the actuated equipment assignments to each actuation device were made in a manner to minimize the number of components which cannot be tested with the plant in operation.

APS Response: Attachment 2 presents the actuated equipment assignments to each actuation device. A total of 104 actuation devices (including the 8 cycling relays which function in conjunction with an associated subgroup relay) exists for both trains, of which 84 can be tested at power and 20 cannot be tested.

Of the 20 actuation devices that cannot be tested (ref. table in APS Response to NRC Question 1), 12 have actuated equipment assigned in such a manner that none of this equipment can be actuated. (Note that the BYP TRIPS, ALARM, DISPLAY and BYP-T.O. functions are not included as actuated equipment). The remaining 8 actuation devices which cannot be tested at power are of "mixed assignments", and are listed below:

RELAYS OF "MIXED ASSIGNMENTS"			
TRAIN A		TRAIN B	
ESF FUNCTION	ACTUATION DEVICE	ESF FUNCTION	ACTUATION DEVICE
SIAS A	K108	SIAS B	K108
SIAS A	K409	SIAS B	K409
CIAS A	K202	CIAS B	K204
CIAS A	K204	-	-
AFAS-2A	K112	-	-

In conclusion, actuated equipment has been judiciously assigned to 96 of a total of 104 actuation/cycling relays. (Note that in cases where a certain piece of equipment cannot be actuated, whereas the actuation device will be actuated, it is possible to prevent that piece of equipment from actuating by racking out the associated breaker or pulling the thermal overload,etc.).

NRC Question 5: A list of actuation devices and associated actuated equipment which can be tested at power.

APS Response: Attachment 2 lists all actuation devices and associated equipment that can be tested at power (ref. APS response to NRC Question 1), as indicated in the ACTUATION DEVICE and ASSOCIATED EQUIPMENT columns.

From Attachment 2, the actuation devices that can be tested at power may be summarized as follows:

TRAIN A		TRAIN B	
ESF FUNCTION	ACTUATION DEVICE	ESF FUNCTION	ACTUATION DEVICE
SIAS A	K101	SIAS B	K101
SIAS A	K102	SIAS B	K102
SIAS A	K103	SIAS B	K103
SIAS A	K109	SIAS B	K109
SIAS A	K110	SIAS B	K110
SIAS A	K301	SIAS B	K301*
SIAS A	K302	SIAS B	K302
SIAS A	K308	SIAS B	K308*
SIAS A	K311	SIAS B	K311
SIAS A	K401*	SIAS B	K401
SIAS A	K403	SIAS B	K403
SIAS A	K408	SIAS B	K408
SIAS A	K410*	SIAS B	K410
SIAS A	K412*	SIAS B	K412
CIAS A	K201	CIAS B	K201
CIAS A	K203*	CIAS B	K202
CIAS A	K206	CIAS B	K203*
CIAS A	K208	CIAS B	K206
CIAS A	K209	CIAS B	K208
CIAS A	K210*	CIAS B	K209
CIAS A	K212	CIAS B	K210*
CIAS A	K213	CIAS B	K212
CSAS A	K111	CIAS B	K213
CSAS A	K114	CSAS B	K111
MSIS A	K105	CSAS B	K114
MSIS A	K303	MSIS B	K105
MSIS A	K306	MSIS B	K303
MSIS A	K313	MSIS B	K306
MSIS A	K411	MSIS B	K313
RAS A	K104*	MSIS B	K411
RAS A	K309	RAS B	K104*
RAS A	K312*	RAS B	K309
RAS A	K405*	RAS B	K312*
AFAS-1A	K113*	RAS B	K405*
AFAS-1A	K307	AFAS-1B	K307
AFAS-1A	K402	AFAS-1B	K402
AFAS-2A	K310	AFAS-2B	K310
AFAS-2A	K413	AFAS-2B	K413
(cycling)	K629	(cycling)	K629
(cycling)	K628	(cycling)	K628
(cycling)	K729	(cycling)	K729
(cycling)	K728	(cycling)	K728

Thus a total of 42 actuation devices for each train A and train B (total of 84) can be tested at power. The relay types and associated actuated equipment/functions for each actuation device listed above is contained in Attachment 2.

For each relay listed above all the associated actuated equipment/functions will be tested with the exception of the relays marked(*). In these cases one or more pieces of equipment cannot be actuated, but can be racked out, bypassed, etc., and this will not preclude the relay from being tested. Justification for equipment that cannot be actuated is provided in the COMMENTS column and the referenced notes. (ref. APS response to NRC Question 2).

ATTACHMENT 2

LIST OF ESFAS ACTUATION DEVICES AND ASSOCIATED ACTUATED EQUIPMENT

NOTES:

(1) Tables are divided into Train A and Train B actuated equipment/devices.

(2) Actuated equipment/devices are sequentially listed and grouped according to the ESF initiation function (SIAS, CIAS, etc.)

(3) The relay model number is listed in parenthesis together with each subgroup relay:

(a) MDR-7032, -7033, -7034 and -136-1 relays are Potter Brumfield.
(b) 2BP36AF relays are Deutsch

(4) The following abbreviations are used in the "Function" column:

(a) BYP-T.O.: Bypass Thermal Overload
(b) OR-PRM: Override Permissive
(c) BYP TRIPS: Bypass Trips (i.e., bypass certain other inherent equipment protective trips)

(5) The notes referenced in the COMMENTS column are provided in the APS Response to NRC Question (2) in Attachment 1.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS A-K101							X	
(MDR-7034)	M-WCN-E01A	Normal Chiller	Trip		X			Note 5
	E-NHN-M19	480V MCC Incoming Feeder	Trip	X				Test relay but chiller will not be tested.
	E-QBN-D91	Essential Lighting Panel	Trip	X				
	M-RCE-B01, B09, A14	PZR Backup Heaters	Trip	X				
	M-HAA-Z06	Elec. Penetration Rm A Ess. ACU	Start	X				
SIAS A-K102							X	
(MDR-7033)	M-HCN-A01A	Cntmt normal ACU fan	Interlock*	X				
	M-HCN-A01C	Cntmt normal ACU fan	Interlock*	X				
	M-HCN-A02A	CEDM normal ACU fan	Interlock*	X				
	M-HCN-A02C	CEDM normal ACU fan	Interlock*	X				
	J-ESA-C01	SESS	Alarm	X				
SIAS A-K103							X	
(MDR-7033)	M-HCN-A01A	Cntmt Normal ACU Fan	Trip	X				
	M-HCN-A01C	Cntmt Normal ACU Fan	Trip	X				
	M-HCN-A02A	CEDM Normal ACU Fan	Trip	X				
	M-HCN-A02C	CEDM Normal ACU Fan	Trip	X				

Note:* Interlock to prevent auto-start following SIAS reset.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS A-K108							X	
(MDR-7033)	M-DGA-H01	Diesel Generator A	Start		X			Notes 3 & 5
	(MODE 1)	ESFAS BOP "A" Load Sequencer	Start		X			Note 3
	E-PEA-G01	Diesel Generator "A" Breaker	Trip		X			Note 3
	E-NHN-M71	480V MCC Incoming Feeder	Trip	X				
	M-HJA-Z04	ESF Eqpt. Rm "A" Ess AHU	Start	X				
	M-AFN-P01	Non-Safety AFW Pump	Trip		X			Note 5
	M-SIA-P01	LPSI pump	OR PRM	X				Sequencer run weekly in auto test, and M-DGA-H01, M-PEA-G01 and M-AFN-P01 tested monthly with manual actuation to control circuits.
	M-SIA-P02	HPSI pump	OR PRM	X				
	M-DGA-H01	Diesel generator A	BYP Trips	X				
	J-ESA-C01	SESS	Alarm	X				
	M-RCE-B01, B09, A14	PZR backup heaters	Interlock*	X				
	M-HAA-Z01	HPSI pump room A ESS ACU	BYP-T.O.	X				
	M-HAA-Z02	LPSI pump room A ESS ACU	BYP-T.O.	X				
	M-HAA-Z05	ECW pump room A ESS ACU	BYP-T.O.	X				
	J-SDA-C07	ERFDADS	Display	X				M-HJA-Z04 does not require surveillance testing in Tech Specs.
	J-SHA-C01	QSPDS	Display	X				
								E-NHN-71 is same model as E-NHN-M19 and NHN-M20 which are tested in SIAS A-K101 and SIAS B-K101 respectively.

Note:* Interlock to prevent auto-on following SIAS reset.

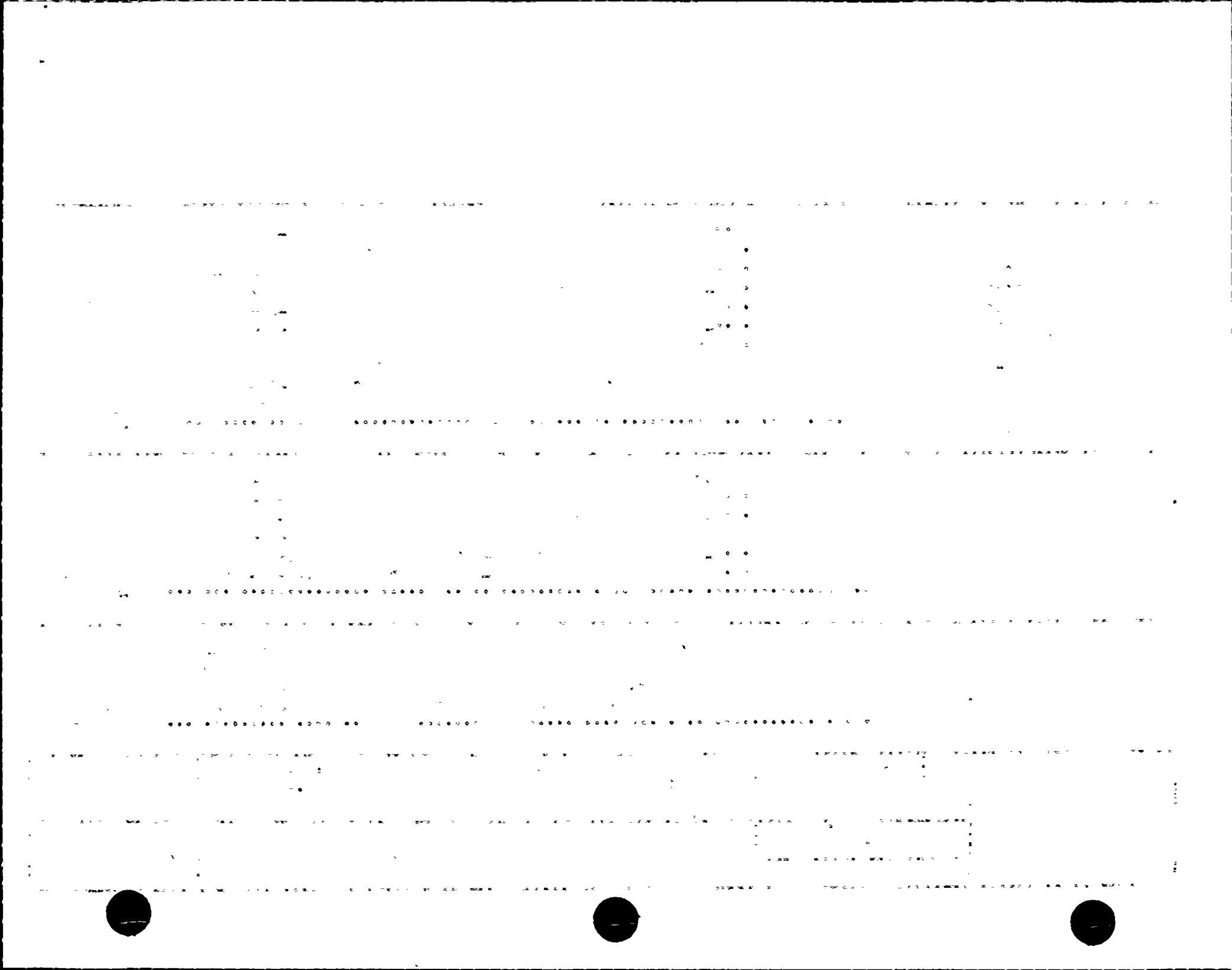
SIAS A-K109							X	
(2BP36AF)	M-CTA-P01	Condensate Transfer Pump A	Start	X				
	M-HFA-J01	Fuel & Aux Bldg ESS Exh AFU fan	(Start)*	X				

Note:* Require sequencer permissive too.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS A-K110						X		
(2BP36AF)	M-HJA-Z03	ESF Swgr. Room ESS AHU A	Start	X				
	M-HJA-J01A	Control Bldg Bat Rms ESS Exh Fan	Start	X				
	M-HJA-J01B	Control Bldg Bat Rms ESS Exh Fan	Start	X				
SIAS A-K301						X		
(MDR-7034)	J-SIA-UV-709	HPSI Pump Recirc Line Pass Isol Vlv	Close	X				
	J-SIA-UV-647	HPSI-1 Flow Control to Reac Coolant Valve	Open	X				
	J-SIA-UV-635	LPSI-1 Flow Control to Reac Coolant Valve	Open	X				
	M-SIA-P03	Cntmt Spray Pump	OR-PRM	X				
SIAS A-K302						X		
(MDR-7034)	J-SGA-UV-223	Blowdn Sample Cntmt ISO Valve SG-2	Close	X				
	J-SGA-UV-225	Blowdn Sample Cntmt ISO Valve SG-2	Close	X				
	J-SGA-UV-227	Blowdn Sample Cntmt ISO Valve SG-2	Close	X				
	J-SGA-UV-500S	Blowdn Sample Cntmt ISO Valve SG-2	Close	X				
SIAS A-K308						X		
(MDR-7034)	J-SIA-UV-637	HPSI-1 Flow Cntrl to Reac Cool Vlv	Open	X				
	J-SIA-UV-645	LPSI-1 Flow Cntrl to Reac Cool Vlv	Open	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS A-K311							X	
(MDR-7033)	M-HJA-M01	CR Norm AHU ISO Damper	Close	X				
	M-HJA-M52	CR Norm AHU ISO Damper	Close	X				
	M-HJA-M25	Cont Bldg ESS ISO Damper	Close	X				
	M-HJA-M28	Cont Bldg ESS ISO Damper	Close	X				
	M-HJA-M36	Cont Bldg ESS ISO Damper	Close	X				
	M-HJA-M51	Cont Bldg ESS ISO Damper	Close	X				
	M-HJA-M62	Cont Bldg ESS ISO Damper	Close	X				
	M-HJA-M66	Cont Bldg ESS ISO Damper	Close	X				
	M-HJA-M23	ESF Swgr Rm Norm ISO Damper	Close	X				
	M-HJA-M56	Cont Room ESS ISO Damper	Close	X				
	M-HJA-M57	Cont Room ESS ISO Damper	Close	X				
	M-HJA-M15	CR Toilet & Kitchen Exh ISO Damper	Close	X				
	M-HJA-M16	CR Toilet & Kitchen Exh ISO Damper	Close	X				
	M-HJA-M34	ESF RMS A&C ESS Rtn ISO Damper	Open	X				
	M-HJA-M58	Comm Eqpt Rm ESS ISO Damper	Close	X				
	M-HJA-M59	Comm Eqpt Rm ESS ISO Damper	Close	X				
	M-HJA-M53	ESF Swgr Rm Outside Air & Exh ISO Damper	Close	X				
	M-HJA-M54	ESF Swgr Rm Outside Air & Exh ISO Damper	Close	X				
	M-HJA-M55	ESF Swgr Rm Outside Air & Exh ISO Damper	Close	X				
	M-HJA-M02	CR ESS AHU Outside Air Intake Dmpr	Open	X				
	M-HJA-M03	CR ESS AHU Outside Air Intake Dmpr	Open	X				
SIAS-A K401							X	
(MDR-7034)	J-SIA-UV-627	HPSI-1 Flow Cntrl to Reac Coolnt Vlv	Open	X				
	J-SIA-UV-634	SI TK-3 Iso Valve	Open		X			Note 4 Test Relay only. Do Not Actuate Valve SIA-UV-634 - normally locked open in safety position.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS A-K403						X		
(MDR-7034)	J-SGA-UV-211	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
	J-SGA-UV-204	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
	J-SGA-UV-500P	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
	J-SGA-UV-220	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
SIAS A-K408						X		
(MDR-7034)	J-SIC-HV-321	HPSI pump A long-term clg valve	BYP-T.O.	X				
	J-SIA-HV-604	HPSI pump A long-term clg valve	BYP-T.O.	X				
	J-SIA-HV-657	SD clg temp cont valve	BYP-T.O.	X				
	J-SIA-HV-686	Cntmt spray cross connect valve	BYP-T.O.	X				
	J-SIA-HV-685	LPSI pump cross connect valve	BYP-T.O.	X				
	J-SIA-HV-688	SD clg exch bypass valve	BYP-T.O.	X				
SIAS A-K409							X	
(MDR-7034)	J-SIA-UV-682	SI TK RWT Rtn Hdr Cntmt ISO Valve	Close	X				
	J-CHA-UV-516	Letdown Line to Regen Heat Exch ISO Valve	Close		X			Note 1 J-SIA-UV-682 is opened and closed quarterly with manual trip to control circuit (per ASME Section XI)
	J-SIA-HV-698	HPSI pump A discharge	BYP-T.O.	X				
	J-SIA-HV-306	LPSI hdr discharge valve	BYP-T.O.	X				
	J-SIA-HV-638	LPSI pump A isol valve	BYP-T.O.	X				
	J-SIA-HV-691	SD clg loop warmup bypass valve	BYP-T.O.	X				
	J-SIA-HV-687	Cntmt spray isol valve	BYP-T.O.	X				
	J-SIA-HV-684	SD clg heat exch isol valve	BYP-T.O.	X				
	J-SIA-HV-678	SD clg heat exch isol valve	BYP-T.O.	X				



ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS A-K410						X		
(MDR-7034)	J-SIA-UV-617	HPSI-1 Flow Cntrl to Reac Coolnt Vlv	Open	X				
	J-SIA-UV-644	SI TK-4 ISO Valve	Open		X			Note 4 Will not actuate valve SIA-UV-644 - normally locked open in safety position.
SIAS A-K412						X		
(MDR-7034)	M-HAA-M03	Pump RMS Exh ISO Damper	Close	X				
	M-HAA-M01	Pump RMS Sply & Exh ISO Damper	Close	X				
	M-HAA-M02	Pump RMS Sply & Exh ISO Damper	Close	X				
	M-HAA-M04	Pump RMS Sply & Exh ISO Damper	Close	X				
	M-HAA-M05	Pump RMS Sply & Exh ISO Damper	Close	X				
	M-HAA-M06	Pump RMS Sply & Exh ISO Damper	Close	X				
	J-EWA-UV-145	ECW Loop A-NCW Cross Tie Valve	Close		X			Note 6
	J-EWA-UV-65	ECW Loop A-NCW Cross Tie Valve	Close		X			Note 6 Test relay but valves EWA-UV-145 & 65 will not be stroked. Valves J-EWA-UV-145 and UV-65 are normally locked closed in the safety position.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CIAS A-K201						X		
(MDR-7034)	J-SSA-UV-203	Sample Cntmt ISO Valve	Close	X				
	J-SSA-UV-204	Sample Cntmt ISO Valve	Close	X				
	J-SSA-UV-205	Sample Cntmt ISO Valve	Close	X				
	J-SIA-UV-708	Recirc Sump "A" Pass ISO Valve	Close	X				
CIAS A-K202							X	
(MDR-7034)	J-GAA-UV-001	Hi Press Nitrogen Cntmt ISO Valve	Close	X				
	J-GAA-UV-002	Lo Press Nitrogen Cntmt ISO Valve	Close	X				
	J-IAA-UV-002	Instr & Service Air Cntmt ISO Valve	Close		X			Notes 1 & 7 J-GAA-UV-001 and UV-002 are tested quarterly with manual trip to control circuit (ASME Section XI). All three valves have same Target Rock solenoid actuator (300525-1) as J-HPA-UV-23 and UV-24 which are tested for CIAS A-K213.
CIAS A-K203						X		
(MDR-7034)	J-CPA-002A	Cntmt Purge Refueling Mode ISO Vlv	Close		X			Note 8 Test relay only don't actuate valve CPA-002A. Valve not tested, and is normally locked closed in the safety position.
	J-CPA-004A	Cntmt Purge Power ACC Mode ISO Vlv	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CIAS A-K204							X	
(MDR-7033)	J-CHA-UV-560	Reac Drain Tk Outlet ISO Valve	Close	X				
	J-CHA-UV-506	RCP Controlled Bleedoff to VCT Vlv	Close		X			Notes 2 & 9
	J-CHA-UV-516	Letdn Line to Regen Heat Exch Cntmt ISO Valve	Close		X			Note 1
	J-CHA-UV-580	Makeup to RDT Valve	Close	X				J-CHA-UV-560, UV-580, and UV-715 are tested quarterly with manual trip to control circuit (ASME Section XI).
	J-CHA-UV-715	Letdown Line PASS ISO Valve	Close	X				
CIAS A-K205							X	
(MDR-7034)	J-NCA-UV-402	Nucl Coolng Water Syst Cntmt ISO Vlv	Close		X			Notes 5 & 10. Lose cooling water to RCP. RCP can only operate 10 min. without cooling water. (Close System)
CIAS A-K206						X		
(MDR-7034)	J-WCA-UV-062	Normal Chilled Water Rtn & Suply Cntmt ISO Valve	Close	X				
CIAS A-K208						X		
(MDR-7034)	J-HCA-UV-045	Cntmt ATM Rad Monitor Cntmt ISO Vlv	Close	X				
	J-HCA-UV-046	Cntmt ATM Rad Monitor Cntmt ISO Vlv	Close	X				
CIAS A-K209						X		
(MDR-7034)	J-RDA-UV-023	Cntmt Radwst Sumps Internal ISO Vlv	Close	X				
	J-GRA-UV-001	Gas Surge Header Cntmt ISO Valve	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CIAS A-K210						X		
(MDR-7034)	J-CPA-UV-002B	Cntmt Purge Refueling Mode ISO Vlv	Close		X			Note 8 (See K203) J-CPA-UV-002B normally locked closed in safety position.
	J-CPA-UV-004B	Cntmt Purge Power ACC Mode ISO Vlv	Close	X				
CIAS A-K212						X		
(MDR-7034)	J-ESA-C01	SESS	Alarm	X				
	J-SDA-C07	ERFDADS	Display	X				
	J-SHA-C01	QSPDS	Display	X				
CIAS A-K213						X		
(MDR-7033)	J-HPA-UV-023	Hyd Mon Pass Ret ISO Valve	Close	X				
	J-HPA-UV-024	Hyd Mon Pass Sup ISO Valve	Close	X				
	J-HPA-UV-001	Hyd Control Cntmt ISO Valve	Close	X				
	J-HPA-UV-003	Hyd Control Cntmt ISO Valve	Close	X				
	J-HPA-UV-005	Hyd Control Cntmt ISO Valve	Close	X				

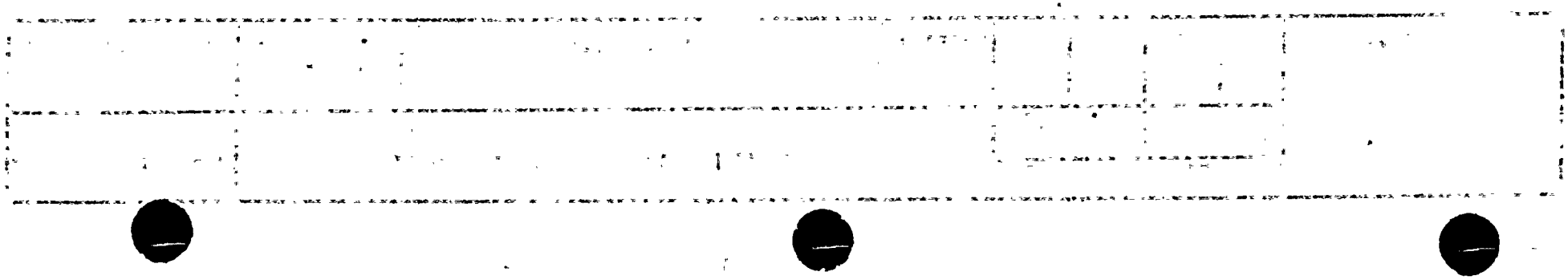
ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CSAS A-K111						X		
(2BP36AF)	J-SIA-UV-681	Hydrzne Pump to Cntmt Spray Pump V1v	Open	X				
	J-SIA-UV-672	Cntmt Spray Control Valve	Open	X				
	J-SHA-C01	QSPDS	Display	X				
CSAS A-K114						X		
(2BP36AF)	J-SIA-UV-603	Spray Chem Pump Suction Valve	Open	X				
	M-SIA-P05	Spray Chem Add Pump	Start	X				
	J-SDA-C07	ERFDADS	Display	X				
CSAS A-K304						X		
(MDR-7034)	(MODE 1)	ESFAS BOP "A" Load Sequencer	Start		X			Note 3
	M-DGA-H01	Diesel Generator	Start		X			Note 3 & 5
	J-ESA-C01	SESS	Alarm	X				Sequencer run weekly in auto test, and M-DGA-H01 tested monthly with manual start to control circuit.
	M-HAA-Z03	C.S. pump Rm B ESS ACU	BYP-T.O.	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
MSIS A-K105						X		
(MDR-7034)	J-ESA-C01	SESS	Alarm	X				
	J-SDA-C07	ERFDADS	Display	X				
	J-SHA-C01	QSPDS	Display	X				
MSIS A-K303						X		
(MDR-7034)	J-SGE-UV-183	SG-2 MSIV Bypass Valve	Close	X				
	J-SGA-UV-1133	Stm Traps ISO Valve	Close	X				
	J-SGA-UV-1134	Stm Traps ISO Valve	Close	X				
MSIS A-K305							X	Note 11
(MDR-7034)	J-SGA-UV-172	SG-1 Downcomer FDW ISO Valve	Close		X			Test per Note 3 of
	J-SGA-UV-175	SG-2 Downcomer FDW ISO Valve	Close		X			T.S. Pg. 3/4.3.32
	J-SGE-UV-170	SG-1 Line-1 MS ISO Valve	Close		X			
	J-SGE-UV-180	SG-1 Line-2 MS ISO Valve	Close		X			
MSIS A-K306						X		
(MDR-7034)	J-SGE-UV-169	SG-1 MSIV Bypass Valve	Close	X				
MSIS A-K313						X		
(MDR-7034)	J-SGA-UV-223	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-SGA-UV-225	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-SGA-UV-227	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-SGA-UV-500S	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
MSIS A-K404.....							X	Note 11
(MDR-7034)	J-SGA-UV-174	SG-1 Economizer FWIV	Close		X			Test per Note 3 of
	J-SGA-UV-177	SG-2 Economizer FWIV	Close		X			T.S. Pg. 3/4.3.32
	J-SGE-UV-171	SG-2 Line-1 MS ISO Valve	Close		X			
	J-SGE-UV-181	SG-2 Line-2 MS ISO Valve	Close		X			
MSIS A-K411.....						X		
(MDR-7034)	J-SGA-UV-211	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
	J-SGA-UV-204	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
	J-SGA-UV-500P	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				
	J-SGA-UV-220	Blowdn Sample Cntmt ISO Valve SG-1	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
RAS A-K104 (MDR-7034)						X		
	M-SIA-P01	LPSI Pump	Stop		X			Notes 3 & 5 Test relay but pump will not be tested - it is started and tripped quarterly with manual trip to control circuit.
	J-ESA-C01	SESS	Alarm	X				
	J-SDA-C07	ERFDADS	Display	X				
	J-SHA-C01	QSPDS	Display	X				
RAS A-K309 (MDR-7034)						X		
	J-SIA-UV-664	Cntmt Spray Pump to RWT ISO Valve	Close	X				
RAS A-K312 (2BP36AF)						X		
	J-SIA-UV-666	HPSI Pump to RWT ISO Valve	Close	X				
	J-SIA-UV-669	LPSI Pump to RWT ISO Valve	Close	X				
	J-SIA-UV-673	Cntmt Sump ISO Valve	Open		X			Note 12 This will be tested by interrupting power to valve SIA-UV-673. Valve will not be stroked.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
RAS A-K405 (MDR-7034)						X		
	J-SIA-UV-660	HPSI Recirc to RWT Valve	Close	X				
	J-SIA-UV-674	Cntmt Sump ISO Valve	Open		X			Note 12 This will be tested by interrupting power to valve SIA-UV-674. Valve will not be stroked.



ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-1 A-K113						X		
(2BP36AF)	E-PEA-G01	Diesel Generator Breaker	Trip		X			Test relay, but we will not trip the breaker which is closed and tripped monthly with manual trip to control circuit.
	J-SGA-UV-134	SG-1 to AFW Pump Steam Supply Valve	Open	X				
	M-HAA-Z04	Aux FDW Pmp Rm A Ess ACU	Start*	X				
	J-SGA-UV-138	SG-2 to AFW Pump Steam Supply Valve	Close	X				
	M-DGA-H01	Diesel generator A	BYP Trips	X				
	M-HAA-Z05	ECW pump room A ESS ACU	BYP-T.O.	X				
	M-HAA-Z04	Aux FDW pump room A ESS ACU	BYP-T.O.	X				
AFAS-1 A-K211							X	
(MDR-7033)	(MODE 4A)	ESFAS BOP "A" Load Sequencer	Start		X			Note 3
	M-DGA-H01	Diesel Generator A	Start		X			Notes 3 & 5
	J-ESA-C01	SESS	Alarm	X				Sequencer run weekly in auto test, and M-DGA-H01 tested monthly with manual trip to control circuit.
	J-SDA-C07	ERFDADS	Display	X				
	J-SHA-C01	QSPDS	Display	X				
AFAS-1 A-K307						X		
(MDR-7033)	J-SGA-UV-225	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-SGA-UV-227	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-SGA-UV-500S	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-SGA-UV-223	Blowdown Sample Cntmt ISO Vlv SG-2	Close	X				
	J-CTA-HV-4	Cnds tk to AFW pump ISO valve	BYP-T.O.	X				
	J-CTA-HV-1	Cnds tk to AFW pump ISo valve	BYP-T.O.	X				

Note: (1) *M-HAA-Z04 starts when J-SGA-UV-134 opens.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-1 A-K402							X	
(MDR-7034)	J-SGA-UV-204	Blowdown Sample Cntmt ISO Vlv SG-1	Close	X				
	J-SGA-UV-500P	Blowdown Sample Cntmt ISO Vlv SG-1	Close	X				
	J-SGA-UV-220	Blowdown Sample Cntmt ISO Vlv SG-1	Close	X				
	J-SGA-UV-211	Blowdown Sample Cntmt ISO Vlv SG-1	Close	X				
K629* & K402**	J-AFC-HV-33	AFAS Chan C Init CKT	Open	X				
K628* & K402**	J-AFC-UV-36	AFAS Chan C Init CKT	Open	X				
K729* & K402**	J-AFA-UV-37	Aux Fdw ISO Valve to SG-2	Open	X				
K728* & K402**	J-AFA-HV-32	Aux Fdw Reg Valve to SG-1	Open	X				

Note: (1) * K629, K628, K729 and K728 are relay type MDR-136-1
(2) * K629 and K729 are from AFAS-2A circuit
(3) ** K402 only maintains the four valves closed. They can be cycled open individually by deenergizing the associated cycling relay via the PPS Matrix test module

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-2 A-K112							X	
(MDR-7033)	E-PEA-G01	Diesel Generator Breaker	Trip		X			Notes 3 & 5
	J-SGA-UV-138	SG-2 to Aux Fdw Pump A	Open	X				
	M-HAA-Z04	Aux Fdw Pump Rm A ESS ACU	Start*		X			
	(MODE 4A)	ESFAS BOP "A" Load Sequencer	Start		X			Note 3
	M-DGA-H01	Diesel Generator A	Start		X			Notes 3 & 5
	M-DGA-H01	Diesel Generator A	BYP trips	X				E-PEA-G01, J-SGA-UV-138, M-HAA-Z04 and M-DGA-H01 tested monthly with manual actuation to control circuits. Sequencer is tested weekly in auto test.
	J-ESA-C01	SESS	Alarm	X				
	J-SDA-C07	ERFDADS	Display	X				
	J-SHA-C01	QSPDS	Display	X				
	M-HAA-Z05	ECW pump room A ESS ACU	BYP-T.O.	X				
	M-HAA-Z04	Aux FDW pump room A ESS ACU	BYP-T.O.	X				
AFAS-2 A-K310							X	
(MDR-7034)	J-SGA-UV-225	Blowdn Sample Cntmt ISO Vlv to SG-2	Close	X				
	J-SGA-UV-227	Blowdn Sample Cntmt ISO Vlv to SG-2	Close	X				
	J-SGA-UV-500S	Blowdn Sample Cntmt ISO Vlv to SG-2	Close	X				
	J-SGA-UV-223	Blowdn Sample Cntmt ISO Vlv to SG-2	Close	X				
	J-CTA-HV-4	Cnds tk to AFW pump ISO valve	BYP-T.O.	X				
	J-CTA-HV-1	Cnds tk to AFW pump ISO valve	BYP-T.O.	X				

Note: *M-HAA-Z04 starts when J-SGA-UV-138 opens.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-2 A-K413.....					X			
(MDR-7032)	J-SGA-UV-204	Blowdn Sample Cntmt ISO Vlv to SG-1	Close	X				
	J-SGA-UV-500P	Blowdn Sample Cntmt ISO Vlv to SG-1	Close	X				
	J-SGA-UV-220	Blowdn Sample Cntmt ISO Vlv to SG-1	Close	X				
	J-SGA-UV-211	Blowdn Sample Cntmt ISO Vlv to SG-1	Close	X				
K629* & K413**	J-AFC-UV-33	AFAS Chan C Init CKT	Open	X				
K628* & K413**	J-AFA-UV-36	AFAS Chan C Init CKT	Open	X				
K729* & K413**	J-AFA-UV-37	Aux Fdw ISO Valve to SG-2	Open	X				
K728* & K413**	J-AFA-UV-32	Aux Fdw Reg Valve to SG-1	Open	X				

Note: (1) * K629, K628, K729 and K728 are relay type MDR-136-1
(2) * K628 and 728 are from AFAS-1A circuit
(3) ** K413 only maintains the four valves closed. They can be cycled open individually by deenergizing the associated cycling relay via the PPS matrix test module.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS B-K101							X	
(MDR-7034)	E-NHN-M20	480v MCC incoming feeder	Trip	X				
	E-QBN-D90	Essential lighting panel	Trip	X				
	M-RCE-B18, B10, A05	PZR backup heaters	Trip	X				
	M-HAB-Z06	Elec penetration rm B ESS ACU	Start	X				
SIAS B-K102							X	
(MDR-7033)	M-HCN-A01B	Cntmt normal ACU fan	Interlock*	X				
	M-HCN-A01D	Cntmt normal ACU fan	Interlock*	X				
	M-HCN-A02B	CEDM normal ACU fan	Interlock*	X				
	M-HCN-A02D	CEDM normal ACU fan	Interlock*	X				
	J-ESB-C01	SESS	Alarm	X				
SIAS B-K103							X	
(MDR-7033)	M-HCN-A01B	Cntmt normal ACU fan	Trip	X				
	M-HCN-A01D	Cntmt normal ACU fan	Trip	X				
	M-HCN-A02B	CEDM normal ACU fan	Trip	X				
	M-HCN-A02D	CEDM normal ACU fan	Trip	X				

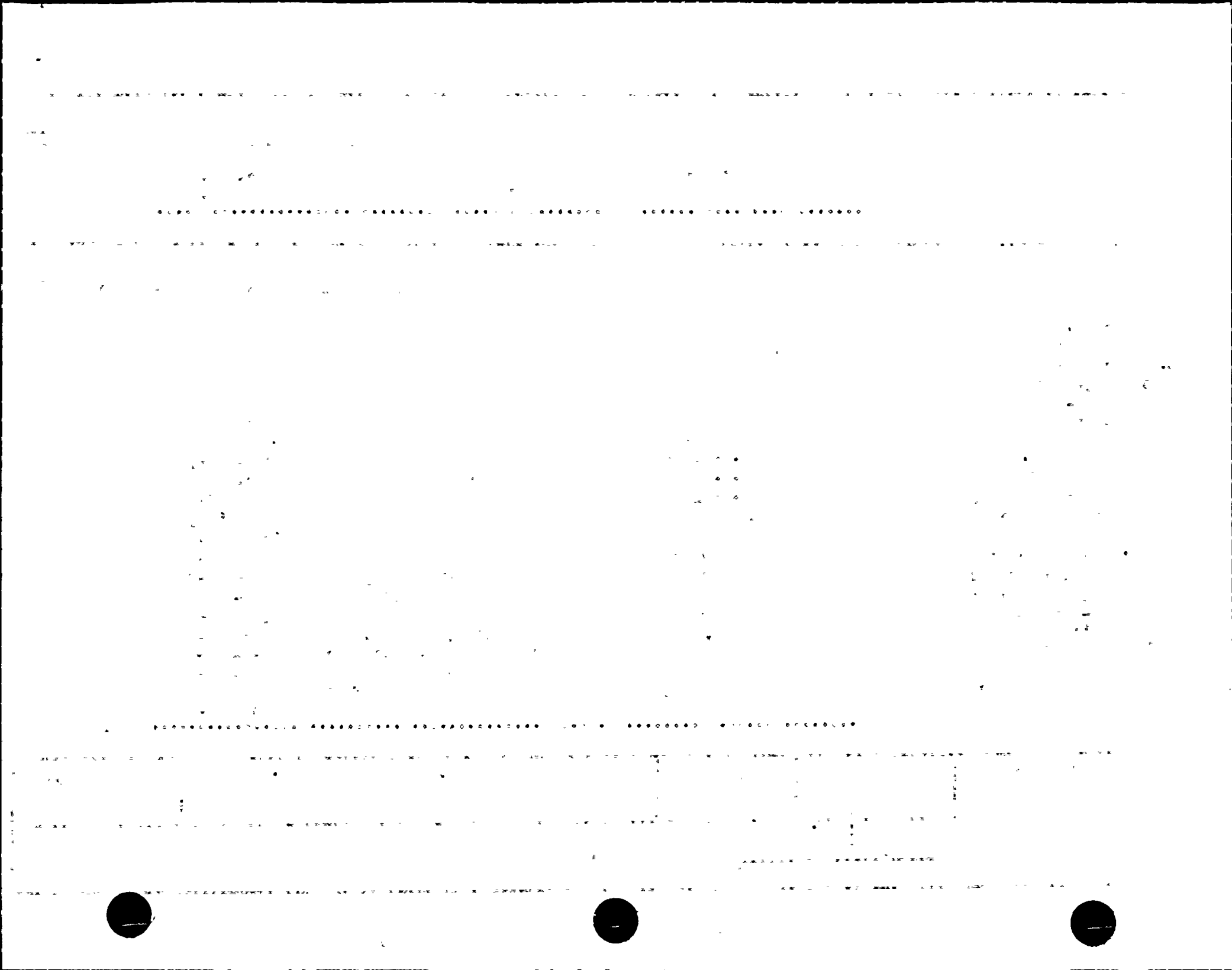
Note: Interlock to prevent auto-start following SIAS reset.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS B-K108					X			
(MDR-7033)	M-DGB-H01	Diesel generator B	Start		X			Notes 3 & 5
	(Mode 1)	ESFAS BOP "B" load sequencer	Start		X			Note 3
	E-PEB-G02	Diesel generator "B" breaker	Trip		X			Note 3
	E-NHN-M-72	480v MCC incoming feeder	Trip	X				Sequencer run weekly in auto test, and M-DGA-H01, E-PEB-G02 tested monthly with manual actuation to control circuits.
	M-HJB-Z04	ESF eqpt rm "B" ESS AHU	Start	X				
	M-SIB-P01	LPSI pump	OR PRM	X				
	M-SIB-P02	HPSI pump	OR PRM	X				
	M-DGB-H01	Diesel generator B	BYP Trips	X				
	J-ESB-C01	SESS	Alarm	X				
	M-RCE-B18, B10, A05	PZR backup heaters	Interlock*	X				M-HJB-Z04 does not require surveillance testing in Tech Specs.
	M-HAB-Z01	HPSI pump room ESS ACU	BYP-T.O.	X				
	M-HAB-Z02	LPSI pump room ESS ACU	BYP-T.O.	X				
	M-HAB-Z05	ECW pump room ESS ACU	BYP-T.O.	X				
	J-SDB-C08	ERFDADS	Display	X				
	J-SHB-C01	QSPDS	Display	X				E-NHN-M-72 is same model as E-NHN-M-19 and E-NHN-M-20 which are tested in SIAS A-K101 and SIAS B-K101 respectively.

Note: Interlock to prevent auto-on following SIAS reset.

SIAS B-K109					X	
(2BP36AF)	M-CTB-P01	Condensate transfer pump B	Start	X		
	M-HFB-J01	Fuel & aux bldg ESS exh AFU fan	(Start)*	X		

Note: *Require sequencer start permissive too.



ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS B-K110						X		
(2BP36AF)	M-HJB-Z03	ESF SWGR rm ESS AHU	Start	X				
	M-HJB-J01A	Cont bldg Batt RMS ESS exh fan	Start	X				
	M-HJB-J01B	Cont Bldg Batt RMS ESS exh fan	Start	X				
SIAS B-K301						X		
(MDR-7034)	J-SIB-UV-611	SI TK-1 Fill & drain valve	Close	X				
	J-SIB-UV-618	SI TK-1 check valve leakage line ISO valve	Close	X				
	J-SIB-UV-710	HPSI pump recirc line pass ISO v1v	Close	X				
	J-SIB-UB-646	HPSI-2 flow control to reac coolant valve	Open	X				
	J-SIB-UV-624	SI TK ISO valve	Open		X			Note 4 Relay only tested on SIB-UV-624 - normally locked open in safety position.
	M-SIB-P03	Cntmt Spray Pump	OR PRM	X				
SIAS B-K302						X		
(MDR-7034)	J-SGB-UV-222	Blowdown sample cntmt ISO valve SG-2	Close	X				
	J-SGB-UV-224	Blowdown sample cntmt ISO valve SG-2	Close	X				
	J-SGB-UV-500R	Blowdown sample cntmt ISO valve SG-2	Close	X				
	J-SGB-UV-226	Blowdown sample cntmt ISO valve SG-2	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS B-K308						X		
(MDR-7034)	J-SIB-UV-621	SI TK-1 fill & drain valve	Close	X				
	J-SIB-UV-628	SI TK-1 check valve leakage line ISO valve	Close	X				
	J-SIB-UV-636	HPSI-2 flow control to reac coolant valve	Open	X				
	J-SIB-UV-614	SI TK-2 ISO valve	Open		X			Note 4 Relay only tested on SIB-UV-614 - normally locked open in safety position.
SIAS B-K311						X		
(MDR-7033)	M-HJB-M01	CR AHU ISO damper	Close	X				
	M-HJB-M55	CR AHU ISO damper	Close	X				
	M-HJB-M10	Comm eqpt rm ESS ISO damper	Close	X				
	M-HJB-M13	Comm eqpt rm ESS ISO damper	Close	X				
	M-HJB-M28	ESF SWGR rm sply & exh ISO damper	Close	X				
	M-HJB-M32	ESF SWGR rm sply & exh ISO damper	Open	X				
	M-HJB-M52	ESF SWGR rm sply & exh ISO damper	Close	X				
	M-HJB-M31	Cont bldg ESS ISO damper	Open	X				
	M-HJB-M34	Cont bldg ESS ISO damper	Close	X				
	M-HJB-M38	Cont bldg ESS ISO damper	Close	X				
	M-HJB-M58	Cont bldg ESS ISO damper	Open	X				
	M-HJB-M66	Cont bldg ESS ISO damper	Close	X				
	M-HJB-M56	Cont rm ESS ISO damper	Close	X				
	M-HJB-M57	Cont rm ESS ISO damper	Close	X				
	M-HJB-M23	Cont rm toilet & kitchen exh ISO damper	Close	X				
	M-HJB-M24	Cont rm toilet & kitchen exh ISO damper	Close	X				
	M-HJB-M02	CR ESS AHU outside source intake damper	Open	X				
	M-HJB-M03	CR ESS AHU outside source intake damper	Open	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS B-K401							X	
(MDR-7034)	J-SIB-UV-641	SI TK-4 fill & drain valve	Close	X				
	J-SIB-UV-648	SI TK-4 check valve leakage line ISO valve	Close	X				
	J-SIB-UV-626	HPSI-2 flow cont to reac coolant valve	Open	X				
	J-SIB-UV-615	LPSI-2 flow cont to reac coolant valve	Open	X				
SIAS B-K403							X	
(MDR-7034)	J-SGB-UV-219	Blowdown sample Cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-228	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-221	Blowdown sample Cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-500Q	Blowdown sample cntmt ISO vlv SG-1	Close	X				
SIAS B-K408							X	
(MDR-7034)	J-SIB-UV-332	Hot leg inj check valve leakage ISO valve	Close	X				
	J-SID-HV-331	HPSI pump B long-term clg valve	BYP-T.O.	X				
	J-SIB-HV-609	HPSI pump B long-term clg valve	BYP-T.O.	X				
	J-SIB-HV-658	SD clg temp cont valve	BYP-T.O.	X				
	J-SIB-HV-696	Cntmt spray cross connect valve	BYP-T.O.	X				
	J-SIB-HV-694	LPSI pump cross connect valve	BYP-T.O.	X				
	J-SIB-HV-693	SD clg exch bypass valve	BYP-T.O.	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
SIAS B-K409							X	
(MDR-7034)	J-SIB-UV-322	Hot leg inj check valve leakage ISO valve	Close	X				
	J-CHB-UV-515	Letdown line to regen exch valve	Close		X			Note 1
	J-SIB-HV-699	HPSI pump B discharge valve	BYP-T.O.	X				J-SIB-UV-322 is tested quarterly with manual trip to control circuit (ASME Section XI)
	J-SIB-HV-307	LPSI HDR discharge valve	BYP-T.O.	X				
	J-SIB-HV-692	LPSI pump B ISO valve	BYP-T.O.	X				
	J-SIB-HV-690	SD clg loop warm-up BYP valve	BYP-T.O.	X				
	J-SIB-HV-695	Cntmt spray ISO valve	BYP-T.O.	X				
	J-SIB-HV-689	SD clg heat exch ISO valve	BYP-T.O.	X				
	J-SIB-HV-679	SD clg heat exch ISO valve	BYP-T.O.	X				
SIAS B-K410							X	
(MDR-7034)	J-SIB-UV-631	SI TK-3 fill & drain valve	Close	X				
	J-SIB-UV-638	SI TK-3 check valve leakage ISO valve	Close	X				
	J-SIB-UV-616	HPSI-2 flow control to reac coolant valve	Open	X				
	J-SIB-UV-625	LPSI-2 flow control to reac coolant valve	Open	X				
SIAS B-K412							X	
(MDR-7034)	M-HAB-M03	Pump rm exh ISO damper	Close	X				
	M-HAB-M01	Pump rm sply & exh ISO damper	Close	X				
	M-HAB-M02	Pump rm sply & exh ISO damper	Close	X				
	M-HAB-M04	Pump rm sply & exh ISO damper	Close	X				
	M-HAB-M05	Pump rm sply & exh ISO damper	Close	X				
	M-HAB-M06	Pump rm sply & exh ISO damper	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CIAS B-K201						X		
(MDR-7034)	J-SSB-UV-200	Sample cntmt ISO valve	Close	X				
	J-SSB-UV-201	Sample cntmt ISO valve	Close	X				
	J-SSB-UV-202	Sample cntmt ISO valve	Close	X				
CIAS B-K202						X		
(MDR-7034)	J-SGB-HV-200	Chem INJ ISO valve SG-1	Close	X				
	J-SGB-HV-201	Chem INJ ISO valve SG-2	Close	X				
CIAS B-K203						X		
(MDR-7034)	J-CPB-UV-3A	Cntmt purge refueling mode ISO vlv	Close		X			Note 8
	J-CPB-UV-5A	Cntmt purge power ACC mode ISO vlv	Close	X				J-CPB-UV-3A normally locked closed in safety position.
CIAS B-K204							X	
(MDR-7033)	J-CHB-UV-561	Reac drain TK outlet ISO valve	Close	X				
	J-CHB-UV-505	RCP controlled bleedoff to VCT vlv	Close		X			Notes 2 & 9
	J-CHB-UV-523	Regen heat exch to letdown heat ISO valve	Close		X			Note 1
	J-CHB-UV-924	Letdown line pass ISO valve	Close	X				J-CHB-UV-561 and UV-924 are tested quarterly with manual trip to control circuit (ASME Section XI).
CIAS B-K205							X	
(MDR-7034)	J-NCB-UV-401	Nuclear cooling water system cntmt ISO valve	Close		X			Notes 5 & 10
	J-NCB-UV-403	Nuclear cooling water return cntmt ISO valve	Close		X			Notes 2 & 5 & 10

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CIAS B-K206							X	
(MDR-7034)	J-WCB-UV-61	Normal chilled water return cntmt ISO valve	Close	X				
	J-WCB-UV-63	Normal chilled water return & sply cntmt ISO valve	Close	X				
CIAS B-K208							X	
(MDR-7034)	J-HCB-UV-44	Cntmt ATM Rad monitor (inside) ISO valve	Close	X				
	J-HCB-UV-47	Cntmt ATM Rad monitor (inside) ISO valve	Close	X				
CIAS B-K209							X	
(MDR-7034)	J-GRB-UV-2	Gas surge HDR external ISO valve	Close	X				
	J-RDB-UV-24	Cntmt radwaste sumps external ISO valve	Close	X				
	J-RDB-UV-407	Cntmt radwaste sumps pass ISO valve	Close	X				
CIAS B-K210							X	
(MDR-7034)	J-CPB-UV-3B	Cntmt purge refueling mode ISO vlv	Close		X			Note 8
	J-CPB-UV-5B	Cntmt purge power ACC mode ISO vlv	Close	X				J-CPB-UV-3B normally locked closed in safety position.
CIAS B-K212							X	
(MDR-7034)	J-ESB-C01	SESS	Alarm	X				
	J-SDB-C08	ERFDADS	Display	X				
	J-SHB-C01	QSPDS	Display	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CIAS B-K213.....						X		
(MDR-7033)	J-HPB-UV-2	Hydrogen control cntmt ISO valve	Close	X				
	J-HPB-UV-4	Hydrogen control cntmt ISO valve	Close	X				
	J-HPB-UV-6	Hydrogen control cntmt ISO valve	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
CSAS B-K111						X		
(2BP36AF)	J-SIB-UV-680	Hydrazine pump to cntmt spray pump valve	Open	X				
	J-SIB-UV-671	Cntmt spray control valve	Open	X				
	J-SHB-C01	QSPDS	Display	X				
CSAS B-K114						X		
(2BP36AF)	J-SIB-UV-602	Spray chem pump suction valve	Open	X				
	M-SIB-P05	Spray chem add pump	Start	X				
	J-SDB-C08	ERFDADS	Display	X				
CSAS B-K304							X	
(MDR-7034)	(Mode 1)	ESFAS BOP "B" load sequencer	Start		X			Note 3
	M-DGB-H01	Diesel generator	Start		X			Notes 3 & 5
	J-ESB-C01	SESS	Alarm	X				Sequencer tested weekly in auto test, and M-DGB-H01 tested monthly with manual start to control circuit.
	M-HAB-Z03	C.S. pump room B ESS ACU	BYP T.O.	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
MSIS B-K105							X	
(MDR-7034)	J-SGB-HV-200	Chem INJ ISO valve SG-1	Close	X				
	J-SGB-HV-201	Chem INJ ISO valve SG-2	Close	X				
	J-ESB-C01	SESS	Alarm	X				
	J-SDB-C08	ERFDADS	Display	X				
	J-SHB-C01	QSPDS	Display	X				
MSIS B-K303							X	
(MDR-7034)	J-SGE-UV-183	SG-2 MSIV bypass valve	Close	X				
	J-SGB-UV-1135A	Steam traps ISO valve	Close	X				
	J-SGB-UV-1135B	Steam traps ISO valve	Close	X				
	J-SGB-UV-1136A	Steam traps ISO valve	Close	X				
	J-SGB-UV-1136B	Steam traps ISO valve	Close	X				
MSIS B-K305							X	
(MDR-7034)	J-SGB-UV-130	SG-1 downcomer FDW ISO valve	Close		X			Note 11 Test per Note 3 T.S. Pg. 3/4 3-32
	J-SGB-UV-135	SG-2 downcomer FDW ISO valve	Close		X			
	J-SGE-UV-170	SG-1 line 1 MS ISO valve	Close		X			
	J-SGE-UV-180	SG-1 line 2 MS ISO valve	Close		X			
MSIS B-K306							X	
(MDR-7034)	J-SGE-UV-169	SG-1 MSIV bypass valve	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
MSIS B-K313.....							X	
(MDR-7034)	J-SGB-UV-222	Blowdown sample cntmt ISO vlv SG-2	Close	X				
	J-SGB-UV-224	Blowdown sample cntmt ISO vlv SG-2	Close	X				
	J-SGB-UV-500R	Blowdown sample cntmt ISO vlv SG-2	Close	X				
	J-SGB-UV-226	Blowdown sample cntmt ISO vlv SG-2	Close	X				
MSIS B-K404.....							X	
(MDR-7034)	J-SGB-UV-132	SG-1 Economizer FWIV	Close		X			Note 11 Test valves per T.S. Note 3 Pg 3/4 3-32
	J-SGB-UV-137	SG-2 Economizer FWIV	Close		X			
	J-SGE-UV-171	SG-2 Line 1 MSIV	Close		X			
	J-SGE-UV-181	SG-2 Line 2 MSIV	Close		X			
MSIS B-K411.....							X	
(MDR-7034)	J-SGB-UV-219	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-228	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-221	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-500Q	Blowdown sample cntmt ISO vlv SG-1	Close	X				

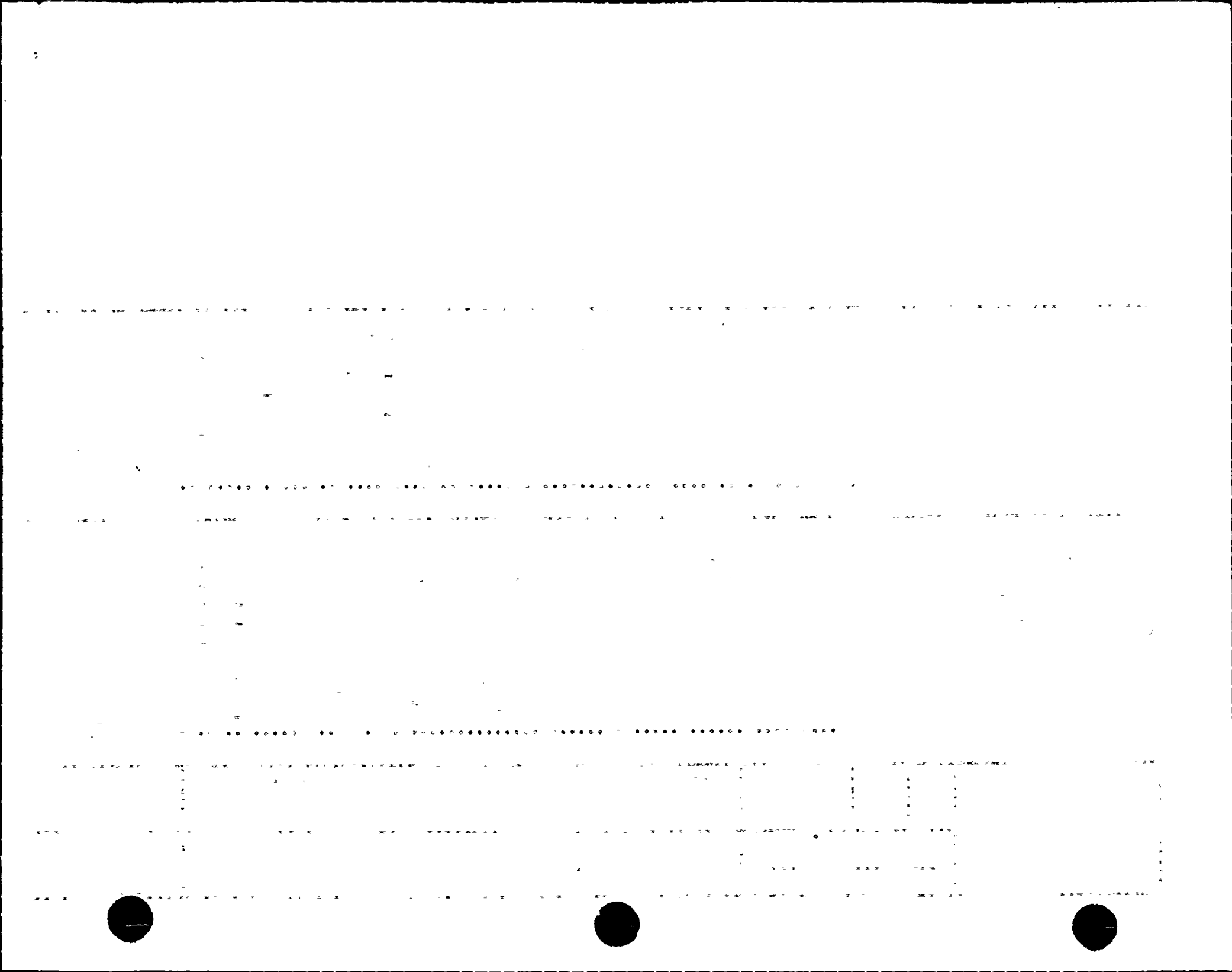
ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
RAS B-K104						X		
(MDR-7034)	M-SIB-P01	LPSI pump	Stop		X			Notes 3 & 5
	J-ESB-C01	SESS	Alarm	X				Test relay but pump will not be tested - it is started and tripped quarterly with manual trip to control circuit.
	J-SDB-C08	ERFDADS	Display	X				
	J-SHB-C01	QSPDS	Display	X				
RAS B-K309						X		
(MDR-7034)	J-SIB-UV-665	Cntmt spray pump to RWT ISO valve	Close	X				
RAS B-K312						X		
(2BP36AF)	J-SIB-UV-667	HPSI pump to RWT ISO valve	Close	X				
	J-SIB-UV-668	LPSI pump to RWT ISO valve	Close	X				
	J-SIB-UV-675	Cntmt sump ISO valve	Open		X			Note 2 & 12
RAS B-K405						X		
(MDR-7034)	J-SIB-UV-659	HPSI recirc to RWT valve	Close	X				
	J-SIB-UV-676	Cntmt sump ISO valve	Open		X			Note 12

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-1 B-K113							X	
(2BP36AF)	E-PEB-G02	Diesel generator breaker	Trip		X			Notes 3 & 5
	M-DGB-H01	Diesel generator B	BYP Trips	X				E-PEB-G02 is closed and tripped monthly with manual trip to control circuit.
	M-HAB-Z05	ECW pump room B ESS ACU	BYP-T.O.	X				
	M-HAB-Z04	Aux FDW pump room B ESS ACU	BYP-T.O.	X				
AFAS-1 B-K211							X	
(MDR-7033)	(Mode 4A)	ESFAS BOP "B" load sequencer	Start		X			Note 3
	M-DGB-H01	Diesel generator B	Start		X			Notes 3 & 5
	J-ESB-C01	SESS	Alarm	X				Sequencer tested weekly in auto test, and M-DGB-H01 tested monthly with manual start to control circuits.
	J-SDB-C08	ERFDADS	Display	X				
	J-SHB-C01	QSPDS	Display	X				
AFAS-1 B-K307						X		
(MDR-7033)	J-SGB-UV-222	Blowdown sample cntmt ISO vlv SG-2	Close	X				
	J-SGB-UV-224	Blowdown sample cntmt ISO vlv SG-2	Close	X				
	J-SGB-UV-500R	Blowdown sample cntmt ISO vlv SG-2	Close	X				
	J-SGB-UV-226	Blowdown sample cntmt ISO vlv SG-2	Close	X				

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-1 B-K402.....					X			
(MDR-7034)	J-SGB-UV-219	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-228	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-221	Blowdown sample cntmt ISO vlv SG-1	Close	X				
	J-SGB-UV-500Q	Blowdown sample cntmt ISO vlv SG-1	Close	X				
K628* & K402**	J-AFB-HV-30	Aux FDW REG valve to SG-1	Open	X				
K728* & K402**	J-AFB-UV-34	Aux FDW ISO valve to SG-1	Open	X				
K629* & K402**	J-AFB-HV-31	Aux FDW REG valve to SG-2	Open	X				
K729* & K402**	J-AFB-UV-35	Aux FDW ISO valve to SG-2	Open	X				

Note: (1) * K628, K728, K629 and K729 are relay type MDR-136-1
(2) * K629 and K729 are from AFAS-2B circuit
(3) ** K402 only maintains the four valves closed. They can be cycled open individually by de-energizing the associated cycling relay via the PPS matrix test module.

ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-2 B-K112							X	
(MDR-7033)	E-PEB-G02	Diesel generator breaker	Trip		X			Notes 3 & 5
	(Mode 4A)	ESFAS BOP "B" load sequencer	Start		X			Note 3
	M-DGB-H01	Diesel generator "B"	Start		X			Notes 3 & 5
	M-DGB-H01	Diesel generator "B"	BYP Trips	X				Sequencer is tested weekly in auto test, E-PEB-G02 and M-DGB-H01 are tested monthly with manual actuation to control circuit.
	J-ESB-C01	SESS	Alarm	X				
	J-SDB-C08	ERFDADS	Display	X				
	J-SHB-C01	QSPDS	Display	X				
	M-HAB-Z05	ECW pump room B ESS ACU	BYP-T.O.	X				
	M-HAB-Z04	Aux FDW pump room B ESS ACU	BYP-T.O.	X				
AFAS-2 B-K310							X	
(MDR-7034)	J-SGB-UV-222	Blowdown sample cntmt ISO valve to SG-2	Close	X				
	J-SGB-UV-224	Blowdown sample cntmt ISO valve to SG-2	Close	X				
	J-SGB-UV-500R	Blowdown sample cntmt ISO valve to SG-2	Close	X				
	J-SGB-UV-226	Blowdown sample cntmt ISO valve to SG-2	Close	X				



ACTUATION DEVICES	ASSOCIATED ACTUATED EQUIPMENT/FUNCTIONS			TESTING AT POWER				
				ASSOCIATED EQUIP.		ACTUATION DEVICE		
SUBGROUP RELAYS	TAG ID NO. (MODE NO.)	DESCRIPTION	FUNCTION	YES	NO	YES	NO	COMMENTS
AFAS-2 B-K413.....							X	
(MDR-7032)	J-SGB-UV-219	Blowdown sample cntmt ISO valve to SG-1	Close	X				
	J-SGB-UB-228	Blowdown sample cntmt ISO valve to SG-1	Close	X				
	J-SGB-UB-221	Blowdown sample cntmt ISO valve to SG-1	Close	X				
	J-SGB-UB-500Q	Blowdown sample cntmt ISO valve to SG-1	Close	X				
K628* & K413**	J-AFB-HV-30	Aux FDW REG valve to SG-1	Open	X				
K728* & K413**	J-AFB-UV-34	Aux FDW ISO valve to SG-1	Open	X				
K629* & K413**	J-AFB-HV-31	Aux FDW REG valve to SG-2	Open	X				
K729* & K413**	J-AFB-UV-35	Aux FDW ISO valve to SG-2	Open	X				

Note: (1) * K628, K728, K629 and K729 are relay type MDR-136-1
(2) * K628 and K728 are from AFAS-1B circuit
(3) ** K413 only maintains the four valves closed. They can be cycled open individually by de-energizing the associated cycling relay via the PPS matrix test module.

ATTACHMENT 3: Characteristics of the Potter Brumfield relay types MDR-7033 and MDR-7034

AMF

POTTER & BRUMFIELD DIVISION

CUSTOMER:
ELECTRO-MECHANICS, INC.
NEW BRITIAN, CONN.

RELAY TYPE: MDR-7033

Size: Medium

Rated Coil Voltage: 28 VDC

PULL IN Voltage: Less than 18.6 VDC AT 25°C.

Release Voltage: More than 2.8 VDC AT 25°C.

TEMPERATURE RANGE: 0°C. TO +65°C.

DC Resistance of Coil: 42 ohms ±10% AT 25°C.

Power (steady state): 18.7 watts

Inrush Current: 0.667 ampere

Current (steady state): 0.667 ampere

CONTACT PRESSURE: 60 GRAMS MINIMUM.

* COIL LEADS EXTENDED 18 INCHES OUT OF BASE.

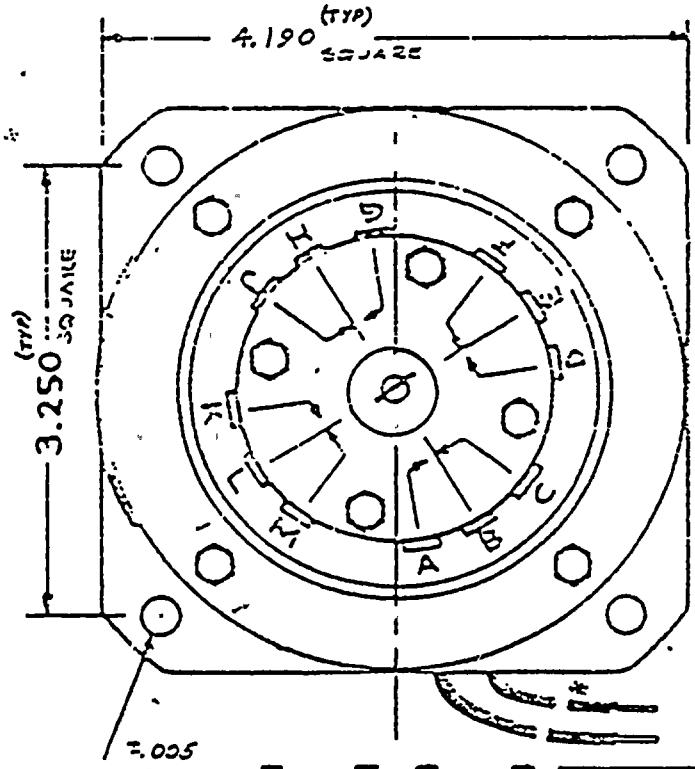
CONTACT RATINGS:

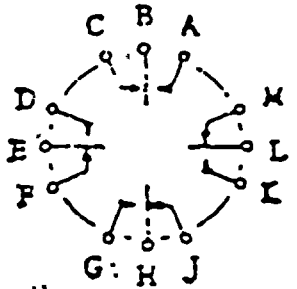
SINGLE CONTACTS

10 AMPS	115 V.AC 50% P.F.
3.0 AMPS	28 V.D.C. RESISTIVE
0.8 AMPS	125 V.D.C. RESISTIVE

TWO CONTACTS IN SERIES

3.0 AMPS	440 V.AC 50% P.F.
15.0 AMPS	115 V.AC 50% P.F.
1.5 AMPS	125 V.D.C. RESISTIVE





Six Contact Sections 24PDT total

NO AUTOMATIC DISTRIBUTION OF UPDATED REVISIONS

DRAWN [illegible] DATE 4-24-74 CHANGED [illegible] UPDATED [illegible]

CHECKED [illegible] 4-25-74

TOL. ±.010 UNLESS OTHERWISE SPECIFIED.

POTTER & BRUMFIELD

CUSTOMER:
ELECTRO-MECHANICS, INC.
NEW BRITAIN, CONN.

RELAY TYPE MDR-7034

Size: Medium

Rated Coil Voltage: 28 VDC

Pull In Voltage: Less than 18.6 VDC AT 25°C.

Release Voltage: More than 2.8 VDC AT 25°C.
TEMPERATURE RANGE: 0°C. TO +65°C.
DC Resistance of Coil: 42. ohms ±10% AT 25°C.

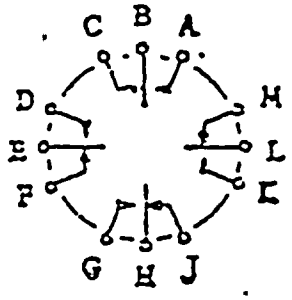
Power (steady state): 16.7watts

Inrush Current: 0.667 ampere

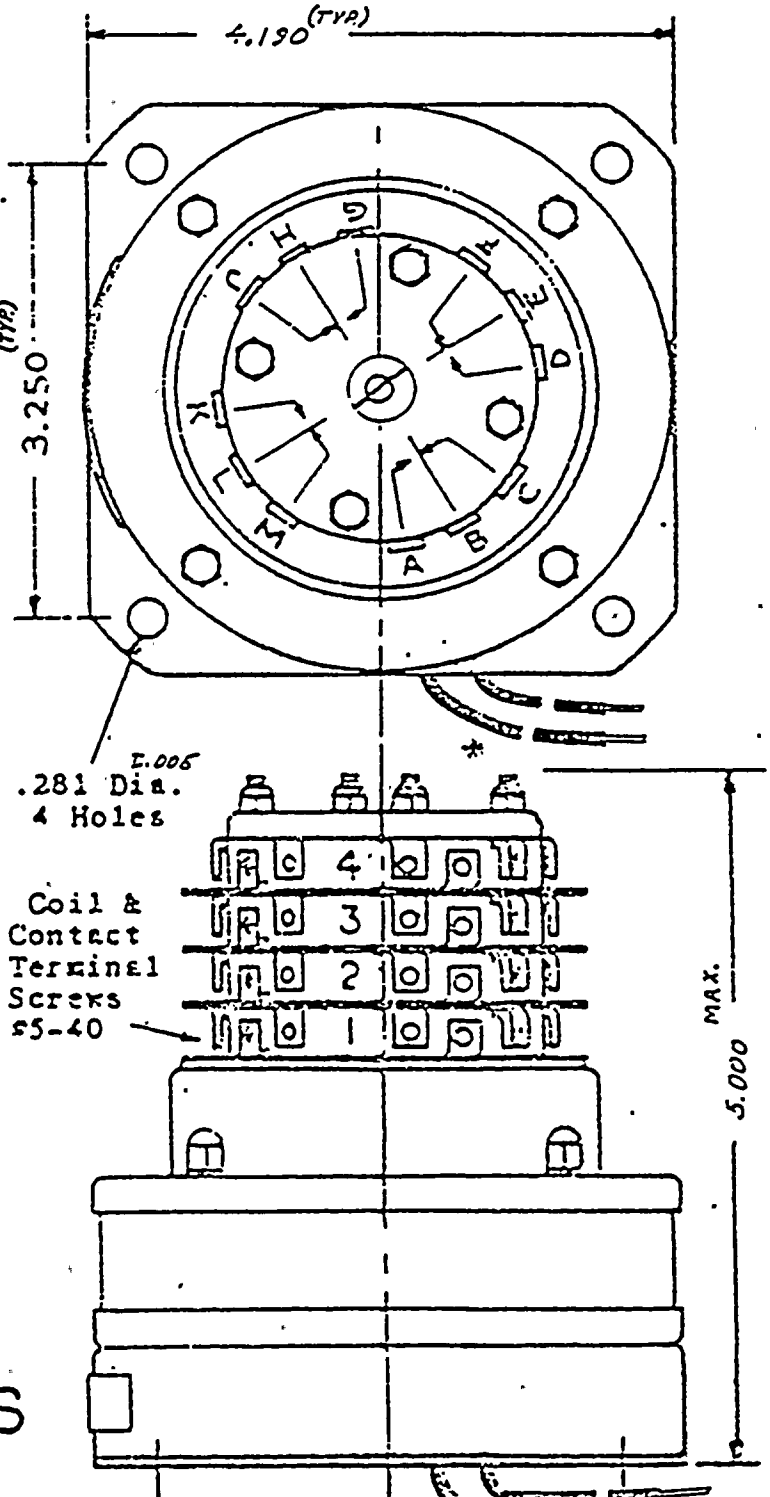
Steady State Current: 0.667 amp.
CONTACT PRESSURES: 60 GRAMS MINIMUM

*COIL LEADS EXTENDED 18 INCHES OUT OF BASE.

CONTACT RATINGS:
SINGLE CONTACTS
10 AMPS 115 V.AC 50% P.F.
3.0 AMPS 28 V.D.C. RESISTIVE
0.8 AMPS 125 V.D.C. RESISTIVE
TWO CONTACTS IN SERIES
3.0 AMPS 440 V.AC 50% P.F.
15.0 AMPS 115 V.AC 50% P.F.
1.5 AMPS 125 V.D.C. RESISTIVE



Four Contact Makers Alike (1cPDT. total)



JAN 8 1981

NO AUTOMATIC DISTRIBUTION OF UPGRADED REVISIONS

DRAWN [illegible] DATE 4-24-74 CHANGED LEADS WERE SHEET 5-13-81 UPDATED 5-14-81 CHECKED 5-15-81
CHECKED [illegible] 4-25-74

TOL. ±.010" UNLESS OTHERWISE SPECIFIED.