



Duquesne Light

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September 27, 1984

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. Harold R. Denton
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Failure Modes and Effects Analysis - Amendment 3

Gentlemen:

Duquesne Light Company, acting on its own behalf and as agent for The Cleveland Electric Illuminating Company, Ohio Edison Company, and The Toledo Edison Company, is filing herewith three (3) signed originals plus three (3) copies of Amendment 3 to the Failure Modes and Effects Analysis (FMEA) for the Beaver Valley Power Station Unit No. 2.

This Amendment consists of our changes resulting from plant design modifications impacting the analysis.

Please insert the revised Amendment 3 material into the FMEA as per the attached Amendment Instruction Sheets.

DUQUESNE LIGHT COMPANY

By *E. J. Woolever*
E. J. Woolever
Vice President

GLB/wjs
Attachments

SUBSCRIBED AND SWORN TO BEFORE ME THIS
27 DAY OF September, 1984.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

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COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On this 27th day of September, 1984, before me, a Notary Public in and for said Commonwealth and County, personally appeared E. J. Woolever, who being duly sworn, deposed and said that (1) he is Vice President of Duquesne Light, (2) he is duly authorized to execute and file the foregoing Submittal on behalf of said Company, and (3) the statements set forth in the Submittal are true and correct to the best of his knowledge.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

STONE & WEBSTER ENGINEERING CORPORATION



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Transmitted with this letter is Amendment 3 to Duquesne Light Company's Beaver Valley Power Station - Unit 2 Failure Modes and Effects Analyses (BVPS-2 FMEA). Insertion instructions for Amendment 3 pages are also included.

Please acknowledge receipt of your BVPS-2 FMEA Amendment 3 package by completing and returning the attached form in the envelope provided.

Acknowledgement of Receipt of
Amendment to Failure Modes and Effects
Analyses
Beaver Valley Power Station - Unit 2

Please sign, dated, and return this sheet to:

Stone & Webster Engineering Corporation
P.O. Box 2325
Boston, MA 02107
Attn: Mr. J. Nawazelski, BVPS-2 Licensing 245/8

Receipt of Amendment 3 to the Failure Modes and Effects Analyses (FMEA) is acknowledged.

My copy has been brought up to date, and superseded pages have been removed and destroyed.

Change my address as follows:

Please reassign this manual (as applicable) to:

_____ Name _____

_____ Name of Organization _____

_____ Address _____

_____ City _____ State _____ Zip Code _____

Signature _____ Date _____

Print name of person to whom FMEA is assigned _____

Serial Number (located inside cover) _____

INSERTION INSTRUCTIONS FOR FMEA AMENDMENT 3

Remove old pages and insert Amendment 3 pages as instructed below.

Transmittal letters along with these insertion instructions should either be filed or entered in Volume 1 in front of any existing letters, instructions, distribution lists, etc.

LEGEND

Remove/Insert Columns

Entries beginning with "T" designate table numbers. All other entries are page numbers:

2-1 = Table 2-1

3-3 = Page 3-3

EP-1 = Page EP-1

vii = Page vii

Pages printed back to back are indicated by a "/":

1-1/2 = Page 1-1 backed by Page 1-2

T6-1(1 of 4)/2 of 4 = Table 6-1, Sheet 1 of 4, backed by Sheet 2 of 4

Location Column

Ch = Chapter, S = Section, Ap = Appendix

| <u>Remove</u> | <u>Insert</u> | <u>Location</u> |
|-------------------------------|-----------------------------|---------------------|
| | <u>Book 1</u> | |
| 2-1/2-2 | 2-1/2-2 | After Section 2 tab |
| T2-1(1 thru 4 of 4) | T2-1(1 thru 4 of 4) | Section 2 |
| 3-1/3-2 thru 3-3/blank | 3-1/3-2 thru 3-3/blank | After Section 3 tab |
| T6-1(1 thru 2 of 2) | T6-1(1 thru 2 of 2) | Section 6 |
| A-i/A-ii | A-i/A-ii | Appendix A |
| FMEA-5-4 (1 thru 10 of 10) | FMEA-5-4 (1 thru 9 of 9) | After FMEA-5-4 tab |

BVPS-2 FMEA

INSERTION INSTRUCTIONS FOR FMEA AMENDMENT 3 (Cont)

| <u>Remove</u> | <u>Insert</u> | <u>Location</u> |
|----------------------------------|-----------------------------------|----------------------|
| FMEA-5-13 (1 thru 34 of 34) | FMEA-5-13 (1 thru 75 of 75) | After FMEA-5-13 tab |
| FMEA-5-15 (1 thru 12 of 12) | FMEA-5-15 (1 thru 16 of 16) | After FMEA-5-15 tab |
| FMEA-14-15 (1 thru 3 of 3) | FMEA-14-15 (1 thru 11 of 11) | After FMEA-14-15 tab |
| FMEA-15-2 (1 thru 145 of 145) | FMEA-15-2 1 thru 16 of 16 | After FMEA-15-2 tab |
| FMEA-21-1 (1 thru 25 of 25) | FMEA-21-1 (1 thru 26 of 26) | After FMEA-21-1 tab |
| FMEA-21-2 (1 thru 10 of 10) | FMEA-21-2 (1 thru 10 of 10) | After FMEA-21-2 tab |
| FMEA-21-6 (1 thru 12 of 12) | FMEA-21-6 (1 thru 47 of 47) | After FMEA-21-6 tab |
| <u>Book 2</u> | | |
| FMEA-21-8 (1 thru 17 of 17) | FMEA-21-8 (1 thru 45 of 45) | After FMEA-21-8 tab |
| FMEA 21-18 (1 thru 84 of 84) | FMEA 21-18 (1 thru 111 of 111) | After FMEA 21-18 tab |
| FMEA 21-19 (1 thru 7 of 7) | FMEA 21-19 (1 thru 6 of 6) | After FMEA 21-19 tab |
| FMEA 21-23 (1 thru 4 of 4) | FMEA 21-23 (1 thru 20 of 20) | After FMEA 21-23 tab |
| FMEA 21-34 (1 thru 7 of 7) | FMEA 21-34 (1 thru 10 of 10) | After FMEA 21-34 tab |
| FMEA 22-5 (1 thru 30 of 30) | FMEA 22-5 (1 thru 32 of 32) | After FMEA 22-5 tab |
| FMEA-25-4 (1 thru 9 of 9) | FMEA-25-4 (1 thru 10 of 10) | After FMEA-25-4 tab |
| FMEA-25-6 (1 thru 8 of 8) | FMEA-25-6 (1 thru 11 of 11) | After FMEA-25-6 tab |

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INSERTION INSTRUCTIONS FOR FMEA AMENDMENT 3 (Cont)

| <u>Remove</u> | <u>Insert</u> | <u>Location</u> |
|--------------------------------|----------------------------------|---------------------|
| FMEA-25-7 (1 thru 53 of 53) | FMEA-25-7 (1 thru 53 of 53) | After FMEA-25-7 tab |
| FMEA-27-1 (1 thru 34 of 34) | FMEA-27-1 (1 thru 115 of 115) | After FMEA-27-1 tab |

BVPS-2 FMEA

LIST OF EFFECTIVE PAGES

| <u>Page, Table (T), or Figure (F)</u> | <u>Amendment Number</u> | <u>Computer Address</u> |
|---|-----------------------------|-----------------------------|
| Frontispiece | 0 | |
| iii | 0 | |
| 1-1 thru 1-2 | 2 | fmea2d |
| 2-1 | 0 | |
| 2-2 | 3 | fmea3c |
| T2-1 (1 thru 4 of 4) | 3 | fmea2a |
| 3-1 thru 3-3 | 3 | fmea3a |
| 4-1 thru 4-2 | 0 | |
| F4-1 | 0 | |
| F4-2 | 0 | |
| F4-3 | 0 | |
| F4-4 | 0 | |
| F4-5 | 0 | |
| F4-6 | 0 | |
| 5-1 | 0 | |
| 6-1 | 0 | |
| T6-1 (1 of 2) | 2 | |
| T6-1 (2 of 2) | 3 | fmea3e |
| T6-2 (1 of 1) | 0 | |
| Appendix A Title Page | 0 | |
| A-i thru A-ii | 3 | fmea3f |
| FMEA-5-4 (1 thru 9 of 9) | 3 | |
| FMEA-5-13 (1 thru 75 of 75) | 3 | |
| FMEA-5-15 (1 thru 12 of 12) | 0 | |
| FMEA-8-9 (1 thru 5 of 5) | 0 | |
| FMEA-12-7 (1 thru 171 of 171) | 1 | |
| FMEA-14-15 (1 thru 11 of 11) | 3 | |
| FMEA-15-2 (1 thru 16 of 16) | 3 | |
| FMEA-17-1 (1 thru 46 of 46) | 1 | |

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LIST OF EFFECTIVE PAGES

| <u>Page, Table (T), or Figure (F)</u> | <u>Amendment Number</u> | <u>Computer Address</u> |
|---|-----------------------------|-----------------------------|
| FMEA-21-1 (1 thru 26 of 26) | 3 | |
| FMEA-21-2 (1 thru 10 of 10) | 3 | |
| FMEA-21-6 (1 thru 47 of 47) | 3 | |
| FMEA-21-7 (1 thru 2 of 2) | 0 | |
| Frontispiece (Book 2) | 0 | |
| FMEA-21-8 (1 thru 17 of 17) | 0 | |
| FMEA-21-18 (1 thru 108 of 108) | 3 | |
| FMEA-21-19 (1 thru 6 of 6) | 3 | |
| FMEA-21-21 (1 thru 8 of 8) | 0 | |
| FMEA-21-23 (1 thru 20 of 20) | 3 | |
| FMEA-21-34 (1 thru 10 of 10) | 3 | |
| FMEA-21-55 (1 thru 15 of 15) | 0 | |
| FMEA-21-56 (1 thru 2 of 2) | 0 | |
| FMEA-22-5 (1 thru 32 of 32) | 3 | |
| FMEA-22-6 (1 thru 6 of 6) | 0 | |
| FMEA-22-6.1 (1 thru 10 of 19) | 2 | |
| FMEA-22-6.1 (11 thru 19 of 19) | 0 | |
| FMEA-22-6.5 (1 thru 10 of 10) | 0 | |
| FMEA-22-8 (1 thru 45 of 45) | 3 | |
| FMEA-22-10 (1 thru 6 of 6) | 0 | |
| FMEA-22-12 (1 thru 7 of 7) | 0 | |
| FMEA-25-4 (1 thru 10 of 10) | 3 | |

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LIST OF EFFECTIVE PAGES

| <u>Page, Table (T), or Figure (F)</u> | <u>Amendment Number</u> | <u>Computer Address</u> |
|---|-----------------------------|-----------------------------|
| FMEA-25-6 (1 thru 11 of 11) | 3 | |
| FMEA-25-7 (1 thru 53 of 53) | 3 | |
| FMEA-25-13 (1 thru 17 of 17) | 0 | |
| FMEA-26-1 (1 thru 32 of 32) | 1 | |
| FMEA-26-2 (1 thru 64 of 64) | 0 | |
| FMEA-27-1 (1 thru 115 of 115) | 3 | |
| FMEA-27-9 (1 thru 34 of 34) | 1 | |
| FMEA-27-10 (1 thru 4 of 4) | 0 | |
| FMEA-27-12 (1 thru 2 of 2) | 0 | |
| FMEA-27-13 (1 thru 10 of 10) | 0 | |
| FMEA-29-8 (1 thru 4 of 4) | 0 | |

SECTION 2

SCOPE OF FAILURE ANALYSIS

2.1 ACTIVE COMPONENT FAILURES

The FTA on the electrical controls portion of the plant design extends down to the active component level. Active components would be, for example, switch and relay contacts, coils, fuses, transformers, and other items normally found in a control circuit. Their modes of failure could be open or short circuits, grounding, loss of electrical power, and mechanical failure.

2.2 PASSIVE COMPONENT FAILURES

Passive component failures are not included in the FTA. Examples of passive components would be piping, heat exchangers, tanks, air cooling coils, accumulators, cables, and cable trays. These components, in general, have active components to assure system integrity upon failure of the passive ones, especially for those cases where a failure would adversely affect a safety-related system.

2.3 SYSTEMS ANALYZED

The systems analyzed are the Class 1E instrumentation and controls and electrical power portions of the BOP safety-related systems. They include the systems actuated or controlled by the protection systems, auxiliary or supporting systems which must be operable for the protection systems, and those systems actuated to perform their safety-related functions.

2.4 INTERFACE WITH NUCLEAR STEAM SUPPLY SYSTEM VENDOR

Analysis of the reactor trip system and certain other related engineered safety features systems are performed by the nuclear steam supply system vendor, Westinghouse Electric Corporation. The failure analyses of the BOP safety-related system components extend only to their interface with the Westinghouse scope of design components.

2.5 LIST OF SAFETY-RELATED SYSTEMS

The BOP safety-related systems analyzed and the reference documents and diagrams used in the analysis of each system are presented in Table 2.1. A brief description of each columnar heading used in the tabulation follows:

- FMEA: The number for the FMEA of the safety-related system, as derived from Stone & Webster Engineering Corporation (SWEC) Corporate Standard C-4, Systems Identification Index. This same number is used for the fault trees of this system.
- System Title: The title of the system, as it corresponds with the nomenclature in NUREG-0800, Standard Review Plan.

EVPS-2 FMEA

- System Code: The three-letter acronym of the system title.
- System Description: The applicable section of the final safety analysis report (FSAR) where the detailed system description can be found.
- Flow Diagrams/One-Lines: The drawing numbers and revisions of the Flow Diagrams and One-Line Drawings used in the failure analysis.
- Elementary Diagram: The drawing numbers and revisions of the associated Elementary Diagrams (electrical, instrumentation, and control drawings) used in the failure analysis. These diagrams are in the drawing package that is provided separately (Section 1.7.1).

BYPS-2 FMEA

TABLE 2-1

SAFETY-RELATED SYSTEMS AND THEIR REFERENCE DOCUMENTS

| <u>FMEA(1)</u> | <u>System Title</u> | <u>Sys Code</u> | <u>System Descr FSAR Section</u> | <u>Flow Diagrams/ One-Lines(2)</u> | <u>Elementary Diagrams(3)</u> |
|----------------|---|-----------------|----------------------------------|--|---|
| 5-4 | Condensate & Feedwater Systems | FWS | 10.4.7 | RM-45A/15 | 11E/4, 11F/3, 11ER/5 |
| 5-13 | Auxiliary Feedwater System | FWA/FWE | 10.4.9 | RM-45A/15, RM-45B/4 Borg Warner Dwg 86010 SWEC 2007.630.209.095 SWEC 2007.630.209.096 SWEC 2007.630.209.097 SWEC 2007.630.209.098 | 3A/8, 12A/3, 12B/3, 5C/8, 11H/8, 11K/9, 11AB/9, 5DE/10, 5DU/11, SEE/10, 5EU/11, 11FZ/1, 11JA/5, 11JB/4, 11JR/1, 11JS/1, 11JT/1, 11JV/4, 6JW/4, 6JX/4 |
| 5-15 | Steam Generator Blowdown System | BDC | 10.4.8 | RM-41A/13, RM-99A/13, RM-100A/14 | 3E/8, 3H/9, 3L/8, 3M/8, 11K/9, 11X/9, 11Y/9, 5DE/10, 5EE/9, 11BK/6, 11JM/2, 11FZ/2 |
| 8-9 | Emergency Diesel Generator Fuel Oil Storage & Transfer System | EGF | 9.5.4 | RM-72A/9 | 6NS/2, 6NT/2 |
| 12-7 | Primary Component Cooling Water System | CCP | 9.2.2.1 | RM-47B/11, RM-47D/10, RM-77A/8, RM-77B/8, RM-77C/8, RM-77E/8, RM-77F/8, RM-77G/11, RM-77H/3 | 5G/8, 12A/3, 12B/3, 5CH/8, 5DG/10, 5DH/10, 5DU/8, 5EG/9, 5EH/10, 5EU/8, 6FL/6, 6FM/4, 6FS/6, 6FT/4, 6GE/3, 6RL/5, 6RM/4, 6RN/4, 6RP/4, 11JA/1, 11JB/1, 11FZ Sh 3/1 |
| 14-15 | Reactor Plant & Process Sampling System | SSR | 9.3.2.1 | RM-99A/13 | 3E/8, 11AH/7, 11HC/2, 11HD/2 |
| 15-2 | Main Steamline Isolation System | MSS | 10.3 | RM-41A/9, RM-58A/6 | 11Q/2, 11AC/6, 11AD/4, 11AS/2, 11AT/2, 11AU/3, 11BW/1, 11EH/3 |
| 17-1 | Station Service Water System | SWS | 9.2.1 | RM-47B/11, RM-47C/10 | 5DN/10, 5DP/7, 5DU/8, 5EE/1, 5EN/8, 5EP/8, 5EU/8, 6GA/4, 6GC/4, 6GE/3, 6MR/4, 6MS/1, 6NQ/4, 11FX/Prelim |

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TABLE 2-1 (Cont)

| <u>FMEA(1)</u> | <u>System Title</u> | <u>Sys Code</u> | <u>System Descr FSAR Section</u> | <u>Flow Diagrams/ One-Lines(2)</u> | <u>Elementary Diagrams(3)</u> |
|----------------|---|-----------------|----------------------------------|------------------------------------|--|
| 21-1 | Control Room Ventilation System | HVC | 9.4.1 | RB-47B/13 RB-84C/7 RE-1AL/4A | 3E/8, 3K/9, 3N/14, 6JD/6, 6JE/3, 6JF/6, 6UP/2, 6UQ/6, 11CL/3, 11JP/2, 11CN/3, 11CQ/3, 11CX/3 |
| 21-2 | Control Building Ventilation System | HVC | 9.4.1 | RB-84A/5 RB-84J/2 | 3K/9, 6UM/6, 6UN/5, 11JA/5, 11JB/4 |
| 21-6 | Main Steam & Feedwater Valve Area Ventilation System | HVT | 9.4.9 | RB-85A/9 RM-47D/14 | 3A/8, 3B/9, 3F/10, 7A/8, 7B/8, 7C/6, 7D/6, 5DU/11, 5EU/10, 6BB/7, 6BC/7, 6E1/2, 6EU/1, 11FV/1 |
| 21-7 | Safeguards Area Ventilation System | HVK | 9.4.11 | RB-85B/2 | 6EK/5 |
| 21-8 | Cable Vault & Rod Control Area Ventilation System | HVR | 9.4.12 | RB-85B/6 | 6EH/8, 6JM/5, 11R/4 |
| 21-18 | Supplementary Leak Collection and Release System | HVS | 6.5.3.2 | RB-85C/6 | 3B/9, 3F/10, 3N/14, 3P/5, 7A/10, 7B/11, 7C/7, 7D/6, 12A/3, 12B/3, 5DU/11, 5EE/11, 5EU/11, 6AG/5, 6AJ/9, 6BB/7, 6BC/7, 11CE/4, 11CF/4, 11CG/4, 11CH/5, 11CJ/3, 11CK/4, 11CP/4, 11CR/4, 11JA/5, 11JB/5 11CM/4 |
| 21-19 | Containment Purge Air System | HVR | 9.4.7.3 | RB-85D/4 | 6UA/3, 6UB/2 |
| 21-21 | Auxiliary Building & Radwaste Area Ventilation System | HVP | 9.4. | RB-85D/4, RB-85C/4 | 6EQ/3, 6ER/3, 11CA/3, 11CB/3 |
| 21-23 | Primary Intake Structure Ventilation System | HVW | 9.4.8 | RB-84B/7 | 6EX/9, 11DP/3 |
| 21-34 | Diesel Generator Building Ventilation System | HVD | 9.4.6 | RB-84B/3 | 6EP/5, 6EV/3, 11DS/3, 11DT/3, 11JA Sh 1/2 & Sh 2/1, 12A Sh 1/3, 12B Sh 1/3 |
| 21-55 | Emergency Switchgear Room Ventilation System | HVZ | 9.4.10.3 | RB-84A/5 | 5DU/8, 6BB/5, 6BW/5, 6BZ/3, 11DU/2, 11DV/2 |

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TABLE 2-1 (Cont)

| <u>FMEA(1)</u> | <u>System Title</u> | <u>Sys Code</u> | <u>System Descr FSAR Section</u> | <u>Flow Diagrams/ One-Lines(2)</u> | <u>Elementary Diagrams(3)</u> |
|----------------|--|-----------------|----------------------------------|--|---|
| 21-56 | Battery Room Ventilation System | HVZ | 9.4.10.2 | RB-84A/5 | 6EB/5 |
| 22-5 | Class 1E AC Power System | ENS | 8.3.1 | RE-1F/4A, RE-1AW/2 RE-1AQ/2 | 5DA/11, 5DB/7, 5DT/7, 5DU/11, 5EA/9, 5EB/5, 5EU/11, 7A/10, 11FZ/2 |
| 22-6 | Emergency Diesel Generator Starting System | EGA | 9.5.6 | - | 12H/2, 12J/2, 12M/2, 12N/2, 5DA/9, 5DU/8, 5EA/8, 5EU/8 |
| 22-6.1 | Engineered Safety Features Load Sequencing | EGS | 8.3.1.1.8 | - | 12A/3, 12B/3, 5DA/10, 5DB/6 |
| 22-6.5 | Emergency Diesel Generator Spurious Trip | EGS | 9.5.5 9.5.7 | - | 12D/3, 12E/3, 12F/2, 12G/2, 12K/2, 12L/2, 5DA/9, 5EA/8 |
| 22-8 | 480 V AC Emergency Power Supply | EJS | 8.3.1.1.3 | RE-1C/3, RE-1J/3 | 5DT/7, 5ET/7, 6BA/4 |
| 22-10 | Class 1E DC Power System | BYS | 8.3.2 | RE-1AR/2, RE-1AW/2 | 6Y/2 |
| 22-12 | Vital Bus Uninterruptible Power System | VBS | 8.3.1.1.17 | RE-1AW/2 | - |
| 25-4 | RCS-Pump, Hot/Cold Leg, Bypass Isolation | RCS | 5.4.13 10.4.4 | RM-75A/10 | 5F/11, 5AF/11, 5BF/11, 6FA/6, 6FB/6, 6FC/6, 6FD/6, 6FE/6, 6KS/4 |
| 25-6 | RCS-Pressurizer Control | RCS | 5.4.10 | RM-75B/12, RM-79C/11 | 11L/5, 6FG/6, 6HZ/5, 6QE Sh 2/7, 11AB Sh 1/7 |
| 25-7 | Residual Heat Removal System | RHS | 5.4.7 | RM-76A/14 | 6RW/8, 6RU/9, 6RV/11, 11AB/9, 11GF Sh 1/3 & 2/2, 11GN Sh 1/3, 2/3, 3/3, 4/3, & 5/2, 11FZ/2 |
| 25-13 | RCS-Reactor Coolant Let-down | RCS | 5.4.1 | RM-75A/10, RM-79C/11 RM-79A/12 | 11J/8, 6HX/3, 6HY/3, 6JN/2, 6QC/7, 6QD/7, 11AF/5, 11AJ/7, 11AB/9, 11FZ/2, 3E/8 |
| 26-1 | High Head Safety Injection System | SIS | 6.3 | RM-75A/10, RM-79A/11, RM-79C/10, RM-79D/9, RM-85B/9, RM-87A/11, RM-87B/11 | 5DL/8, 5DM/6, 5DU/9, 5EL/6, 5EU/9, 6HS/3, 6HT/5, 6JJ/9, 6JK/7, 11AL/6, 11FZ Sh 3/1, 5EM/9, 6JG/4, 6JH/4 |

BVPS-2 FMEA

TABLE 2-1 (Cont)

| <u>FMEA(1)</u> | <u>System Title</u> | <u>Sys Code</u> | <u>System Descr FSAR Section</u> | <u>Flow Diagrams/ One-Lines(2)</u> | <u>Elementary Diagrams(3)</u> |
|----------------|--|-----------------|----------------------------------|--|--|
| 26-2 | Low Head Safety Injection System | SIS | 6.3 | RE-21S/4, RE-21V/4 | 3B/9, 3E/8, 3F/8, 3H/9, 7C/6, 12A/3, 12B/3, 5DA/9, 5DB/6, 5DR/6, 5DS/7, 5DU/8, 5EA/8, 5EB/5, 5EK/6, 5ES/7, 5EU/8, 6HD/4, 6HR/4, 6QW/4, 6QY/3, 6RA/3, 11AL/4 |
| 27-1 | Recirculation Spray System | RSS | 6.2.2.2.2 | RM-47B/13, RM-85A/14 RE-21S/5, RE-21V/5, RE-21W/5A | 3A/8, 3B/9, 3C/11, 3H/9, 12A/3, 12B/3, 5DA/11, 5DR/7, 5DQ/7, 5DR/7, 5EA/9, 5EB/5, 5EQ/7, 5ER/7, 6GF/7, 6GJ/7, 6GK/7, 6GL/7, 6HA/7, 6HB/7, 6HC/7, 6HD/7, 6QW/7, 5AG/9, 5DT/7, 5DU/11, 5ET/7, 5EU/11, 11AL/7, 7A/10, 7B/11, 7C/6, 7D/6 |
| 27-9 | Quench Spray System | QSS | 6.2.2.2.1 | RM-85B/10 | 3B/9, 3E/8, 3F/8, 3H/9, 12A/3, 12B/3, 5DA/9, 5DK/9, 5DU/8, 5EA/8, 5EK/9, 5EU/8, 6DU/1, 6JA/4, 6JB/4, 6JC/4, 11DY/1, 11DZ/1 |
| 27-10 | Containment Vacuum Leakage Monitoring System | CVS | 6.2.6 | RM-88A/12 | 6DV/5, 6QQ/6, 11AG/8 |
| 27-12 | Containment Isolation Signal Initiation System | LMS | 6.2.4 | RM-88A/10 | 11M/5, Westinghouse SW200-1.409-001-024D |
| 27-13 | Combustible Gas Control System | HCS | 6.2.5 | RM-110A/10 | 11T/2, 6FY/3 |
| 29-8 | Spent Fuel Pool Cooling & Cleanup System | FNC | 9.1.3 | RM-82A/12 | 6ND/5, 6RJ/3 |

(1) Prefix FMEA numbers shown with "12241-FMEA-"

(2) Prefix Flow Diagram/One-Line numbers shown with "12241-"

(3) Prefix Elementary Diagram numbers shown with "12241-E-"

SECTION 3

FAULT TREE METHODOLOGY

3.1 DATA REQUIRED

The BVPS-2 project document, 2BVM-147, Failure Modes and Effects Analysis Procedure, provides the detailed procedure to be used in the performance and documentation of the safety-related system analysis.

Since the FMEA is a computerized tabulation that is derived from the FTA, a fault tree must first be generated. Certain reference material and system information are needed, as well as an understanding of the definitions and terminology used, in order to construct the fault tree.

The reference material and information required includes any or all of the following documents on the safety-related system to be analyzed:

- System Description
- Elementary Diagrams (ESK)
- Electrical Diagrams (One-Lines)
- Flow Diagrams (RB & RM)
- Functional Control Diagrams (KSK)
- Logic Diagrams (LSK)
- Manufacturers Diagrams

Definitions used in the FTA/FMEA context are:

- Failure: The termination of the ability of an item to perform its required function.
- Detectable Failure: A failure that can be revealed through periodic testing, by alarm, inspection, or analog indication.
- Periodic Test: A test performed at scheduled intervals to detect failures and to verify operability.
- Operator Error: Improper action of the plant operator in response to plant conditions (for example, pushing wrong pushbutton switch, setting control switch in wrong position, failure to operate a control, etc).

Terminology of the symbols used in fault tree construction are:

- Top Event: The starting point of a fault tree, which is the single most undesired event, or failed state, of a system. (i fault tree can have only one top event.)

- Basic Fault: A fault event that is fundamental to the given fault tree and that could be either truly basic (requires no further dissection) or assumed basic (could be developed further but is not done or it has no consequence on higher events).
- AND Gate: The intersection operation of sets, that is, an output event occurs only if all the inputs occur.
- OR Gate: The union operation of sets, that is, an output event occurs if any one of the inputs occur.
- CONDITION Gate: The input does not constitute a fault unless the condition is satisfied. Sometimes called an INHIBIT gate.
- DEFINITE MATRIX Gate: Requires X out of N inputs to generate an output. (This gate is structured on fault tree diagrams as a group of AND/OR logic gates to facilitate computer coding.)
- Resultant Event: An event that results from another event or combination of events through the input of one of the logic gates.

3.2 FAULT TREE DEVELOPMENT

To construct a fault tree, the logical sequence of component failures required to cause the failure of a safety-related system or its function must first be established. This is done by utilizing the reference material listed in Section 3.1.

The starting point for the fault tree is the top event. This is the most undesired event, or failed state, of the system being analyzed. Next, on a descending level, will be initiating or resultant events with their logic gates of failures that lead directly to the top event. A branch of the fault tree is then created for each resultant failure event. This branch will contain the downward flow of resultant events and their gates that contribute directly to the failure shown in the previous event block. This continues to ever lower levels until a fundamental, or basic, fault event is reached. The level of detail at which the dissection is stopped is a component or part, such as a contact, a coil, or a fuse, whose failure has no consequence other than to fail this component. It could also be the loss of power, a mechanical failure, an operator error, or a source of protective action (for example, signal sensor from Westinghouse) for which relevant failure data is available.

3.3 FAILURE DETECTION METHODS

The following are used to describe the detectability of component failures:

- Annunciator in the main control room

BVPS-2 FMEA

- Indicating light in the main control room
- Analog indication in the main control room
- More contacts must fail for failure to be detectable
- Periodic test
- Periodic inspection
- Undetectable

It is possible that a failure is either not detectable or that more devices must fail to have a detectable failure. Should the component failure be one of these, a system design change usually must be implemented to make all failures readily detectable.

3.4 SINGLE FAILURE EXAMINATION

After development of the fault tree, all of its branches are examined for any single component failure that leads directly to the top event by utilizing the computer process described in the following section. Where a single failure that could cause loss of the system safety function is identified, the design is evaluated to determine if any compensating features are available that could provide the function. If no compensating features are available, a system design change is required. The tree is then revised to include the change and reexamined for single failure possibility. If the single failure has been eliminated, the design change is then implemented.

3.5 COMPUTER CODING AND OUTPUTS

Each event gate and component block of the fault tree is assigned a unique, computer-readable, identifier code. This identifier code, along with the associated component/device identification number (Mark No.) and failure description of that gate or block, is entered into the computer for processing.

The computer program examines the identifier codes of the fault tree for any single component failures that lead to the top event. The cut set subroutine of the computer program performs the determination of single failure. It can also uncover those cases where an undetectable failure exists in combination with another failure to lead to the top event. The FMEA subroutine of the program utilizes the coded fault tree data to produce the tabulated printouts. These printouts of the failure analyses performed on the BOP safety-related systems can be found in Appendix A.

BVPS-2 FMEA

TABLE 6-1

SYSTEM DESIGNATORS

| <u>System Designator</u> | <u>System Description</u> | <u>System Code</u> |
|--------------------------|---|--------------------|
| A | Safety Injection System - Low Pressure | SIS |
| B | 125 V DC Class 1E Power System | BYS |
| C | Service Water System | SWS |
| D | Residual Heat Removal System | RHS |
| E | 4,160 V AC Class 1E Power System | ENS |
| F | Auxiliary Feedwater System | FWA/FWE |
| G | Emergency Diesel Generator Systems | EGA/EGF/EGS |
| H | Combustible Gas Control System | HCS |
| I | Not used | -- |
| J | 480 V AC Emergency Power Supply | EJS |
| K | HVAC - Service Building HVAC - Main Steam and Feedwater Valve Area | HVL HVT |
| L | Not used | -- |
| M | Main Steamline Isolation System Steam Generator Blowdown System | MSS BDG |
| N | HVAC - Control Building/Room | HVC |
| O | Not used | -- |
| P | Primary Component Cooling Water System | CCP |
| Q | Quench Spray System | QSS |
| R | Recirculation Spray System | RSS |
| S | Not used | -- |
| T | Not used | -- |

BVPS-2 FMEA

TABLE 6-1 (Cont)

| <u>System Designator</u> | <u>System Description</u> | <u>System Code</u> |
|--------------------------|--|--------------------|
| U | Condensate and Feedwater System | FWS |
| V | HVAC - Diesel Generator Building | HVD |
| W | Safety Injection System - High Pressure Reactor Coolant System - Pressurizer Control | SIS RCS |
| | Reactor Coolant System - Reactor Coolant Letdown | RCS |
| X | Not used | -- |
| Y | Containment Isolation Signal Initiation System | ISC |
| | Reactor Coolant System - Pump, Hot/Cold Leg, Bypass Isolation | RCS |
| Z | HVAC - Safeguards Area Containment Purge Air System | HVK HVR |
| 1 | Spent Fuel Pool Cooling and Cleanup System | FNC |
| 2 | Vital Bus Uninterruptible Power System | VBS |
| 3 | HVAC - Primary Intake Structure | HVW |
| 4 | HVAC - Emergency Switchgear Room | HVZ |
| 5 | HVAC - Auxiliary Building | HVP |
| 6 | Containment Vacuum Leakage Monitoring System | CVS HVZ |
| | HVAC - Battery Room | |
| 7 | Supplementary Leak Collection and Release System | HVS |
| 8 | HVAC - Cable Vault and Rod Control Area | HVR |
| 9 | Reactor Plant and Process Sampling System | SSR |

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APPENDIX A

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| FMEA-27-13 | Combustible Gas Control System | 10 |
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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|-----------------------------|--------------------------|---------------|
| 5-4/2-H | U0501ER3 | 3-FNSAJ CONTACT 113 FAILS OPEN | PERIODIC TEST | 3-FNSAJ CONTACT 113 OPEN | |
| 5-4/2-H | U0511ER3 | 3-FNSAJ CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-FNSAJ CONTACT 221 OPEN | |
| 5-4/2-H | U0521ER3 | 2FNS*HYV157A COIL A1 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-H | U0531ER3 | 2FNS*HYV157A COIL A2 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-H | U0541ER3 | 2FNS*HYV157A COIL A3 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-H | U0551ER3 | 2FNS*HYV157A COIL A4 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-H | U0561ER1 | CKT FNSAJ NO 125VDC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2FNS*HYV157A OPEN | |
| 5-4/2-J | U0611ER3 | 2FNS*HYV157B COIL B1 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-J | U0621ER3 | 2FNS*HYV157B COIL B2 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-J | U0631ER3 | 2FNS*HYV157B COIL B3 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-J | U0641ER3 | 2FNS*HYV157B COIL B4 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-J | U0651ER1 | CKT FNSBJ NO 125 VDC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2FNS*HYV157B OPEN | |
| 5-4/2-J | U0661ER1 | CKT FNSBJ ACB (+) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2FNS*HYV157B OPEN | |
| 5-4/2-J | U0671ER1 | CKT FNSBJ ACB (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2FNS*HYV157B OPEN | |
| 5-4/2-K | U0721ER3 | 2FNS*HYV157C COIL C1 FAILS | PERIODIC TEST | NONE | |

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| | | | | |
|---|---|---------|---------|------------------------------------|
| | | 3-16-84 | 16-P-17 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | my | JIL | CONDENSTATE & FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | J.O. 12241 FMEA-5-4/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|-------------------------------------|---------------|
| 5-4/2-K | U0731ER3 | 2FWS*HYV157C COIL C2 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-K | U0741ER3 | 2FWS*HYV157C COIL C3 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-K | U0751ER3 | 2FWS*HYV157C COIL C4 FAILS | PERIODIC TEST | NONE | |
| 5-4/2-K | U0761ER1 | CKT FWSJ NO 125 VDC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2FWS*HYV157C OPEN | |
| 5-4/2-K | U0771ER1 | CKT FWSJ ACB (+) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2FWS*HYV157C OPEN | |
| 5-4/2-K | U0781ER1 | CKT FWSJ ACB (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2FWS*HYV157C OPEN | |
| 5-4/2-K | U0791ER1 | CKT FWSJ SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2FWS*HYV157C OPEN | |
| 5-4/2-H | U1021ER3 | 3-FWSAJ COIL FAILS | PERIODIC TEST | 2FWS*HYV157A OPEN | |
| 5-4/2-AB | U1031ER3 | LHC-B FWSAJ CONTACT B FAILS OPEN | PERIODIC TEST | CKT-FWSAJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AB | U1041ER3 | 1-FWSAJ CONTACT L1 FAILS OPEN | PERIODIC TEST | CKT-FWSAJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AB | U1051ER6 | 1-FWSAJ NOT IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | CKT-FWSAJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AB | U1061ER3 | H910 CONTACT F1 FAILS OPEN | PERIODIC TEST | CKT-FWSAJ NO AUTO CKT ESTABLISHED | |
| 5-4/2-AB | U1081ER3 | H522A TN A CONTACT FAILS OPEN | PERIODIC TEST | CKT-FWSAJ NO AUTO CKT ESTABLISHED | |
| 5-4/2-Y | U1091ER3 | 3-FWSBJ COIL FAILS | PERIODIC TEST | 2FWS*HYV157B OPEN | |
| 5-4/2-AC | U1101ER3 | LHC-B FWSBJ CONTACT B FAILS OPEN | PERIODIC TEST | CKT-FWSBJ NO MANUAL CKT ESTABLISHED | |

| | | | | | |
|----|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | CONDENSATE & FEEDWATER SYSTEM | |
| 19 | 3 | 2 | 1 | | |
| | | | | J.O. 12281 FMEA-5-4/2 SH 2 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|-------------------------------------|---------------|
| 5-4/2-AC | U1111ER3 | 1-FHSSJ CONTACT L1 FAILS OPEN | PERIODIC TEST | CKT-FMSBJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AC | U1121ER6 | 1-FMSBJ NOT IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | CKT-FMSBJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AC | U1131ER3 | K810 CONTACT J1 FAILS OPEN | PERIODIC TEST | CKT-FMSBJ NO AUTO CKT ESTABLISHED | |
| 5-4/2-AC | U1141ER3 | K622A TN A CONTACT 3 FAILS OPEN | PERIODIC TEST | CKT-FMSBJ NO AUTO CKT ESTABLISHED | |
| 5-4/2-AA | U1151ER3 | 3-FMSCJ COIL FAILS | PERIODIC TEST | 2FMS*HYV157C OPEN | |
| 5-4/2-AD | U1161ER3 | LMC-B FMSCJ CONTACT B FAILS OPEN | PERIODIC TEST | CKT FMSCJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AD | U1171ER3 | 1-FMSCJ CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT FMSCJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AD | U1181ER6 | 1-FMSCJ NOT IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | CKT FMSCJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AD | U1191ER3 | K810 CONTACT J3 FAILS OPEN | PERIODIC TEST | CKT FMSCJ NO AUTO CKT ESTABLISHED | |
| 5-4/2-AD | U1201ER3 | K622A TN A CONTACT 7 FAILS OPEN | PERIODIC TEST | CKT FMSCJ NO AUTO CKT ESTABLISHED | |
| 5-4/2-H | U2221ER1 | CKT FMSAJ ACB (+) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2FMS*HYV157A OPEN | |
| 5-4/2-H | U2231ER1 | CKT FMSAJ ACB (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2FMS*HYV157A OPEN | |
| 5-4/2-H | U2241ER1 | CKT FMSAJ SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2FMS*HYV157A OPEN | |
| 5-4/2-J | U2251ER1 | CKT FHSSJ SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2FMS*HYV157B OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|--|-----------------------------|--------------------------------------|------------------------------------|
| 5-4/2-Y | U2261ER3 | 3-FNSBJ CONTACT 113 FAILS OPEN | PERIODIC TEST | 3-FNSBJ CONTACT 113 OPEN | |
| 5-4/2-Y | U2271ER3 | 3-FNSBJ CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-FNSBJ CONTACT 221 OPEN | |
| 5-4/2-AA | U2281ER3 | 3-FNSCJ CONTACT 113 FAILS OPEN | PERIODIC TEST | 3-FNSCJ CONTACT 113 OPEN | |
| 5-4/2-AA | U2291ER3 | 3-FNSCJ CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-FNSCJ CONTACT 221 OPEN | |
| 5-4/2-AB 5-4/2-AC 5-4/2-AD | U2321ER3 | K622A TN A NO ACTUATION SIGNAL | PERIODIC TEST | CKT-FNSAJ NO AUTO CKT ESTABLISHED | (K622A TN A= NSSS INTERFACE) |
| 5-4/2-AB 5-4/2-AC 5-4/2-AD | U3001ER3 | K610 TN A SPURIOUS TEST SIGNAL | PERIODIC TEST | CKT-FNSAJ NO AUTO CKT ESTABLISHED | (K610A TN A= TEST SPURIOUS SIGNAL) |
| 5-4/2-AC | U3011ER3 | 3-FNSBJ CONTACT 223 FAILS OPEN | PERIODIC TEST | CKT-FNSBJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AB | U3021ER3 | 3-FNSAJ CONTACT 223 FAILS OPEN | PERIODIC TEST | CKT-FNSAJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-AD | U3031ER3 | 3-FNSCJ CONTACT 223 FAILS | PERIODIC TEST | CKT FNSCJ NO MANUAL CKT ESTABLISHED | |
| 5-4/2-D | U00211E3 | 2FNS*FSV4783 BINDS UP IN ADMIT AIR | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-V | U00411E3 | 2FNS*FSV478 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-V | U00911E3 | 2RPR-3B K620B CONTACT 2 FAILS CLOSED | PERIODIC TEST | 2RPR-3B K620B CONTACT2 CLOSED | |
| 5-4/2-V 5-4/2-X 5-4/2-Z | U01011E3 | 2RPR-3B K620B NO ACTUATION SIGNAL | PERIODIC TEST | 2RPR-3B K620B CONTACT2 CLOSED | (K620 TN B= NSSS INTERFACE) |

| | | | | | | | |
|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | CONDENSATE & FEEDWATER SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12041 FHFA-5-4/2 SH 4 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------------------|----------------------|--|----------------------------------|--------------------------------------|-----------------------------|
| 5-4/2-V | U0111E3 | 2RPR-3B K601B CONTACT 1 FAILS CLOSED | PERIODIC TEST | 2RPR-3B K601B CONTACT1 CLOSED | |
| 5-4/2-V 5-4/2-X 5-4/2-Z | U0121E3 | 2RPR-3B K601B NO ACTUATION SIGNAL | PERIODIC TEST | 2RPR-3B K601B CONTACT1 CLOSED | (K601 TN B= NSSS INTERFACE) |
| 5-4/2-C | U0141E3 | 2FWS*FSV399 BINDS UP IN ADMIT AIR | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-X | U0161E3 | 2FWS*FSV409 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-X | U0191E3 | 2RPR-3B K620B CONTACT 7 FAILS CLOSED | PERIODIC TEST | 2RPR-3B K620B CONTACT 2 CLOSED | |
| 5-4/2-X | U0201E3 | 2RPR-3B K601B CONTACT 7 FAILS CLOSED | PERIODIC TEST | 2RPR-3B K601B CONTACT 1 CLOSED | |
| 5-4/2-B | U0221E3 | 2FWS*FSV398 BINDS UP IN ADMIT AIR | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-Z | U0241E3 | 2FWS*FSV478 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-Z | U0271E3 | 2RPR-3B K620B CONTACT 11 FAILS CLOSED | PERIODIC TEST | 2RPR-3B K 20B CONTACT 11 CLOSED | |
| 5-4/2-Z | U0281E3 | 2RPR-3B K601B1 CONTACT 11 FAILS CLOSED | PERIODIC TEST | 2RPR-3B K601B CONTACT 1 CLOSED | |
| 5-4/2-E | U0321E2 | 42-FMSAQ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FWS*HYV157A OPEN | |
| 5-4/2-F | U0331E2 | 42-FMSOQ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FWS*HYV157B OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|----------------------------------|--|---------------|
| 5-4/2-G | U08411E2 | 42-FHSDQ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157C OPEN | |
| 5-4/2-E | U08511E2 | 99AX-FHAQ CONTACT 14 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157A OPEN | |
| 5-4/2-F | U08611E2 | 99BX-FHBQ CONTACT 14 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157B OPEN | |
| 5-4/2-G | U08711E2 | 99CX-FHCQ CONTACT 14 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157C OPEN | |
| 5-4/2-L | U08811E2 | 99AX-FHAQ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157A OPEN | |
| 5-4/2-H | U08911E2 | 99BX-FHBQ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157B OPEN | |
| 5-4/2-N | U09011E2 | 99CX-FHCQ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157C OPEN | |
| 5-4/2-L | U09111E2 | 99A-FHSAJ CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157A OPEN | |
| 5-4/2-H | U09211E2 | 99B-FHSDJ CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157B OPEN | |
| 5-4/2-N | U09311E2 | 99C-FHSDJ CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157C OPEN | |
| 5-4/2-L | U09411E2 | 99A-FHSAJ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157A OPEN | |
| 5-4/2-P | U09511E3 | 3A-FHSAJ CONTACT 14 FAILS CLOSED | PERIODIC TEST | 3A-FHSAJ CONT 14 OR 1-FHSAJ CONT R1 CLOSED | |
| 5-4/2-H | U09611E2 | 99B-FHSDJ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS*HYV157B OPEN | |

| | | | | | | | |
|----|----|----|----|------------------------------------|---|---|---|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | CONDENSATE & FEEDWATER SYSTEM | | | |
| 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| | | | | J.O. 12241 FMEA-5-4/2 SN 6 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|----------------------------------|--|------------------------------------|
| 5-4/2-Q | U09711E3 | 3A-FHSBJ CONTACT 14 FAILS CLOSED | PERIODIC TEST | 3A-FHSBJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-N | U09811E2 | 99C-FHSCJ ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 2FHS-HYV157C OPEN | |
| 5-4/2-R | U09911E3 | 3A-FHSCJ CONTACT 14 FAILS CLOSED | PERIODIC TEST | 3A-FHSCJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-R | U10011E3 | 1-FHCCJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 3A-FHSCJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-R | U10111E6 | 1-FHSCJ IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | 3A-FHSCJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-P | U12111E3 | 1-FHSAJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 3A-FHSAJ CONT 14 OR 1-FHSAJ CONT R1 CLOSED | |
| 5-4/2-P | U12211E6 | 1-FHSAJ IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | 3A-FHSAJ CONT 14 OR 1-FHSAJ CONT R1 CLOSED | |
| 5-4/2-Q | U12311E3 | 1-FHSBJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 3A-FHSBJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-Q | U12411E6 | 1-FHSBJ IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | 3A-FHSBJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-X | U13111E3 | CKT-FHSSG K801 LTR SPURIOUS TEST SIGNAL | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-X | U13211E3 | CKT-FHSSG K801 LTR CONTACT FAILS CLOSED | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-Z | U13311E3 | CKT-FHSSH K801 (LTR) CONTACT SPURIOUS TEST SIGNAL | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-V | U13511E3 | CKTFHSSF K801 CONT SPURIOUS TEST SIGNAL | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | (K801B TN B= TEST SPURIOUS SIGNAL) |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| CONDENSATE & FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-5-2/2 SH 7 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|--|---------------|
| 5-4/2-V | U13611E3 | CKT-FHSBF K801 (LTR) CONTACT FAILS CLOSED | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-Z | U13911E3 | CKT-FHSSH K801 (LTR) CONTACT FAILS CLOSED | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-P | U20111E3 | 3A-FHSAJ ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | 3A-FHSAJ CONT 14 OR 1-FHSAJ CONT R1 CLOSED | |
| 5-4/2-P | U20211E3 | 3-FNSAJ CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-FNSAJ CONT 115 CLOSED | |
| 5-4/2-Q | U20311E3 | 3A-FHSBJ ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | 3A-FHSBJ CONT 14 OR 1-FHSBJ CONT R1 CLOSED | |
| 5-4/2-Q | U20411E3 | 3-FNSBJ CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-FNSBJ CONT 115 CLOSED | |
| 5-4/2-R | U20511E3 | 3A-FHSCJ ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | 3A-FHSCJ CONT 14 OR 1-FHSCJ CONT R1 CLOSED | |
| 5-4/2-R | U20611E3 | 3-FHSCJ CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-FHSCJ CONT 115 CLOSED | |
| 5-4/2-S | U03911F3 | 2FHS*FSV479 BINDS UP IN ADMIT AIR | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-T | U04011F3 | 2FHS*FSV489 BINDS UP IN ADMIT AIR | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-U | U04111F3 | 2FHS*FSV499 BINDS UP IN ADMIT AIR | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-S | U04211F3 | 2FHS*479B ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONDENSATE & FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-5-4/2 SH 8 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------------------|----------------------|--|-----------------------------|---|--------------------------------|
| 5-4/2-T | U04311F3 | 2FHS*499 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-U | U04411F3 | 2FHS*499 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-S 5-4/2-T 5-4/2-U | U04511F3 | 2RFR-3B K636B NO ACTUATION SIGNAL | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | (K636 TN B= NSSS INTERFACE) |
| 5-4/2-S | U04611F3 | 2RFR-3B K636B CONTACT 1 FAILS CLOSED | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-T | U04711F3 | 2RFR-3B K636B CONTACT 3 FAILS CLOSED | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |
| 5-4/2-U | U04811F3 | 2RFR-3B K636B CONTACT 7 FAILS CLOSED | PERIODIC TEST | MAIN OR BYPASS FEEDWATER VALVES OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|---------------------------------|--|--|
| 5-13/-AE | F6751FZ1 | 1C-FHEAA CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-AE | F6761FZ1 | PB1-CESN9 TRANS SH CONT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FNE*P23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FNE*P23A FAILS TO OPERATE | |
| 5-13/-AE | F6771FZ1 | 43-CESNMX1 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FNE*P23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FNE*P23A FAILS TO OPERATE | |
| 5-13/-AE | F6781FZ3 | 43-CESNMX1 CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-AE | F6791FZ3 | 43-CESNMX1 CONTACT 4 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-J | F6511JR2 | 2FNE*LY100A 2FNE*LKC100A FAILS HIGH | INDICATING LIGHT IN CONTRL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN C PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN C PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

Amendment 3

September 1984

| | | | | | |
|---|----|----|--------|---------|------------------------------------|
| | | | 3/6/84 | 7-20-82 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | Call | RS | AUXILIARY FEEDWATER SYSTEM |
| 4 | 13 | 21 | EG | 11 | NP |
| | | | | | J.O. 12241 FHEA-5-13/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--|--|
| 5-13/-J | F6521JR2 | CKT FHEAB REVERSIBLE MOTOR SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-J | F6531JR6 | 2FHE*HIC100A IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-J | F6541JR2 | 2FHE*HIC100A FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-BB | F6551JR3 | 2FHE*HIC100A1 2SPD FAILS HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-J | F6561JR2 | CKT FHEAB LVDT FEEDBACK FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-J | F6571JR2 | CKT FHEAB REMOTE CONTROLLER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-5-13/2 SH 2 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT OF SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE NODE FAILURE DETECTION

| | | | | | |
|----------|----------|--|-------------------------------------|--|------------------------------|
| 5-13/-BB | F6581JR3 | 43-CESAAX1 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESAAX1 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESAAX1 CONTACT 2 CLOSED | |
| 5-13/-BB | F6591JR1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESAAX1 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESAAX1 CONTACT 2 CLOSED | |
| 5-13/-BB | F6601JR1 | 43-CESAAX1 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESAAX1 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESAAX1 CONTACT 2 CLOSED | |
| 5-13/-L | F6611JR2 | 2FHE*LY100B 2FHE*LKC100B FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-L | F6621JR2 | CMT FHEBB REVERSIBLE MOTOR SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-L | F6631JR6 | 2FHE*HIC100B IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--|--|
| 5-13/-L | F6641JR2 | 2FME*HIC100B FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-BC | F6651JR3 | 2FME*HIC100B1 2SPD FAILS HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-L | F6661JR2 | CKT FHEB3 LVDT FEEDBACK FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-L | F6671JR2 | CKT FHEB3 REMOTE CONTROLLER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN C PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN C PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-BC | F6681JR3 | 43-CESBAX1 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX1 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX1 CONTACT 2 CLOSED | |
| 5-13/-BC | F6691JR1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX1 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX1 CONTACT 2 CLOSED | |

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|---|----|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 13 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 54 4 |

| FTSK IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------|---|-------------------------------------|--|------------------------------|
| 5-13/-6 F6701J51 | 43-CESBAX1 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX1 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX1 CONTACT 2 CLOSED | |
| 5-13/-6 F6261J52 | 2FNE-WY100C 2FNE-WK100C FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH |
| 5-13/-6 F6271J52 | -CMT FHEAC REVERSIBLE MOTOR SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AZ F6291J53 | 2FNE-WX100C2 LOOP POWER FAILS HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH |
| 5-13/-6 F6291J56 | 2FNE-WY100C IM CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH |
| 5-13/-6 F6301J52 | 2FNE-WY100C FAILS HIGH OUTPUT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH |
| | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH |

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|----|---|----|----|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 14 | 3 | 12 | 11 | | |
| | | | | | J.O. 12261 FHEA-5-13/2 SH 5 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|--|--|
| 5-13/-AY | F6311JS3 | 2FHE*HIC100C1 2SPD FAIL HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-G | F6321JS2 | CKT FHEAC LVDT FEEDBACK FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN B PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-G | F6331JS2 | CKT FHEAC REMOTE CONTROLLER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN B PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN B PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-AY | F6341JS3 | 43-CESAAX2 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX2 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX2 CONTACT 2 CLOSED | |
| 5-13/-AZ | F6351JS3 | 43-CESNFX1 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-AZ | F6361JS3 | 43-CESNFX1 CONTACT 4 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 6 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|---|---------------------------|
| 5-13/-AZ | F6371JS1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX1 ENERGIZED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX1 ENERGIZED | |
| 5-13/-AZ | F6381JS1 | 43-CESNFX1 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX1 ENERGIZED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX1 ENERGIZED | |
| 5-13/-AY | F6391JS1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX2 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX2 CONTACT 2 CLOSED | |
| 5-13/-AY | F6401JS1 | 43-CESAAX2 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX2 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX2 CONTACT 2 CLOSED | |
| 5-13/-H | F6411JS2 | 2FNE*LY1000 2FNE*LKC1000 FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-H | F6421JS2 | CKT FWBC REVERSIBLE MOTOR SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|--|--|
| 5-13/-H | F6431JS6 | 2FNE#HIC100D IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-H | F6441JS2 | 2FNE#HIC100D FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-BA | F6451JS3 | 2FNE#HIC100D1 2SPD FAILS HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: N. E. IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-H | F6461JS2 | CKT FWBC LVDT FEEDBACK FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-H | F6471JS2 | CKT FWBC REHOTE CONTROLLER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN B PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN B PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-BA | F6481JS3 | 43-CESBAX2 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX2 CONTACT 2 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX2 CONTACT 2 OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 8 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|--|
| 5-13/-BA | F6491JS1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX2 CONTACT 2 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX2 CONTACT 2 OPEN | |
| 5-13/-BA | F6501JS1 | 43-CESBAX2 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX2 CONTACT 2 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX2 CONTACT 2 OPEN | |
| 5-13/-E | F6011JT2 | 2FNEWLY100E 2FNEWLNK100E FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-E | F6021JT2 | -CKT FHEAD REVERICLE MOTOR SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-AN | F6031JT2 | 2FNEHX100E2 LOOP POWER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-E | F6041JT6 | 2FNEHXIC100E IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12291 FMEA-5-13/2 SH 9 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|--|--|
| 5-13/-E | F6051JT2 | 2FNE*HIC100E FAILS HIGH OUTPUT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-AV | F6061JT3 | 2FRE*HICE1 2SPD FAIL HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-E | F6071JT2 | CKT FHEAD LVDT FEEDBACK FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-E | F6081JT2 | CKT FHEAD REMOTE CONTROLLER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 1 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 1 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-AV | F6091JT3 | 43-CESAAX3 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESAAX3 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESAAX3 CONTACT 2 CLOSED | |
| 5-13/-AM | F6101JT3 | 43-CESNFX2 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-5-13/2 SH 10 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|--|
| 5-13/-AH | F6111JT3 | 43-CESNFX2 CONTACT 4 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-AH | F6121JT3 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX2 ENERGIZED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX2 ENERGIZED | |
| 5-13/-AH | F6131JT1 | 43-CESNFX2 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESNFX2 ENERGIZED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESNFX2 ENERGIZED | |
| 5-13/-AV | F6141JT1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESAAX3 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESAAX3 CONTACT 2 CLOSED | |
| 5-13/-AV | F6151JT1 | 43-CESAAX3 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESAAX3 CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESAAX3 CONTACT 2 CLOSED | |
| 5-13/-F | F6161JT2 | 2FME*LY100F 2FME*LKC100F FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STM GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STM GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
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| AUXILIARY FEEDWATER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-5-13/2 SH 11 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--|--|
| 5-13/-F | F6171JT2 | CKT FNEED REVERSIBLE MOTOR SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-F | F6181JT6 | 2FNE*HIC100F IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-F | F6191JT4 | 2FNE*HIC100F FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-AX | F6201JT3 | 2FNE*HIC100F1 2SPD FAILS HIGH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-F | F6211JT2 | CKT FNEBD LVDT FEEDBACK FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-F | F6221JT2 | CKT FNEBD REMOTE CONTROLLER FAILS HIGH | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-5-13/2 SH 12 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 5-13/-AX | F6231JT3 | 43-CESBAX3 CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX3 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX3 CONTACT 2 CLOSED | |
| 5-13/-AX | F6241JT1 | PB TRANSFER SWITCH FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX3 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX3 CONTACT 2 CLOSED | |
| 5-13/-AX | F6251JT1 | 43-CESBAX3 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-CESBAX3 CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-CESBAX3 CONTACT 2 CLOSED | |
| 5-13/-CH | F17711K1 | 3-HSSATX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CH | F17811K1 | CKT HSSATX CONTACT CLS FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CF | F18311K1 | 3-HSSAUX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
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| AUXILIARY FEEDWATER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 10041 FHEA-5-13/2 SH 13 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-CF | F18911K1 | CLS-MSSAUX CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-BX | F18911K1 | 3-MSSCTX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105C H B MAN-AUTO CLOSE CKT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105C H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BX | F19011K1 | CLS-MSSCT CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105C H B MAN-AUTO CLOSE CKT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105C H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BD | F20711K3 | 2FHE*P22 TURB GOVERNOR FAILS LOH | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P22 FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P22 FAILS TO OPERATE | |
| 5-13/-BD | F20811K1 | 2FHE*P22 TURB OVERSPEED SPURIOUS | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P22 FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P22 FAILS TO OPERATE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-5-13/2 SH 14 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

5-13/-BD F20911K1 2FHE*P22 ANNUNCIATED IN IF EMERGENCY POWER BUS 2AE
 TURBINE TRIP CONTROL ROOM AND NORMAL POWER BUS 2AE:
 LATCH ENERGIZED 2FHE*P22 FAILS TO OPERATE

 IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2FHE*P22 FAILS TO OPERATE

5-13/-B F21011K3 2FHE*P22 TRIP P B PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 CONTACT AND NORMAL POWER BUS 2AE:
 FAILS CLOSED 2FHE*P22 FAILS TO OPERATE

 IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2FHE*P22 FAILS TO OPERATE

5-13/-BD F21111K6 2FHE*P22 TRIP P B PERIODIC INSPECTION IF EMERGENCY POWER BUS 2AE
 DEPRESSED AND NORMAL POWER BUS 2AE:
 (OP ERROR) 2FHE*P22 FAILS TO OPERATE

 IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2FHE*P22 FAILS TO OPERATE

5-13/-BJ F21211K3 2HSS*SOV105A PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 ENERGIZED BY AND NORMAL POWER BUS 2AE:
 SHORT CIRCUIT 2FHE*P22 NO STEAM SUPPLY
 FROM 5TH GEN A

 IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2FHE*P22 NO STEAM SUPPLY
 FROM 5TH GEN A

5-13/-BJ F21311K3 1B-HSSAT PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 CONTACT L1 AND NORMAL POWER BUS 2AE:
 FAILS CLOSED NONE

 IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 NONE

5-13/-BN F21411K3 K632A TRAIN A PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 CONTACT 1 AND NORMAL POWER BUS 2AE:
 FAILS CLOSED K632A TRAIN A CONTACT 1 CLOSED

 IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 K632A TRAIN A CONTACT 1 CLOSED

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|---|----|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 13 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 15 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|---|-----------------------------|--|--|
| 5-13/-BN 5-13/-BR 5-13/-PH | F21511K3 | K632A TRAIN A NO ACTUATION SIGNAL PRESENT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632A TRAIN A CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632A TRAIN A CONTACT 1 CLOSED | (K632A=NSSS INTERFACE) (K632A=NSSS INTERFACE) |
| 5-13/-BN | F21611K3 | K633A TRAIN A CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633A TRAIN A CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633A TRAIN A CONTACT 7 CLOSED | |
| 5-13/-BN 5-13/-BR 5-13/-BN | F21711K3 | K633A TRAIN A NO ACTUATION SIGNAL PRESENT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633A TRAIN A CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633A TRAIN A CONTACT 7 CLOSED | (K633A=NSSS INTERFACE) (K633A=NSSS INTERFACE) |
| 5-13/-BJ | F21811K3 | 43-HSS BTX CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBTX CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBTX CONTACT 2 CLOSED | |
| 5-13/-BJ | F21911K3 | 43-HSSBTX CONTACT 6 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBTX CONTACT 6 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBTX CONTACT 6 CLOSED | |
| 5-13/-BN | F22011K3 | 3-HSSATX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105A H B MAN-AUTO CLOSE CKT ESTD IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105A H B MAN-AUTO CLOSE CKT ESTD | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | AUXILIARY FEEDWATER SYSTEM | | | |
| 4 | 13 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-5-13/2 SH 16 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|---|-----------------------------|--|------------------------|
| 5-13/-BN | F2211K3 | 1A-MSSAT CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2MSS*SOV105A H B MAN-AUTO CLOSE CKT ESTD IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2MSS*SOV105A H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BN | F2221K6 | 1A-MSSAT IN CLOSE (CP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2MSS*SOV105A H B MAN-AUTO CLOSE CKT ESTD IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2MSS*SOV105A H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BE | F2231K3 | 2MSS*SOV105D ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P22 NO STEAM SUPPLY FROM 5TH GEN A IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P22 NO STEAM SUPPLY FROM 5TH GEN A | |
| 5-13/-BP | F2241K3 | 1B-MSSAU CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-BQ | F2251K3 | K632B TRAIN B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632B TRAIN B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632B TRAIN B CONTACT 1 CLOSED | |
| 5-13/-BT 5-13/-BL 5-13/-BQ | F2261K3 | K632B TRAIN B NO ACTUATION SIGNAL PRESENT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632B TRAIN B CONTACT 7 CLOSED | (K632B=NSSS INTERFACE) |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|---|-----------------------------|--|------------------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632B TRAIN B CONTACT 7 CLOSED | (K632B=NSSS INTERFACE) |
| 5-13/-BQ | F22711K3 | K633B TRAIN B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633B TRAIN B CONTACT 7 CLOSED | |
| 5-13/-BT 5-13/-BL 5-13/-BQ | F22811K3 | K633B TRAIN B NO ACTUATION SIGNAL PRESENT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633B TRAIN B CONTACT 1 CLOSED | (K633B=NSSS INTERFACE) |
| 5-13/-BP | F22911K3 | 43-HSSDUX CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633B TRAIN B CONTACT 1 CLOSED | (K633B=NSSS INTERFACE) |
| 5-13/-BP | F23011K3 | 43-HSSDUX CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSDUX CONTACT 3 CLOSED | |
| 5-13/-BQ | F23111K3 | 3-HSSDUX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSDUX CONTACT 3 CLOSED | |
| 5-13/-BQ | F23211K3 | 1A-HSSAU CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSDUX CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV10SD H B MAN-AUTO CLOSE CKT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV10SD H B MAN-AUTO CLOSE CKT ESTD | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 19 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-5-13/2 SH 1A | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105D H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BQ | F23311K6 | 1A-HSSAU IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105D H B MAN-AUTO CLOSE CKT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105D H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-CH | F23411K1 | CKT HSSBT CLS CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CH | F23511K1 | 3-HSSBTX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-BK | F23611K3 | 2HSS*SOV105B ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P22 NO STEAM SUPPLY FROM 5TH GEN B | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P22 NO STEAM SUPPLY FROM 5TH GEN B | |
| 5-13/-BK | F23711K3 | 1B-HSSBT CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM |
|----------|----------------------|--------------------------------------|-----------------------------|---|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE |
| 5-13/-BR | F23811K3 | K632A TRAIN A CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632A TRAIN A CONTACT 7 CLOSED |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632A TRAIN A CONTACT 7 CLOSED |
| 5-13/-BR | F23911K3 | K633A TRAIN A CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633A TRAIN A CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633A TRAIN A CONTACT 1 CLOSED |
| 5-13/-BK | F24011K3 | 43-HSSBUX CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBUX CONTACT 2 CLOSED |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBUX CONTACT 2 CLOSED |
| 5-13/-BK | F24111K3 | 43-HSSBUX CONTACT 6 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBUX CONTACT 6 CLOSED |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBUX CONTACT 6 CLOSED |
| 5-13/-BR | F24211K3 | 3-HSSAUX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSSNSOV1059 H B MAN-AUTO CLOSE CKT ESTD |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSSNSOV1059 H B MAN-AUTO CLOSE CKT ESTD |
| 5-13/-BR | F24311K3 | 1A-HSSBT CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSSNSOV1059 H B MAN-AUTO CLOSE CKT ESTD |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSSNSOV1059 H B MAN-AUTO CLOSE CKT ESTD |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | |
| 4 | 13 | 2 | 1 | |
| J.O. 12241 FMEA-5-13/2 SH 20 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105B H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BR | F24411K6 | 1A-HSSBT IN CLOSE (CP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105B H B MAN-AUTO CLOSE CKT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105B H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BS | F24511K2 | 43-HSSBUX ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBTX CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBTX CONTACT 2 CLOSED | |
| 5-13/-BS | F24611K2 | P B-HSSBU CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBTX CONTACT 2 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBTX CONTACT 2 CLOSED | |
| 5-13/-BE | F24711K3 | 2HSS*SOV105E ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P22 NO STEAM SUPPLY FROM STM GEN B | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P22 NO STEAM SUPPLY FROM STM GEN B | |
| 5-13/-BS | F24811K3 | 1B-HSSBU CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FHEA-5-13/2 SH 21 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 5-13/-BT | F24911K3 | K632B TRAIN B CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632B TRAIN B CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632B TRAIN B CONTACT 7 CLOSED | |
| 5-13/-BT | F25011K3 | K633B TRAIN B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633B TRAIN B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633B TRAIN B CONTACT 1 CLOSED | |
| 5-13/-BS | F25111K3 | 43-HSSBUX CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBUX CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBUX CONTACT 1 CLOSED | |
| 5-13/-BS | F25211K3 | 43-HSSBUX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSBUX CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSBUX CONTACT 3 CLOSED | |
| 5-13/-BT | F25311K3 | 3-HSSBUX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105E H B MAN-AUTO CLOSE CHT ESTD IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105E H B MAN-AUTO CLOSE CHT ESTD | |
| 5-13/-BT | F25411K3 | 1A-HSSBU CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105E H B MAN-AUTO CLOSE CHT ESTD | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 22 |

 FTSN COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSN | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105E H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BT | F25511K6 | 1A-HSSBU IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105E H B MAN-AUTO CLOSE CKT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105E H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-CF | F25311K1 | 3-HSSBUX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-CF | F25911K1 | CLS-HSSBU CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-BM | F26011K3 | 2HSS*SOV105C ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P22 NO STEAM SUPPLY FROM 5TH GEN C | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P22 NO STEAM SUPPLY FROM 5TH GEN C | |
| 5-13/-BU | F26111K3 | 1B-HSSCT CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-BM | F26211K3 | K632A TRAIN A CONTACT 9 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632A TRAIN A CONTACT 9 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632A TRAIN A CONTACT 9 CLOSED | |
| 5-13/-BM | F26311K3 | K633A TRAIN A CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633A TRAIN A CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633A TRAIN A CONTACT 3 CLOSED | |
| 5-13/-BU | F26411K3 | 43-HSSCTX CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSCTX CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSCTX CONTACT 1 CLOSED | |
| 5-13/-BU | F26511K3 | 43-HSSCTX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSCTX CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSCTX CONTACT 3 CLOSED | |
| 5-13/-BX | F26611K3 | 3-HSSCTX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105C M B MAN-AUTO CLOSE CHT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105C M B MAN-AUTO CLOSE CHT ESTD | |
| 5-13/-BX | F26711K3 | 1A-HSSCT CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105C M B MAN-AUTO CLOSE CHT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105C M B MAN-AUTO CLOSE CHT ESTD | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | AUXILIARY FEEDWATER SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-5-13/2 SH 24 | | | |

 FTSC COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2HSS*SOV105C H B MAN-AUTO
 CLOSE CKT ESTD

5-13/-BX F26011K6 1A-HSSCT IN CLOSE PERIODIC INSPECTION
 (OP ERROR)
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 2HSS*SOV105C H B MAN-AUTO
 CLOSE CKT ESTD

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2HSS*SOV105C H B MAN-AUTO
 CLOSE CKT ESTD

5-13/-BU F26911K2 43-HSSCTX INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 43-HSSCTX CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 43-HSSCTX CONTACT 1 CLOSED

5-13/-BU F27011K2 P B-HSSCT CONTACT INDICATING LIGHT
 FAILS CLOSED IN CONTROL ROOM
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 43-HSSCTX CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 43-HSSCTX CONTACT 1 CLOSED

5-13/-BL F27111K3 2HSS*SOV105F PERIODIC TEST
 ENERGIZED BY
 SHORT CIRCUIT
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 2FNE*P22 NO STEAM SUPPLY
 FROM 5TH GEN C

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 2FNE*P22 NO STEAM SUPPLY
 FROM 5TH GEN C

5-13/-BV F27211K3 1B-HSSCU PERIODIC TEST
 CONTACT L1 FAILS
 CLOSED
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 NONE

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 NONE

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 25 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 5-13/-BL | F27311K3 | K632B TRAIN B CONTACT 9 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K632B TRAIN B CONTACT 9 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K632B TRAIN B CONTACT 9 CLOSED | |
| 5-13/-BL | F27411K3 | K633B TRAIN B CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K633B TRAIN B CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K633B TRAIN B CONTACT 3 CLOSED | |
| 5-13/-BV | F27511K3 | 43-HSSCUX CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSCUX CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSCUX CONTACT 1 CLOSED | |
| 5-13/-BV | F27611K3 | 43-HSSCUX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSCUX CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSCUX CONTACT 3 CLOSED | |
| 5-13/-BY | F27711K3 | 3-HSSCUX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105F H B MAN-AUTO CLOSE CKT ESTD IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS*SOV105F H B MAN-AUTO CLOSE CKT ESTD | |
| 5-13/-BY | F27811K3 | 1A-HSSCU CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS*SOV105F H B MAN-AUTO CLOSE CKT ESTD | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 26 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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|----------|----------|--|-------------------------------------|--|--|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |
| 5-13/-BY | F27911K6 | 1A-HSSCU IN CLOSE (CP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |
| 5-13/-BV | F28011K2 | 43-HSSCUX ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSCUX CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSCUX CONTACT 1 CLOSED | |
| 5-13/-BV | F28111K2 | P B HSSCU CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-HSSCUX CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-HSSCUX CONTACT 1 CLOSED | |
| 5-13/-BY | F28211K1 | 3-HSSCUX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |
| 5-13/-BY | F28311K1 | CLS-HSSCU CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2HSS&SOV105F H B MAN-AUTO CLOSE CHT ESTD | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|---------------|
| 5-13/-BP | F68211K2 | 43-MSSBTX ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-MSSBTX CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-MSSBTX CONTACT 2 CLOSED | |
| 5-13/-BP | F68311K2 | PB-MSSBT CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-MSSBTX CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-MSSBTX CONTACT 2 CLOSED | |
| 5-13/-M | F0495DE3 | 2FHEWP23A ACB CLOSING MECH FAILURE | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEWP23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEWP23A FAILS TO OPERATE | |
| 5-13/-M | F0505DE1 | CKT F1EAA NO 4KV OPER PWR AVAIL (BUS 2AE) | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEWP23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEWP23A FAILS TO OPERATE | |
| 5-13/-T | F0515DE1 | CKT F1EAA NO 125VDC CONTROL POWER | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEWP23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEWP23A FAILS TO OPERATE | |
| 5-13/-H | F0525DE3 | 43-FHEAAX CONTACT 9 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEWP23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEWP23A FAILS TO OPERATE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 5-13/-BH | F0535DE3 | 43-FHEAAX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE&P23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE&P23A FAILS TO OPERATE | |
| 5-13/-BH | F0545DE3 | PB-FHEAAX CONTACT FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE&P23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE&P23A FAILS TO OPERATE | |
| 5-13/-T | F0555DE1 | CKT FHEAA 125V (+)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE&P23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE&P23A FAILS TO OPERATE | |
| 5-13/-T | F0565DE1 | CKT FHEAA 125V (-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE&P23A FAILS TO OPERATE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE&P23A FAILS TO OPERATE | |
| 5-13/-S | F0575DE3 | 1A-FHEAA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE&P23A NO MANUAL START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE&P23A NO MANUAL START CKT ESTABLISHED | |
| 5-13/-S | F0585DE6 | 1A-FHEAA NOT IN START (CR EDDCR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE&P23A NO MANUAL START CKT ESTABLISHED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-5-13/2 SH 29 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEW23A NO MANUAL START CKT ESTABLISHED | |
| 5-13/-S | F0595DE3 | 43-FHEAAX CONTACT 10 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEW23A NO MANUAL START CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEW23A NO MANUAL START CKT ESTABLISHED | |
| 5-13/-V | F0605DE3 | 1A-FHEAA CONTACT 7 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEW23A NO AUTO START CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEW23A NO AUTO START CKT ESTABLISHED | |
| 5-13/-V | F0615DE3 | 1A-FHEAA CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEW23A NO AUTO START CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEW23A NO AUTO START CKT ESTABLISHED | |
| 5-13/-V | F0625DE6 | 1A-FHEAA NOT IN AUTO (OP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEW23A NO AUTO START CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEW23A NO AUTO START CKT ESTABLISHED | |
| 5-13/-V | F0635DE3 | 43-FHEAAX CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHEW23A NO AUTO START CKT ESTABLISHED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | J.O. 12241 FHEA-5-13/2 SH 30 |

***** OTHER REMARKS *****

***** EFFECT ON SYSTEM *****

***** METHOD OF FAILURE DETECTION *****

***** COMPONENT AND FAILURE MODE *****

***** FTSK COMPONENT AND FAILURE MODE IDENTIFIER *****

5-13/-Z F067SDE3

IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
2FNE#P23A NO AUTO START
CKT ESTABLISHED

5-13/-Z F067SDE3

PERIODIC TEST

50-VE218X
CONTACT 1
FAILS OPEN

IF EMERGENCY POWER BUS 2AE
AND NORMAL POWER BUS 2AE:
2FNE#P23A NO AUTO START
CKT ESTABLISHED

5-13/-AB F066SDE4

MORE CONTACTS MUST
FAIL TO BE DETECTABLE

52-EGSAAJ3
CONTACT 115
FAILS OPEN

IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
2FNE#P23A NO AUTO START
CKT ESTABLISHED

5-13/-AB F066SDE4

MORE CONTACTS MUST
FAIL TO BE DETECTABLE

142-EGSAAK
CONTACT 223
FAILS OPEN

IF EMERGENCY POWER BUS 2AE
AND NORMAL POWER BUS 2AE:
52-EGSAAK3 CONTACT 115 OPEN

5-13/-AB F067SDE3

PERIODIC TEST

0 6 2-1
AUTO LONG SEQ
NO STEP SIGNAL

IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
162-C6SAAX CONTACT 223 OPEN

5-13/-AB F068SDE3

PERIODIC TEST

52-ENCAK
CONTACT 77
FAILS CLOSED

IF EMERGENCY POWER BUS 2AE
AND NORMAL POWER BUS 2AE:
52-EGSAAK3 CONTACT 115 OPEN

5-13/-AB F069SDE3

PERIODIC TEST

52-EGSAAK3
EXERCIZED BY
SHORT CIRCUIT

IF EMERGENCY POWER BUS 2AE
AND NORMAL POWER BUS 2AE:
52-EGSAAK3 CONTACT 115 OPEN

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|----|---|----|----|--|--|--|--|---|------------------------------|
| | | | | | | | | IF FAILURE MODES AND EFFECTS ANALYSIS AUXILIARY FEEDWATER SYSTEM | |
| 14 | 3 | 12 | 11 | | | | | | J.O. 10041 FMEA-5-13/2 SH 31 |

| FTSK COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------|---------------------------------------|-----------------------------|--|---------------|
| 5-13/-AJ F0705DE3 | 27-VE200X3 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS ZDF AND NORMAL POWER ZDF: 52-EG2AAX3 CONTACT 115 OPEN | |
| 5-13/-AL F0715DE3 | 27-VE3200X CONTACT 221 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS ZDF AND NORMAL POWER ZDF: 2FNE#P23A FAILS TO OPERATE | |
| 5-13/-AJ F0755DE3 | 27-VE200X CONTACT 221 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS ZDF AND NORMAL POWER ZDF: 2FNE#P_3A FAILS TO OPERATE | |
| 5-13/-AL F0735DE3 | 27-VE3200X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS ZDF AND NORMAL POWER ZDF: 2FNE#P23A FAILS TO OPERATE | |
| 5-13/-AJ F0745DE3 | 27-VE200X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS ZDF AND NORMAL POWER ZDF: 2FNE#P23A FAILS TO OPERATE | |
| 5-13/-AL F0755DE3 | 62-ENSAA CONTACT 1DPU FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS ZDF AND NORMAL POWER ZDF: 2FNE#P23A FAILS TO OPERATE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-5-13/2 SH 32 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION
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|----------|----------|-------------------------------------|--|--|--|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHEM23A FAILS TO OPERATE | |
| 5-13/-CD | F0765DE4 | 27-VE200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 5-13/-CD | F0775DE3 | 69-ENSAA CONTACT 425 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSAA CONTACT 425 CLOSED | |
| 5-13/-CD | F0785DE4 | 27-VE1200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE120 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE120 CONTACT 11 CLOSED | |
| 5-13/-AN | F0795DE3 | 69-ENSAA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSAA CONTACT 425 CLOSED | |
| 5-13/-CR | F0805DE4 | 27-VE200 A-B COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 5-13/-CQ | F0915DE4 | 27-VE200 B-C COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE200 CONTACT 11 CLOSED | |

| TASK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|----------------------------------|--|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 5-13/-DH | F0825DE3 | 162-ENSAA CONTACT 5 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-CU | F0835DE4 | 27-VE1200 A-B COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE120 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE120 CONTACT 11 CLOSED | |
| 5-13/-CT | F0845DE4 | 27-VE1200 B-C COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE120 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE120 CONTACT 11 CLOSED | |
| 5-13/-DH | F0855DE3 | 162-ENSAA COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-DH | F0865DE3 | 99-INNSAC FAILS | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-DH | F0875DE3 | 99-INNSAC CONTACT FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 34 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 20F AND NORMAL POWER 20F: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-AN | F0885DE3 | 69-ENSAA CONTACT 423 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 423 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 20F AND NORMAL POWER 20F: 69-ENSAA CONTACT 423 CLOSED | |
| 5-13/-AQ | F0895DE3 | 27-RN200 CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 20F AND NORMAL POWER 20F: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-AQ | F0905DE3 | 27-RN2200 A-B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 20F AND NORMAL POWER 20F: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-AQ | F0915DE1 | 27-RN2200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 20F AND NORMAL POWER 20F: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DK | F0925DE1 | 27-RN200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 20F AND NORMAL POWER 20F: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DJ | F0935DE1 | 27-RN200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|--|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-AU | F0945DE4 | 27-VE3200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AC: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-AT | F0955DE4 | 27-VE4200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-AU | F0965DE1 | 27-VE3200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-AU | F0975DE1 | 27-VE3200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-AT | F0985DE1 | 27-VE4200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-AT | F0995DE1 | 27-VE4200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12201 FMEA-5-13/2 54 36 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFJER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE4200 CONTACT 11 CLOSED

5-13/-DA F1005DE1 POTENTIAL XFMR ANNUNCIATED IN
 A-B SIDE CONTROL ROOM
 FAILS OPEN IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE4200 CONTACT 11 CLOSED

5-13/-CR F1015DE1 PT CKT 120V SIDE ANNUNCIATED IN
 FUSE A FAILS OPEN CONTROL ROOM
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE4200 CONTACT 11 CLOSED

5-13/-CR F1025DE1 PT CKT ANNUNCIATED IN
 120V SIDE A-B CONTROL ROOM
 SHORT CIRCUIT IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE4200 CONTACT 11 CLOSED

5-13/-CQ F1035DE1 PT CKT ANNUNCIATED IN
 120V SIDE B-C CONTROL ROOM
 SHORT CIRCUIT IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE4200 CONTACT 11 CLOSED

5-13/-CQ F1045DE1 PT CKT 120V SIDE ANNUNCIATED IN
 FUSE C FAILS OPEN CONTROL ROOM
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE4200 CONTACT 11 CLOSED

5-13/-DB F1055DE1 POTENTIAL XFMR ANNUNCIATED IN
 B-C SIDE CONTROL ROOM
 FAILS OPEN IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-VE4200 CONTACT 11 CLOSED

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | AUXILIARY FEEDWATER SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-5-13/2 SH 37 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DA | F1065DE1 | PT CKT 4KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DA | F1075DE1 | PT CKT 4KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DA | F1085DE1 | PT CKT 4KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DB | F1095DE1 | PT CKT 4KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DB | F1105DE1 | PT CKT 4KV SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DB | F1115DE1 | PT CKT 4KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE4200 CONTACT 11 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | AUXILIARY FEEDWATER SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-5-13/2 SH 39 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 5-13/-DC | F1125DE1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-CU | F1135DE1 | PT CKT 120V SIDE FASE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-CU | F1145DE1 | PT CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-CT | F1155DE1 | PT CKT 120 SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-CT | F1165DE1 | PT CKT 120 SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DD | F1175DE1 | POTENTIAL XFMR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-5-13/2 SH 39 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DC | F1185DE1 | PT CKT 4KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DC | F1195DE1 | PT CKT 4KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DC | F1205DE1 | PT CKT 4KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DD | F1215DE1 | PT CKT 4KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DD | F1225DE1 | PT CKT 4KV SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 5-13/-DD | F1235DE1 | PT CKT 4KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VE3200 CONTACT 11 CLOSED | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-5-13/2 SH 40 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-VE3200 CONTACT 11 CLOSED

5-13/-DU F1245DE1 POTENTIAL XFMR ANNUNCIATED IN
 A-B SIDE CONTROL ROOM
 FAILS OPEN
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-RN200 CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-RN200 CONTACT 1 CLOSED

5-13/-DK F1255DE1 PT CKT 120V SIDE ANNUNCIATED IN
 FUSE A FAILS OPEN CONTROL ROOM
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-RN200 CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-RN200 CONTACT 1 CLOSED

5-13/-DK F1265DE1 PT CKT ANNUNCIATED IN
 120 SIDE A-B CONTROL ROOM
 SHORT CIRCUIT
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-RN200 CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-RN200 CONTACT 1 CLOSED

5-13/-DJ F1275DE1 PT CKT ANNUNCIATED IN
 120 SIDE B-C CONTROL ROOM
 SHORT CIRCUIT
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-RN200 CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-RN200 CONTACT 1 CLOSED

5-13/-DJ F1285DE1 PT CKT ANNUNCIATED IN
 120V SIDE FUSE C CONTROL ROOM
 FAILS OPEN
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-RN200 CONTACT 1 CLOSED

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 27-RN200 CONTACT 1 CLOSED

5-13/-DV F1295DE1 POTENTIAL XFMR ANNUNCIATED IN
 B-C SIDE CONTROL ROOM
 FAILS OPEN
 IF EMERGENCY POWER BUS 2AE
 AND NORMAL POWER BUS 2AE:
 27-RN200 CONTACT 1 CLOSED

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FHEA-5-13/2 SH 41 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DU | F1305DE1 | PT CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DU | F1315DE1 | PT CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DU | F1325DE1 | PT CKT 480V SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DV | F1335DE1 | PT CKT 480V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DV | F1345DE1 | PT CKT 480V SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DV | F1355DE1 | PT CKT 480V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 CONTACT 1 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 42 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|--|--------------------------------|---|--|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 CONTACT 1 CLOSED | |
| 5-13/-DQ | F1365DE1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DL | F1375DE1 | PT CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DL | F1385DE1 | PT CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DL | F1395DE1 | PT CKT 120V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DQ | F1405DE1 | PT CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DQ | F1415DE1 | PT CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN2200 A-B CONTACT 1 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-5-13/2 SH 47 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RN200 A-B CONTACT 1 CLOSED | |
| 5-13/-DQ | F1425DE1 | PT CKT 480V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RN200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-PN200 A-B CONTACT 1 CLOSED | |
| 5-13/-DR | F1435DE1 | NO 125VDC CONTROL PWR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-DR | F1445DE1 | CKT ENSAA 125 (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-DR | F1455DE1 | CKT ENSAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-DR | F1465DE1 | CKT ENSAA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSAA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 5-13/-AA | F1075DE3 | 99AX-FHSNE CONTACT 14 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99AX-FHSNE CONTACT 14 FAILS OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 14 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 44 |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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|----------------------|----------|---|---------------|--|------------------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99AX-FHSNE CONTACT 14 FAILS OPEN | |
| 5-13/-AA | F1485DE3 | K634A TRAIN A CONTACT 7 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K634A TR A CONTACT 7 OPEN | |
| 5-13/-AA | F1495DE3 | K634A TRAIN A NO ACTUATION SIGNAL | PERIODIC TEST | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K634A TR A CONTACT 7 OPEN | (K634A=NSSS INTERFACE) |
| 5-13/-CC | F1505DE3 | 62-FHEAA CONTACT 3 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K634A TR A CONTACT 7 OPEN | (K634A=NSSS INTERFACE) |
| 5-13/-AA | F1515DE3 | K611A TRAIN A CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-AF 5-13/-AA | F1525DE3 | K611A TRAIN A NO ACTUATION SIGNAL | PERIODIC TEST | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | (K611A=NSSS INTERFACE) |
| 5-13/-AA | F1535DE3 | 99AX-FHSNE COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K611A TR A CONTACT 11 OPEN | (K611A=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K611A TR A CONTACT 17 CLOSED | (K611A=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K611A TR A CONTACT 17 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99AX-FHSNE CONTACT 14 FAILS OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|----------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99AX-FHSNE CONTACT 14 FAILS OPEN | |
| 5-13/-CC | F1545DE3 | 62-FHEAA COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CE | F1555DE3 | 99A-FHSNE CONTACT FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99AX-FHSNE CONTACT 14 FAILS OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99AX-FHSNE CONTACT 14 FAILS OPEN | |
| 5-13/-BH | F1565DE3 | 99AX-FHEAA CONTACT 14 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CC | F1575DE3 | 62-FHEAA MOTOR FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CC | F1585DE3 | 62-FHEAA CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.C. 12241 FHEA-5-13/2 SH 46 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

5-13/-CP F1595DE1 CKT FMSNE ANNUNCIATED IN IF EMERGENCY POWER BUS 2DF
 NO 125V CONT F.MR CONTROL ROOM AND NORMAL POWER 2DF:
 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

5-13/-CE F1605DE3 52S-FMSAA PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 CONTACT 57 AND NORMAL POWER BUS 2AE:
 FAILS OPEN 99BX-FMSNE CONTACT 14 OPEN

5-13/-CE F1615DE3 52S-FMSAA PERIODIC TEST IF EMERGENCY POWER BUS 2DF
 CONTACT 57 AND NORMAL POWER 2DF:
 FAILS OPEN 99BX-FMSNE CONTACT 14 OPEN

5-13/-CE F1615DE3 52S-FMSAA PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 CONTACT 57 AND NORMAL POWER BUS 2AE:
 FAILS OPEN 99BX-FMSNE CONTACT 14 OPEN

5-13/-CE F1625DE3 1-FMSAA CONTACT 3 PERIODIC TEST IF EMERGENCY POWER BUS 2DF
 FAILS OPEN AND NORMAL POWER 2DF:
 99BX-FMSNE CONTACT 14 OPEN

5-13/-CE F1625DE3 1-FMSAA CONTACT 3 PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 FAILS OPEN AND NORMAL POWER BUS 2AE:
 NONE

5-13/-CE F1635DE3 1-FMSAA CONTACT 3 PERIODIC TEST IF EMERGENCY POWER BUS 2DF
 FAILS OPEN AND NORMAL POWER 2DF:
 NONE

5-13/-CE F1635DE3 1-FMSAA CONTACT 3 PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 FAILS OPEN AND NORMAL POWER BUS 2AE:
 NONE

5-13/-CE F1645DE1 CKT FMSNE ANNUNCIATED IN IF EMERGENCY POWER BUS 2DF
 125V (+)ACB CONTROL ROOM AND NORMAL POWER 2DF:
 FAILS OPEN 99BX-FMSNE CONTACT 14 OPEN

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-5-13/2 SH 47 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99BX-FHSNE CONTACT 14 OPEN | |
| 5-13/-CP | F1655DE1 | CKT FHSNE CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99BX-FHSNE CONTACT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99BX-FHSNE CONTACT 14 OPEN | |
| 5-13/-CP | F1665DE1 | CKT FHSNE 125V (-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99BX-FHSNE CONTACT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99BX-FHSNE CONTACT 14 OPEN | |
| 5-13/-BH | F1675DE3 | 99AX-FHEAA COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CG | F1685DE3 | 99A-PSISBA CONTACT FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CG | F1695DE3 | 99A-PSISBA COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-5-13/2 SK 48 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

5-13/-CV F1705DE1 NO 125VDC ANNUNCIATED IN IF EMERGENCY POWER BUS 2AE
 CONTROL POWER CONTROL ROOM AND NORMAL POWER BUS 2AE:
 AVAILABLE (PNL#DC2-12) 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

5-13/-CG F1715DE3 2FME-PSISB PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 CONTACT AND NORMAL POWER BUS 2AE:
 FAILS OPEN 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

5-13/-CG F1725DE3 2FME-PSISBA PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 PRESSURE SWITCH AND NORMAL POWER BUS 2AE:
 FAILS 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

5-13/-CV F1735DE1 CKT CESAC ANNUNCIATED IN IF EMERGENCY POWER BUS 2AE
 125V (+)ACB CONTROL ROOM AND NORMAL POWER BUS 2AE:
 FAILS OPEN 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

5-13/-CV F1745DE1 CKT CESAC ANNUNCIATED IN IF EMERGENCY POWER BUS 2AE
 CONTROL POWER CONTROL ROOM AND NORMAL POWER BUS 2AE:
 SHORT CIRCUIT 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

IF EMERGENCY POWER BUS 2DF
 AND NORMAL POWER 2DF:
 62-FHEAA CONT 3 OR 99AX-FHEAA
 CONT 14 OPEN

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | AUXILIARY FEEDWATER SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FHEA-5-13/2 SH 49 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--|---------------|
| 5-13/-CV | F1755DE1 | CKT CESAC 125V (-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-P | F1945DE3 | 2FHE*P23A TRIP COIL ENER BY SHORT CKT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-AG | F1955DE3 | 50-VE210X CONTACT 13 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-P | F1965DE3 | 27-VE200X4 CONTACT 221 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-P | F1975DE3 | 1B-FHEAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-AF | F1985DE3 | 1A-FHEAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 1A-FHEAA CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 1A-FHEAA CONTACT 3 CLOSED | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-5-13/2 SH 50 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 5-13/-AF | F1995DE6 | 1A-FHEAA IN STOP (UP ERRCR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 1A-FHEAA CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 1A-FHEAA CONTACT 3 CLOSED | |
| 5-13/-AG | F2005JE3 | 50-VE218X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-AG | F2015DE1 | 50-VE218G GND O C PROT FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-AG | F2025DE1 | 2FHE*P23A GND OVERCURRENT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-AG | F2035DE1 | 50-VE218 PHASE O C PROT FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |
| 5-13/-AG | F2045DE1 | 2FHE*P23A PHASE OVERCURRENT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23A FAILS TO OPERATE | |

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|---|--|---|--|---|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | | 3 | | 2 | | 1 |
| | | | | | | J.O. 12241 FHEA-5-13/2 SH 51 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 5-13/-BH | F2055DE3 | 43-FWEAAX CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-FWEAAX CONTACT 1 FAILS CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-FWEAAX CONTACT 1 FAILS CLOSED | |
| 5-13/-BH | F2065DE3 | 43-FWEAAX CONTACT 4 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-FWEAAX CONTACT 6 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-FWEAAX CONTACT 6 CLOSED | |
| 5-13/-Q | F2935DE3 | 1A-FWEBA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FWE*P23B NO MANUAL START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FWE*P23B NO MANUAL START CKT ESTABLISHED | |
| 5-13/-Q | F2945DE6 | 1A-FWEBA NOT IN START (OP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FWE*P23B NO MANUAL START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FWE*P23B NO MANUAL START CKT ESTABLISHED | |
| 5-13/-Q | F2955DE3 | 43-FWEBA CONTACT 10 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FWE*P23B NO MANUAL START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FWE*P23B NO MANUAL START CKT ESTABLISHED | |
| 5-13/-T | F4505DE1 | CKT FWEAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FWE*P23A FAILS TO OPERATE | |

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|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FWEA-5-13/2 SH 52 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE CODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE CODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------|----------------------|--|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE#P23A FAILS TO OPERATE | |
| 5-13/-V 5-13/-CE | F4515DE3 | 27-VE200X9 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE#P23A NO AUTO START CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE#P23A NO AUTO START CKT ESTABLISHED | |
| 5-13/-M | F6715DE3 | 43-CESNHX1 CONTACT 13 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE#P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE#P23A FAILS TO OPERATE | |
| 5-13/-M | F6725DE3 | 43-CESNHX1 CONTACT 10 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE#P23A FAILS TO OPERATE | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE#P23A FAILS TO OPERATE | |
| 5-13/-AF | F6735DE3 | H611A TN A CONTACT 17 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: H611A TN A CONTACT 17 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: H611A TN A CONTACT 17 CLOSED | |
| 5-13/-CH | F6805DE3 | 3-HSSATX CONTACT 225 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--|--|
| 5-13/-CH | F6815DE3 | 3-HSSBTX CONTACT 225 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEAA CONT 3 OR 99AX-FHEAA CONT 14 OPEN | |
| 5-13/-CS | F4805DU3 | 52-EGPAA (73) FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-K | F2845EE3 | 2FHE#P23B ACB CLOSING MECH FAILURE | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-K | F2855EE1 | CKT FHEBA NO 4KV OPER PWR AVAIL (BUS 2DF) | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-R | F2865EE1 | CKT FHEBA NO 125V DC CONTROL PWR | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-K | F2875EE3 | 43-FHEBAX CONTACT 9 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|----|----|----|--|--|
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 13 | 12 | 11 | | |
| J.O. 12281 FMEA-5-13/2 SH 54 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|--|
| 5-13/-BG | F2885EE3 | 43-FHEBAX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-BG | F2895EE3 | PB-FHEBAX CONTACT FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-R | F2905EE1 | CKT FHEBA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-R | F2915EE1 | CKT FHEBA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-R | F2925EE1 | CKT FHEBA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-U | F2965EE3 | 1A-FHEBA CONTACT 7 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23B NO AUTO START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23B NO AUTO START CKT ESTABLISHED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|-----------------------------------|-----------------------------|--|---------------|
| 5-13/-U | F2975EE3 | 27-VF200X4 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23B NO AUTO START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23B NO AUTO START CKT ESTABLISHED | |
| 5-13/-U | F2985EE3 | 1A-FHEBA CONTACT L1 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23B NO AUTO START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23B NO AUTO START CKT ESTABLISHED | |
| 5-13/-U | F2995EE6 | 1A-FHEBA NOT IN AUTO (OP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23B NO AUTO START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23B NO AUTO START CKT ESTABLISHED | |
| 5-13/-U | F3005EE3 | 43-FHEBAX CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23B NO AUTO START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23B NO AUTO START CKT ESTABLISHED | |
| 5-13/-H | F3015EE3 | 50-VF210X CONTACT 1 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 2FHE*P23B NO AUTO START CKT ESTABLISHED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 2FHE*P23B NO AUTO START CKT ESTABLISHED | |

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|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FHEA-5-13/2 SH F6 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|--|--|--|
| 5-13/-Y | F3025EE4 | 52-EGSBAX3 CONTACT 115 FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 52-EGSBAX3 CONTACT 115 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 52-EGSBAX3 CONTACT 115 OPEN | |
| 5-13/-Y | F3035EE4 | 162-EGSBAX CONTACT 223 FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-EGSBAX CONTACT 223 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 162-EGSBAX CONTACT 223 OPEN | |
| 5-13/-Y | F3045EE3 | D G 2-2 AUTO LOAD SEQ NO STEP4 SIGNAL | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-EGSBAX CONTACT 223 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 162-EGSBAX CONTACT 223 OPEN | |
| 5-13/-Y | F3055EE3 | 52-EN59C CONTACT 77 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 52-EGSBAX3 CONTACT 115 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 52-EGSBAX3 CONTACT 115 OPEN | |
| 5-13/-Y | F3065EE3 | 52-EGSBAX3 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 52-EGSBAX3 CONTACT 115 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 52-EGSBAX3 CONTACT 115 OPEN | |
| 5-13/-AH | F3075EE3 | 27-VF200X4 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO 5TH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO 5TH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|--|---|---------------------------|
| 5-13/-AK | F3085EE3 | 27-VF3200X CONTACT 221 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AH | F3095EE3 | 27-VF200X CONTACT 221 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AK | F3105EE3 | 27-VF3200X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AH | F3115EE3 | 27-VF200X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AK | F3125EE3 | 62-ENSSA CONTACT TDPU FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-CB | F3135EE4 | 27-VF200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|--|---|---------------|
| 5-13/-CB | F3145EE3 | 69-ENSBA CONTACT 425 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSBA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-CB | F3155EE4 | 27-VF1200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-AH | F3165EE3 | 69-ENSBA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSBA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-CK | F3175EE4 | 27-VF200 A-B COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF200 CONTACT 11 CLOSED | |
| 5-13/-CJ | F3185EE4 | 27-VF200 B-C COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF200 CONTACT 11 CLOSED | |
| 5-13/-DH | F3195EE3 | 162-ENSBA CONTACT 5 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|---|--|---------------|
| 5-13/-CH | F3205EE4 | 27-VF1200 A-B COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CH | F3215EE4 | 27-VF1200 B-C COIL FAILS OPEN | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-DH | F3225EE3 | 162-ENSBA COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-DH | F3235EE3 | 99-INNSDC FAILS | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-DH | F3245EE3 | 99-INNSDC CONTACT FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-AH | F3255EE3 | 69-ENSBA CONTACT 423 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 69-ENSBA CONTACT 423 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 423 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 4 | 13 | 2 | 1 | | |
| J.O. 12241 FHEA-5-13/2 SH 60 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|--|--|---------------|
| 5-13/-AP | F3265EE3 | 27-RP200 CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP200 CONTACT 1 CLOSED | |
| 5-13/-AP | F3275EE3 | 27-RP2200 A-B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-AP | F3285EE1 | 27-RP2200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DF | F3295EE1 | 27-RP200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP200 CONTACT 1 CLOSED | |
| 5-13/-DE | F3305EE1 | 27-RP200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP200 CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP200 CONTACT 1 CLOSED | |
| 5-13/-AS | F3315EE4 | 27-VF3200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|---|--|---------------|
| 5-13/-AR | F3325EE4 | 27-VF4200 CONTACT 11 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-AS | F3335EE1 | 27-VF3200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-AS | F3345EE1 | 27-VF3200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-AR | F3355EE1 | 27-VF4200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-AR | F3365EE1 | 27-VF4200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-CH | F3375EE1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-5-13/2 SH 62 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 5-13/-CK | F3385EE1 | P T CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-CK | F3395EE1 | P T CKT 120V SIDE A-B SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-CJ | F3405EE1 | P T CKT 120V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-CJ | F3415EE1 | P T CKT 120V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-CX | F3425EE1 | POTENTIAL XFMR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 5-13/-CN | F3435EE1 | P T CKT 4 KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF4200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
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|----------|----------|---|--------------------------------|--|--|
| 5-13/-CH | F3445EE1 | P T CKT 4 KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED | |
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IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
27-VF4200 CONTACT 11 CLOSED

| | | | | | |
|----------|----------|---|--------------------------------|--|--|
| 5-13/-CH | F3455EE1 | P T CKT 4 KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED | |
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IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
27-VF4200 CONTACT 11 CLOSED

| | | | | | |
|----------|----------|---|--------------------------------|--|--|
| 5-13/-CX | F3465EE1 | P T CKT 4 KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED | |
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IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
27-VF4200 CONTACT 11 CLOSED

| | | | | | |
|----------|----------|---|--------------------------------|--|--|
| 5-13/-CX | F3475EE1 | P T CKT 4 KV SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED | |
|----------|----------|---|--------------------------------|--|--|

IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
27-VF4200 CONTACT 11 CLOSED

| | | | | | |
|----------|----------|--|--------------------------------|--|--|
| 5-13/-CX | F3485EE1 | P T CKT 4 KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF4200 CONTACT 11 CLOSED | |
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IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
27-VF4200 CONTACT 11 CLOSED

| | | | | | |
|----------|----------|--|--------------------------------|--|--|
| 5-13/-CY | F3495EE1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
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IF EMERGENCY POWER BUS 2DF
AND NORMAL POWER 2DF:
27-VF1200 CONTACT 11 CLOSED

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-5-13/2 SH 64 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|---|---------------|
| 5-13/-CN | F3505EE1 | P T CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CN | F3515EE1 | P T CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CH | F3525EE1 | P T CKT 120V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CH | F3535EE1 | P T CKT 120V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CZ | F3545EE1 | POTENTIAL XTHR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CY | F3555EE1 | P T CKT 4KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 5-13/-CY | F3565EE1 | P T CKT 4KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CY | F3575EE1 | P T CKT 4KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CZ | F3585EE1 | P T CKT 4KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CZ | F3595EE1 | P T CKT 4KV SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-CZ | F3605EE1 | P T CKT 4KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 5-13/-DS | F3615EE1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-5-13/2 SH 66 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|---|---------------|
| 5-13/-DF | F3625EE1 | P T CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DF | F3635EE1 | P T CKT 120V SIDE A-N SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DE | F3645EE1 | P T CKT 120V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DE | F3655EE1 | P T CKT 120V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DT | F3665EE1 | POTENTIAL XFMR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DS | F3675EE1 | P T CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 5-13/-DS | F3685EE1 | P T CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DS | F3695EE1 | P T CKT 480V SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DT | F3705EE1 | P T CKT 480V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DT | F3715EE1 | P T CKT 480V SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DT | F3725EE1 | P T CKT 480V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 5-13/-DN | F3735EE1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| AUXILIARY FEEDWATER SYSTEM | | | | | |
| 19 | 13 | 12 | 11 | | |
| J.O. 12241 FMEA-5-13/2 SH 68 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 5-13/-DG | F3745EE1 | P T CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DG | F3755EE1 | P T CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DG | F3765EE1 | P T CKT 120V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DN | F3775EE1 | P T CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DN | F3785EE1 | P T CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 5-13/-DN | F3795EE1 | P T CKT 480V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |

| FRSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--|---------------|
| 5-13/-DP | F3805EE1 | CKT ENSBA NO 125V DC CONTL PWR AVAIL | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-DP | F3815EE1 | CKT ENSBA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-DP | F3825EE1 | CKT ENSBA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-DP | F3835EE1 | CKT ENSBA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-X | F3845EE3 | 99DX-FHONE CONTACT 14 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 162-ENSBA CONTACT 5 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 5-13/-X | F3855EE3 | K634B TRAIN B CONTACT 7 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K634B TRAIN B CONTACT 7 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K634B TRAIN B CONTACT 7 OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-5-13/2 SH 70 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------|----------------------|-------------------------------------|-----------------------------|--|------------------------|
| 5-13/-X | F3865EE3 | K634B TRAIN B NO ACTUATION SIGNAL | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K634B TRAIN B CONTACT 7 OPEN | (K634B=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K634B TRAIN B CONTACT 7 OPEN | (K634B=NSSS INTERFACE) |
| 5-13/-CA | F3875EE3 | 62-FHEBA CONTACT 3 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-AC 5-13/-X | F3885EE3 | K611B TRAIN B CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K611B TN B CONTACT 17 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K611B TN B CONTACT 17 CLOSED | |
| 5-13/-X | F3895EE3 | K611B TRAIN B NO ACTUATION SIGNAL | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K611B TRAIN B CONTACT 11 OPEN | (K611B=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K611B TRAIN B CONTACT 11 OPEN | (K611B=NSSS INTERFACE) |
| 5-13/-BZ | F4005EE3 | 99BX-FHSNE COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99BX-FHSNE CONTACT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99BX-FHSNE CONTACT 14 OPEN | |
| 5-13/-CA | F4015EE3 | 62-FHEBA COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------------------|
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-BZ | F4025EE3 | 99B-FHSNE CONTACT FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99BX-FHSNE CONTACT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99BX-FHSNE CONTACT 14 OPEN | |
| 5-13/-CA | F4045EE3 | 62-FHEBA MOTOR FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-CA | F4055EE3 | 62-FHEBA CONTACT 11 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FHEBA CONT 3 OR 99BX-FHEBA CONT 14 OPEN | |
| 5-13/-BZ | F4065EE3 | 99B-FHSNE COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 99BX-FHSNE CONTACT 14 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 99BX-FHSNE CONTACT 14 OPEN | |
| 5-13/-N | F4275EE3 | 2FHE=P23 TRIP COIL ENER BY SHORT CKT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 13 | | 12 | | 1 | |
| | | | | | | J.O. 12241 FHEA-5-13/2 SH 72 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|--|
| 5-13/-AD | F4285EE3 | 50-VF210X CONTACT 13 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-N | F4295EE3 | 27-VF200X4 CONTACT 221 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |
| 5-13/-N | F4305EE3 | 1B-FHEBA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |
| 5-13/-AC | F4315EE3 | 1A-FHEBA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 1A-FHEBA CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 1A-FHEBA CONTACT 3 CLOSED | |
| 5-13/-AC | F4325EE6 | 1A-FHEBA IN STOP (OP ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 1A-FHEBA CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 1A-FHEBA CONTACT 3 CLOSED | |
| 5-13/-AD | F4335EE3 | 50-VF218X ENERGIZED BY SHORT CKT | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH ONE OF TWO REDUNDANT PATH |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-5-13/2 SH 73 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|------------------------------|
| 5-13/-AD | F4345EE1 | 50-VF218G GND O C PROT FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AD | F4355EE1 | 2FNE*P23B GND OVERCURRENT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AD | F4365EE1 | 50-VF218 PHASE O C PROT FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-AD | F4375EE1 | 2FNE*P23B PHASE OVERCURRENT | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NO AUX FEED TO STH GEN A PATH 2 | ONE OF TWO REDUNDANT PATH |
| 5-13/-BG | F4385EE3 | 43-FNEBA CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-FNEBA CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-FNEBA CONTACT 1 CLOSED | |
| 5-13/-BG | F4395EE3 | 43-FNEBA CONTACT 4 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 43-FNEBA CONTACT 4 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 43-FNEBA CONTACT 4 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | AUXILIARY FEEDWATER SYSTEM |
| 19 | 3 | 12 | 1 | | J.O. 12241 FMEA-5-13/2 SH 74 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| 5-13/-AC | F6745EE3 | K611B TN B CONTACT 17 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: K611B TN B CONTACT 17 CLOSED IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: K611B TN B CONTACT 17 CLOSED | |
| 5-13/-CF | F6845EE3 | 3-HSSAUX CONTACT 225 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FNEBA CONT 3 OR 99BX-FNEBA CONT 14 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FNEBA CONT 3 OR 99BX-FNEBA CONT 14 OPEN | |
| 5-13/-CF | F6855EE3 | 3-HSSBUX CONTACT 225 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FNEBA CONT 3 OR 99BX-FNEBA CONT 14 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FNEBA CONT 3 OR 99BX-FNEBA CONT 14 OPEN | |
| 5-13/-X | F6865EE3 | 99BX-FNEBA CONTACT 14 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: 62-FNEBA CONT 3 OR 99BX-FNEBA CONT 14 OPEN IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: 62-FNEBA CONT 3 OR 99BX-FNEBA CONT 14 OPEN | |
| 5-13/-CL | F6875EU3 | 52-EGPBA CONTACT 73 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND NORMAL POWER BUS 2AE: NONE IF EMERGENCY POWER BUS 2DF AND NORMAL POWER 2DF: NONE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|---------------------------------------|-----------------------------|---|---------------|
| 5-15/-Y | M141EE73 | 3-FNEBA CONTACT 117 FAILS CLOSED | PERIODIC TEST | 3-FNEBA CONTACT 117 CLOSED | |
| 5-15/-V | M221XSH3 | 3-BDGCC CONT 115 FAILS CLOSED | PERIODIC TEST | 3-BDGCC CONT 115 CLOSED | |
| 5-15/-AS | M222XSH3 | 3-BDGCC COIL FAILS | PERIODIC TEST | 3-BDGCC CONT 115 CLOSED | |
| 5-15/-AH 5-15/-BA | M223XSH3 | TS101B2 CONT FAILS OPEN | PERIODIC TEST | TS101A2 OR TS101B2 FAIL OPEN | |
| 5-15/-AH | M224XSH3 | TS101A2 CONT FAILS OPEN | PERIODIC TEST | TS101A2 OR TS101B2 FAIL OPEN | |
| 5-15/-AH 5-15/-BA | M225XSH3 | TS101B2 CONT FAILS OPEN | PERIODIC TEST | TS101A2 OR TS101B2 OR TS101C2 FAIL OPEN | |
| 5-15/-AH | M226XSH3 | TS101C2 CONT FAILS OPEN | PERIODIC TEST | TS101A2 OR TS101B2 OR TS101C2 FAIL OPEN | |
| 5-15/-AH 5-15/-BA | M227XSH3 | TS101B2 CONT FAILS OPEN | PERIODIC TEST | TS101B2 OR TS101C2 FAIL OPEN | |
| 5-15/-J | M1181BK3 | 2BDG*SOV102B1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV102B1 OR 102B2 FAILS TO CLOSE | |
| 5-15/-H | M1191BK3 | 2BDG*SOV102B2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV102B1 OR 102B2 FAILS TO CLOSE | |
| 5-15/-J | M1201BK3 | 3-BDGBA CONTACT 1 FAILS CLOSED | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-N | M1211BK3 | 3-BDGBA CONTACT 2 FAILS CLOSED | PERIODIC TEST | 3-BDGBA CONTACT 24 CLOSED | |
| 5-15/-N | M1221BK3 | 3-BDGBA COIL FAILS | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-H | M3061BK6 | 1-BDGBA IN BLOWDOWN SAMPLE OPER ERROR | PERIODIC INSPECTION | 1-BDGBA CONTACT L1 CLOSED | |
| 5-15/-H | M3071BK3 | 1-BDGBA CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGBA CONTACT L1 CLOSED | |

Amendment 3

September 1984

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| 5-8-84/10/02 | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| WV H 94 | | | | STEAM GENERATOR BLOWDOWN SYSTEM | |
| 4 | 3 | 2 | 2079 | 1 | RRP |
| J.O. 12241 FMEA-5-15/2 SH 1 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--|---------------|
| 5-15/-L | M3101BK6 | 1-BDGCA IN BLOWDOWN SAMPLE OPER ERROR | PERIODIC INSPECTION | 1-BDGCA CONTACT L1 CLOSED | |
| 5-15/-L | M3111BK3 | 1-BDGCA CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGCA CONTACT L1 CLOSED | |
| 5-15/-P | M3901BK3 | 3-BDGCA COIL FAILS | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-M | M4081BK1 | 2BDG*SOV102C1 ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2BDG*AOV102C1 OR 102C2 FAILS TO CLOSE | |
| 5-15/-L | M4091BK1 | 2BDG*SOV102C2 ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2BDG*AOV102C1 OR 102C2 FAILS TO CLOSE | |
| 5-15/-M | M4101BK3 | 3-BDGCA CONTACT C1 FAILS CLOSED | PERIODIC TEST | 3-BDSCA CONTACT 1 CLOSED | |
| 5-15/-P | M4111BK3 | 3-BDGCA CONTACT 26 FAILS CLOSED | PERIODIC TEST | 3-BDGCA CONTACT 26 CLOSED | |
| 5-15/-AV | M05611F3 | 43-CESNHX1 CONT 14 FAILS OPEN | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AV | M21311F3 | 43-CESNHX1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AV | M21411F3 | PB1 TRANSFER ASP FAILS CLOSED | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AV | M21511F3 | 43-CESNHX1 CONT 9 FAILS OPEN | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AZ | M41311J3 | 99AX-SSRNA COIL FAILS | PERIODIC TEST | 99AX-SSRNA CONT 16 CLOSED | |
| 5-15/-AZ | M41411J3 | 99AX-SSRNA CONT 14 FAILS OPEN | PERIODIC TEST | 99AX-SSRNA CONT 16 CLOSED | |
| 5-15/-AZ | M41511J3 | 99A-SSRNA CONT FAILS OPEN | PERIODIC TEST | 99AX-SSRNA CONT 16 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| STEAM GENERATOR BLOWDOWN SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-5-15/2 SH 2 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|---------------------------|---------------|
| 5-15/-AZ | M41611J3 | 99A-SSRNA 3-01 CKT FAILS | PERIODIC TEST | 99AX-SSRNA CONT 16 CLOSED | |
| 5-15/-AZ | M41711J7 | 99AX-SSRNA CONT 16 FAILS CLOSED | PERIODIC TEST | 99AX-SSRNA CONT 16 CLOSED | |
| 5-15/-R | M03211K3 | 99AX TS100A CONT FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-R | M03311K3 | 99AX-TS100A COIL FAILS | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-R | M20011K3 | 99A-TS100A CONT FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-R | M20111K3 | 99A-TS100A ISOLATION CKT FAILS | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-BF | M20211K3 | 99AX-CONT 24 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-BF | M20311K3 | 1-BD SAMPLE CONT L2 FAILS OPEN | PERIODIC TEST | 1-BD SAMPLE CNT L2 OPEN | |
| 5-15/-BF | M20411K6 | 1-BD SAMPLE CONT L2 IN CLOSE (OP. ERROR) | PERIODIC INSPECTION | 1-BD SAMPLE CNT L2 OPEN | |
| 5-15/-BF | M20511K1 | 1-STH SAMPLE CONT RZ FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 1-STH SAMPLE CONT R2 OPEN | |
| 5-15/-BF | M20611K6 | 1-STH SAMPLE CNT RZ NOT IN OPEN (OP. ERROR) | PERIODIC INSPECTION | 1-STH SAMPLE CONT R2 OPEN | |
| 5-15/-BE | M20711K3 | 3-FNEBA COIL FAILS | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-Q | M21211K3 | 3-MSSAU CONT 113 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-N | M23411K3 | 99BX TS100B CONT FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-N | M23511K3 | 3-FNEBA CONT 223 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | STEAM GENERATOR BLOWDOWN SYSTEM |
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| | | | | | J.O. 12241 FMEA-5-15/2 SH 3 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------|---------------|
| 5-15/-N | H23611K3 | 3-HSSAU CONT 221 FAILS OPEN | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-BC | H23711K3 | 99BX-TS100B COIL FAILS | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-BC | H23811K3 | 99B TS100B CONT FAILS OPEN | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-BG | H23911K3 | 99BX CONT 24 FAILS OPEN | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-BC | H24011K3 | 99B-TS100B COIL FAILS | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-BC | H24111K3 | 2 SSR-TS100B CONT FAILS OPEN | PERIODIC TEST | 3-BDGBA CONTACT 14 CLOSED | |
| 5-15/-BG | H24211K3 | 1-BD SAMPLE CONT L2 FAILS OPEN | PERIODIC TEST | 1-BD SAMPLE CONT L2 OPEN | |
| 5-15/-BG | H24311K3 | 1-STM SAMPLE CONT R2 FAILS OPEN | PERIODIC TEST | 1-STM SAMPLE CONT R2 OPEN | |
| 5-15/-BG | H24411K6 | 1-STM SAMPLE CONT R2 NOT IN OPEN (CP. ERROR) | PERIODIC INSPECTION | 1-STM SAMPLE CONT R2 OPEN | |
| 5-15/-BG | H24511K6 | 1-BD SAMPLE CONT L2 IN CLOSE (OP. ERROR) | PERIODIC INSPECTION | 1-BD SAMPLE CONT L2 OPEN | |
| 5-15/-P | H35011K3 | 99CX-TS100C COIL FAILS | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-BD | H35111K3 | 99C TS100C CONT FAILS OPEN | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-BH | H35211K3 | 99CX CONT 24 FAILS OPEN | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-BD | H35311K3 | 99C-TS100C COIL FAILS | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-BD | H35411K3 | 2SSR-TS100C CONT FAILS OPEN | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | STEAM GENERATOR BLOWDOWN SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FHEA-5-15/2 SH 4 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------|---------------|
| 5-15/-BH | H35511K3 | 1-BD SAMPLE CONT L2 FAILS OPEN | PERIODIC TEST | 1-BD SAMPLE CONT L2 OPEN | |
| 5-15/-BH | H35611K6 | 1-BD SAMPLE CONT L2 IN CLOSE (OPER. ERROR) | PERIODIC INSPECTION | 1-BD SAMPLE CONT L2 OPEN | |
| 5-15/-BH | H35711K3 | 1-STH SAMPLE CONT RZ OPEN | PERIODIC TEST | 1-STH SAMPLE CONT R2 OPEN | |
| 5-15/-BH | H35811K6 | 1-STH SAMPLE CONT RZ NOT IN OPEN (OP. ERROR) | PERIODIC INSPECTION | 1-STH SAMPLE CONT R2 OPEN | |
| 5-15/-P | H35911K3 | 3-FHEBA CONT 227 FAILS OPEN | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-P | H36011K3 | 3-MSSAU CONT 223 FAILS OPEN | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-BD | H36211K3 | 99CX-TS100C COIL FAILS | PERIODIC TEST | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-Q | H37311K1 | CKT BDGAA BKR FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-Q | H37411K1 | CKT BDGAA SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-Q | H37511K1 | NO PHR AVAILABLE FROM PNL*ACZ-E8 | ANNUNCIATED IN CONTROL ROOM | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-S | H37611K1 | NO PHR AVAILABLE FROM PNL*ACZ-E8 | ANNUNCIATED IN CONTROL ROOM | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-S | H37711K1 | CKT BDGAA BKR FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-S | H37811K1 | CKT BDGAA SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 3-BDGCA CONTACT 1 CLOSED | |
| 5-15/-U | H03411X1 | 2BDG*SOV 100A1 ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2BDG*AOV100A1 OPEN | |
| 5-15/-AE | H03511X3 | LMD-BDGAB CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 5-15/-AE | M03611X3 | 1-BDGAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGAB CONTACT L1 CLOSED | |
| 5-15/-AE | M03711X6 | 1-BDGAB NOT IN CLOSE (OPER.ERROR) | PERIODIC INSPECTION | 1-BDGAB CONTACT L1 CLOSED | |
| 5-15/-U | M03811X3 | 3-HSSAT CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-HSSAT CONTACT 115 CLOSED | |
| 5-15/-AE | M04311X3 | 1-BDGAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV100A1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AE | M04411X6 | 1-BDGAB IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 2BDG*AOV100A1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-T | M08111X1 | 2BDG*SOV101A1 ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2BDG*AOV101A1 OPEN | |
| 5-15/-T | M08211X3 | 3-BDGAD CONTACT 14 FAILS CLOSED | PERIODIC TEST | 3-BDGAD CONTACT 14 CLOSED | |
| 5-15/-AF | M08411X3 | 1A-BDGAD CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV101A1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AF | M08511X6 | 1A-BDGAD IN OPEN OPER.ERROR | PERIODIC INSPECTION | 2BDG*AOV101A1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AF | M08611X3 | LMO-BDGAD CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 5-15/-AF | M08911X3 | 1A-BDGAD CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1A-BDGAD CONTACT L1 CLOSED | |
| 5-15/-AF | M09011X6 | 1A-BDGAD NOT IN CLOSE OPER.ERROR | PERIODIC INSPECTION | 1A-BDGAD CONTACT L1 CLOSED | |
| 5-15/-E | M10511X1 | 2BDG*SOV100C1 ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2BDG*AOV100C1 OPEN | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | STEAM GENERATOR BLOWDOWN SYSTEM | | | |
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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 5-15/-X | H12511X3 | 2-BDG*SOV100B1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV100B1 OPEN | |
| 5-15/-AH | H12611X3 | LHO-BDG8B CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 5-15/-AH | H12711X3 | 1-BDG8B CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDG8B CONTACT L1 CLOSED | |
| 5-15/-AH | H12811X6 | 1-BDG8B NOT IN CLOSE OPER.ERROR | PERIODIC INSPECTION | 1-BDG8B CONTACT L1 CLOSED | |
| 5-15/-X | H12911X3 | 3-HSSAT CONTACT 117 FAILS CLOSED | PERIODIC TEST | 3-HSSAT CONTACT 117 CLOSED | |
| 5-15/-AH | H13011X3 | 1-BDG8B CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV100B1 MAN-AUTO CKT | |
| 5-15/-AH | H13111X3 | 1-BDG8B IN OPEN OPER.ERROR | PERIODIC TEST | 2BDG*AOV100B1 MAN-AUTO CKT | |
| 5-15/-X | H13211X3 | 3-FHEAA CONTACT 117 FAILS CLOSED | PERIODIC TEST | 3-FHEAA CONTACT 117 CLOSED | |
| 5-15/-Y | H13311X3 | 2BDG*SOV101B2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV101B2 OPEN | |
| 5-15/-Y | H13511X3 | 3-HSSAU CONTACT 117 FAILS CLOSED | PERIODIC TEST | 3-HSSAU CONTACT 117 CLOSED | |
| 5-15/-AG | H13611X3 | 1-BDG8C CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV101B2 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AG | H13711X6 | 1-BDG8C IN OPEN OPER.ERROR | PERIODIC INSPECTION | 2BDG*AOV101B2 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AG | H13811X3 | LHO-BDG8C CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 5-15/-AG | H13911X3 | 1-BDGBC CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGBC CONTACT L1 CLOSED | |
| 5-15/-AG | H14011X6 | 1-BDGBC NOT IN CLOSED OPER ERROR | PERIODIC INSPECTION | 1-BDGBC CONTACT L1 CLOSED | |
| 5-15/-W | H14211X3 | 2BDG*SOV101B1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV101B1 OPEN | |
| 5-15/-W | H14311X3 | 3-BDGAD CONTACT FAILS CLOSED | PERIODIC TEST | 3-BDGAD CONTACT CLOSED | |
| 5-15/-AJ | H14411X3 | 1B-BDGAD CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV101B1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AJ | H14511X3 | 1B-BDGAD IN OPEN OPER.ERROR | PERIODIC TEST | 2BDG*AOV101B1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AJ | H14611X3 | LHO-BDGAD CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 5-15/-AJ | H14711X3 | 1B-BDGAD CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1B-BDGAD CONTACT L1 CLOSED | |
| 5-15/-AJ | H14811X6 | 1B-EDGAD NOT IN CLOSE OPER.ERROR | PERIODIC INSPECTION | 1B-EDGAD CONTACT L1 CLOSED | |
| 5-15/-AM | H15111X3 | LHO-BDGCB CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 5-15/-AM | H15211X3 | 1-BDGCB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGCB CONTACT L1 CLOSED | |
| 5-15/-AM | H15311X6 | 1-BDGCB NOT IN CLOSE OPER.ERROR | PERIODIC INSPECTION | 1-BDGCB CONTACT L1 CLOSED | |
| 5-15/-AP | H15411X3 | 3-HSSAT CONTACT 225 FAILS CLOSED | PERIODIC TEST | 3-HSSAT CONTACT 225 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 5-15/-AM | H15511X3 | 1-BDGCB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV100C1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AM | H15611X6 | 1-BDGCB IN OPEN OPER.ERROR | PERIODIC INSPECTION | 2BDG*AOV100C1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-E | H15811X3 | 2BDG*SOV101C2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV101C2 OPEN | |
| 5-15/-AC | H16011X3 | 3-HSSAU CONTACT 225 FAILS CLOSED | PERIODIC TEST | 3-HSSAU CONTACT 225 CLOSED | |
| 5-15/-AK | H16111X3 | 1-BDGCC CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV101C2 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AK | H16211X3 | LMO-BDGCC CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 5-15/-AK | H16311X3 | 1-BDGCC CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGCC CONTACT L1 CLOSED | |
| 5-15/-AK | H16411X6 | 1-BDGCC NOT IN CLOSE OPER.ERROR | PERIODIC INSPECTION | 1-BDGCC CONTACT L1 CLOSED | |
| 5-15/-Z | H16611X3 | 2BDG*SOV101C1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV101C1 OPEN | |
| 5-15/-Z | H16711X3 | 3-BDGAD CONTACT FAILS CLOSED | PERIODIC TEST | 3-BDGAD CONTACT CLOSED | |
| 5-15/-AQ | H16811X3 | 1C-BDGAD CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2BDG*AOV101C1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AQ | H16911X3 | 1C-BDGAD IN OPEN OPER.ERROR | PERIODIC TEST | 2BDG*AOV101C1 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AQ | H17011X3 | LMO-BDGAD CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|----------------------------------|-----------------------------|--|---------------|
| 5-15/-AQ | H17111X3 | 1C-BDGAD CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1C-BDGAD CONTACT L1 CLOSED | |
| 5-15/-AQ | H17211X6 | 1C-BDGAD NOT IN CLOSE OPER.ERROR | PERIODIC INSPECTION | 1C-BDGAD CONTACT L1 CLOSED | |
| 5-15/-AK | H17311X6 | 1-BDGCC IN OPEN OPER ERROR | PERIODIC INSPECTION | 2BDG#AOV101C2 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AT | M22811X3 | 3-BDGAD COIL FAILS | PERIODIC TEST | 3-BDGAD CONTACT 14 CLOSED | |
| 5-15/-AY 5-15/-BB | M22911X3 | TS101B1 CONT FAILS OPEN | PERIODIC TEST | TS101A1 OR TS101B1 FAIL OPEN | |
| 5-15/-AY | M23011X3 | TS101A1 CONT FAILS OPEN | PERIODIC TEST | TS101A1 OR TS101B1 FAIL OPEN | |
| 5-15/-AY 5-15/-BB | M23111X3 | TS101B1 CONT FAILS OPEN | PERIODIC TEST | TS101A1 OR TS101B1 OR TS101C1 FAILS OPEN | |
| 5-15/-AY | M23211X3 | TS101C1 CONT FAILS OPEN | PERIODIC TEST | TS101A1 OR TS101B1 OR TS101C1 FAILS OPEN | |
| 5-15/-AY 5-15/-BB | M23311X3 | TS101B1 CONT FAILS OPEN | PERIODIC TEST | TS101B1 OR TS101C1 FAIL OPEN | |
| 5-15/-Y | M24611X3 | 3-BDGCC CONT 117 FAILS CLOSED | PERIODIC TEST | 3-BDGCC CONT 117 CLOSED | |
| 5-15/-AC | M36111X3 | 3-BDGCC CONT 225 FAILS CLOSED | PERIODIC TEST | 3-BDGCC CONT 225 CLOSED | |
| 5-15/-AS | M38011X1 | NO PHR AVAILABLE FROM PNL#DC2-10 | ANNUNCIATED IN CONTROL ROOM | 3-BDGCC CONT 115 CLOSED | |
| 5-15/-AS | M38111X1 | CKT BDGCC BHR FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-BDGCC CONT 115 CLOSED | |
| 5-15/-AS | M38211X1 | CKT BDGCC SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 3-BDGCC CONT 115 CLOSED | |
| 5-15/-AT | M38411X1 | NO PHR AVAILABLE FROM PNL#DC2-11 | ANNUNCIATED IN CONTROL ROOM | 3-BDGAD CONTACT 14 CLOSED | |
| 5-15/-AT | M38511X1 | CKT BDGAD SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 3-BDGAD CONTACT 14 CLOSED | |

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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------------|----------------------|--|--------------------------------|--|---------------|
| 5-15/-AT | H38611X1 | CKT BDGAD BKR FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-BDGAD CONTACT 14 CLOSED | |
| 5-15/-D | H00111Y3 | 2SSR*SOV 117A ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV117A FAILS TO CLOSE | |
| 5-15/-AU | H00211Y1 | 3-HSSATX COIL ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AU | H00311Y1 | 2HSS*AOV105A FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AB | H00411Y3 | 3-HSSAT CONTACT 227 FAILS CLOSED | PERIODIC TEST | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AB | H00511Y3 | 3-FHEAA CONTACT 227 FAILS CLOSED | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AP | H00611Y3 | 3-HSSAT COIL FAILS OPEN | PERIODIC TEST | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AP | H00711Y3 | CKT-HSSAT NO 125VDC PWR AVAILABLE | PERIODIC TEST | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AP | H00811Y1 | CKT-HSSAT ACB-15A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AU | H00911Y1 | 3-HSSATX CONTACT 115 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AP | H01011Y3 | 1A-HSSAT CONTACT R2 FAILS OPEN | PERIODIC TEST | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AP | H01111Y6 | 1A-HSSAT IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AA 5-15/-AB 5-15/-K | H01211Y3 | 1-SSRPA CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*AOV117C MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AA 5-15/-AB 5-15/-K | H01311Y6 | 1-SSRPA IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 2SSR*AOV117C MAN-AUTO CKT ESTABLISHED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--|---------------|
| 5-15/-AU | H01411Y1 | 2HSS*AOV105A CONT CLS FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 3-HSSAT CONTACT 227 CLOSED | |
| 5-15/-AR | H01511Y3 | 3-SSRNA CONTACT 14 FAILS CLOSED | PERIODIC TEST | 3-SSRNA CONTACT 14 CLOSED | |
| 5-15/-AR | H01811Y3 | LHO-2SSR*AOV117C CONTACT C FAILS CLOSED | PERIODIC TEST | 3-SSRNA CONTACT 14 CLOSED | |
| 5-15/-AR | H01911Y3 | LHO-2SSR*AOV117B CONTACT C FAILS CLOSED | PERIODIC TEST | 3-SSRNA CONTACT 14 CLOSED | |
| 5-15/-AR | H02011Y3 | LHO-2SSR*AOV117A CONTACT C FAILS CLOSED | PERIODIC TEST | 3-SSRNA CONTACT 14 CLOSED | |
| 5-15/-AR | H02111Y3 | 3-SSRNA ENERGIZED BY SHORT CKT | PERIODIC TEST | 3-SSRNA CONTACT 14 CLOSED | |
| 5-15/-G | H02711Y3 | 2-BDG*SOV 102A1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV102A1 OR 102A2 FAILS TO CLOSE | |
| 5-15/-F | H02811Y3 | 2-BDG*SOV 102A2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV102A1 OR 102A2 FAILS TO CLOSE | |
| 5-15/-G | H02911Y3 | 3-BDGAA CONTACT 14 FAILS CLOSED | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-F | H03011Y3 | 3-BDGAA CONTACT 24 FAILS CLOSED | PERIODIC TEST | 3-BDGAA CONTACT 24 CLOSED | |
| 5-15/-Q | H03111Y3 | 3-BDGAA COIL FAILS | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-C | H09111Y1 | 2SSR*SOV117B ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2SSR*AOV117B FAILS TO CLOSE | |
| 5-15/-B | H14911Y3 | 2SSR*SOV117C ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV117C FAILS TO CLOSE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
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| FTSK IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-----------------|--|--------------------------------|----------------------------|---------------|
| 5-15/-G | M30011Y6 1-B0GAA IN 5TH SAMPLE OPER ERROR | PERIODIC INSPECTION | 1-B0GAA CONTACT R1 CLOSED | |
| 5-15/-G | M30111Y3 1-B0GAA CONTACT R1 CLOSED | PERIODIC TEST | 1-B0GAA CONTACT R1 CLOSED | |
| 5-15/-F | M30211Y6 1-B0GAA IN BLOWDOWN SAMPLE OPER ERROR | PERIODIC INSPECTION | 1-B0GAA CONTACT L1 CLOSED | |
| 5-15/-F | M30311Y3 1-B0GAA CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-B0GAA CONTACT L1 CLOSED | |
| 5-15/-J | M30411Y6 1-B0G8A IN 5TH SAMPLE OPER ERROR | PERIODIC INSPECTION | 1-B0G8A CONTACT R1 CLOSED | |
| 5-15/-J | M30511Y3 1-B0G8A CONTACT R1 CLOSED | PERIODIC TEST | 1-B0G8A CONTACT R1 CLOSED | |
| 5-15/-H | M30611Y6 1-B0GCA IN 5TH SAMPLE OPER ERROR | PERIODIC INSPECTION | 1-B0GCA CONTACT R1 CLOSED | |
| 5-15/-M | M30911Y3 1-B0GCA CONTACT P1 CLOSED | PERIODIC TEST | 1-B0GCA CONTACT R1 CLOSED | |
| 5-15/-U | M04750E3 3-FWEAA CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-FWEAA CONTACT 115 CLOSED | |
| 5-15/-AN | M04650E1 3-FWEAA COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 3-FWEAA CONTACT 227 CLOSED | |
| 5-15/-AN | M04950E1 CKT-FWEAA NO 125VDC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 3-FWEAA CONTACT 227 CLOSED | |
| 5-15/-AN | M05050E3 CKT-FWEAA 125VDC AT SHGR ACB (-) FAILS OPEN | PERIODIC TEST | 3-FWEAA CONTACT 227 CLOSED | |
| 5-15/-AN | M05150E3 CKT-FWEAA SHORT CKT | PERIODIC TEST | 3-FWEAA CONTACT 227 CLOSED | |

| FAILURE MODES AND EFFECTS ANALYSIS | | STEAM GENERATOR BLOWDOWN SYSTEM | |
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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|----------------------------|---------------|
| 5-15/-AN | M0525DE3 | CKT-FHEAA 125VDC AT SHGR ACB (+) FAILS OPEN | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AV | M0535DE3 | 1A-FHEAA CONTACT 21 FAILS OPEN | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AV | M0545DE6 | 1A-FHEAA IN CLOSE (OP.ERROR) | PERIODIC INSPECTION | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-AV | M0555DE3 | 52S-CONT 63 FAILS OPEN | PERIODIC TEST | 3-FHEAA CONTACT 227 CLOSED | |
| 5-15/-V | M0715DE3 | 3-FHEBA CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M0725DE3 | 3-FHEBA COIL FAILS OPEN | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M0735DE3 | CKT-FHEBA NO 125VDC POWER AVAILABLE | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M0745DE3 | CKT-FHEBA ACB(-) FAILS OPEN | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M0755DE3 | CKT-FHEBA SHORT CKT | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M0765DE3 | CKT-FHEBA ACB (+) FAILS OPEN | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AN | M1575DE3 | 3-FHEAA CONTACT 225 FAILS CLOSED | PERIODIC TEST | 3-FHEAA CONTACT 225 CLOSED | |
| 5-15/-Q | M0145EE3 | 3-FHEBA CONT 221 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-V | M0575EE3 | 2BDG*SOV101A2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 2BDG*AOV101A2 OPEN | |
| 5-15/-AX | M0605EE3 | CKT-HSSAU 1A CONTACT R2 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| STEAM GENERATOR BLOWDOWN SYSTEM | | | | |
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| J.O. 12241 FMEA-5-15/2 SH 14 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 5-15/-AX | M0615EE6 | CKT-MSSAU 1A IN OPEN OPER.ERROR | PERIODIC INSPECTION | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-V | M0625EE3 | 3-MSSAU CONTACT 115 FAILS CLOSED | PERIODIC TEST | 3-MSSAU CONTACT 115 CLOSED | |
| 5-15/-AD | M0635EE3 | 1-BDG CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2-BDG#A0V1C1A2 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AD | M0645EE6 | 1-BDGAC IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 2-BDG#A0V101A2 MAN-AUTO CKT ESTABLISHED | |
| 5-15/-AD | M0655EE3 | LHO-BDGAC CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 5-15/-AD | M0665EE3 | 1-BDGAC CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1-BDGAC CONTACT L1 CLOSED | |
| 5-15/-AD | M0675EE6 | 1-BDGAC NOT IN CLOSE (OPER.ERROR) | PERIODIC INSPECTION | 1-BDGAC CONTACT L1 CLOSED | |
| 5-15/-AC | M0685EE3 | 3-MSSAU COIL FAILS | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AC | M0695EE3 | 125VDC NO POWER AVAILABLE | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AC | M0705EE3 | CKT-MSSAU 15A BRKR FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AL | M1655EE3 | 3-FWEBA CONTACT 225 FAILS CLOSED | PERIODIC TEST | 3-FWEBA CONTACT 225 CLOSED | |
| 5-15/-BE | M2085EE3 | 52S-CONT 63 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-BE | M2095EE3 | 1A-CONT 21 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-BE | M2105EE6 | 1A CONT IN CLOSE (OP. ERROR) | PERIODIC INSPECTION | 3-BDGAA CONTACT 14 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|----------------------------|---------------|
| 5-15/-BE | M2115EE3 | 2FHE*P23B ACB FAILS | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AX | M2165EE3 | 3-HASSAUX CONTACT 115 FAILS OPEN | PERIODIC TEST | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AX | M2175EE1 | CKT HSSAU CNT CLS FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AX | M2185EE1 | 3-HSSAUX ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTRUL ROOM | 3-BDGAA CONTACT 14 CLOSED | |
| 5-15/-AL | M3705EE3 | CKT FHEBA 52S-CNT 63 FAILS OPEN | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M3715EE3 | 1A-FHEBA CNT 21 FAILS OPEN | PERIODIC TEST | 3-FHEBA CONTACT 115 CLOSED | |
| 5-15/-AL | M3725EE6 | 1A-FHEBA IN START (OP. ERROR) | PERIODIC INSPECTION | 3-FHEBA CONTACT 115 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| STEAM GENERATOR BLOWDOWN SYSTEM | | | | | |
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| J.O. 12241 FMEA-5-15/2 SH 16 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|---|---------------|
| 14-15-F | 90011AH3 | 2SSR*SOV 102A1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV 102A1 OPEN | |
| 14-15-E | 90021AH3 | 2SSR*SOV 102A2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV 102A2 OPEN | |
| 14-15-F | 90031AH3 | K612A-SSRAA CONTACT 7 FAILS CLOSED | PERIODIC TEST | K612A-SSRAA AUTO CONTACT 7 CLOSED | |
| 14-15-F | 90041AH3 | K612A-SSRAA ISOLATION SIGNAL FAILURE | PERIODIC TEST | K612A-SSRAA AUTO CONTACT 7 CLOSED | |
| 14-15-S | 90051AH3 | 1C-SSPAA MANUAL OPEN CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 102A1 MANUAL OPEN OR CLOSE CKT ESTABLISHED | |
| 14-15-S | 90061AH6 | 1C-SSRAA IN OPEN (OP ERROR) | PERIODIC INSPECTION | 2SSR*SOV 102A1 MANUAL OPEN OR CLOSE CKT ESTABLISHED | |
| 14-15-S | 90071AH3 | 2SSR*AVO 102A1 LMD CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-S | 90081AH3 | 1C-SSRAA MANUAL CLOSE CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1C-SSRAA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-S | 90091AH6 | 1C-SSRAA NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 1C-SSRAA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-E | 90101AH3 | K612B-SSRBA CONTACT 7 FAILS CLOSED | PERIODIC TEST | K612B-SSRBA AUTO CONTACT 7 CLOSED | |
| 14-15-E | 90111AH3 | K612B-SSRBA ISOLATION SIGNAL FAILURE | PERIODIC TEST | K612B-SSRBA AUTO CONTACT 7 CLOSED | |
| 14-15-T | 90121AH3 | 1C-SSRBA MANUAL OPEN CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 102A2 MANUAL OPEN OR CLOSE CKT ESTABLISHED | |

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| | | | | 13-6-84 | FAILURE MODES AND EFFECTS ANALYSIS |
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| | | | | - | J.O. 12241 FHEA-14-15/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|---|---------------|
| 14-15-T | 90131AH6 | 1C-SSRBA IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 102A2 MANUAL OPEN OR CLOSE CKT ESTABLISHED | |
| 14-15-T | 90141AH3 | 2SSR*AOV 102A2 LHD CONTACT C FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-T | 90151AH3 | 1C-SSRBA MANUAL CLOSE CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1C-SSRBA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-T | 90161AH6 | 1C-SSRBA NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 1C-SSRBA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-K | 90171AH3 | 2SSR*SOV 109A-1 ENERGISED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV 109A1 OPEN | |
| 14-15-J | 90181AH3 | 2SSR*SOV 109A-2 ENERGISED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV 109A2 OPEN | |
| 14-15-K | 90191AH3 | H612-SSRAA CONTACT 11 FAILS CLOSED | PERIODIC TEST | H612A-SSRAA AUTO CONTACT 11 CLOSED | |
| 14-15-M | 90201AH3 | H612A-SSRAA ISOLATION SIGNAL FAILURE | PERIODIC TEST | H612A-SSRAA AUTO CONTACT 11 CLOSED | |
| 14-15-M | 90211AH3 | 1A-SSRAA MANUAL OPEN CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 109A1 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-M | 90221AH6 | 1A-SSRAA IN OPEN (OP ERROR) | PERIODIC INSPECTION | 2SSR*SOV 109A1 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-M | 90231AH3 | 2SSR*AOV 109A-1 LHD CONTACT C FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 109A1 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-M | 90241AH3 | 1A-SSRAA MANUAL CONTACT L1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 109A1 MANUAL OPEN OR CLOSE CKT ESTAB | |

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| | | | | | J.O. 12241 FMEA-14-15/2 SH 2 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 14-15-N | 90251AH6 | 1A-SSRAA NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 109A1 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-J | 90261AH3 | H612B-SSRBA CONTACT 11 FAILS CLOSED | PERIODIC TEST | H612B-SSRBA CONTACT 11 CLOSED | |
| 14-15-J | 90271AH3 | H612B-SSRBA ISOLATION SIGNAL FAILURE | PERIODIC TEST | H612B-SSRBA CONTACT 11 CLOSED | |
| 14-15-X | 90281AH3 | 1A-SSRBA MANUAL OPEN CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 109A2 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-X | 90291AH6 | 1A-SSRBA IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 109A2 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-X | 90301AH3 | 2SSR*AOV 109A-2 LHO CONTACT C FAILS CLOSED | PERIODIC TEST | 2. SSR*SOV 109A2 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-X | 90311AH3 | 1A-SSRBA MANUAL CONTACT L1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 109A2 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-X | 90321AH6 | 1A-SSRBA NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 109A2 MANUAL OPEN OR CLOSE CKT ESTAB | |
| 14-15-C | 91171AH3 | 2SSR*SOV 112A-1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR* AOV112A1 OPEN | |
| 14-15-C | 91181AH3 | 2SSR*SOV 112A-2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR* AOV112A2 OPEN | |
| 14-15-R | 91191AH3 | 2SSR*SOV 100A-1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV 100A1 OPEN | |
| 14-15-Q | 91201AH3 | 2SSR*SOV 100A-2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*AOV 100A2 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 14-15-R | 91211AH3 | K612A-SSRAA CONTACT 9 FAILS CLOSED | PERIODIC TEST | K612A-SSRAA CONTACT 9 CLOSED | |
| 14-15-R | 91221AH3 | K612A-SSRAA ISOLATION SIG FAILURE | PERIODIC TEST | K612A-SSRAA CONTACT 9 CLOSED | |
| 14-15-AC | 91231AH3 | 1D-SSRAA MANUAL OPEN CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 100A1 2SSR*SOV 112A1 MANUAL OPEN OR CLOSE CKT EST | |
| 14-15-AC | 91241AH6 | 1D-SSRAA IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 100A1 2SSR*SOV 112A1 MANUAL OPEN OR CLOSE CKT EST | |
| 14-15-AC | 91251AH3 | 1D-SSRAA MANUAL CLOSE CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1D-SSRAA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-AC | 91261AH6 | 1D-SSRAA NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 1D-SSRAA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-AC | 91271AH3 | 2SSR*AOV 100A-1 LHO CONTACT C FAILS CLOSED | PERIODIC TEST | 2SSR*AOV 100A1 2SSR*AOV 112A1 LHO CONTACTS C CLOSED | |
| 14-15-AC | 91281AH3 | 2SSR*AOV 112A-1 LHO CONTACT C FAILS CLOSED | PERIODIC TEST | 2SSR*AOV 100A1 2SSR*AOV 112A1 LHO CONTACTS C CLOSED | |
| 14-15-Q | 91291AH3 | K612B-SSRBA CONTACT 9 FAILS CLOSED | PERIODIC TEST | K612B-SSRBA CONTACT 9 CLOSED | |
| 14-15-Q | 91301AH3 | K612B-SSRBA ISOLATION SIG FAILURE | PERIODIC TEST | K612B-SSRBA CONTACT 9 CLOSED | |
| 14-15-AD | 91311AH3 | 1D-SSRBA MANUAL OPEN CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 100A2 2SSR*SOV 112A2 MANUAL OPEN OR CLOSE CKT EST | |
| 14-15-AD | 91321AH6 | 1D-SSRBA IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 100A2 2SSR*SOV 112A2 MANUAL OPEN OR CLOSE CKT EST | |

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| | | | | | J.O. 12241 FMEA-14-15/2 SH 4 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 14-15-AD | 91331AH3 | 1D-SSRBA MANUAL CLOSE CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1D-SSRBA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-AD | 91341AH6 | 1D-SSRBA NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 1D-SSRBA MANUAL CLOSE CONTACT L1 CLOSED | |
| 14-15-AD | 91351AH3 | 2SSR*AOV 100A-2 LMO CONTACT 6 FAILS CLOSED | PERIODIC TEST | 2SSR*AOV 100A2 2SSR*AOV 112A2 LMO CONTACTS C CLOSED | |
| 14-15-AD | 91361AH3 | 2SSR*AOV 112A-2 LMO CONTACT 6 FAILS CLOSED | PERIODIC TEST | 2SSR*AOV 100A2 2SSR*AOV 112A2 LMO CONTACTS C CLOSED | |
| 14-15-G | 90341HC3 | 2SSR*SOV 128A-2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*SOV 128A2 ENERGIZED | |
| 14-15-G | 90361HC3 | 3A-SSRBB CONTACT 16 FAILS CLOSED | PERIODIC TEST | 3A-SSRBB AUTO CONT 16 CLOSED | |
| 14-15-AF | 90381HC3 | 3A-SSRBB COIL FAILS OPEN | PERIODIC TEST | 3A-SSRBB AUTO CONT 16 CLOSED | |
| 14-15-U | 90391HC3 | 1D-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 128A1 MANUAL CKT ESTAB | |
| 14-15-U | 90401HC3 | 1D-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-U | 90411HC3 | 1A-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 128A1 MANUAL CKT ESTAB | |
| 14-15-U | 90421HC6 | 1A-SSRAB IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 128A1 MANUAL CKT ESTAB | |
| 14-15-U | 90431HC3 | 1A-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1A-SSRAB CONTACT L1 CLOSED | |
| 14-15-U | 90441HC6 | 1A-SSRAB IN OPEN OR AUTO OP ERROR | PERIODIC INSPECTION | 1A-SSRAB CONTACT L1 CLOSED | |

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| | | | | J.O. 12241 FMEA-14-15/2 SH 5 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------------|---------------|
| 14-15-AE | 90451HC3 | 3D-SSRAB CONTACT 111 FAILS OPEN | PERIODIC TEST | 3A-SSRAB AUTO CONT 16 CLOSED | |
| 14-15-AE | 90461HC3 | 3A-SSRAB SEAL IN CONTACT 14 FAILS OPEN | PERIODIC TEST | 3A-SSRAB AUTO CONT 16 CLOSED | |
| 14-15-AE | 90471HC3 | 1A-SSRAB CONTACT L2 FAILS OPEN | PERIODIC TEST | 3A-SSRAB AUTO CONT 16 CLOSED | |
| 14-15-AM | 90481HC3 | 3D-SSRAB COIL FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AM | 90491HC3 | 62-SSRAB CONTACT 4 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AM | 90501HC3 | 62-SSRAB CONTACT 6 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AM | 90511HC3 | 62-SSRAB FAILURE | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AM | 90521HC3 | K607A-SSRAB CONTACT 9 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AM | 90531HC3 | K607A-SSRAB ISOLATION SIGNAL FAILURE | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-M | 90691HC3 | 2SSR*SOV 129A-1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*SOV 129A1 OPEN | |
| 14-15-M | 90711HC3 | 3B-SSRAB CONTACT 16 FAILS CLOSED | PERIODIC TEST | 3B-SSRAB AUTO CONTACT 16 CLOSED | |
| 14-15-AG | 90731HC3 | 3B-SSRAB COIL FAILS OPEN | PERIODIC TEST | 3B-SSRAB AUTO CONTACT 16 CLOSED | |
| 14-15-AG | 90751HC3 | 3D-SSRAB CONTACT 113 FAILS OPEN | PERIODIC TEST | 3B-SSRAB AUTO CONTACT 16 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
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| J.O. 12241 FHEA-14-15/2 SH 6 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------------|---------------|
| 14-15-AG | 90761HC3 | 3B-SSRAB SEAL IN CONTACT 14 FAILS OPEN | PERIODIC TEST | 3B-SSRAB AUTO CONTACT 16 CLOSED | |
| 14-15-AG | 90771HC3 | 1B-SSRAB CONTACT L2 FAILS OPEN | PERIODIC TEST | 3B-SSRAB AUTO CONTACT 16 CLOSED | |
| 14-15-Y | 90781HC3 | 1E-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 129A1 MANUAL CKT ESTAB | |
| 14-15-Y | 90791HC3 | 1E-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-Y | 90801HC3 | 1B-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 129A1 MANUAL CKT ESTAB | |
| 14-15-Y | 90811HC6 | 1B-SSRAB IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 129A1 MANUAL CKT ESTAB | |
| 14-15-Y | 90821HC3 | 1B-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1B-SSRAB CONTACT L1 CLOSED | |
| 14-15-Y | 90831HC6 | 1B-SSRAB IN OPEN OR AUTO OP ERROR | PERIODIC INSPECTION | 1B-SSRAB CONTACT L1 CLOSED | |
| 14-15-P | 90931HC3 | 2SSR*SOV 130A-1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-P | 90951HC3 | 3C-SSRAB CONTACT 16 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AJ | 90971HC3 | 3C-SSRAB COIL FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AH | 91051HC3 | 3D-SSRAB CONTACT 115 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AJ | 91061HC3 | 3C-SSRAB CONTACT 14 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------------|---------------|
| 14-15-AJ | 91071HC3 | 1C-SSRAB CONTACT 12 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-H | 90331HD3 | 2SSR*SOV 128A-1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*SOV 128A1 ENERGIZED | |
| 14-15-H | 90351HD3 | 3A-SSRAB CONTACT 16 FAILS CLOSED | PERIODIC TEST | 3A-SSRAB AUTO CONT 16 CLOSED | |
| 14-15-AE | 90371HD3 | 3A-SSRAB COIL FAILS | PERIODIC TEST | 3A-SSRAB AUTO CONT 16 CLOSED | |
| 14-15-V | 90541HD3 | 1D-SSRBB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 128A2 MANUAL CKT ESTAB | |
| 14-15-V | 90551HD3 | 1D-SSRBB CONTACT L1 FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-V | 90561HD3 | 1A-SSRBB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 128A2 MANUAL CKT ESTAB | |
| 14-15-V | 90571HD6 | 1A-SSRBB IN OPEN OR ERROR | PERIODIC INSPECTION | 2SSR*SOV 128A2 MANUAL CKT ESTAB | |
| 14-15-V | 90581HD3 | 1A-SSRBB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1A-SSRBB CONTACT L1 CLOSED | |
| 14-15-V | 90591HD6 | 1A-SSRBB IN OPEN OR AUTO OR ERROR | PERIODIC INSPECTION | 1A-SSRBB CONTACT L1 CLOSED | |
| 14-15-AF | 90601HD3 | 3D-SSRBB CONTACT 112 FAILS OPEN | PERIODIC TEST | 3A-SSRBB AUTO CONT 16 CLOSED | |
| 14-15-AF | 90611HD3 | 3A-SSRBB SEAL IN CONTACT 14 FAILS OPEN | PERIODIC TEST | 3A-SSRBB AUTO CONT 16 CLOSED | |
| 14-15-AF | 90621HD3 | 1A-SSRBB CONTACT L2 FAILS OPEN | PERIODIC TEST | 3A-SSRBB AUTO CONT 16 CLOSED | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
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| 14 | 3 | 2 | 1 | | | J.O. 12241 FHEA-14-15/2 SH 8 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------------|---------------|
| 14-15-AL | 90631HD3 | 3D-SSRBB COIL FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AL | 90641HD3 | 62-SSRBB CONTACT 4 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AP | 90651HD3 | 62-SSRBB CONTACT 6 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AP | 90661HD3 | 62-SSRBB FAILURE | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AP | 90671HD3 | K607B-SSRBB CONTACT 9 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AP | 90681HD3 | K607B-SSRBB ISOLATION SIGNAL FAILURE | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-L | 90701HD3 | 2SSR*SOV 129A-2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*SOV 129A2 OPEN | |
| 14-15-L | 90721HD3 | 3B-SSRBB CONTACT 16 FAILS CLOSED | PERIODIC TEST | 3B-SSRBB AUTO CONTACT 16 CLOSED | |
| 14-15-AH | 90741HD3 | 3B-SSRBB COIL FAILS OPEN | PERIODIC TEST | 3B-SSRBB AUTO CONTACT 16 CLOSED | |
| 14-15-AH | 90841HD3 | 3D-SSRBB CONTACT 113 FAILS OPEN | PERIODIC TEST | 3B-SSRBB AUTO CONTACT 16 CLOSED | |
| 14-15-AH | 90851HD3 | 3B-SSRBB SEAL IN CONTACT 14 FAILS OPEN | PERIODIC TEST | 3B-SSRBB AUTO CONTACT 16 CLOSED | |
| 14-15-AH | 90861HD3 | 1B-SSRBB CONTACT L2 FAILS OPEN | PERIODIC TEST | 3B-SSRBB AUTO CONTACT 16 CLOSED | |
| 14-15-Z | 90871HD3 | 1E-SSRBB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 129A2 MANUAL CKT ESTAB | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---------------------------------|---------------|
| 14-15-Z | 90891HD3 | 1E-SSRDB CONTACT L1 FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-Z | 90891HD3 | 1B-SSRDB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 129A2 MANUAL CKT ESTAB | |
| 14-15-Z | 90901HD6 | 1B-SSRDB IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 129A2 MANUAL CKT ESTAB | |
| 14-15-Z | 90911HD3 | 1B-SSRDB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1B-SSRDB CONTACT L1 CLOSED | |
| 14-15-Z | 90921HD6 | 1B-SSRDB IN OPEN OR AUTO OP ERROR | PERIODIC INSPECTION | 1B-SSRDB CONTACT L1 CLOSED | |
| 14-15-N | 90941HD3 | 2SSR*SOV 130A-2 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-N | 90961HD3 | 3C-SSRDB CONTACT 16 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AK | 90981HD3 | 3C-SSRAB COIL FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AB | 91081HD3 | 1F-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AB | 91091HD3 | 1F-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-AB | 91101HD3 | 1C-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AB | 91111HD6 | 1C-SSRAB IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV,130A2 OPEN | |
| 14-15-AB | 91121HD3 | 1C-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1C-SSRAB CONTACT L1 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|----------------------------|---------------|
| 14-15-AB | 91131HD6 | 1C-SSRAB IN OPEN OR AUTO OP ERROR | PERIODIC INSPECTION | 1C-SSRAB CONTACT L1 CLOSED | |
| 14-15-AL | 91141HD3 | 3D-SSRPB CONTACT 115 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AK | 91151HD3 | 3C-SSREB SEAL IN CONTACT 14 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AK | 91161HD3 | 1C-SSRBB CONTACT 12 FAILS OPEN | PERIODIC TEST | 2SSR*SOV 130A2 OPEN | |
| 14-15-AA | 909911C3 | 1F-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AA | 910011C3 | 1F-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | NONE | |
| 14-15-AA | 910111C3 | 1C-SSRAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | 2SSR*SOV 130A1 OPEN | |
| 14-15-AA | 910211C6 | 1C-SSRAB IN OPEN OP ERROR | PERIODIC INSPECTION | 2SSR*SOV 130A1 OPEN | |
| 14-15-AA | 910311C3 | 1C-SSRAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | 1C-SSRAB CONTACT L1 CLOSED | |
| 14-15-AA | 910411C6 | 1C-SSRAB IN OPEN OR AUTO OP ERROR | PERIODIC INSPECTION | 1C-SSRAB CONTACT L1 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|----------------------------|---------------|
| 21-1/-G | N2241CL3 | 2HVC * MOD 202A LHS FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-G | N2251CL3 | 2HVC * MOD 202A MOTOR FAILS | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-G | N2261CL3 | 2HVC * MOD 202A RELAY VALVE COIL FAILS | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-AB | N2271CL1 | PNL * AC-EC2-E3 BREAKER 4 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | FILTER SYSTEM PATH A FAILS | |
| 21-1/-AB | N2281CL1 | CKT-HVCAE SHORT CKT | ANNUNCIATED IN CONTROL ROOM | FILTER SYSTEM PATH A FAILS | |
| 21-1/-G | N2291CL3 | 42-HVCADX1-HVCAE CONTACT 115 FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-AB | N2301CL3 | 2HVC * MOD 203A LHS FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-AB | N2311CL3 | 2HVC * MOD 203A MOTOR FAILS | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-AB | N2321CL3 | 2HVC * MOD 203A RELAY VALVE COIL FAILS | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-AG | N2331CL3 | 42-HVCADX1-HVCAE CONTACT 225 FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |
| 21-1/-F | N2341CN3 | 2HVC * MOD 202B LHS FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-F | N2351CN3 | 2HVC * MOD 202B MOTOR FAILS | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-F | N2361CN3 | 2HVC * MOD 202B RELAY VALVE COIL FAILS | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-H | N2371CN1 | PNL * AC2-E4 BREAKER 4 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | FILTER SYSTEM PATH B FAILS | |

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| | | | | 3-29-84 | 10/10/84 | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RG | PD | CONTROL ROOM VENT SYSTEM | |
| 4 | 3 | 2 | 1 | RG | RRB | | |
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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|--------------------------------|--|---------------|
| 21-1/-H | N2381CN1 | CKT-HVCBE SHORT CKT | ANNUNCIATED IN CONTROL ROOM | FILTER SYSTEM PATH B FAILS | |
| 21-1/-F | N2391CN3 | 42-HVCBDX1-HVCBE CONTACT 115 FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-H | N2401CN3 | 2HVC * MOD 203B LHS FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-H | N2411CN3 | 2HVC * MOD 203B MOTOR FAILS | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-H | N2421CN3 | 2HVC * MOD 203B RELAY VALVE COIL FAILS | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-L | N2431CN3 | 42-HVCBDX1-HVCBE CONTACT 225 FAILS OPEN | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |
| 21-1/-W | N2791CQ3 | 2HVC * MOD 205A LHS FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-W | N2801CQ3 | 2HVC * MOD 205A MOTOR FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-W | N2811CQ3 | 2HVC * MOD 205A RELAY VALVE COIL FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-S | N2821CQ1 | PNL * AC2-E3 BREAKER 5 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-S | N2831CQ1 | CKT-HVCAF SHORT CKT | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-W | N2841CQ3 | 42-HVCACX-HVCAF CONTACT 115 FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-S | N2851CQ3 | 2HVC * MOD 206A LHS FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-S | N2861CQ3 | 2HVC * MOD 206A MOTOR FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-21-1/2 SH 2 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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|----------|----------|---|--------------------------------|---|
| 21-1/-S | N2871CQ3 | 2HVC * MOD 206A RELAY VALVE COIL FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS |
| 21-1/-Z | N2881CQ3 | 42-HVCACX-HVCAF CONTACT 113 FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS |
| 21-1/-Y | N2891CX3 | 2HVC * MOD 205B LHS FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-Y | N2901CX3 | 2HVC * MOD 205B MOTOR FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-Y | N2911CX3 | 2HVC * MOD 205B RELAY VALVE COIL FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-R | N2921CX1 | PNL * AC2-E4 BREAKER 5 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-R | N2931CX1 | CKT-HVCBF SHORT CKT | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-Y | N2941CX3 | 42-HVCBCX-HVCBF CONTACT 115 FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-R | N2951CX3 | 2HVC * MOD 206B LHS FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-R | N2961CX3 | 2HVC * MOD 206B MOTOR FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-R | N2971CX3 | 2HVC * MOD 206B RELAY VALVE COIL FAILS | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-AA | N2981CX3 | 42-HVCBCX-HVCBF CONTACT 113 FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS |
| 21-1/-BS | N0271JP3 | CKT-CESAN NO 125VDC AVAIL FROM PNL * CDC-03 | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB |
| 21-1/-BS | N0281JP3 | 99X1-H626A-1 CESAN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
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| CONTROL ROOM VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHFA-21-1/2 SH 3 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 21-1/-BS | N0291JP3 | 99X-K626A-1 CESAN CONTACT 14 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BT | N0301JP3 | CKT-CESAN 3P BREAKER P FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BT | N0311JP3 | CKT-CESAN 3P BREAKER N FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BS | N0321JP3 | 99X-K626A-1 CESAN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0331JP3 | 99-K626A-1 CESAN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0341JP3 | 99-K626A-1 CESZ1 COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0351JP3 | CKT-CESZ1 NO 125VDC AVAIL FROM UNIT 1 PNL DC-3 CKT 8-60 | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0361JP3 | K626A-CESZ1 CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0371JP3 | K626A-CESZ1 SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0381JP3 | CKT-CESZ1 3P BREAKER P FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BX | N0391JP3 | CKT-CESZ1 3P BREAKER N FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BT | N0401JP3 | CKT-CESAN NO 125VDC AVAIL FROM PNL*20C-03 | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BT | N0411JP3 | 99X-1K630A-1 CESAN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
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| J.O. 12241 FMEA-21-1/2 SH 4 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---|---------------|
| 21-1/-BT | N0421JP3 | 99X-K630A-1 CESAN CONTACT 14 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BT | N0431JP3 | 99X-K630A-1 CESAN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BY | N0441JP3 | 99-K630A-1 CESAN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BY | N0451JP3 | 99-K630A-1 CESZ1 COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BY | N0521JP3 | CKT-CESZ1 NO 125VDC AVAIL FROM UNIT 1 PNL DC-3 CKT8-60 | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BY | N0531JP3 | K630A-CESZ1 CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BY | N0541JP3 | K630A-CESZ1 SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BU | N1551JP3 | CKT-CESDN NO 125VDC AVAIL FROM PNL*2DC-02 | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BU | N1561JP3 | 99X1-K626B-1 CESDN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BU | N1571JP3 | 99X-K626B-1 CESDN CONTACT 14 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BV | N1581JP3 | CKT-CESAN 3P BREAKER P FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BV | N1591JP3 | CKT-CESAN 3P BREAKER N FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BU | N1601JP3 | 99X-K626B-1 CESDN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
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| | | | | | J.O. 12241 FMEA-21-1/2 SH 5 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|---|---------------|
| 21-1/-BZ | N1611JP3 | 99-K626B-1 CESAN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BZ | N1621JP3 | 99-K626B-1 CESZ2 COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BZ | N1631JP3 | CKT-CESZ2 NO 125VDC AVAIL FROM UNIT 1 PNL DC-2 CKT8-46 | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BZ | N1641JP3 | K626-CESZ2 CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BZ | N1651JP3 | K626B-CESZ2 SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-CA | N1661JP2 | CKT-CESZ2 3P BREAKER N FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-CA | N1671JP2 | CKT-CESZ2 3P BREAKER P FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BV | N1681JP3 | CKT-CESBN 125VDC AVAIL FROM PNL* 2DC-02 | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BV | N1691JP3 | 99X1-K630B-1 CESBN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BV | N1701JP3 | 99X-K630B-1 CESBN CONTACT 14 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1.-BV | N1711JP3 | 99X-K630B-1 CESBN COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-CA | N1721JP3 | 99-K630B-1 CESBN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-CA | N1731JP3 | 99-K630B-1 CESZ2 COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--|----------------------|--|----------------------------------|---|---------------|
| 21-1/-CA | N1741JP3 | CKT-CESZ2 NO 125VDC AVAIL FROM UNIT 1 PNL DC2 CKT 8-46 | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-CA | N1751JP3 | K630B-CESZ2 CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-CA | N1761JP3 | K630B-CESZ2 SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-V 21-1/-Q 21-1/-P 21-1/-S 21-1/-B 21-1/-R 21-1/-AB | N0036JD1 | NO 480V PWR TO MCC * 2-E09 | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-Q | N0046JD2 | CKT-HVCAH FUSE FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201A OPEN | |
| 21-1/-Q | N0056JD2 | CKT-HVCAH 480-120 X FORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201A OPEN | |
| 21-1/-Q | N0066JD3 | 42C-HVCAH COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A OPEN | |
| 21-1/-Q | N0076JD3 | 420-HVCAH CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A OPEN | |
| 21-1/-Q | N0086JD3 | LMS-HVCAH CONTACT 8 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A OPEN | |
| 21-1/-BA | N0096JD3 | 42C-HVCAH SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BH | N0106JD3 | 49X-HVCAH CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BA | N0116JD3 | LMS-HVCAH CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-1/2 SH 7 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| 21-1/-BA | N0126JD3 | 1-HVCAH CONTACT L2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BA | N0136JD6 | 1-HVCAH NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BH | N0146JD1 | 49X-HVCAH COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BA | N0156JD3 | TQ5-C-HVCAH FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BA | N0166JD3 | 2HVC * MOD201A EXCESSIVE TORQUE | PERIODIC TEST | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BH | N0176JD1 | 49-HVCAH CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-BH | N0186JD1 | 2-HVC * MOD201A OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 201A NO MANUAL CLOSING CKT ESTAB | |
| 21-1/-AT | N0196JD3 | 1-HVCAH CONTACT R2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AT | N0206JD6 | 1-HVCAH IN OPEN OP ERROR | PERIODIC INSPECTION | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BJ | N0216JD3 | K630A-HVCAH CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BJ | N0226JD3 | K630A-HVCAH UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BJ | N0236JD3 | K625A-HVAH CONTACT 11 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BJ | N0246JD3 | K625A-HVCAH SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-BJ | N0256JD3 | 99X1-K626A-1 HVCAH CONTACT 113 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-1/2 SH 8 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|---|---------------|
| 21-1/-BJ | N0266JD3 | 99X1-K630A-1 HVCAH CONTACT 113 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201A NO AUTO CLOSING CKT ESTAB | |
| 21-1/-Q | N0556JD2 | 420-HVCAH ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201A OPEN | |
| 21-1/-BB | N0566JD3 | 420-HVCAH SEAL IN CONTACT FAILS CLOSED | PERIODIC TEST | 420-HVCAH MANUAL OPEN CKT ESTAB | |
| 21-1/-AU | N0576JD3 | K630-HVCAH CONTACT 9 FAILS CLOSED | PERIODIC TEST | CKT-HVCAH BLOCKING CONTACTS CLOSED | |
| 21-1/-AU | N0586JD3 | K625A-HVCAH CONTACT 15 FAILS CLOSED | PERIODIC TEST | CKT-HVCAH BLOCKING CONTACTS CLOSED | |
| 21-1/-AU | N0596JD3 | 99X1-K626A-1-HVCAH CONTACT 117 FAILS CLOSED | PERIODIC TEST | CKT-HVCAH BLOCKING CONTACTS CLOSED | |
| 21-1/-AU | N0606JD3 | 99X1-K630-1-HVCAH CONTACT117 FAILS CLOSED | PERIODIC TEST | CKT-HVCAH BLOCKING CONTACTS CLOSED | |
| 21-1/-BB | N0616JD3 | 1-HVCAH CONTACT R1 FAILS CLOSED | PERIODIC TEST | 420-HVCAH MANUAL OPEN CKT ESTAB | |
| 21-1/-AU | N0626JD3 | K630A-HVCAH UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | CKT-HVCAH BLOCKING CONTACTS CLOSED | |
| 21-1/-AU | N0636JD3 | K625A-HVCAH SIGNAL FAILURE | PERIODIC TEST | CKT-HVCAH BLOCKING CONTACTS CLOSED | |
| 21-1/-BB | N0646JD6 | 1-HVCAH IN OPEN OP ERROR | PERIODIC INSPECTION | 420-HVCAH MANUAL OPEN CKT ESTAB. | |
| 21-1/-X | N0656JDI | NO 480V PWR TO MCC * 2-E10 | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-T | | | | | |
| 21-1/-U | | | | | |
| 21-1/-R | | | | | |
| 21-1/-C | | | | | |
| 21-1/-N | | | | | |
| 21-1/-H | | | | | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-1/2 SH 9 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|----------------------------------|--|---------------|
| 21-1/-T | N0666JD2 | CKT-HVCBH FUSE FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201B OPEN | |
| 21-1/-T | N0676JD2 | CKT-HVCBH 480-120 X FORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201B OPEN | |
| 21-1/-T | N0686JD3 | 42C-HVCBH COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B OPEN | |
| 21-1/-T | N0696JD3 | 420-HVCBH CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B OPEN | |
| 21-1/-T | N0706JD3 | LMS-HVCBH CONTACT 8 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B OPEN | |
| 21-1/-AH | N0716JD3 | 42C-HVCBH SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-BK | N0726JD3 | 49X-HVCBH CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-AH | N0736JD3 | LMS-HVCBH CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-AH | N0746JD3 | 1-HVCBH CONTACT L2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-AH | N0756JD6 | 1-HVCBH NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-BK | N0766JD1 | 49X-HVCBH COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-AH | N0776JD3 | TQS-HVCBH FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-AH | N0786JD3 | 2HVC * MOD 201B EXCESSIVE TORQUE | PERIODIC TEST | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-BK | N0796JD1 | 49-HVCBH CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
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| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 10 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|---|---------------|
| 21-1/-BK | N0806JD1 | 2-HVC * MOD 201B OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 201B NO MAN CLOSING CKT ESTAB | |
| 21-1/-AC | N0816JD3 | 1-HVCBH CONTACT R2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AC | N0826JD6 | 1-HVCBH CONTACT 3 OPEN | PERIODIC INSPECTION | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AL | N0836JD3 | K630B-HVCBH CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AL | N0846JD3 | K630B-HVCBH UNIT 2 HI CHLOR | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AL | N0856JD3 | K625B-HVCBH CONTACT 11 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AL | N0866JD3 | K625B-HVCBH SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AL | N0876JD3 | 99X1-K626B-1 HVCBH CONTACT 113 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AL | N0886JD3 | 99X1-K630B-1 HVCBH CONTACT 113 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201B NO AUTO CLOSING CKT ESTAB | |
| 21-1/-T | N0896JD2 | 420-HVCBH ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201B OPEN | |
| 21-1/-BC | N0906JD3 | 420-HVCBH SEAL IN CONTACT FAILS CLOSED | PERIODIC TEST | 420-HVCBH MANUAL OPEN CKT ESTAB | |
| 21-1/-AV | N0916JD3 | K630B-HVCBH CONTACT 9 CLOSED | PERIODIC TEST | CKT-HVCBH BLOCKING CONTACTS CLOSED | |
| 21-1/-AV | N0926JD3 | K625B-HVCBH CONTACT 15 FAILS CLOSED | PERIODIC TEST | CKT-HVCBH BLOCKING CONTACTS CLOSED | |
| 21-1/-AV | N0936JD3 | 99X1-K626B-1-HVCBH CONTACT 117 FAILS CLOSED | PERIODIC TEST | CKT-HVCBH BLOCKING CONTACTS CLOSED | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
|------------------------------------|---|---|---|--|
| CONTROL ROOM VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-1/2 SH 11 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 21-1/-AV | N0946JD3 | 99X1-K630B-1-HVCBH CONTACT 117 FAILS CLOSED | PERIODIC TEST | CKT-HVCBH BLOCKING CONTACTS CLOSED | |
| 21-1/-BC | N0956JD3 | 1-HVCBH CONTACT R1 FAILS CLOSED | PERIODIC TEST | 420-HVCBH MANUAL OPEN CKT ESTAB | |
| 21-1/-AV | N0966JD3 | K630B-HVCBH UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | CKT-HVCBH BLOCKING CONTACTS CLOSED | |
| 21-1/-AV | N0976JD3 | K625B-HVCBH SIGNAL FAILURE | PERIODIC TEST | CKT-HVCBH BLOCKING CONTACTS CLOSED | |
| 21-1/-BC | N0986JD6 | 1-HVCBH IN OPEN OP ERROR | PERIODIC INSPECTION | 420-HVCBH MANUAL OPEN CKT ESTAB | |
| 21-1/-B | N1876JE1 | CKT-HVCAG 480-120 PHR XFORMER FAILURE | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-B | N1886JE3 | LHS-HVCAG CONTACT 4 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 204A CLOSED | |
| 21-1/-B | N1896JE3 | 420-HVCAG COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 204A CLOSED | |
| 21-1/-B | N1906JE3 | 42C-HVCAG CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 204A CLOSED | |
| 21-1/-BN | N1916JE3 | 49X-HVCAG CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-M | N1926JE3 | LHS-HVCAG CONTACT 5 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-M | N1936JE3 | 1-HVCAG CONTACT R1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-M | N1946JE6 | 1-HVCAG NOT IN OPEN OP ERROR | PERIODIC INSPECTION | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-BN | N1956JE1 | 49X-HVCAG COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-1/2 SH 12 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|---------------|
| 21-1/-H | N1966JE3 | TOS-0-HVCAG CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-H | N1976JE3 | 2HVC * MOD 204A EXCESSIVE TORQUE | PERIODIC TEST | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-BN | N1986JE1 | 49-HVCAG CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-BN | N1996JE1 | 2HVC * MOD 204A OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD204A NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-J | N2006JE3 | 42-HVCADX1 HVCAG CONTACT 113 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO AUTO OPEN CKT ESTAB | |
| 21-1/-J | N2016JE3 | 1-HVCAG CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO AUTO OPEN CKT ESTAB | |
| 21-1/-J | N2026JE6 | 1-HVCAG IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD204A NO AUTO OPEN CKT ESTAB | |
| 21-1/-AG | N2036JE3 | 42-HVCADX1 HVCAD COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO AUTO OPEN CKT ESTAB | |
| 21-1/-AG | N2046JE3 | 42-HVCAD CONTACT 7 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204A NO AUTO OPEN CKT ESTAB | |
| 21-1/-B | N2056JE2 | 42C-HVCAG ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-AF | N2066JE2 | 1-HVCAG CONTACT L3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-AF | N2076JE6 | 1-HVCAG IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD 204A CLOSED | |
| 21-1/-AF | N2086JE2 | 1-HVCAG CONTACT R3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-AF | N2096JE2 | 1-HVCAG NOT IN OPEN OP ERROR | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|----------------------------------|--|---------------|
| 21-1/-AF | N2106JE2 | 42-HVCAG CONTACT 9 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-C | N2116JE3 | CKT-HVCBG 480-120 PWR XFORMER FAILURE | PERIODIC TEST | 2HVC * MOD 204B CLOSED | |
| 21-1/-C | N2126JE3 | 420-HVCBG CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 204B CLOSED | |
| 21-1/-C | N2136JE3 | 42C-HVCBG CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 204B CLOSED | |
| 21-1/-BP | N2146JE3 | 49-HVCBG CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-L | N2166JE3 | 42-HVCBDX1 HVCB0 COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO AUTO OPEN CKT ESTAB | |
| 21-1/-L | N2176JE3 | 42-HVCBD CONTACT 7 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO AUTO OPEN CKT ESTAB | |
| 21-1/-C | N2186JE2 | 42C-HVCBG ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-K | N2196JE2 | 1-HVCBG CONTACT L3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-K | N2206JE2 | 1-HVCBG IN CLOSE OP ERROR | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-K | N2216JE2 | 1-HVCBG CONTACT R3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-K | N2226JE6 | 1-HVCBG NOT IN OPEN OP ERROR | PERIODIC INSPECTION | 2HVC * MOD 204B CLOSED | |
| 21-1/-K | N2236JE2 | 42-HVCBG CONTACT 9 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-1/2 SH 14 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--|---------------|
| 21-1/-C | N3236JE3 | LMS-HVCBG CONTACT 4 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 204B CLOSED | |
| 21-1/-E | N3376JE3 | LMS-HVCBG CONTACTS FAILS OPEN DURING START | PERIODIC TEST | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-E | N3386JE3 | 1-HVCBG CONTACT R1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-E | N3396JE6 | 1-HVCBG NOT IN OPEN OP ERROR | PERIODIC INSPECTION | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-BP | N3406JE1 | 49X-HVCBG COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-E | N3416JE3 | TQS-O-HVCBG CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-E | N3426JE3 | 2HVC * MOD 204B EXCESSIVE TORQUE | PERIODIC TEST | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-BP | N3436JE1 | 49-HVCBG CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-BP | N3446JE1 | 2HVC * MOD 204B OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD204B NO MANUAL OPENING CKT ESTABLISHED | |
| 21-1/-D | N3456JE3 | 42-HVCBDX1 HVCBG CONTACT 113 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO AUTO OPEN CKT ESTAB | |
| 21-1/-D | N3466JE3 | 1-HVCBG CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD204B NO AUTO OPEN CKT ESTAB | |
| 21-1/-D | N3476JE6 | 1-HVCBG IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD204B NO AUTO OPEN CKT ESTAB | |
| 21-1/-P | N0996JF2 | CKT-HVCAJ FUSE FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201C OPEN | |
| 21-1/-P | N1006JF2 | CKT-HVCAJ 480-120 X FORNER FAILS | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201C OPEN | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL ROOM VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-1/2 SH 15 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 21-1/-P | N1016JF3 | 42C-HVCAJ COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201C OPEN | |
| 21-1/-P | N1026JF3 | 420-HVCAJ CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201C OPEN | |
| 21-1/-P | N1036JF3 | LMS-HVCAJ CONTACT 8 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201C OPEN | |
| 21-1/-AJ | N1046JF3 | 42C-HVCAJ SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-BL | N1056JF3 | 49X-HVCAJ CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-AJ | N1066JF3 | LMS-HVCAJ CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-AJ | N1076JF3 | 1-HVCAJ CONTACT L2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-AJ | N1086JF6 | 1-HVCAJ NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-BL | N1096JF1 | 49X-HVCAJ COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-AJ | N1106JF3 | TOS-HVCAJ FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-AJ | N1116JF3 | 2HVC * MOD 201C EXCESSIVE TORQUE | PERIODIC TEST | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-BL | N1126JF1 | 49-HVCAJ CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-BL | N1136JF1 | 2HVC * MOD 201C OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD201C NO MAN CLOSING CKT ESTAB | |
| 21-1/-AD | N1146JF3 | 1-HVCAJ CONTACT R2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 16 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|---------------|
| 21-1/-AD | N1156JF6 | 1-HVCAJ IN OPEN OP ERROR | PERIODIC INSPECTION | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AH | N1166JF3 | K630A-HVCAJ CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AH | N1176JF3 | K630A-HVCAJ UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AM | N1186JF3 | K625A-HVAJ CONTACT 13 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AM | N1196JF3 | K625A-HVCAJ SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AM | N1206JF3 | 99X1-K626A-1 HVCAJ CONTACT 115 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AM | N1216JF3 | 99X1-K630A-1 HVCAJ CONTACT 115 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201C NO AUTO CLOSING CKT ESTAB | |
| 21-1/-P | N1226JF2 | 420-HVCAJ ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201C OPEN | |
| 21-1/-BD | N1236JF3 | 420-HVCAJ SEAL IN CONTACT FAILS CLOSED | PERIODIC TEST | 420-HVCAJ MANUAL OPEN CKT ESTAB | |
| 21-1/-AH | N1246JF3 | K630A-HVCAJ CONTACT 7 FAILS CLOSED | PERIODIC TEST | CKT-HVCAJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AH | N1256JF3 | K625A-HVCAJ CONTACT 17 FAILS CLOSED | PERIODIC TEST | CKT-HVCAJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AH | N1266JF3 | 99X1-K626A-1-HVCAJ CONTACT 227 FAILS CLOSED | PERIODIC TEST | CKT-HVCAJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AH | N1276JF3 | 99X1-K630A-1-HVCAJ CONTACT 227 FAILS CLOSED | PERIODIC TEST | CKT-HVCAJ BLOCKING CONTACTS CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL ROOM VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-1/2 SH 17 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|---|---------------|
| 21-1/-BD | N1286JF3 | 1-HVCAJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 420-HVCAJ MANUAL OPEN CKT ESTAB | |
| 21-1/-AH | N1296JF3 | K630A-HVCAJ UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | CKT-HVCAJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AH | N1306JF3 | K625A-HVCAJ SIGNAL FAILURE | PERIODIC TEST | CKT-HVCAJ BLOCKING CONTACTS CLOSED | |
| 21-1/-BD | N1316JF6 | 1-HVCAJ IN OPEN OP ERROR | PERIODIC INSPECTION | 420-HVCAJ MANUAL OPEN CKT ESTAB | |
| 21-1/-U | N1326JF2 | CKT-HVCBJ FUSE FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201D OPEN | |
| 21-1/-U | N1336JF2 | CKT-HVCBJ 480-120 X FORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201D OPEN | |
| 21-1/-U | N1346JF3 | 42C-HVCBJ COIL FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201D OPEN | |
| 21-1/-U | N1356JF3 | 420-HVCBJ CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201D OPEN | |
| 21-1/-U | N1366JF3 | LMS-HVCBJ CONTACT 8 FAILS OPEN | PERIODIC TEST | 2HVC * MOD 201D OPEN | |
| 21-1/-AK | N1376JF3 | 42C-HVCBJ SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-BM | N1386JF3 | 49X-HVCBJ HVCBJ CONTACT 3 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-AK | N1396JF3 | LMS-HVCBJ CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-AK | N1406JF3 | 1-HVCBJ CONTACT L2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-AK | N1416JF6 | 1-HVCBJ NOT IN CLOSE OP ERROR | PERIODIC INSPECTION | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 18 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|---------------|
| 21-1/-BM | N1426JF1 | 49X-HVCBJ COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-AK | N1436JF3 | TQS-HVCBJ FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-AK | N1446JF3 | 2HVC * MOD 201B EXCESSIVE TORQUE | PERIODIC TEST | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-BM | N1456JF1 | 49-HVCBJ CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-BM | N1466JF1 | 2-HVC * MOD 201D OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD201D NO MAN CLOSING CKT ESTAB | |
| 21-1/-AE | N1476JF3 | 1-HVCBJ CONTACT R2 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AE | N1486JF6 | 1-HVCBJ IN OPEN OP ERROR | PERIODIC INSPECTION | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AN | N1496JF3 | K630B-HVCBJ CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AN | N1506JF3 | K630B-HVCBJ UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AN | N1516JF3 | K625B-HVCBJ CONTACT 13 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AN | N1526JF3 | K625B-HVCBJ SIGNAL FAILURE | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AN | N1536JF3 | 99X1-K626B-1 HVCBJ CONTACT 115 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-AN | N1546JF3 | 99X1-K630B-1 HVCBJ CONTACT 115 FAILS OPEN | PERIODIC TEST | 2HVC * MOD201D NO AUTO CLOSING CKT ESTAB | |
| 21-1/-U | N1776JF2 | 420-HVCBJ ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 201D OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-1/2 SH 19 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------|----------------------|---|-----------------------------|---|---------------|
| 21-1/-BE | N1786JF3 | 420-HVCBJ SEAL IN CONTACT FAILS CLOSED | PERIODIC TEST | 420-HVCBJ MANUAL OPEN CKT ESTAB | |
| 21-1/-AX | N1796JF3 | K630B-HVCBJ CONTACT 7 FAILS CLOSED | PERIODIC TEST | CKT-HVCBJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AX | N1806JF3 | K625B-HVCBJ CONTACT 17 FAILS CLOSED | PERIODIC TEST | CKT-HVCBJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AX | N1816JF3 | 99X1-K626B-1-HVCBJ CONTACT 227 CLOSED | PERIODIC TEST | CKT-HVCBJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AX | N1826JF3 | 99X1-K630B-1-HVCBJ CONTACT 227 CLOSED | PERIODIC TEST | CKT-HVCBJ BLOCKING CONTACTS CLOSED | |
| 21-1/-BE | N1836JF3 | 1-HVCBJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 420-HVCBJ MANUAL OPEN CKT ESTAB | |
| 21-1/-AX | N1846JF3 | K630B-HVCBJ UNIT 2 HI CHLOR SIG FAILURE | PERIODIC TEST | CKT-HVCBJ BLOCKING CONTACTS CLOSED | |
| 21-1/-AX | N1856JF3 | K625B-HVCBJ SIGNAL FAILURE | PERIODIC TEST | CKT-HVCBJ BLOCKING CONTACTS CLOSED | |
| 21-1/-BE | N1866JF6 | 1-HVCBJ IN OPEN OP ERROR | PERIODIC INSPECTION | 420-HVCBJ MANUAL OPEN CKT ESTAB | |
| 21-1/-W 21-1/-Z | N2996UP3 | 42-HVCACX-HVCAC COIL FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-Z | N3006UP3 | 42-HVCAC CONTACT 7 FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-Y 21-1/-AA | N3016UP3 | 42-HVCBCX-HVCBC COIL FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-AA | N3026UP3 | 42-HVCBC CONTACT 7 FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-V | N3036UP3 | 2HVC * ACU201A FAILURE | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTROL ROOM VENT SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-1/2 SH 20 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 21-1/-V | N3046UP1 | CKT-HVCAC 480-120 PWR TRANSFORMER FAILURE | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-V | N3056UP3 | 49-HVCAC CONTACT FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-V | N3066UP1 | 2HVC * ACU201A OVERLOAD | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH A FAILS | |
| 21-1/-BF | N3076UP3 | 42-HVCAC SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCAC NO MANUAL CKT ESTAB | |
| 21-1/-AY | N3086UP3 | 2HVC * PDS201B CONTACT FAILS OPEN | PERIODIC TEST | 42-HVCAC NO AUTO CKT ESTAB | |
| 21-1/-AY | N3096UP3 | 2HVC * PDS201B FAILURE | PERIODIC TEST | 42-HVCAC NO AUTO CKT ESTAB | |
| 21-1/-AY | N3106UP3 | 1-HVCAC CONTACT 5 FAILS OPEN | PERIODIC TEST | 42-HVCAC NO AUTO CKT ESTAB | |
| 21-1/-AY | N3116UP6 | 1-HVCAC NOT IN AUTO OP ERROR | PERIODIC INSPECTION | 42-HVCAC NO AUTO CKT ESTAB | |
| 21-1/-X | N3126UP3 | 2HVC * ACU201B FAILURE | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-X | N3136UP1 | CKT-HVCBC 480-120 PWR TRANSFORMER FAILURE | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-X | N3146UP3 | 42-HVCBC COIL FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-X | N3156UP3 | 49-HVCBC CONTACT FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-X | N3166UP1 | 3HVC * ACU201B OVERLOAD | ANNUNCIATED IN CONTROL ROOM | CONTROL ROOM AIR COND UNIT PATH B FAILS | |
| 21-1/-BG | N3176UP3 | 42-HVCBC SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCBC NO MANUAL CKT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL ROOM VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-1/2 SH 21 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|---|---------------|
| 21-1/-AZ | N3186UP3 | 42-HVCBC SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCBC NO AUTO CKT ESTAB | |
| 21-1/-AZ | N3196UP3 | 2HVC * PDS201A CONTACT FAILS OPEN | PERIODIC TEST | 42-HVCBC NO AUTO CKT ESTAB | |
| 21-1/-AZ | N3206UP3 | 2HVC * PDS201A FAILURE | PERIODIC TEST | 42-HVCBC NO AUTO CKT ESTAB | |
| 21-1/-AZ | N3216UP3 | 1-HVCBC CONTACT 5 FAILS OPEN | PERIODIC TEST | 42-HVCBC NO AUTO CKT ESTAB | |
| 21-1/-AZ | N3226UP6 | 1-HVCBC NOT IN AUTO OP ERROR | PERIODIC INSPECTION | 42-HVCBC NO AUTO CKT ESTAB | |
| 21-1/-AY | N3246UP3 | 42-HVCAC SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCAC NO AUTO CKT ESTAB | |
| 21-1/-BF | N3256UP3 | 1-HVCAC CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCAC NO MANUAL CKT ESTAB | |
| 21-1/-BF | N3266UP6 | 1-HVCAC NO START ACTION OP ERROR | PERIODIC INSPECTION | 42-HVCAC NO MANUAL CKT ESTAB | |
| 21-1/-BF | N3276UP3 | 1-HVCAC CONTACT 7 FAILS OPEN | PERIODIC TEST | 42-HVCAC NO MANUAL CKT ESTAB | |
| 21-1/-BF | N3286UP6 | 1-HVCAC NO START ACTION OP ERROR | PERIODIC INSPECTION | 42-HVCAC NO MANUAL CKT ESTAB | |
| 21-1/-BG | N3326UP3 | 1-HVCBC CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCBC NO MANUAL CKT ESTAB | |
| 21-1/-BG | N3336UP6 | 1-HVCBC NO START ACTION OP ERROR | PERIODIC INSPECTION | 42-HVCBC NO MANUAL CKT ESTAB | |
| 21-1/-BG | N3346UP3 | 1-HVCBC CONTACT 7 FAILS OPEN | PERIODIC TEST | 42-HVCBC NO MANUAL CKT ESTAB | |
| 21-1/-BG | N3356UP6 | 1-HVCBC NO START ACTION OP ERROR | PERIODIC INSPECTION | 42-HVCBC NO MANUAL CKT ESTAB | |
| 21-1/-V | N3486UP3 | 42-HVCAC COIL FAILS OPEN | PERIODIC TEST | CONTROL ROOM AIR COND UNIT PATH A FAILS | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 22 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|----------------------------------|---------------|
| 21-1/-AR | N2446UQ2 | CKT-HVCAD 480-120 PWR TRANSFORMER FAILURE | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-AR | N2456UQ2 | 42-HVCAD COIL FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-AR | N2466UQ2 | 49-HVCAD CONTACT FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204A CLOSED | |
| 21-1/-AR | N2476UQ3 | 2HVC * FN241A OVERLOAD | PERIODIC TEST | 2HVC * MOD 204A CLOSED | |
| 21-1/-BR | N2486UQ3 | 42-HVCAD SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO MANUAL CKT ESTAB | |
| 21-1/-BR | N2496UQ3 | 1-HVCAD CONTACT 7 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO MANUAL CKT ESTAB | |
| 21-1/-BR | N2506UQ6 | 1-HVCAD START ACTION NOT INITIATED OP ERROR | PERIODIC INSPECTION | 42-HVCAD NO MANUAL CKT ESTAB | |
| 21-1/-BR | N2516UQ3 | 1-HVCAD CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO MANUAL CKT ESTAB | |
| 21-1/-BQ | N2526UQ6 | 1-HVCAD IN PULL TO LOCK OP ERROR | PERIODIC INSPECTION | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BQ | N2536UQ3 | 1-HVCAD CONTACT 5 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BQ | N2546UQ3 | 62-HVCAD CONTACT 4 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BQ | N2556UQ3 | 62-HVCAD FAILURE | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BW | N2566UQ3 | 62-HVCAD SEAL IN CONT 6 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BW | N2576UQ6 | 1-HVCAD SWITCH MOVED OUT OF AUTO OP ERROR | PERIODIC INSPECTION | 42-HVCAD NO AUTO DELAY CKT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 23 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|----------------------------------|---------------|
| 21-1/-BW | N2586UQ3 | 1-HVCAD CONTACT 19 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BW | N2596UQ3 | K625A-HVCAD CONTACT 3 FAILS TO CLOSE | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BW | N2606UQ3 | K625A-HVC D SIGNAL FAILURE | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BW | N2616UQ3 | 99X1-K626A-1-HVCAD CONTACT 221 FAILS OPEN | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-N | N2626UQ2 | CKT-HVCBD 480-120 PWR TRANSFORMER FAILURE | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-N | N2636UQ2 | 42-HVCBD COIL FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-N | N2646UQ2 | 49-HVCBD CONTACT FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-N | N2656UQ1 | 2HVC * FN241B OVERLOAD | ANNUNCIATED IN CONTROL ROOM | 2HVC * MOD 204B CLOSED | |
| 21-1/-AQ | N2666UQ3 | 42-HVCBD SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO MANUAL CKT ESTAB | |
| 21-1/-AQ | N2676UQ3 | 1-HVCBD CONTACT 7 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO MANUAL CKT ESTAB | |
| 21-1/-AQ | N2686UQ6 | 1-HVCBD START ACTION NOT INITIATED OP ERROR | PERIODIC INSPECTION | 42-HVCBD NO MANUAL CKT ESTAB | |
| 21-1/-AQ | N2696UQ3 | 1-HVCBD CONTACT 2 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO MANUAL CKT ESTAB | |
| 21-1/-AP | N2706UQ6 | 1-HVCBD IN PULL TO LOCK OP ERROR | PERIODIC INSPECTION | 42-HVCBD NO AUTO DELAY CKT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 24 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|----------------------------------|---------------|
| 21-1/-AP | N2716UQ3 | 62-HVCBD CONTACT 4 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AP | N2726UQ3 | 62-HVCBD FAILURE | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AS | N2736UQ3 | 62-HVCBD SEAL IN CONT 6 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AS | N2746UQ6 | 1-HVCBD SWITCH MOVED OUT OF AUTO OP ERROR | PERIODIC INSPECTION | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AS | N2756UQ3 | 1-HVCBD CONTACT 19 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AS | N2766UQ3 | K625B-HVCBD CONTACT 3 FAILS TO CLOSE | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AS | N2776UQ3 | K625B-HVCBD SIGNAL FAILURE | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-AS | N2786UQ3 | 99X1-K626B-1-HVCBD CONTACT 221 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BR | N3296UQ3 | 1-HVCAD START ACTION NOT INITIATED OP ERROR | PERIODIC TEST | 42-HVCAD NO MANUAL CKT ESTAB | |
| 21-1/-AQ | N3306UQ3 | 1-HVCBD START ACTION NOT INITIATED OP ERROR | PERIODIC TEST | 42-HVCBD NO MANUAL CKT ESTAB | |
| 21-1/-AP | N3316UQ3 | 1-HVCBD CONTACT 5 FAILS OPEN | PERIODIC TEST | 42-HVCBD NO AUTO DELAY CKT ESTAB | |
| 21-1/-BW | N3366UQ3 | 99X1-K626A-1-CESAN DENERGIZED | PERIODIC TEST | 42-HVCAD NO AUTO DELAY CKT ESTAB | |
| 21-1/-G | N00184C3 | CONTROL ROOM PRESSURIZATION FILTER ASSEMBLY A FAILS | PERIODIC TEST | FILTER SYSTEM PATH A FAILS | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| CONTROL ROOM VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-1/2 SH 25 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|----------------------------|---------------|
| 21-1/-F | N00284C3 | CONTROL ROOM PRESSURIZATION FILTER ASSEMBLY B FAILS | PERIODIC TEST | FILTER SYSTEM PATH B FAILS | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|---|----------------------------------|-----------------------------------|---------------|
| 21-2/-B 21-2/-D | N0016UH2 | NO 480V TO MCC#2-E03 | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265A FAILS TO OPERATE | |
| 21-2/-B | N0026UH3 | 42-HVCAA COIL FAILS OPEN | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-B | N0036UH2 | CKT-HVCAA 480-120V PHR TRANSFORMER FAILURE | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-B | N0046UH2 | CKT-HVCAA SHORT CHT | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-Q | N0056UH3 | 1-HVCAA CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-Q | N0066UH6 | 1-HVCAA IN PULL TO LOCK OP ERROR | PERIODIC INSPECTION | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-Q | N0076UH3 | 2HVC*TH21A1 HVCAA CONTACT 2A FAILS OPEN | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-Q | N0086UH3 | 2HVC*TH21A1 ERRONEOUS LCH TEMP SIG SENSOR FAILURE | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-Q | N0096UH3 | 49-HVCAA CONTACT FAILS OPEN | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-Q | N0106UH3 | 2HVC*FN266A OVERLOAD | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-AA | N0116UH3 | 99AX-FN266A-HVCAA CONTACT 16 FAILS OPEN | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-V | N0126UH3 | 3-HVCAA CO2 OVERRIDE CONTACT 115 FAILS OPEN | PERIODIC TEST | CHT-HVCAB AUTO CHT NOT ESTAB | |
| 21-2/-AA | N0136UH3 | 99AX-FN266A-HVCAA ENERGIZED BY SHORT CHT | PERIODIC TEST | 99AY-FN266A-HVCAB CONTACT 16 OPEN | |

Amendment 3

September 1984

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|---|---|---|--------|---------|------------------------------------|
| | | | 4/3/84 | 10/1/84 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | RG | 644 | CONTROL BUILDING VENT SYSTEM |
| 4 | 3 | 2 | CRP | 1 | RRP |
| | | | | | J.O. 12241 FMEA-21-2/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------------|----------------------|--|-----------------------------|-----------------------------------|---------------|
| 21-2/-V | N0146UH3 | 3-HVCAA COIL FAILS | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-AA | N0156UH3 | 99A-FN266A-HVCAA CONTACT FAILS CLOSED | PERIODIC TEST | 99AY-FN266A-HVCAB CONTACT 16 OPEN | |
| 21-2/-AL | N0166UH3 | 99AX-FN266A-HVCAA CO2 OVERRIDE ENABLE C14 FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-AL | N0186UH3 | 3-HVCAA SEAL IN CONTACT 113 FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-AL | N0216UH3 | 1-HVCAA CONTACT 22 FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-S 21-2/-AG 21-2/-AL | N0226UH6 | 1-HVCAA NO START INITIATE OP ERROR | PERIODIC INSPECTION | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-S | N0236UH3 | 1-HVCAA CONTACT 9 FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AC | N0246UH3 | 2HVC*TH21A-HVCAA CONTACT 1B FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AC | N0256UH3 | 2HVC*TH21A ERRONEOUS SIG TEMP SENSOR FAILURE | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AC | N0266UH3 | 2HVC*PDS24A-HVCAA CONTACT FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AC | N0276UH3 | 2HVC*PDS24A ERRONEOUS SIG PRESSURE SENSOR FAILURE | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AG | N0286UH3 | 42-HVCAAX-HVCAA SEAL IN CONTACT 225 FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |

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|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | CONTROL BUILDING VENT SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FHEA-21-2/2 SH 2 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|------------------------------------|---------------|
| 21-2/-AG | N0296UM3 | 1-HVCAA CONTACT 1 FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO STOP CKT NOT ESTAB | |
| 21-2/-W | N0306UM3 | 3-HVCAAX-HVCAA CONTACT 24 FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-W | N0316UM3 | 3-HVCAAX-HVCAA COIL FAILS | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-W | N0326UM3 | 1-HVCAA-CONTACT 17 FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-AB | N0336UM3 | 42-HVCAAX-HVCAA SEAL IN CONTACT 221 FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-AB | N0346UM3 | 2HVC*TH21A1-HVCAA CONTACT 2B FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-AB | N0356UM3 | 2HVC*TH21A1 SENSOR FAILURE | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-AB | N0366UM3 | 2HVC*PDS24A-HVCAA CONTACT FAILS OPEN | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-AB | N0376UM3 | 2HVC*PDS24A PRESSURE SIG FAILURE | PERIODIC TEST | CKT-HVCAA AUTO START CKT NOT ESTAB | |
| 21-2/-AG | N0386UM3 | 42-HVCAAX-HVCAA COIL FAILS | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-AG | N0396UM3 | 42-HVCAAX-CONTACT FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-U | N0406UM2 | 62-HVCAA CONTACT 4 FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-U | N0416UM2 | 62-HVCAA ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-U | N0426UM2 | 2HVC*PDS25A ERRONEOUS SIGNAL SENSOR FAILS | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCAB AUTO CKT NOT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL BUILDING VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-21-2/2 SH 3 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|---|----------------------------------|------------------------------|---------------|
| 21-2/-U | N0436UH2 | 2HVC*PDS25A-HVCAA CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-P | N0446UH2 | 42-HVCBA COIL FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-P | N0456UH2 | CKT-HVCBA 480-120V PWR TRANSFORMER FAILURE | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-P | N0466UH2 | CKT-HVCBA SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-P 21-2/-E | N0476UH1 | NO 480V TO MCC*2-E04 | ANNUNCIATED IN CONTROL ROOM | 2HVC*FN265B FAILS TO OPERATE | |
| 21-2/-R | N0486UH3 | 1-HVCBA CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-R | N0496UH6 | 1-HVCBA IN PULL TO LOCK OP ERROR | PERIODIC INSPECTION | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-R | N0506UH3 | 2HVC*TH21B1 HVCBA CONTACT 2A FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-R | N0516UH3 | 2HVC*TH21B1 ERRONEOUS LOW TEMP SIG SENSOR FAILURE | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-R | N0526UH3 | 49-HVCBA CONTACT FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-R | N0536UH3 | 2HVC*FN266B OVERLOAD | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-AD | N0546UH3 | 99BX-FN266B HVCBA CONTACT 16 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-Y | N0556UH3 | 3-HVCBA CO2 OVERRIDE CONTACT 115 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CONTROL BUILDING VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 1224 FMEA-21-2/2 SH 4 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------------|----------------------|---|-----------------------------|-----------------------------------|---------------|
| 21-2/-AD | N0566UM3 | 99BX-FN266B-HVCBA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 99BY-FN266B-HVCBB CONTACT 16 OPEN | |
| 21-2/-Y | N0576UM3 | 3-HVCBA COIL FAILS | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-AD | N0586UM3 | 99B-FN266B-HVCBA CONTACT FAILS CLOSED | PERIODIC TEST | 99BY-FN266B-HVCBB CONTACT 16 OPEN | |
| 21-2/-AM | N0596UM3 | 99BX-FN266B-HVCBA CO2 OVERRIDE ENABLE | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-AM | N0616UM3 | 3-HVCBA SEAL IN CONTACT 113 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-AM | N0636UM3 | 1-HVCBA CONTACT 22 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-T 21-2/-AH 21-2/-AH | N0646UM6 | 1-HVCBA NO START INITIATE OP ERROR | PERIODIC INSPECTION | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-T | N0656UM3 | 1-HVCBA CONTACT 9 FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AF | N0666UM3 | 2-HVC*TH21B-HVCBA CONTACT 1B FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AF | N0676UM3 | 2-HVC*TH21B ERRONEOUS SIG TEMP SENSOR FAILURE | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AF | N0686UM3 | 2-HVC*PDS24B-HVCBA CONTACT FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AF | N0696UM3 | 2-HVC*PDS24B-ERRON PRESSURE SENSOR FAILURE | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL BUILDING VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-2/2 SH 5 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|------------------------------------|---------------|
| 21-2/-AH | N0706UM3 | 42-HVCBAX-HVCBA SEAL IN CONTACT 225 FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |
| 21-2/-AH | N0716UM3 | 1-HVCBA CONTACT 1 FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO STOP CKT NOT ESTAB | |
| 21-2/-Z | N0726UM3 | 3-HVCBAX-HVCBA CONTACT 24 FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-Z | N0736UM3 | 3-HVCBAX-HVCBA COIL FAILS | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-Z | N0746UM3 | 1-HVCBA CONTACT 17 FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-AE | N0756UM3 | 42-HVCBAX-HVCBA SEAL IN CONTACT 221 FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-AE | N0766UM3 | 2HVC*TH21B1 SENSOR FAILURE | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-AE | N0770UM3 | 2HVC*TH21B1 SENSOR FAILURE | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-AE | N0786UM3 | 2HVC*PDS24B-HVCBA CONTACT FAILS OPEN | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-AE | N0796UM3 | 2HVC*PDS24B-PRESSURE SIG FAILURE | PERIODIC TEST | CKT-HVCBA AUTO START CKT NOT ESTAB | |
| 21-2/-AH | N0806UM3 | 42-HVCBAX-HVCBA COIL FAILS | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-AH | N0816UM3 | 42-HVCBA CONTACT 2 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-X | N0826UM2 | 62-HVCBA CONTACT 4 FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|----------------------------------|--|---------------|
| 21-2/-X | N0836UH2 | 62-HVCBA ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-X | N0846UH2 | 2HVC*PDS25B ERRONEOUS SIGNAL SENSOR FAILS | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-X | N0856UH2 | 2HVC*PDS25B-HVCBA CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-D | N0866UH2 | 42-HVCBA ENERGIZING CKT NOT ESTAB | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265A FAILS TO OPERATE | |
| 21-2/-D | N0876UH2 | CKT-HVCAB 420-120V PHR TRANSFORMER FAILURE | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265A FAILS TO OPERATE | |
| 21-2/-D | N0886UH2 | CKT-HVCAB SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265A FAILS TO OPERATE | |
| 21-2/-D | N0896UH2 | 49-HVCAB CONTACT FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265A FAILS TO OPERATE | |
| 21-2/-D | N0906UH2 | 2HVC*FN265A OVERLOAD | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265A FAILS TO OPERATE | |
| 21-2/-H | N0916UH3 | 99AY-FN266A-HVCAB CONTACT 16 FAILS OPEN | PERIODIC TEST | 99AY-FN266A-HVCAB CONTACT 16 OPEN | |
| 21-2/-J | N0926UH3 | 3-HVCAB CO2 SIGNAL OVERRIDE CONTACT 115 FAILS OPEN | PERIODIC TEST | 3-HVCAB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-H | N0936UH3 | 99AY-FN266A-HVCAA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 99AY-FN266A-HVCAB CONTACT 16 OPEN | |
| 21-2/-H | N0946UH3 | 99AX-FN266A-HVCAA CONTACT 24 FAILS CLOSED | PERIODIC TEST | 99AY-FN266A-HVCAB CONTACT 16 OPEN | |
| 21-2/-E | N1066UH2 | 42-HVCBB COIL FAILS | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265B FAILS TO OPERATE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL BUILDING VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-2/2 SH 7 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------------------|----------------------|--|-------------------------------------|---|---------------|
| 21-2/-E | N1075UH2 | CKT-HVCBB 480-120V PWR TRANSFORMER FAILURE | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265B FAILS TO OPERATE | |
| 21-2/-E | N1086UH2 | 49-HVCBB CONTACT FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265B FAILS TO OPERATE | |
| 21-2/-E | N1096UH2 | 2HVC*FN265B OVERLOAD | INDICATING LIGHT IN CONTROL ROOM | 2HVC*FN265B FAILS TO OPERATE | |
| 21-2/-K | N1106UH2 | 99BY-FN266B- HVCBB CONTACT 16 FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 99BY-FN266B-HVCBB CONTACT 16 OPEN | |
| 21-2/-G | N1116UH3 | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 FAILS OPEN | PERIODIC TEST | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-K | N1126UH2 | 99BY-FN266B- HVCBA COIL ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 99BY-FN266B-HVCBB CONTACT 16 OPEN | |
| 21-2/-K | N1136UH2 | 99BX-FN266B- HVCBA CONTACT 24 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | 99BY-FN266B-HVCBB CONTACT 16 OPEN | |
| 21-2/-A 21-2/-B 21-2/-C | N1256UH3 | 2HVC*TSV27A 26A 25A-HVCAA ENERGIZED BY SHORT CKT | PERIODIC TEST | 2HVC*AOD201A FAILS OPEN | |
| 21-2/-C | N1266UH3 | 2HVC*TH21A-HVCAA CONTACT 1A FAILS CLOSED | PERIODIC TEST | 2HVC*AOD201A FAILS OPEN | |
| 21-2/-C | N1276UH3 | 2HVC*TH21A ERRONEOUS LOW TEMP SIGNAL SENSOR FAILURE | PERIODIC TEST | 2HVC*AOD201A FAILS OPEN | |
| 21-2/-A 21-2/-B 21-2/-C | N1286UH3 | 2HVC*TSV27B 26B 25B-HVCBA ENERGIZED BY SHORT CKT | PERIODIC TEST | 2HVC*AOD201B FAILS OPEN | |

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|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL BUILDING VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-2/2 SH 8 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------|----------------------|---|-----------------------------|--|---------------|
| 21-2/-C | N1296UN3 | 2HVC*TH21B-HVCBA CONTACT 1A FAILS CLOSED | PERIODIC TEST | 2HVC*A00201B FAILS OPEN | |
| 21-2/-C | N1306UN3 | 2HVC*TH21B ERRONEOUS LOW TEMP SIGNAL SENSOR FAILURE | PERIODIC TEST | 2HVC*A00201B FAILS OPEN | |
| 21-2/-AA | N1316UN3 | CKT-CESAC TRAIN A CNTL ISOLATION CKT FAILURE | PERIODIC TEST | 99AY-FN266A-HVCAB CONTACT 16 OPEN | |
| 21-2/-AD | N1326UN3 | CKT-CESBC TRAIN B CNTL ISOLATION CKT FAILURE | PERIODIC TEST | 99BY-FN266B-HVCBB CONTACT 16 OPEN | |
| 21-2/-N | N0956UN3 | 1-HVCAB CONTACT 7 FAILS OPEN | PERIODIC TEST | CKT-HVCAB MANUAL CKT NOT ESTAB | |
| 21-2/-N | N0966UN3 | 42-HVCAB SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | CKT-HVCAB MANUAL CKT NOT ESTAB | |
| 21-2/-H | N0976UN3 | 1-HVCAB CONTACT 3 FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-H | N0986UN6 | 1-HVCAB NOT IN AUTO OP ERROR | PERIODIC INSPECTION | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-H | N0996UN3 | 42-HVCAA-HVCAB CONTACT 7 FAILS OPEN | PERIODIC TEST | CKT-HVCAB AUTO CKT NOT ESTAB | |
| 21-2/-M | N1006UN3 | 1-HVCAB CONTACT 1 FAILS OPEN | PERIODIC TEST | CKT-HVCAB MANUAL CKT NOT ESTAB | |
| 21-2/-N 21-2/-AK | N1016UN6 | 1-HVCAB NO START INITIATE OP ERROR | PERIODIC INSPECTION | 3-HVCAB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-J | N1026UN3 | 3-HVCAB COIL FAILS | PERIODIC TEST | 3-HVCAB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-AK | N1036UN3 | 99AY-FN266A-HVCAB CONTACT 14 FAILS OPEN | PERIODIC TEST | 3-HVCAB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------|----------------------|---|-----------------------------|--|---------------|
| 21-2/-AK | N1046UN3 | 3-HVCAB SEAL IN CONTACT 113 FAILS OPEN | PERIODIC TEST | 3-HVCAB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-AK | N1056UN3 | 1-HVCAB CONTACT 22 FAILS OPEN | PERIODIC TEST | 3-HVCAB CO2 SIGNAL OVEPRIDE CONTACT 115 OPEN | |
| 21-2/-L | N1146UN3 | 1-HVCBB CONTACT 7 FAILS OPEN | PERIODIC TEST | CKT-HVCBB MANUAL CKT NOT ESTAB | |
| 21-2/-L 21-2/-AJ | N1156UN6 | 1-HVCBB NO START INITIATE OP ERROR | PERIODIC INSPECTION | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-L | N1166UN3 | 42-HVCBB SEAL IN CONTACT 2 FAILS OPEN | PERIODIC TEST | CKT-HVCBB MANUAL CKT NOT ESTAB | |
| 21-2/-F | N1176UN3 | 1-HVCBB CONTACT 3 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-F | N1186UN6 | 1-HVCBB NOT IN AUTO OP ERROR | PERIODIC INSPECTION | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-F | N1196UN3 | 42-HVCBA-HVCBB CONTACT 7 FAILS OPEN | PERIODIC TEST | CKT-HVCBB AUTO CKT NOT ESTAB | |
| 21-2/-L | N1206UN3 | 1-HVCBB CONTACT 1 FAILS OPEN | PERIODIC TEST | CKT-HVCBB MANUAL CKT NOT ESTAB | |
| 21-2/-G | N1216UN3 | 3-HVCBB COIL FAILS | PERIODIC TEST | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-AJ | N1226UN3 | 99BY-FN264B-HVCBB CONTACT 14 FAILS OPEN | PERIODIC TEST | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-AJ | N1236UN3 | 3-HVCBB SEAL IN CONTACT 113 FAILS OPEN | PERIODIC TEST | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |
| 21-2/-AJ | N1246UN3 | 1-HVCBB CONTACT 22 FAILS OPEN | PERIODIC TEST | 3-HVCBB CO2 SIGNAL OVERRIDE CONTACT 115 OPEN | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTROL BUILDING VENT SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-2/2 SH 10 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AP | K03407A3 | 1C-ENSABX OPERATE COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AP | K03507A3 | 1C-ENSABX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AH | K08107B3 | 1C-ENSBBX OPERATE COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AH | K08207B3 | 1C-ENSBBX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |

Amendment 3

September 1984

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|-----------------|----|---|---|------------------------------------|---|---|---|
| H-20 8417/24/82 | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 13 | 2 | 1 | 1 | 1 | 1 | 1 |
| | | | | J.O. 12241 FMEA-21-6/2 SH 1 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AK | K02807C3 | 27RN1200 B-C EJSAL COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED | |
| 21-6/-AK | K02907C3 | 1A-EJSABX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED | |
| 21-6/-AR | K03007C3 | 1A-EJSABX2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED | |
| 21-6/-AR | K03107C3 | 1A-EJSABX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| MAIN STM FDHT VALVE AREA VENT SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-6/2 SH 2 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-6/-AR K03207C3 1A-EJSAB PERIODIC TEST
 CONTACT 3
 FAILS CLOSED
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 27RN1200-EJSAA CONTACT 11 CLOSED

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 27RN1200-EJSAA CONTACT 11 CLOSED

21-6/-AR K03207C3 1A-EJSABX PERIODIC TEST
 OP COIL EMERG
 BY SHORT CKT
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 27RN1200-EJSAA CONTACT 11 CLOSED

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 27RN1200-EJSAA CONTACT 11 CLOSED

21-6/-AL K07507D3 27-RP1200 B-C PERIODIC TEST
 EJSBL COIL FAILS
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 27RP1200-EJSBA CONTACT 11 CLOSED

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 27RP1200-EJSBA CONTACT 11 CLOSED

21-6/-AL K07607D3 1A-EJSBBX2 PERIODIC TEST
 CONTACT 115
 FAILS OPEN
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 27RP1200-EJSBA CONTACT 11 CLOSED

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 27RP1200-EJSBA CONTACT 11 CLOSED

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| MAIN STM FDHT VALVE AREA VENT SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-6/2 SH 3 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AT | K07707D3 | 1A-EJSBBX2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| 21-6/-AT | K07807D3 | 1A-EJSBBX CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| 21-6/-AT | K07907D3 | 1A-EJSBB CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| 21-6/-AT | K08007D3 | 1A-EJSBBX OP COIL ENERG BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| MAIN STH FDHT VALVE AREA VENT SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-6/2 SH 4 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AH | K0365DU3 | 52-EGPAA CONTACT 73 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSAA OP COIL ENERGIZE CKT ESTABLISHED EMERG POWER MODE | |
| 21-6/-AU | K0375DU3 | 52-ENSAC CONTACT 75 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 52-ENSAC CONTACT 75 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 52-ENSAC CONTACT 75 CLOSED | |
| 21-6/-AU | K0385DU3 | ACB 2E7 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 52-ENSAC CONTACT 75 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 52-ENSAC CONTACT 75 CLOSED | |
| 21-6/-AU | K0395DU3 | 99X-52-NNSAC CONTACT 14 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 99X-52-NNSAC CONTACT 14 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 99X-52-NNSAC CONTACT 14 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AU | K0405DU3 | 99-52-NNSAC CONTACT FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 99X-52-NNSAC CONTACT 14 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 99X-52-NNSAC CONTACT 14 CLOSED | |
| 21-6/-AU | K0415DU3 | 99X-52-NNSAC COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 99X-52-NNSAC CONTACT 14 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 99X-52-NNSAC CONTACT 14 CLOSED | |
| 21-6/-AQ | K0445DU3 | 162-ENSA A CONTACT 5 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSA A OP COIL ENERGIZE CKT ESTABLISHED NORMAL POWER MODE IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSA A CONTACT 317 CLOSED | |
| 21-6/-AQ | K0455DU3 | 162-ENSA A COIL FAILURE | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSA A OP COIL ENERGIZE CKT ESTABLISHED NORMAL POWER MODE IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSA A CONTACT 317 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 6 |

| PNK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|----------------------------------|-----------------------------|---|---------------|
| 21-6/-AQ | K0465DU3 | 99-INNSAC CONTACT FAILS OPEN | PERIODIC TEST | <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSAA OP COIL ENERGIZE CKT ESTABLISHED NORMAL POWER MODE</p> <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED</p> | |
| 21-6/-AQ | K0475DU3 | 99-INNSAC COIL FAILS | PERIODIC TEST | <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSAA OP COIL ENERGIZE CKT ESTABLISHED NORMAL POWER MODE</p> <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED</p> | |
| 21-6/-AN | K0835EU3 | 52-EGPBA CONTACT 73 FAILS CLOSED | PERIODIC TEST | <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED</p> <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA OP COIL ENERGIZE CKT ESTABLISHED EMERG PWR MODE</p> | |
| 21-6/-AV | K0845EU3 | 52-ENSBC CONTACT 75 FAILS CLOSED | PERIODIC TEST | <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 52-ENSBC CONTACT 75 CLOSED</p> <p>IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 52-ENSBC CONTACT 75 CLOSED</p> | |

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 7 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AV | K0855EU3 | ACB 2F7 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): 52-ENSBC CONTACT 75 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): 52-ENSBC CONTACT 75 CLOSED | |
| 21-6/-AV | K0865EU3 | 99X-52-NNSDC CONTACT 14 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): 99X-52-NNSDC CONTACT 14 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): 99X-52-NNSDC CONTACT 14 CLOSED | |
| 21-6/-AV | K0875EU3 | 99-52-NNSDC CONTACT FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): 99X-52-NNSDC CONTACT 14 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): 99X-52-NNSDC CONTACT 14 CLOSED | |
| 21-6/-AV | K0885EU3 | 99X-52-NNSDC COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): 99X-52-NNSDC CONTACT 14 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): 99X-52-NNSDC CONTACT 14 CLOSED | |

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|---|---|---|---|--|------------------------------------|--|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | | MAIN STM FOHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | | |
| | | | | | J.O. 12231 FMEA-21-6/2 SH 8 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|----------------------------------|-----------------------------|--|---------------|
| 21-6/-AS | K0915EU3 | 162-ENSBA CONTACT 5 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA OP COIL ENERGIZE CKT ESTABLISHED NORMAL PWR MODE IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| 21-6/-AS | K0925EU3 | 162-ENSBA COIL FAILURE | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA OP COIL ENERGIZE CKT ESTABLISHED NORMAL PWR MODE IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| 21-6/-AS | K0935EU3 | 99-1NNSDC CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA OP COIL ENERGIZE CKT ESTABLISHED NORMAL PWR MODE IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| 21-6/-AS | K0945EU3 | 99-1NNSDC COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA OP COIL ENERGIZE CKT ESTABLISHED NORMAL PWR MODE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| 21-6/-H | K0146BB3 | 27-RN200X1 CONTACT 225 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-X | K0156BB3 | 27-RN200X1 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-X | K0166BB3 | 27-RN200X CONTACT 111 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STM FDWT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-6/2 SH 10 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|--|-------------------------------------|--|---------------|
| 21-6/-X | K0176BB3 | 27-RN200X COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-AH | K0186BB3 | 27-RN2200-EJSAA CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AD | K0196BB3 | 27RN1200-EJSAA CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED | |
| 21-6/-AH 21-6/-AK | K0206BB2 | 480V EMERG BUS 2N NO PWR AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STM EDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-6/2 SH 11 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 21-6/-AH | K0216BB3 | CKT-EJSAM 120V CKT FUSE C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AH | K0226BB3 | CKT-EJSAM 480V CKT FUSE C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AH | K0236BB3 | CKT-EJSAM 480-120VAC TRANSFORMER FAILURE | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AH | K0246BB3 | 1C-ENSABX1 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | HAIN 5TH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-6/2 SH 12 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AK | K0256BB3 | 27RN1200 A-B EJSAL COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN1200-EJSAA CONTACT 11 CLOSED | |
| 21-6/-AP | K0266BB3 | 1C-ENSABX1 COIL ENERG BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AP | K0276BB3 | 1C-ENSABX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-6/-AD | K0426BB3 | 69-ENSAA CONTACT 317 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-6/-AD | K0436BB3 | 69-ENSAA OPERATE COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSAA CONTACT 317 CLOSED | |
| 21-6/-J | K0616BC3 | 27-RP200X1 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AA | K0626BC3 | 27-RP200X1 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AA | K0636BC3 | 27-RP200X CONTACT 111 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-6/2 SH 14 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|---|-------------------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AA | K0646BC3 | 27-RP200X COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AJ | K0656BC3 | 27-RP2200-EJSBA CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AF | K0666BC3 | 27-RP1200-EJSBA CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| 21-6/-AJ 21-6/-AL | K0676BC2 | 480V EMERG BUS 2P NO PWR AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-6/2 SH 15 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AJ | K0686BC3 | CKT-EJSBH 120V CKT FUSE C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AJ | K0696BC3 | CKT-EJSBH 480V CKT FUSE C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AJ | K0706BC3 | CKT-EJSBH 480-120VAC TRANSFORMER FAILURE | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AJ | K0716BC3 | 1C-ENSBBX1 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN 5TH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-6/2 SH 16 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AL | K0726BC3 | 27RP1200 A-B EJSBL COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP1200-EJSBA CONTACT 11 CLOSED | |
| 21-6/-AH | K0736BC3 | 1C-ENSBBX1 COIL ENERG BY SHOR CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AH | K0746BC3 | 1C-ENSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-6/-AF | K0896BC3 | 69-ENSBA CONTACT 317 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| 21-6/ AF | K0906BC3 | 69-ENSBA OPERATE COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): 69-ENSBA CONTACT 317 CLOSED | |
| 21-6/-H | K0016ET3 | 2HVR#FN206A CLOSING MECH FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-H | K0026ET2 | CKT-HVRAS NO 125VDC PWR AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 18 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|--|---------------|
| 21-6/-H | K0036ET3 | 1-HVRAS CONTACT 5 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-H | K0046ET6 | 1-HVRAS IN PULL TO LOCK OP ERROR | PERIODIC INSPECTION | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-L | K0056ET3 | LMO-HVRAS 2HVR#H0D201A CONTACT C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-H | K0066ET3 | LMO-HVRAS 2HVR#H0D202A CONTACT C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |

| | | | | |
|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 19 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-H K0076ET2 CKT-HVRAS 125VDC +ACB FAILS OPEN INDICATING LIGHT IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-H K0086ET2 CKT-HVRAS SHORT CKT INDICATING LIGHT IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-H K0096ET2 CKT-HVRAS 125VDC -ACB FAILS OPEN INDICATING LIGHT IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

| | | | | |
|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FHEA-21-6/2 SH 20 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|--|---------------|
| 21-6/-E | K0106ET1 | 2HVR*FN206A TRIP COIL ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-E | K0116ET1 | LMO-HVRAS 2HVR*MOD201A CONTACT E FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-E | K0126ET1 | LMO-HVRAS 2HVR*MOD202A CONTACT E FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-E | K0136ET1 | 27-RN200X1 CONTACT 223 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 21 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-J K0486ET3 2HVR*FN206B PERIODIC TEST
 CLOSING MECH
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-J K0496ET2 CKT-HVRBS INDICATING LIGHT
 NO 125VDC PWR IN CONTROL ROOM
 AVAILABLE

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-J K0506ET3 1-HVRBS CONTACT 5 PERIODIC TEST
 FAILS OPEN

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

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|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 22 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|--|---------------|
| 21-6/-J | K0516ET6 | 1-HVRBS IN PULL TO LOCK OP ERROR | PERIODIC INSPECTION | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-N | K0526ET3 | LMO-HVRBS 2HVR*MOD201B CONTACT C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-M | K0536ET3 | LMO-HVRBS 2HVR*MOD202B CONTACT C FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-J | K0546ET2 | CKT-HVRBS 125DC +ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STM FDWT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 23 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-J K0556ET2 CKT-HVRBS INDICATING LIGHT
 SHORT CKT IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-J K0566ET2 CKT-HVRBS INDICATING LIGHT
 125VDC -ACB IN CONTROL ROOM
 FAILS OPEN
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-G K0576ET1 2HVR*FN206B ANNUNCIATED IN
 TRIP COIL CONTROL ROOM
 ENERGIZED
 BY SHORT CKT
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

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|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 24 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|--|---------------|
| 21-6/-G | K0586ET1 | LMO-HVRBS 2HVR#MOD201B CONTACT E FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-G | K0596ET1 | LMO-HVRBS 2HVR#MOD202B CONTACT E FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-G | K0606ET1 | 27-RP200X1 CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-C | K0956EU3 | 2HVR#MOD 201A MOTOR FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | J.O. 1224] FMEA-21-6/2 SH 25 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|-----------------------------------|----------------------------------|--|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-C | K0966EU3 | 2HVR*HOD 201A LMS FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN ENERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN ENERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-C | K0976EU3 | 2HVR*HOD 201A RV COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN ENERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN ENERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-P | K0986EU2 | CKT-HVRAT NO 120VAC PWR AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN ENERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN ENERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-6/2 SH 26 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-------------------------------------|--|---------------|
| 21-6/-P | K0996EU2 | CKT-HVRAT SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-P | K1006EU2 | CKT-HVRAT 120VAC ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-Z | K1016EU3 | 62B-HVRAT CONTACT 1 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-Y | K1026EU3 | CKT-HVRAT STOP AFT STOP CONTACT 7 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): NONE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-6/2 SH 27 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---------------------------------------|-----------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): NONE | |
| 21-6/-T | K1036EU3 | 2HVR*PDS 207A CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-T | K1046EU3 | 2HVR*PDS 207A PRESSURE SENSOR FAILURE | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-Z | K1056EU3 | 62B-HVRAT-COIL ENE BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |

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|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 28 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-6/-Z K1066EU3 1-HVRAT CONTACT 3
 FAILS CLOSED PERIODIC TEST IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-Z K1076EU6 1-HVRAT
 21-6/-Y NOT IN START PERIODIC INSPECTION IF U.V. TRIP BLOCK CONTROL TRAIN A
 21-6/-AE OP ERROR IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-Y K1086EU3 1-HVRAT CONTACT 9
 FAILS OPEN PERIODIC TEST IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 CKT-HVRAT START AFT START CKT OPEN

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 CKT-HVRAT START AFT START CKT OPEN

21-6/-AE K1096EU3 62A-HVRAT
 CONTACT 3 PERIODIC TEST IF U.V. TRIP BLOCK CONTROL TRAIN A
 FAILS OPEN IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 CKT-HVRAT START AFT START CKT OPEN

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|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | MAIN STM FDHT VALVE AREA VENT SYS | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 29 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| 21-6/-Y | K1106EU3 | 52-HVRAS CONTACT 23 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| 21-6/-AE | K1116EU3 | 62A-HVRAT COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| 21-6/-AE | K1126EU3 | 1-HVRAT CONTACT 1 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRAT START AFT START CKT OPEN | |
| 21-6/-B | K1136EU3 | 2HVR#MOD 201B MOTOR FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STN VALVE AREA TRAIN B VENT FAILS | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STN FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-6/2 5H 30 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

21-6/-B K1146EU3 2HVR#MOD 201B
 LMS FAILS OPEN PERIODIC TEST
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

21-6/-B K1156EU3 2HVR#MOD 201B
 RV COIL FAILS PERIODIC TEST
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

21-6/-R K1166EU2 CKT-HVRBT
 NO 120VAC PWR
 AVAILABLE INDICATING LIGHT
 IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN B VENT
 FAILS

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STH FDHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 31 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-------------------------------------|--|---------------|
| 21-6/-R | K1176EU2 | CKT-HVRBT SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-R | K1186EU2 | CKT-HVRBT 120VAC ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AC | K1196EU3 | 62B-HVRBT CONTACT 1 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AB | K1206EU3 | CKT-HVRBT STOP AFT STOP CONTACT 7 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): NONE | |

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STH FDHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 32 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): NONE | |
| 21-6/-V | K1216EU3 | 2HVR*PDS 207B CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-V | K1226EU3 | 2HVR*PDS 207B PRESSURE SENSOR FAILURE | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AC | K1236EU3 | 62B-HVRBT COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-6/2 SH 33 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|--------------------------------|-----------------------------|--|---------------|
| 21-6/-AC | K1246EU3 | 1-HVRBT CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AC 21-6/-AB 21-6/-AG | K1256EU6 | 1-HVRBT NOT IN START OP ERROR | PERIODIC INSPECTION | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-AB | K1266EU3 | 1-HVRBT CONTACT 9 FAILS CLOSED | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| 21-6/-AG | K1286EU3 | 62A-HVRBT CONTACT 3 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-6/2 SH 34 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| 21-6/-AB | K1296EU3 | 52-HVRBS CONTACT 23 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| 21-6/-AG | K1306EU3 | 62A-HVRBT COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| 21-6/-AG | K1316EU3 | 1-HVRBT CONTACT 1 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): CKT-HVRBT START AFT START CKT OPEN | |
| 21-6/-P | K1336EU3 | 2HVR MOD 202A MOTOR FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE NODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-6/2 SH 35 |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-P K1346EU3 2HVR*MOD 202A PERIODIC TEST
 RV COIL FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-P K1356EU3 2HVR*MOD 202A PERIODIC TEST
 LMS FAILS OPEN

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-R K1366EU3 2HVR*MOD 202B PERIODIC TEST
 MOTOR FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STM FDWT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12291 FMEA-21-6/2 SH 36 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---------------------------------|-------------------------------------|--|---------------|
| 21-6/-R | K1376EU3 | 2HVR*MOD 202B RV COIL FAILS | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-R | K1386EU3 | 2HVR*MOD 202B LHS FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-D | K1396GD2 | NO 480V PWR TO MCC#2-E03 | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-D | K1406GD3 | CKT-3SHSAJ FUSE FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STM VALVE AREA TRAIN A VENT FAILS | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|---|---------------|
| 21-6/-D | K1416GD2 | CKT-SHSAJ 480-120VAC TRANSFORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-D | K1426GD3 | CKT-SHSAJ SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-Q | K1436GD2 | 42C-SHSAJ ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| | | | | IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| MAIN STH FDHT VALVE AREA VENT SYS | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-6/2 SH 38 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|----------------------------------|--|---------------|
| 21-6/-D | K1446GD3 | 49-SHSAJ CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-D | K1456GD3 | SHS*MOV120A OVERLOAD | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-U | K1466GD3 | LMS-SHSAJ CONTACT 4 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-Q | K1476GD2 | 42C-SHSAJ SEAL IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-6/2 SH 39 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

21-6/-U K1486GD3 420-SHSAJ PERIODIC TEST
 SEAL IN CONTACT
 FAILS OPEN

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

21-6/-U K1496GD3 LMS-SHSAJ PERIODIC TEST
 CONTACT 5
 FAILS OPEN

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

21-6/-Q K1506GD2 1-SHSAJ INDICATING LIGHT
 CONTACT L1 IN CONTROL ROOM
 FAILS CLOSED

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STH VALVE AREA TRAIN A VENT
 FAILS

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STH FDHT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 40 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|-------------------------------|-----------------------------|--|---------------|
| 21-6/-Q | K1516GD6 | 1-SHSAJ IN CLOSED OP ERROR | PERIODIC INSPECTION | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORHAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORHAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-U | K1526GD3 | 1-SHSAJ CONTACT R1 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORHAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORHAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-U | K1536GD6 | 1-SHSAJ NOT IN OPEN OP ERROR | PERIODIC INSPECTION | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORHAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORHAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |
| 21-6/-U | K1546GD3 | TQSD-SHSAJ CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN A VENT FAILS | |

| | | | | | | |
|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | MAIN STH FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-6/2 SH 41 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-U K1556G03 2SHS*NOV 120A PERIODIC TEST
 EXCESSIVE TORQUE
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN A VENT
 FAILS

21-6/-F K1566G02 NO 480V PWR INDICATING LIGHT
 TO MCC*2-E04 IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-F K1576G03 CKT-SHSBJ PERIODIC TEST
 FUSE FAILS OPEN
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| MAIN STM F0HT VALVE AREA VENT SYS | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-6/2 SH 42 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|--|---------------|
| 21-6/-F | K1586G02 | CKT-SHSBJ 460-120VAC TRANSFORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-F | K1596G03 | CKT-SHSBJ SHORT CKT | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-S | K1606G02 | 42C-SHSBJ ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-F | K1616G03 | 49-SHSBJ CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PWR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PWR MODE (PURPLE): MAIN STH VALVE AREA TRAIN B VENT FAILS | |

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STH FDWT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 43 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-F K1626GD3 SHS*MOV 120B
 OVERLOAD PERIODIC TEST
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-H K1636GD3 LMS-SHSBJ
 CONTACT 4
 FAILS OPEN PERIODIC TEST
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-S K1646GD2 42C-SHSBJ
 SEAL IN CONTACT
 FAILS CLOSED INDICATING LIGHT
 IN CONTROL ROOM
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STM FDHT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-6/2 SH 44 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|--|---------------|
| 21-6/-H | K1656GD3 | 420-SHSBJ SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-H | K1666GD3 | LMS-SHSBJ CONTACT 5 FAILS OPEN | PERIODIC TEST | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-S | K1676GD2 | 1-SHSBJ CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS IF U.V. TRIP BLOCK CONTROL TRAIN A IN NORMAL PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN NORMAL PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |
| 21-6/-S | K1686GD6 | 1-SHSBJ IN CLOSE OP ERROR | PERIODIC INSPECTION | IF U.V. TRIP BLOCK CONTROL TRAIN A IN EMERG PHR MODE (ORANGE) AND U.V. TRIP BLOCK CONTROL TRAIN B IN EMERG PHR MODE (PURPLE): MAIN STM VALVE AREA TRAIN B VENT FAILS | |

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| MAIN STM FDHT VALVE AREA VENT SYS | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-6/2 SH 45 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-W K1696GD3 1-SHSBJ CONTACT R1 FAILS OPEN PERIODIC TEST
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-W K1706GD6 1-SHSBJ NOT IN OPEN OP ERROR PERIODIC INSPECTION
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

21-6/-W K1716GD3 TQSO-SHSBJ CONTACT FAILS OPEN PERIODIC TEST
 IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN EMERG PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN EMERG PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
 IN NORMAL PWR MODE (ORANGE)
 AND U.V. TRIP BLOCK CONTROL TRAIN B
 IN NORMAL PWR MODE (PURPLE):
 MAIN STM VALVE AREA TRAIN B VENT
 FAILS

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | MAIN STM FDWT VALVE AREA VENT SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 46 | |


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*****
FTSK  COMPONENT  COMPONENT AND  METHOD OF  EFFECT ON SYSTEM  OTHER REMARKS
IDENTIFIER  FAILURE MODE  FAILURE DETECTION
*****
21-6/-H  K1726GD3  2SHS*MOV 120B  PERIODIC TEST  IF U.V. TRIP BLOCK CONTROL TRAIN A
EXCESSIVE TORQUE  IN EMERG PWR MODE (ORANGE)
AND U.V. TRIP BLOCK CONTROL TRAIN B
IN EMERG PWR MODE (PURPLE):
MAIN STM VALVE AREA TRAIN B VENT
FAILS

IF U.V. TRIP BLOCK CONTROL TRAIN A
IN NORMAL PWR MODE (ORANGE)
AND U.V. TRIP BLOCK CONTROL TRAIN B
IN NORMAL PWR MODE (PURPLE):
MAIN STM VALVE AREA TRAIN B VENT
FAILS
*****

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| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | MAIN STM FDNT VALVE AREA VENT SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-6/2 SH 47 |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|---------|----------|---|---------------|--|--|
| 21-8/-G | 801211R3 | 2HVR#FLTA224A MOTOR FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-G | 801311R3 | CKT HVRAQ ON-OFF SH CONTACTS FAIL OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-G | 801411R3 | CKT HVRAQ MEDIA SH CONTACT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS | |

Amendment 3

September 1984

| | | | | | |
|---|---|---|---------|---------|-------------------------------------|
| | | | 4/24/84 | 7/19/84 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | RG | RG | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | RG | 1 | J.O. 12241 FHEA-21-8/2 SH 1 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|---------------|
| 21-8/-N | 801511R3 | 42-HVRAFX CONTACT I15 FAILS OPEN | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-H | 801611R3 | CKT HVRAQ MAN OVERRIDE SW CONTACT M FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: NONE IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: NONE IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: NONE IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: NONE | |

| | | | | |
|-------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CABLE VAULT & ROD CONT AREA VENT SY | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-8/2 SH 2 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|---|-------------------------------------|--|---------------|
| 21-8/-G 21-8/-F | 801711R2 | CKT HVRAQ NO 120VAC AVAIL FROM PNL*AC2-E1 | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-M | 801811R3 | CKT HVRAQ PRES SW CONT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED | |
| 21-8/-M | 801911R3 | CKT HVRAQ SEQUENCE RELAY COIL FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|---|---------------|--|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| 21-8/-M | 802011R3 | CKT HVRAQ SEQUENCE RELAY SWITCH CONTACT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| 21-8/-M | 802111R3 | CKT HVRAQ PULSE GEN SW CONT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRAQ NO AUTO CKT ESTABLISHED |

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|-------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CABLE VAULT & ROD CONT AREA VENT SY | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-8/2 SH 4 | | | | |

 FT#N COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-M 802211R3 CKT HVRAQ PERIODIC TEST IF PATH A NORM MODE PATH B
 MAN OVERRIDE STBY MODE
 SH CONT A AND CO2 TN A DISCH SYS NOT ACTUATED:
 FAILS OPEN CKT HVRAQ NO AUTO CKT ESTABLISHED

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 CKT HVRAQ NO AUTO CKT ESTABLISHED

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 CKT HVRAQ NO AUTO CKT ESTABLISHED

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 CKT HVRAQ NO AUTO CKT ESTABLISHED

21-8/-G 802311R3 CKT HVRAQ ACB PERIODIC TEST
 FAILS OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A COOLING FAILS

21-8/-G 802411R3 CKT HVRAQ CIRCUIT PERIODIC TEST
 SHORT CIRCUIT

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-L | 807411R3 | 2HVR*FLTA244B MOTOR FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-L | 807511R3 | CKT HVRBQ ON-OFF SW CONTACTS FAIL OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-L 807611R3 CKT HVRBQ PERIODIC TEST IF PATH A NORM MODE PATH B
 MEDIA SW CONTACT STBY MODE
 FAILS OPEN AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-Q 807711R3 42-HVRBFX PERIODIC TEST
 CONTACT 115
 FAILS OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-P 807811R3 CKT HVRBQ PERIODIC TEST
 MAN OVERRIDE SW
 CONTACT M
 FAILS OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 NONE

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 NONE

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 7 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|

| | | | | | |
|--------------------|----------|---|-------------------------------------|--|--|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: NONE | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: NONE | |
| 21-8/-L 21-8/-K | 807911R2 | CKT HVRBQ NO 120VAC AVAIL FROM PNL*AC2-E2 | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-P | 808011R3 | CKT HVRBQ PRESS SW CONT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 8 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|--|---------------|
| 21-8/-P | 808111R3 | CKT HVRBQ SEQUENCE RELAY COIL FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| 21-8/-P | 808211R3 | CKT HVRBQ SEQUENCE RELAY SWITCH CONTACT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| 21-8/-P | 808311R3 | CKT HVRBQ PULSE GEN SW CONT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|---------------|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| 21-8/-P | 808411R3 | CKT HVRBQ MAN OVERRIDE SH CONT A FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: CKT HVRBQ NO AUTO CKT ESTABLISHED | |
| 21-8/-L | 808511R3 | CKT HVRBQ ACB FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |

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|---|---|---|---|--|--|-------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FHEA-21-8/2 SH 10 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 21-8/-L | 808611R3 | CKT HVRBQ CIRCUIT SHORT CIRCUIT | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-D | 80016EH3 | 2HVR*TH213A CONTACT (06) FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A FAILS NORMAL MODE IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A FAILS NORMAL MODE | |
| 21-8/-D 21-8/-R | 80026EH3 | 42-HVRAF COIL FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS | |

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|---|---|---|---|-------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FHEA-21-8/2 SH 11 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|---|---------------|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-R | 80036EH2 | CKT HVRAF 480-120VAC TRANSFORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-R | 80046EH2 | CKT HVRAF NO 480VAC POWER FROM MCC#2-E13 | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |

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|-------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CABLE VAULT & ROD CONT AREA VENT SY | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-8/2 SH 12 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-D 80056EH3 1-HVRAF CONTACT 3 PERIODIC TEST IF PATH A NORM MODE PATH B
 21-8/-AB FAILS OPEN STBY MODE

AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A FAILS NORMAL MODE

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A FAILS NORMAL MODE

21-8/-D 80066EH6 1-HVRAF PERIODIC INSPECTION IF PATH A NORM MODE PATH B
 NOT IN START STBY MODE
 OPERATOR ERROR AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A FAILS NORMAL MODE

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A FAILS NORMAL MODE

21-8/-D 80076EH3 42-HVRAF PERIODIC TEST IF PATH A NORM MODE PATH B
 CONTACT 221 STBY MODE
 FAILS OPEN AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

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|---|---|---|---|--|--|-------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-8/2 SH 13 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | |
|-------------------|---|---------------------|---|
| 21-8/-AB 80086EH3 | 1-HVRAF CONTACT 2 FAILS OPEN | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A FAILS NORMAL MODE |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A FAILS NORMAL MODE |
| | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A FAILS NORMAL MODE |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A FAILS NORMAL MODE |
| 21-8/-AB 80096EH6 | 1-HVRAF NOT IN START OPERATOR ERROR | PERIODIC INSPECTION | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A FAILS NORMAL MODE |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A FAILS NORMAL MODE |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 14 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|--------------------------------|---|---------------|
| 21-8/-T | 80106EH3 | 2HVR*ACU208A MOTOR THERMAL OVERLOAD | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-T | 80116EH3 | 49-HVRAF CONTACT FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-F | 80256EH1 | CHT HVRAR ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

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|---------|----------|-------------------------------------|--------------------------------|---|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS |
| 21-8/-F | 80266EH1 | CKT HVRAR SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS |
| 21-8/-F | 80276EH3 | 42-HVRAF CONTACT 8 FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-8/2 SH 16 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|------------------------------------|-----------------------------|---|---------------|
| 21-8/-F | 80286EH3 | 2HVR*MOD26A MOTOR FAILS | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-F | 80296EH3 | 2HVR*MOD26A CONTACT LHS FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-F | 80306EH3 | 2HVR*MOD26A RV SOLENOID FAILS | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |

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|---|---|---|---|-------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-8/2 SH 17 |

 F13K COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| F13K | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|----------------------------------|-----------------------------|--|---------------|
| 21-8/-E | 80316EH3 | 42-HVRAFY CONTACT 113 FAILS OPEN | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-E | 80326EH3 | 2HVR#MOD27A MOTOR FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 21-8/-E | 80336EH3 | 2HVR#MOD27A CONTACT LMS FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-E | 80346EH3 | 2HVR#MOD27A RV SOLENOID FAILS | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-N | 80356EH3 | 42-HVRAFX COIL FAILS | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-8/2 SH 19 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****
 ***** ***** ***** ***** *****

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|---------|----------|--|---------------|--|--|
| 21-8/-N | 80366EH3 | 42-HVRAF CONTACT 5 FAILS OPEN | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS | |
| 21-8/-Z | 80376EH3 | 99AX-ACU208A CONTACT 16 FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 99AX-ACU208A CONTACT 16 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-8/2 SH 20 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 21-8/-U | 80386EH3 | 62-HVRAF CONTACT 5 FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAF CONTACT 5 OPEN</p> | |
| 21-8/-Z | 80396EH3 | 99AX-ACU208A ISOLATION CONTACT FAILS CLOSED | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 99AX-ACU208A CONTACT 16 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN</p> | |
| 21-8/-Z | 80406EH3 | 99AX-ACU208A COIL ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN</p> | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 21 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

| | | | | | |
|----------|----------|---|---------------|--|--|
| 21-8/-Z | 80416EH3 | 99A-PS210 SPURIOUS CO-2 ACTUAT SIGNAL | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 99AX-ACU208A CONTACT 16 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 99AX-ACU208A CONTACT 16 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99AX-ACU208A CONTACT 16 OPEN | |
| 21-8/-AB | 80426EH3 | 62-HVRAF COIL FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAF CONTACT 5 OPEN | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | J.O. 12241 FHEA-21-8/2 SH 22 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|---|---------------|
| 21-8/-R | 80436EH3 | 1-HVRAF CONTACT 12 FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-R | 80446EH1 | 1-HVRAF CONTACT 13 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |
| 21-8/-R | 80456EH6 | 1-HVRAF NOT IN AUTO AFTER STOP OPERATOR ERROR | PERIODIC INSPECTION | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12243 FMEA-21-8/2 SH 23 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-R 80466EH3 42-HVRAF
 CONTACT 2
 FAILS OPEN

PERIODIC TEST

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

21-8/-V 80476EH3 2HVR*PDS30A
 CONTACT(LOF)
 FAILS OPEN

PERIODIC TEST

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A COOLING FAILS

| | | | | | | | |
|---|---|---|---|-------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FHEA-21-8/2 SH 24 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-V 80486EH3 2HVR*TH213A
 CONTACT
 EX HI TEMP
 FAILS OPEN

PERIODIC TEST

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A COOLING FAILS

21-8/-R 80496EH3 1-HVRAF CONTACT 7
 FAILS OPEN

PERIODIC TEST

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH A COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH A COOLING FAILS

21-8/-AD 80506EH3 62-HVRAF
 CONTACT 4
 FAILS OPEN

PERIODIC TEST

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 62-HVRAF CONTACT 5 OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH A COOLING FAILS

| | | | | | | |
|---|---|---|---|--|--|-------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FHEA-21-8/2 SH 25 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****
 ***** ***** ***** *****

| | | | | | |
|----------|----------|---|-------------------------------------|--|--|
| 21-8/-AD | 80516EH3 | 42-HVRAFX CONTACT 227 FAILS OPEN | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAFX CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAFX CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAFX CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAFX CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAFX CONTACT 5 OPEN | |
| 21-8/-AD | 80526EH2 | 42-HVRAFX COIL ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAFX CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAFX CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAFX CONTACT 5 OPEN | |

| | | | | | |
|---|---|---|---|-------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-8/2 SH 26 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------|----------------------------------|--|---------------|
| 21-8/-AD | 80536EH2 | 42-HVRAF CONTACT 5 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAF CONTACT 5 OPEN</p> | |
| 21-8/-AE | 80546EH3 | 62-HVRBF CONTACT 6 FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 62-HVRBF CONTACT 5 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |
| 21-8/-AE | 80556EH3 | 42-HVRBF CONTACT 227 FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 62-HVRBF CONTACT 5 OPEN</p> | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

| | | | | |
|----------|----------|---|-------------------------------------|--|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |
| 21-8/-AE | 80566EH2 | 42-HVRBFX COIL ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |
| 21-8/-AE | 80576EH2 | 42-HVRFBF CONTACT 5 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|---|---------------|
| 21-8/-AB | 80586EH3 | 99AX-ACU208A CONTACT 14 FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAF CONTACT 5 OPEN | |
| 21-8/-AB | 80596EH3 | 99A-ACU208A CONTACT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 62-HVRAF CONTACT 5 OPEN | |
| 21-8/-AB | 80606EH3 | 99AX-ACU208A COIL FAILURE | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRAF CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH A COOLING FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-AC 80616EH3 99BX-ACU208B
 CONTACT 14
 FAILS OPEN

PERIODIC TEST

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 62-HVRAF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 62-HVRAF CONTACT 5 OPEN

IF PATH A NOPM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-AC 80626EH3 99B-ACU208A
 CONTACT
 FAILS OPEN

PERIODIC TEST

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

| | | | | |
|---|---|---|---|-------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-6/2 SH 30 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|--------------------------------|-----------------------------|---|---------------|
| 21-8/-AC | 80636EH3 | 99BX-ACU208A COIL FAILURE | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 62-HVRBF CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-H | 80646EH3 | 2HVR*TH213B CONTACT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B FAILS NORMAL MODE IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B FAILS NORMAL MODE IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-H 21-8/-S | 80656EH3 | 42-HVRBF COIL FAILS | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|---|---------------|
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-5 | 80666EH2 | CKT HVRBF 480-120VAC TRANSFORMER FAILS | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-5 | 80675EH2 | CKT HVRBF NO 480VAC POWER FROM MCCA2-E14 | INDICATING LIGHT IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 21-8/-H 21-8/-AC | 80686EH3 | 1-HVRBF CONTACT 3 FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B FAILS NORMAL MODE IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B FAILS NORMAL MODE IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-H 21-8/-AC | 80696EH6 | 1-HVRBF NOT IN START OPERATOR ERROR | PERIODIC INSPECTION | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B FAILS NORMAL MODE IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B FAILS NORMAL MODE IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-H | 80706EH3 | 42-HVRBF CONTACT 221 FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B FAILS NORMAL MODE IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B FAILS NORMAL MODE | |

| | | | | | | |
|---|---|---|---|--|--|-------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-8/2 SH 33 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-AC 80716EH3 1-HVRBF CONTACT 2 PERIODIC TFST
 FAILS OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B FAILS NORMAL MODE

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B FAILS NORMAL MODE

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-W 80726EH3 2HVR*ACU208B PERIODIC TEST
 MOTOR THERMAL
 OVERLOAD

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

| | | | | | | | |
|---|---|---|---|-------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-21-8/2 SH 34 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|-----------------------------|-----------------------------|--|---------------|
| 21-8/-M | 80736EH3 | 49-HVRBF CONTACT FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-K | 80876EH1 | CKT HVRBQ ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS | |
| 21-8/-K | 80886EH1 | CKT HVRBQ SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-K 80896EH3 42- HVRBF PERIODIC TEST
 CONTACT B
 FAILS OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-K 80906EH3 2HVR*MOD26B PERIODIC TEST
 MOTOR FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-8/2 SH 36 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 21-8/-K | 80916EH3 | 2HVR#MOD26B CONTACT LMS FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |
| 21-8/-K | 80926EH3 | 2HVR#MOD26B RV SOLENOID FAILS | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |
| 21-8/-J | 80936EH3 | 42-HVRBFX CONTACT 113 FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-Q 80946EH3 42-HVRBFX COIL PERIODIC TEST
 FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-J 80956EH3 2HVR*MOD27B MOTOR PERIODIC TEST
 FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 38 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-J 80966EH3 2HVR*MOD27B PERIODIC TEST IF PATH A NORM MODE PATH B
 CONTACT LHS STBY MODE
 FAILS OPEN AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-J 80976EH3 2HVR*MOD27B PERIODIC TEST IF PATH A NORM MODE PATH B
 RV SOLENOID FAILS STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

21-8/-Q 80986EH3 42-HVRBF PERIODIC TEST IF PATH A NORM MODE PATH B
 CONTACT 5 STBY MODE
 FAILS OPEN AND CO2 TN A DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 PATH B COOLING FAILS

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-8/2 SH 39 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-8/-AA 80996EH3 99BX-ACU208B PERIODIC TEST
 CONTACT 16
 FAILS OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 99BX-ACU208B CONTACT 16 OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 99BX-ACU208B CONTACT 16 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 PATH B COOLING FAILS

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 99BX-ACU208B CONTACT 16 OPEN

21-8/-X 81006EH3 62-HVRBF PERIODIC TEST
 CONTACT 5
 FAILS OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS NOT ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A NORM MODE PATH B
 STBY MODE
 AND CO2 TN A DISCH SYS ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS NOT ACTUATED:
 62-HVRBF CONTACT 5 OPEN

IF PATH A STBY MODE PATH B
 NORMAL MODE
 AND CO2 TN B DISCH SYS ACTUATED:
 PATH B COOLING FAILS

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-8/2 SH 40 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---|---------------|
| 21-8/-AA | 81016EH3 | 99B-ACU208B ISOLATION CONT FAILS CLOSED | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> | |
| 21-8/-AA | 81026EH3 | 99BX-ACU208B COIL ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> | |
| 21-8/-AA | 81036EH3 | 99B-PS210 SPURIOUS CO-2 ACTUAT SIGNAL | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 99BX-ACU208B CONTACT 16 OPEN</p> | |

| | | | | | |
|---|---|---|---|-------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | CABLE VAULT & ROD CONT AREA VENT SY | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FHEA-21-8/2 SH 41 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIFR FAILURE MODE FAILURE DETECTION

| | | | |
|-------------------|-------------------------------------|---------------|---|
| 21-8/-AC 81046EH3 | 62-HVRBF3 COIL FAILS | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: 99BX-ACU208B CONTACT 16 OPEN |
| | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: 62-HVRBF CONTACT 5 OPE! |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: 62-HVRBF CONTACT 5 OPEN |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |
| 21-8/-S 81056EH3 | 1-HVRBF CONTACT 12 FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|---|---------------|
| 21-8/-S | 81066EH1 | 1-HVRBF CONTACT 13 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |
| 21-8/-S | 81076EH6 | 1-HVRBF NOT IN AUTO AFTER STOP OPERATOR ERROR | PERIODIC INSPECTION | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |
| 21-8/-S | 81086EH3 | 42-HVRBF CONTACT 2 FAILS OPEN | PERIODIC TEST | <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS</p> <p>IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS</p> | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CABLE VAULT & ROD CONT AREA VENT SY | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-8/2 SH 43 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|---|---------------------|---|
| 21-8/-S | 81096EH3 | 1-HVRBF CONTACT 7 FAILS OPEN | PERIODIC TEST | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |
| 21-8/-S | 81106EH6 | 1-HVRBF NOT IN AUTO AFTER START OPERATOR ERROR | PERIODIC INSPECTION | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS NOT ACTUATED: PATH B COOLING FAILS |
| | | | | IF PATH A STBY MODE PATH B NORMAL MODE AND CO2 TN B DISCH SYS ACTUATED: PATH B COOLING FAILS |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 44 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|

| | | | | | |
|---------|----------|-------------------------------------|---------------|--|--|
| 21-8/-Y | 81116EH3 | 2HVR*PDS30B CONTACT(LOF) FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
|---------|----------|-------------------------------------|---------------|--|--|

IF PATH A NORM MODE PATH B STBY MODE
AND CO2 TN A DISCH SYS ACTUATED:
PATH B COOLING FAILS

IF PATH A STBY MODE PATH B NORMAL MODE
AND CO2 TN B DISCH SYS NOT ACTUATED:
PATH B COOLING FAILS

IF PATH A STBY MODE PATH B NORMAL MODE
AND CO2 TN B DISCH SYS ACTUATED:
PATH B COOLING FAILS

| | | | | | |
|---------|----------|---|---------------|--|--|
| 21-8/-Y | 81126EH3 | 2HVR*TH213B CONTACT EX HI TEMP FAILS OPEN | PERIODIC TEST | IF PATH A NORM MODE PATH B STBY MODE AND CO2 TN A DISCH SYS NOT ACTUATED: PATH B COOLING FAILS | |
|---------|----------|---|---------------|--|--|

IF PATH A NORM MODE PATH B STBY MODE
AND CO2 TN A DISCH SYS ACTUATED:
PATH B COOLING FAILS

IF PATH A STBY MODE PATH B NORMAL MODE
AND CO2 TN B DISCH SYS NOT ACTUATED:
PATH B COOLING FAILS

IF PATH A STBY MODE PATH B NORMAL MODE
AND CO2 TN B DISCH SYS ACTUATED:
PATH B COOLING FAILS

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CABLE VAULT & ROD CONT AREA VENT SY |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-8/2 SH 45 |

FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-L 70211CE2 CKT HVSAE NO 120V AC PWR AVAILABLE INDICATING LIGHT IN CONTROL ROOM IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE

IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE

IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE

21-18-L 70221CE2 CKT HVSAE 120 ACB FAILS OPEN INDICATING LIGHT IN CONTROL ROOM IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE

IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE

IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE

21-18-L 70231CE2 CKT HVSAE SHORT CKT INDICATING LIGHT IN CONTROL ROOM IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE

IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE

IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE

Amendment 3

September 1984

| | | | | |
|---|---|---------|----------|------------------------------------|
| | | 5-18-84 | 10-19-82 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | 1/21 | 1/16 | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | J.O. 12241 FMEA-21-18/2 SH 1 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------------|----------------------|----------------------------------|-----------------------------|--|--|
| 21-18-N | 70241CE3 | 1-HVSAE CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 1-HVSAE CONTACT R1 OPEN IF LOP MODE AND EMERGENCY POWER: 1-HVSAE CONTACT R1 OPEN IF NORMAL POWER AND NO LOP MODE: 1-HVSAE CONTACT R1 OPEN IF EMERGENCY POWER AND LOP MODE: 1-HVSAE CONTACT R1 OPEN | |
| 21-18-N | 70251CE3 | K613XA TRA CONTACT 15 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD218A NO AUTO CKT ESTABLISHED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD218A NO AUTO CKT ESTABLISHED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD218A NO AUTO CKT ESTABLISHED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD218A NO AUTO CKT ESTABLISHED | |
| 21-18-S 21-18-BQ 21-18-ER | 70261CE3 | K613XA TRA NO ACTUATION SIGNAL | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD218A NO AUTO CKT ESTABLISHED | (K613X TN A =NSSS INTERFACE) (K613XA TN A =NSSS INTERFACE) (K613XA TN A =NSSS INTERFACE) |

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 2 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER (K613XA TN A =NSSS
 AND LOP MODE: INTERFACE)
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED

21-18-R 70271CE3 1-HVSAE PERIODIC TEST
 CONTACT L1
 FAILS OPEN
 IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED
 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED
 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED

21-18-R 70281CE6 1-HVSAE PERIODIC INSPECTION
 NOT IN AUTO
 (OPERATOR ERROR)
 IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED
 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED
 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED

21-18-R 70291CE3 52-HVSAD PERIODIC TEST
 CONTACT 19
 FAILS OPEN
 IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD218A NO AUTO CKT
 ESTABLISHED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 3 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD218A NO AUTO CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD218A NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD218A NO AUTO CKT ESTABLISHED | |
| 21-18-N | 73411CE6 | 1-HVSAE NOT IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 1-HVSAE CONTACT R1 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HVSAE CONTACT R1 OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 1-HVSAE CONTACT R1 OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 1-HVSAE CONTACT R1 OPEN | |
| 21-18-G | 74021CE3 | 2HVS*MOD218A MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-G | 74031CE3 | 2HVS*MOD218A RV SOLENOID FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 4 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|---------|----------|--|---------------|--|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-G | 74041CE3 | 2HVS#MOD218A LMS SWITCH FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-L | 74201CE3 | 2HVS#MOD203A MOTOR FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-L | 74211CE3 | 2HVS#MOD203A RV SOLENOID FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|---------|----------|---|---------------|--|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-L | 74221CE3 | 2HVS*MOD203A LMC CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-M | 74881CE3 | 2HVS*MOD203B MOTOR FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LCP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-M | 74891CE3 | 2HVS*MOD203B RV SOLENOID FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|---|-------------------------------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-- | 7490ICE3 | 2HVS#MOD203B LMC CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-H | 71581CF2 | 1-HVSBE NO 120VAC PWR AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-H | 71591CF2 | 1-HVSBE 120V ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE |

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|---|---|--|---|--|---|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | | 2 | | 1 | |
| | | | | | | J.O. 12241 FMEA-21-18/2 SH 7 |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSH | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-M | 71601CF2 | 1-HVSBE SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-P | 71611CF3 | 1-HVSBE CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 1-HVSBE CONTACT R1 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HVSBE CONTACT R1 OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 1-HVSBE CONTACT R1 OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 1-HVSBE CONTACT R1 OPEN | |
| 21-18-P | 71621CF6 | 1-HVSBE NOT IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 1-HVSBE CONTACT R1 OPEN | |

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 8 | |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSH | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|----------------------------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HVSB CONTACT R1 OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 1-HVSB CONTACT R1 OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 1-HVSB CONTACT R1 OPEN | |
| 21-18-P | 71631CF3 | K613XB TN B CONTACT 15 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD218B NO AUTO CKT ESTABLISHED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD218B NO AUTO CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD218B NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD218B NO AUTO CKT ESTABLISHED | |
| 21-18-U | 71641CF3 | K613XB TN B NO ACTUATION SIGNAL | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD218B NO AUTO CKT ESTABLISHED | (K613XB TN B =NSSS INTERFACE) |
| 21-18-P | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD218B NO AUTO CKT ESTABLISHED | (K613XB TN B =NSSS INTERFACE) |
| 21-18-BT | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | (K613XB TN B =NSSS INTERFACE) |
| 21-18-BU | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | (K613XB TN B =NSSS INTERFACE) |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION
 ***** ***** ***** ***** ***** *****

21-18-Q 71651CF3 1-HVSBE
 CONTACT L1
 FAILS OPEN PERIODIC TEST IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

21-18-Q 71661CF6 1-HVSBE
 NOT IN AUTO
 (OPERATOR ERROR) PERIODIC INSPECTION IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

21-18-Q 71671CF3 52-HVSBD
 CONTACT 19
 FAILS OPEN PERIODIC TEST IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD218B NO AUTO CKT
 ESTABLISHED

| | | | | | | |
|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 10 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|------------------------------------|-----------------------------|--|---------------|
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS#MOD218B NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS#MOD218B NO AUTO CKT ESTABLISHED | |
| 21-18-K | 74691CF3 | 2HVS#MOD218B MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-K | 74701CF3 | 2HVS#MOD218B RV SOLENOID FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-K | 74711CF3 | 2HVS#MOD218B LMS SWITCH FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 11 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-------------------------------------|--|---------------|
| 21-18-C | 70011CG3 | 2HVS*MOD202A RV SOLENOID FAILS | PERIODIC TEST | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A CLOSED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A CLOSED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A CLOSED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A CLOSED | |
| 21-18-BC | 70021CG3 | 99AX-4VSAG CONTACT 14 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | |
| 21-18-C | 70031CG2 | 2HVS*MOD202A MOTOR ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-18/2 SH 12 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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|----------|----------|--------------------------------------|--------------------------------|--|--|
| 21-18-AJ | 70071CG1 | CKT HVSAG 120V ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A CLOSED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A CLOSED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A CLOSED IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A CLOSED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A CLOSED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A CLOSED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A CLOSED | |
| 21-18-AJ | 70081CG1 | CKT HVSAG SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A CLOSED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A CLOSED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A CLOSED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A CLOSED | |
| 21-18-BD | 70091CG3 | 3-HVSAG CONTACT 221 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-18/2 SH 14 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|--------------------------------------|---------------|---|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-BD | 70101CG3 | 3-HVSAG COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-BD | 70111CG3 | 3-HVSAG CONTACT 113 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

| | | | | |
|----------|----------|--------------------------------------|---------------|---|
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-BC | 70131CG3 | 99AX-HVSAG COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LCP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-BC | 70141CG3 | 97A-RQ301 CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-BD | 70181CG3 | K614A TRA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |

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|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-18/2 SH 16 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|-------------------------------------|---------------|---|---------------------------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | |
| 21-18-BD | 70191CG3 | K614A TRA NO ACTUATION SIGNAL | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | (K614A TN A =NSSS INTERFACE) |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | (K614A TN A =NSSS INTERFACE) |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | (K614A TN A =NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | (K614A TN A =NSSS INTERFACE) |
| 21-18-AJ | 71341CG3 | 2HVS*MOD201A RV SOLENOID FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD201A OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD201A OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD201A OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD201A OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 17 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|---|-------------------------------------|---|
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-BB | 74271CG3 | 62-HVSAG FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED |
| 21-18-AH | 74681CG2 | 2HVS*MOD201A MOTOR ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD201A OPEN |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD201A OPEN |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD201A OPEN |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD201A OPEN |
| 21-18-AH | 75391CG2 | 1-HVSAG CONTACT R1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A CLOSED |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 19 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | |
|-------------------|-------------------------------------|---------------|---|
| 21-18-BB 75401CG3 | 1-HVSAG CONTACT R1 FAILS OPEN | PERIODIC TEST | <p>IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A CLOSED</p> <p>IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A CLOSED</p> <p>IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A CLOSED</p> <p>IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED</p> <p>IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED</p> <p>IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED</p> <p>IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED</p> <p>IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202B CLOSED</p> <p>IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202B CLOSED</p> <p>IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202B CLOSED</p> <p>IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202B CLOSED</p> |
| 21-18-AF 71401CH3 | 2HVS*MOD202B RV SOLENOID FAILS | PERIODIC TEST | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-18/2 SH 20 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-AF 71421CH2 2HVS*MOD202B INDICATING LIGHT IF NO LOP MODE
 MOTOR ENERGIZED IN CONTROL ROOM AND NORMAL POWER:
 BY SHORT CKT 2HVS*MOD202B CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD202B CLOSED

21-18-AK 71431CH3 1-HVSBG PERIODIC TEST IF NO LOP MODE
 CONTACT L1 AND NORMAL POWER:
 FAILS OPEN 1-HVSBG CONTACT L1 OPEN

IF LOP MODE
 AND EMERGENCY POWER:
 1-HVSBG CONTACT L1 OPEN

IF NORMAL POWER
 AND NO LOP MODE:
 1-HVSBG CONTACT L1 OPEN

IF EMERGENCY POWER
 AND LOP MODE:
 1-HVSBG CONTACT L1 OPEN

21-18-AG 71441CH6 1-HVSBG PERIODIC INSPECTION IF NO LOP MODE
 21-18-AK NOT IN FILTERED AND NORMAL POWER:
 (OPERATOR ERROR) 2HVS*MOD202B CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD202B CLOSED

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-AK 71451CH3 CKT HVSBG PERIODIC TEST IF NO LOP MODE
 120V ACB AND NORMAL POWER:
 FAILS OPEN 2HVS*MOD202B CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD202B CLOSED

21-18-AK 71461CH3 CKT HVSBG SHORT PERIODIC TEST IF NO LOP MODE
 CIRCUIT 2HVS*MOD202B CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD202B CLOSED

21-18-BG 71471CH3 3-HVSBG PERIODIC TEST IF NO LOP MODE
 CONTACT 221 AND NORMAL POWER:
 FAILS OPEN 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 22 | |

 FTS- COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-BF 71481CH3 99BX-HVSBG CONTACT 14 FAILS OPEN PERIODIC TEST
 IF EMERGENCY POWER AND LOP MODE:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF NO LOP MODE AND NORMAL POWER:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF LOP MODE AND EMERGENCY POWER:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF NORMAL POWER AND NO LOP MODE:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF EMERGENCY POWER AND LOP MODE:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

21-18-BG 71491CH3 3-HVSBG COIL FAILS PERIODIC TEST
 IF NO LOP MODE AND NORMAL POWER:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF LOP MODE AND EMERGENCY POWER:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF NORMAL POWER AND NO LOP MODE:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

IF EMERGENCY POWER AND LOP MODE:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

21-18-BF 71501CH3 99BX-HVSBG COIL FAILS PERIODIC TEST
 IF NO LOP MODE AND NORMAL POWER:
 2HVS*HOD202B NO AUTO CKT ESTABLISHED

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|---------------------------------------|---------------|--|---------------------------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| 21-18-BG | 71511CH3 | H614B TN B CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | |
| 21-18-BG | 71521CH3 | H614B TN B NO ACTUATION SIGNAL | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | (K614B TN B =NSSS INTERFACE) |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | (K614B TN B =NSSS INTERFACE) |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS#MOD202B NO AUTO CKT ESTABLISHED | (K614B TN B =NSSS INTERFACE) |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-18/2 SH 24 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER AND LOP MODE:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED (K614B TN B =NSSF INTERFACE)

21-18-BF 71531CH3 99B-RQ301 CONTACT PERIODIC TEST FAILS OPEN
 IF NO LOP MODE AND NORMAL POWER:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

IF LOP MODE AND EMERGENCY POWER:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

IF NORMAL POWER AND NO LOP MODE:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

IF EMERGENCY POWER AND LOP MODE:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

21-18-BG 73401CH3 3-HVSBG PERIODIC TEST CONTACT 113 FAILS OPEN
 IF NO LOP MODE AND NORMAL POWER:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

IF LOP MODE AND EMERGENCY POWER:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

IF NORMAL POWER AND NO LOP MODE:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

IF EMERGENCY POWER AND LOP MODE:
 2HVS*MOD202B NO AUTO CKT ESTABLISHED

21-18-AK 73481CH1 CKT HVSBJ ANNUNCIATED IN NO 120VAC PWR CONTROL ROOM AVAIL FROM
 21-18-J
 IF NO LOP MODE AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-18/2 SH 25 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

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|----------|----------|---|-------------------------------------|--|--|
| 21-18-BF | 74671CH3 | 2RHR-RQ301 CONTROL ISOL CKT FAILURE | PERIODIC TEST | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202B NO AUTO CKT ESTABLISHED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202B NO AUTO CKT ESTABLISHED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202B NO AUTO CKT ESTABLISHED IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| 21-18-AG | 74831CH2 | 2HVS*MOD201B MOTOR ENERGIZED BY SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD201B OPEN IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD201B OPEN IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD201B OPEN IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD201B OPEN | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER WIRE MODE FAILURE DETECTION

21-18-BE 74951CH3 62-HVSBG PERIODIC TEST IF NO LOP MODE
 CONTACT 4 AND NORMAL POWER:
 FAILS OPEN 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

21-18-BE 74961CH3 2HVS*PDS24B PERIODIC TEST IF NO LOP MODE
 CONTACT AND NORMAL POWER:
 FAILS OPEN 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

21-18-BE 74971CH3 62-HVSBG FAILS PERIODIC TEST IF NO LOP MODE
 AND NORMAL POWER:
 ESTABLISHED 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD202B NO AUTO CKT
 ESTABLISHED

| | | | | | | |
|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 27 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------|-----------------------------|--|---------------|
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| 21-18-BE | 75411CH3 | 1-HVSBG CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202B NO AUTO CKT ESTABLISHED | |
| 21-18-AG | 75421CH3 | 1-HVSBG CONTACT R1 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202B CLOSED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD202B CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD202B CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD202B CLOSED | |
| 21-18-AK | 76511CH3 | 2HVS*MOD201B RV SOLENOID FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD201B OPEN | |

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|----|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 14 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-18/2 SH 28 |

 F1SK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| F1SK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD201B OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD201B OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD201B OPEN | |
| 21-18-F | 71031CJ3 | 2HVS*MOD214A LP RELIEF SOV FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71051CJ3 | 2HVS*MOD214A BALANCE MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71061CJ1 | CKT-HVSAJ 120VAC ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|-------------------------------|--------------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71071CJ1 | CKT-HVSAJ SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71081CJ3 | 2HVS*FC22A FAILS LO OUTPUT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71091CJ3 | 2HVS*FT22A FAILS LO OUTPUT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-13/2 SH 30 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71101CJ3 | 2HVS*FE22A FAILS LO OUTPUT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-F | 71111CJ3 | 2HVS*MOD214A 4-20MA CONTROL LOSS OF PHR | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-J | 72401CJ3 | 2HVS*MOD214B LP RELIEF SOV FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-----------------|------------------------|--|--------------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AQ | 72421CJ3 | 2HVS*MOD214B BALANCE MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-J | 72431CJ1 | CKT HVSBJ 120VAC ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-J | 72441CJ1 | CKT HVSBJ SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |

| | | | | | | |
|----|--|---|--|---|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 14 | | 3 | | 2 | | 1 |
| | | | | | | J.O. 12241 FHEA-21-18/2 SH 32 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|----------------------------|-----------------------------|---|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AQ | 72451CJ3 | 2HVS*FC22B FAILS LO OUTPUT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AQ | 72461CJ3 | 2HVS*FT22B FAILS LO OUTPUT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AQ | 72471CJ3 | 2HVS*FE22B FAILS LO OUTPUT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-AL 74121CJ3 2HVS*MOD214A PERIODIC TEST
 RV SOLENOID FAILS OPEN

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH A FAILURE

21-18-AL 74131CJ3 2HVS*MOD214A PERIODIC TEST
 MOTOR FAILS

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

21-18-J 74791CJ3 2HVS*MOD214B PERIODIC TEST
 RV SOLENOID FAILS

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH A FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

| | | | |
|------------------------------------|---|---|---|
| FAILURE MODES AND EFFECTS ANALYSIS | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | |
| 4 | 3 | 2 | 1 |
| J.O. 12241 FMEA-21-18/2 SH 34 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-J | 74801CJ3 | 2HVS*MOD2148 MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BH | 70701CK2 | CKT HVSAB NO 120VAC PWR PNL*A02-E1 | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BH | 70791CK2 | CKT HVSAB 120V ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BH | 70801CK2 | CKT HVSAB SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BQ | 70811CK3 | 1-HVSAB CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: J-HVSAB CONTACT R1 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: J-HVSAB CONTACT R1 OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: J-HVSAB CONTACT R1 OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: J-HVSAB CONTACT R1 OPEN | |
| 21-18-BQ | 70821CK6 | 1-HVSAB NOT IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: J-HVSAB CONTACT R1 OPEN | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 36 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|-----------|---|---------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: J-HVSAB CONTACT R1 OPEN |
| | | | | IF NORMAL POWER AND NO LOP MODE: J-HVSAB CONTACT R1 OPEN |
| | | | | IF EMERGENCY POWER AND LCP MODE: J-HVSAB CONTACT R1 OPEN |
| 21-18-BQ | 70831CHK3 | H613XA TR A CONTACT I1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |
| 21-18-BQ | 70851CHK3 | 1-HVSAB CONTACT L1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD210A NO AUTO CKT ESTABLISHED |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|--|-------------------------------------|--|---------------|
| 21-18-BQ | 70861CK6 | 1-HVSAB NOT IN AUTO (OPERATOR ERROR) | PERIODIC INSPECTION | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD210A NO AUTO CKT ESTABLISHED IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD210A NO AUTO CKT ESTABLISHED IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD210A NO AUTO CKT ESTABLISHED IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD210A NO AUTO CKT ESTABLISHED | |
| 21-18-AU 21-18-AN | 70871CK2 | 1-HVSAB CONTACT L3 FAIL'S CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD210A NO AUTO CKT ESTABLISHED IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AU 21-18-AN | 70881CK6 | 1-HVSAB IN CLOSED (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 38 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|----------------------------------|---|---------------|
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AN | 70891CK2 | 2HVS*MOD210A OR 2HVS*MOD211A RV ENER | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AU | 74081CK3 | 2HVS*MOD210A LHS CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AU | 74091CK3 | 2HVS*MOD210A MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-------------------------------------|--|---------------|
| 21-18-BH | 74181CK3 | 2HVS*MOD211A LMS CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| 21-18-BH | 74191CK3 | 2HVS*MOD211A MOTOR FAILURE | PERIODIC TEST | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| 21-18-BJ | 70911CM2 | CKT-HVSAC NO 120V AC PWR AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |

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|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-18/2 SH 40 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

| FTSK IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------|-------------------------------|----------------------------|----------------------------------|---|---------------|
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BJ 70921CH2 | CKT HVSAC 120V ACB FAILS OPEN | | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BJ 70931CH2 | CKT HVSAC SHT CIRCUIT | | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BR 70941CH3 | 1-HVSAC CONTACT R1 FAILS OPEN | | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 1-HV SAC CONTACT R1 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HV SAC CONTACT R1 OPEN | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 41 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

21-18-BR 70951CH6 1-HVSAC
 NOT IN OPEN(
 OPERATOR ERROR) PERIODIC INSPECTION IF NORMAL POWER
 AND NO LOP MODE:
 1-HV SAC CONTACT R1 OPEN
 IF EMERGENCY POWER
 AND LOP MODE:
 1-HV SAC CONTACT R1 OPEN
 IF NO LOP MODE
 AND NORMAL POWER:
 1-HV SAC CONTACT R1 OPEN
 IF LOP MODE
 AND EMERGENCY POWER:
 1-HV SAC CONTACT R1 OPEN
 IF NORMAL POWER
 AND NO LOP MODE:
 1-HV SAC CONTACT R1 OPEN
 IF EMERGENCY POWER
 AND LOP MODE:
 1-HV SAC CONTACT R1 OPEN

21-18-BR 70961CH3 K613XA TR A
 CONTACT 13
 FAILS OPEN PERIODIC TEST IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD212A NO AUTO CKT
 ESTABLISHED
 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS*MOD212A NO AUTO CKT
 ESTABLISHED
 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*MOD212A NO AUTO CKT
 ESTABLISHED
 IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*MOD212A NO AUTO CKT
 ESTABLISHED

21-18-BR 70981CH3 1-HVSAC
 CONTACT L1
 FAILS OPEN PERIODIC TEST IF NO LOP MODE
 AND NORMAL POWER:
 2HVS*MOD212A NO AUTO CKT
 ESTABLISHED

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 1 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 42 |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------------------|----------|--|-------------------------------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| 21-18-BR | 70991CH6 | 1-HVSAC NOT IN AUTO (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*HOD212A NO AUTO CKT ESTABLISHED |
| 21-18-AV 21-18-AH | 71001CH2 | 1-HVSAC CONTACT L3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | |
| | | | | | | J.O. 12241 FHEA-21-16/2 SH 43 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 21-18-AV 21-18-AM | 71011CM6 | 1-HVSAC IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AV | 74101CM3 | 2HVS*MOD212A LMS CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AV | 74111CM3 | 2HVS*MOD212A MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 44 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-AY 72171CP2 1-HVSBB INDICATING LIGHT IF NO LOP MODE
 21-18-AS CONTACT L3 IN CONTROL ROOM AND NORMAL POWER:
 FAILS CLOSED FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AY 72181CP6 1-HVSBB IN CLOSE PERIODIC INSPECTION
 21-18-AS (OPERATOR ERROR)

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-BL 72191CP1 CKT HVSBB ANNUNCIATED IN
 NO 120VAC PWR CONTROL ROOM
 AVAILABLE

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

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|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 46 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

21-18-BL 72201CP1 CKT HVSB
120VAC ACB
FAILS OPEN ANNUNCIATED IN
CONTROL ROOM IF NO LOP MODE
AND NORMAL POWER:
FILTERED AIR PATH B FAILURE

IF LOP MODE
AND EMERGENCY POWER:
FILTERED AIR PATH B FAILURE

IF NORMAL POWER
AND NO LOP MODE:
FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
AND LOP MODE:
FILTERED AIR PATH B FAILURE

21-18-BL 72211CP1 CKT HVSB
SHORT CIRCUIT ANNUNCIATED IN
CONTROL ROOM IF NO LOP MODE
AND NORMAL POWER:
FILTERED AIR PATH B FAILURE

IF LOP MODE
AND EMERGENCY POWER:
FILTERED AIR PATH B FAILURE

IF NORMAL POWER
AND NO LOP MODE:
FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
AND LOP MODE:
FILTERED AIR PATH B FAILURE

21-18-BT 72221CP3 1-HVSB
CONTACT R1
FAILS OPEN PERIODIC TEST IF NO LOP MODE
AND NORMAL POWER:
1-HVSB CONTACT R1 OPEN

IF LOP MODE
AND EMERGENCY POWER:
1-HVSB CONTACT R1 OPEN

IF NORMAL POWER
AND NO LOP MODE:
1-HVSB CONTACT R1 OPEN

IF EMERGENCY POWER
AND LOP MODE:
1-HVSB CONTACT R1 OPEN

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 47 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

21-18-BT 72231CP6 1-HVSB8
 NOT IN OPEN
 (OPERATOR ERROR) PERIODIC INSPECTION
 IF NO LOP MODE
 AND NORMAL POWER:
 1-HVSB8 CONTACT R1 OPEN
 IF LOP MODE
 AND EMERGENCY POWER:
 1-HVSB8 CONTACT R1 OPEN
 IF NORMAL POWER
 AND NO LOP MODE:
 1-HVSB8 CONTACT R1 OPEN
 IF EMERGENCY POWER
 AND LOP MODE:
 1-HVSB8 CONTACT R1 OPEN

21-18-BT 72241CP3 K613B TN B
 CONTACT 11
 FAILS OPEN PERIODIC TEST
 IF NO LOP MODE
 AND NORMAL POWER:
 2HVS#MOD210B NO AUTO CKT ESTB
 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS#MOD210B NO AUTO CKT ESTB
 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS#MOD210B NO AUTO CKT ESTB
 IF EMERGENCY POWER
 AND LOP MODE:
 2HVS#MOD210B NO AUTO CKT ESTB

21-18-BT 72261CP3 1-HVSB8
 CONTACT L1
 FAILS OPEN PERIODIC TEST
 IF NO LOP MODE
 AND NORMAL POWER:
 2HVS#MOD210B NO AUTO CKT ESTB
 IF LOP MODE
 AND EMERGENCY POWER:
 2HVS#MOD210B NO AUTO CKT ESTB
 IF NORMAL POWER
 AND NO LOP MODE:
 2HVS#MOD210B NO AUTO CKT ESTB
 IF EMERGENCY POWER
 AND LOP MODE:
 2HVS#MOD210B NO AUTO CKT ESTB

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|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |

J.O. 12241 FMEA-21-18/2 SH 48

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|---|-------------------------------------|--|---------------|
| 21-18-BL | 74841CP3 | 2HVS*MOD211B LHS CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BL | 74851CP3 | 2HVS*MOD211B MOTOR FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AY 21-18-AS | 78051CP2 | 2HVS*MOD211B OR 2HVS*MOD211B RV ENERGIZED BY Short Circuit | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FHEA-21-18/2 SH 50 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|-----------------------------------|----------------------------------|--|---------------|
| 21-18-AZ 21-18-AR | 72291CR2 | 1-HVSBC CONTACT L3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AZ 21-18-AR | 72301CR6 | 1-HVSBC IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BM | 72311CR1 | CKT HV5BC NO 120VAC PWR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-18/2 SH 51 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 21-18-BM | 72321CR1 | CKT HVSBC 120VAC ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BU | 72331CR3 | 1-HVSBC CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 1-HVSBC CONTACT R1 OPEN IF LOP MODE AND EMERGENCY POWER: 1-HVSBC CONTACT R1 OPEN IF NORMAL POWER AND NO LOP MODE: 1-HVSBC CONTACT R1 OPEN IF EMERGENCY POWER AND LOP MODE: 1-HVSBC CONTACT R1 OPEN | |
| 21-18-BU | 72341CR6 | 1-HVSBC NOT IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 1-HVSBC CONTACT R1 OPEN IF LOP MODE AND EMERGENCY POWER: 1-HVSBC CONTACT R1 OPEN IF NORMAL POWER AND NO LOP MODE: 1-HVSBC CONTACT R1 OPEN IF EMERGENCY POWER AND LOP MODE: 1-HVSBC CONTACT R1 OPEN | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMFA-21-18/2 SH 52 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 21-18-BU | 72351CR3 | K613XB TN B CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD212B NO AUTO CKT ESTAB IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD212B NO AUTO CKT ESTAB IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD212B NO AUTO CKT ESTAB IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD212B NO AUTO CKT ESTAB | |
| 21-18-BU | 72371CR3 | 1-HVSBC CONTACT L1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD212B NO AUTO CKT ESTAB IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD212B NO AUTO CKT ESTAB IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD212B NO AUTO CKT ESTAB IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD212B NO AUTO CKT ESTAB | |
| 21-18-BU | 72381CR6 | 1-HVSBC NOT IN AUTO (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD212B NO AUTO CKT ESTAB IF LOP MODE AND EMERGENCY POWER: 2HVS*MOD212B NO AUTO CKT ESTAB IF NORMAL POWER AND NO LOP MODE: 2HVS*MOD212B NO AUTO CKT ESTAB IF EMERGENCY POWER AND LOP MODE: 2HVS*MOD212B NO AUTO CKT ESTAB | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 53 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|---|---------------|
| 21-18-BM | 73571CR1 | CKT HVSBC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | <p>IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE</p> <p>IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE</p> <p>IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE</p> <p>IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE</p> | |
| 21-18-AZ | 74771CR3 | 2HVS#HOD212B LMS CONTACT FAILS OPEN | PERIODIC TEST | <p>IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE</p> <p>IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE</p> <p>IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE</p> <p>IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE</p> | |
| 21-18-AZ | 74781CR3 | 2HVS#HOD212B MOTOR FAILS | PERIODIC TEST | <p>IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE</p> <p>IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE</p> <p>IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE</p> <p>IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE</p> | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 54 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|---|-------------------------------------|--|---------------|
| 21-18-BM | 74861CR3 | 2HVS*MOD213B LMS CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BM | 74871CR3 | 2HVS*MOD213B MOTOR FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AZ 21-18-AR | 78041CR2 | 2HVS*MOD212B OR 2HVS*MOD213B RV ENERGIZED BY Short Circuit | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-AP 71126AG3 1-HVSAA CONTACT 7 PERIODIC TEST IF NO LOP MODE
 FAILS OPEN AND NORMAL POWER:
 FILTERED AIR PATH A FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

21-18-AP 71136AG3 CKT-HVSAA PERIODIC TEST IF NO LOP MODE
 NO 480V OP PHR AND NORMAL POWER:
 AVAIL FILTERED AIR PATH A FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

21-18-AP 71146AG3 2HVS*FN209A PERIODIC TEST IF NO LOP MODE
 ACB OPEN MECH AND NORMAL POWER:
 FAILURE FILTERED AIR PATH A FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 56 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 21-18-AP | 71156AG1 | CKT-HVSAA NO 125VDC CONT PWR AVAIL | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AP | 71166AG1 | CKT-HVSAA 125(+)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AP | 71176AG1 | CKT-HVSAA CONTROL PWR SHT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|--------------------------------|---|---------------|
| 21-18-AP | 71186AG1 | CKT-HVSAA 125(-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | <p>IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE</p> <p>IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE</p> <p>IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE</p> <p>IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE</p> | |
| 21-18-AH | 71196AG3 | 1-HVSAA CONTACT 2 FAILS OPEN | PERIODIC TEST | <p>IF NO LOP MODE AND NORMAL POWER: 1-HVSAA CONTACT 2 OPEN</p> <p>IF LOP MODE AND EMERGENCY POWER: 1-HVSAA CONTACT 2 OPEN</p> <p>IF NORMAL POWER AND NO LOP MODE: 1-HVSAA CONTACT 2 OPEN</p> <p>IF EMERGENCY POWER AND LOP MODE: 1-HVSAA CONTACT 2 OPEN</p> | |
| 21-18-AH | 71216AG3 | 1-HVSAA CONTACT 15 FAILS OPEN | PERIODIC TEST | <p>IF NO LOP MODE AND NORMAL POWER: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED</p> <p>IF LOP MODE AND EMERGENCY POWER: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED</p> <p>IF NORMAL POWER AND NO LOP MODE: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED</p> | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER AND LOP MODE: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED | |
| 21-18-AH | 71226AG6 | 1-HVSAA NOT IN AUTO OPERATOR ERROR | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED IF LOP MODE AND EMERGENCY POWER: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED IF NORMAL POWER AND NO LOP MODE: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED | |
| 21-18-E | 71236AG2 | 2HVS*FN204A TRIP COIL ENERGIZED | INDICATING LIGHT IN CONTROL ROOM | IF EMERGENCY POWER AND LOP MODE: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-E | 71246AG | 1-HVSAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

21-18-AT 72486AG3 1-HVSBA CONTACT 7 PERIODIC TEST
 FAILS OPEN

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-15-AT 72496AG1 CKT HVSBA ANNUNCIATED IN
 NO 480 OPER PMR CONTROL ROOM
 AVAILABLE

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AT 72506AG1 2HVS*FN204B ANNUNCIATED IN
 ACB CLOS MECH CONTROL ROOM
 FAILURE

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 60 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AT 72516AG1 CKT HVSBA
 NO 125VDC
 CONT PWR ANNUNCIATED IN
 CONTROL ROOM IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AT 72526AG1 CKT HVSBA
 125V (+) ACB
 FAILS OPEN ANNUNCIATED IN
 CONTROL ROOM IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AT 72536AG1 CKT HVSBA
 CONTROL POWER
 SHORT CIRCUIT ANNUNCIATED IN
 CONTROL ROOM IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 61 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|-----------------------------|---|---------------|
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AT | 72546AG1 | CKT HVSBA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BA | 72556AG3 | 1-HVSBA CONTACT 2 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 1-HVSBA CONTACT 2 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HVSBA CONTACT 2 OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 1-HVSBA CONTACT 2 OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 1-HVSBA CONTACT 2 OPEN | |
| 21-18-BA | 72566AG6 | 1-HVSBA IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 1-HVSBA CONTACT 2 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HVSBA CONTACT 2 OPEN | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

21-18-H 72606AG3 1-HVSBA CONTACT 3 PERIODIC TEST IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE
 FAILS CLOSED

IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE

IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE

21-18-H 72616AG6 1-HVSBA IN STOP PERIODIC INSPECTION IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE
 (OPERATOR ERROR)

IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE

IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE

21-18-AH 73466AG6 1-HVSAA PERIODIC INSPECTION IF NO LOP MODE AND NORMAL POWER: 1-HVSAA CONTACT 2 OPEN
 NOT IN START (OPERATOR ERROR)

IF LOP MODE AND EMERGENCY POWER: 1-HVSAA CONTACT 2 OPEN

IF NORMAL POWER AND NO LOP MODE: 1-HVSAA CONTACT 2 OPEN

IF EMERGENCY POWER AND LOP MODE: 1-HVSAA CONTACT 2 OPEN

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 64 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|----------------------------------|--|---------------|
| 21-18-E | 73476AG6 | 1-HVSAA IN STOP OP ERROR | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-H | 73586AG2 | 2HVS*FN204B TRIP COIL ENERGIZED | INDICATING LIGHT IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AM | 74146AG3 | 362-EGSAAX CONTACT 113 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED IF LOP MODE AND EMERGENCY POWER: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED IF NORMAL POWER AND NO LOP MODE: 2-HVS*FN204A NO AUTO START CKT ESTABLISHED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER
 AND LOP MODE:
 2-HVS*FN204A NO AUTO START CKT
 ESTABLISHED

21-18-AH 74156AG3 362-EGSAAX DG2-1
 AUTO LOAD
 STEP 5 FAILURE PERIODIC TEST

IF NO LOP MODE
 AND NORMAL POWER:
 2-HVS*FN204A NO AUTO START CKT
 ESTABLISHED

IF LOP MODE
 AND EMERGENCY POWER:
 2-HVS*FN204A NO AUTO START CKT
 ESTABLISHED

IF NORMAL POWER
 AND NO LOP MODE:
 2-HVS*FN204A NO AUTO START CKT
 ESTABLISHED

IF EMERGENCY POWER
 AND LOP MODE:
 2-HVS*FN204A NO AUTO START CKT
 ESTABLISHED

21-18-E 74646AG3 27-RN200X3
 CONTACT 221
 FAILS CLOSED PERIODIC TEST

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH A FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH A FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH A FAILURE

21-18-BK 74656AG3 27-RN200X3
 COIL ENERGIZED
 BY SHORT CKT PERIODIC TEST

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH A FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

| | | | | |
|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 66 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BK | 74666AG3 | 27-RN200X CONTACT 115 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BA | 74816AG3 | 362-EGSBX CONTACT 113 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*FN204B NO AUTO START CKT ESTABLISHED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*FN204B NO AUTO START CKT ESTABLISHED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*FN204B NO AUTO START CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*FN204B NO AUTO START CKT ESTABLISHED | |
| 21-18-BA | 74826AG3 | 362-EGSBX DG 2-2 AUTO LOAD STEP 5 FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*FN204B NO AUTO START CKT ESTABLISHED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|---|--------------------------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-T | 70326AJ3 | 2HVS*CH219A ACB MECH FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE |
| 21-18-T | 70346AJ1 | CKT-HVSAD NO 125V DC CONT PWR AVAIL | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE |
| 21-18-T | 70356AJ1 | CKT-HVSAD 125V(+)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|---|--------------------------------|--|--|
| 21-18-T | 70366AJ1 | CKT-HVSAD CONTROL PHR SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-T | 70376AJ1 | CKT-HVSAD 125(-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BP | 70386AJ3 | 99AX-PDIS219A CONTACT 14 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FHEA-21-18/2 SH 70 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|--|---------------------|--|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AC | 70396AJ3 | 1-HVSAD CONT 2 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AC | 70406AJ6 | 1-HVSAD CONT 2 NOT IN FULL HEAT (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BP | 70416AJ3 | 99A-PDIS219A CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|--|---------------|---|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE |
| 21-18-S | 70536AJ3 | 99AX-PDIS219A CONTACT 24 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 99AX-PDS219A CONTACT 24 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 99AX-PDS219A CONTACT 24 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 99AX-PDS219A CONTACT 24 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 99AX-PDS219A CONTACT 24 CLOSED |
| 21-18-S | 70546AJ3 | K613XA TRAIN A CONTACT 17 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: K613XA TRAIN A CONTACT 17 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: K613XA TRAIN A CONTACT 17 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: K613XA TRAIN A CONTACT 17 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: K613XA TRAIN A CONTACT 17 CLOSED |
| 21-18-V | 71716AJ3 | 2HVS*CH219B ACB MECH FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE |

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FTSK   COMPONENT   COMPONENT AND   METHOD OF   EFFECT ON SYSTEM   OTHER REMARKS
IDENTIFIER   FAILURE MODE   FAILURE DETECTION
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                IF LOP MODE
                AND EMERGENCY POWER:
                FILTERED AIR PATH B FAILURE

                IF NORMAL POWER
                AND NO LOP MODE:
                FILTERED AIR PATH B FAILURE

                IF EMERGENCY POWER
                AND LOP MODE:
                FILTERED AIR PATH B FAILURE

21-18-V  71736AJ1  CKT HVSBD      ANNUNCIATED IN
          NO 125VDC      CONTROL ROOM
          CONTROL PHR

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                IF NO LOP MODE
                AND NORMAL POWER:
                FILTERED AIR PATH B FAILURE

                IF LOP MODE
                AND EMERGENCY POWER:
                FILTERED AIR PATH B FAILURE

                IF NORMAL POWER
                AND NO LOP MODE:
                FILTERED AIR PATH B FAILURE

                IF EMERGENCY POWER
                AND LOP MODE:
                FILTERED AIR PATH B FAILURE

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21-18-V  71746AJ1  CKT HVSBD      ANNUNCIATED IN
          125V (+) ACB   CONTROL ROOM
          FAILS OPEN

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                IF NO LOP MODE
                AND NORMAL POWER:
                FILTERED AIR PATH B FAILURE

                IF LOP MODE
                AND EMERGENCY POWER:
                FILTERED AIR PATH B FAILURE

                IF NORMAL POWER
                AND NO LOP MODE:
                FILTERED AIR PATH B FAILURE

                IF EMERGENCY POWER
                AND LOP MODE:
                FILTERED AIR PATH B FAILURE

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21-18-V  71756AJ1  CKT HVSBD      ANNUNCIATED IN
          CONTROL PHR   CONTROL ROOM
          SHORT CIRCUIT

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 74 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|--------------------------------|---|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-V | 71766AJ1 | CKT HVSB0 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-U | 71856AJ1 | 2HVS*CH219B TRIP COIL ENERGIZED BY Short Circuit | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-U | 71866AJ1 | 1-HVSB0 CONTACT 3 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-U | 71876AJ6 | 1-HVSBD IN NO HEAT (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-U | 71906AJ3 | 99BX-PDIS219B CONTACT 24 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 99BX-PDIS219B CONTACT 24 CLOSED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 99BX-PDIS219B CONTACT 24 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 99BX-PDIS219B CONTACT 24 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 99BX-PDIS219B CONTACT 24 CLOSED | |
| 21-18-U | 71916AJ3 | K613XB TN B CONTACT 17 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: K613XB-TRB CONTACT 17 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 76 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|---|---------------|--|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: K6BXB-TRB CONTACT 17 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: K6BXB-TRB CONTACT 17 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: K6BXB-TRB CONTACT 17 CLOSED | |
| 21-18-Z | 72826AJ3 | K613XA TN A CONTACT 9 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP | |
| 21-18-AC | 72846AJ3 | 362-EGSAAX CONTACT 225 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219A NO AUTO CKT EST LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP | |
| 21-18-AE | 72956AJ3 | 99BX-MS21B CONTACT 14 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 77 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

| | | | | |
|----------|----------|--|---------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-AE | 72996AJ3 | 99BX-MS21B FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-AE | 73006AJ3 | 99B-MS21B CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-AA | 73046AJ3 | K3046AJ3 TN B CONTACT 9 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-18/2 SH 78 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|----------|----------|---|---------------|--|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AB | 73066AJ3 | 362-EGSBAX CONTACT 225 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AB | 73076AJ3 | 362-EGSSAX CKT EGSSA DG 2-2 AUTO | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AD | 73176AJ3 | 99AX-MS21A CONTACT 14 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------|-----------------------------|--|---------------|
| 21-18-AD | 73206AJ3 | 99AX-HS21A FAILS OPEN | PERIODIC TEST | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP | |
| 21-18-AD | 73216AJ3 | 99A-HS21A CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP | |
| 21-18-BP | 73436AJ3 | 99AX-PDIS219A COIL FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 80 |

| FTSV | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BS | 73496AJ3 | 99BX-PDIS219B CONTACT 14 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-X | 73506AJ3 | 1-HVSBD CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 1-HVSBD CONTACT 2 OPEN | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 1-HVSBD CONTACT 2 OPEN | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 1-HVSBD CONTACT 2 OPEN | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 1-HVSBD CONTACT 2 OPEN | |
| 21-18-X | 73516AJ6 | 1-HVSBD NOT IN FULL HEAT (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: 1-HVSBD CONTACT 2 OPEN | |

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FTSK  COMPONENT  COMPONENT AND  METHOD OF  EFFECT ON SYSTEM  OTHER REMARKS
IDENTIFIER  FAILURE MODE  FAILURE DETECTION
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                IF LOP MODE
                AND EMERGENCY POWER:
                1-HVSBD CONTACT 2 OPEN

                IF NORMAL POWER
                AND NO LOP MODE:
                1-HVSBD CONTACT 2 OPEN

                IF EMERGENCY POWER
                AND LOP MODE:
                1-HVSBD CONTACT 2 OPEN

21-18-BS  73526AJ3  99B-PDIS219B  PERIODIC TEST
CONTACT
FAILS OPEN

                IF NO LOP MODE
                AND NORMAL POWER:
                2HVS*CH219B NO AUTO CKT EST LOP

                IF LOP MODE
                AND EMERGENCY POWER:
                2HVS*CH219B NO AUTO CKT EST LOP

                IF NORMAL POWER
                AND NO LOP MODE:
                FILTERED AIR PATH B FAILURE

                IF EMERGENCY POWER
                AND LOP MODE:
                FILTERED AIR PATH B FAILURE

21-18-BS  73556AJ3  99BX-PDIS219B  PERIODIC TEST
COIL FAILS OPEN

                IF NO LOP MODE
                AND NORMAL POWER:
                2HVS*CH219B NO AUTO CKT EST LOP

                IF LOP MODE
                AND EMERGENCY POWER:
                2HVS*CH219B NO AUTO CKT EST LOP

                IF NORMAL POWER
                AND NO LOP MODE:
                FILTERED AIR PATH B FAILURE

                IF EMERGENCY POWER
                AND LOP MODE:
                FILTERED AIR PATH B FAILURE

21-18-Y   74056AJ3  1-HVSAD       PERIODIC TEST
CONTACT 11
FAILS OPEN

                IF NO LOP MODE
                AND NORMAL POWER:
                FILTERED AIR PATH A FAILURE

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|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 82 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON WHEN OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON WHEN | OTHER REMARKS |
|---------------------|----------------------|--|-----------------------------|---|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-Y | 74066AJ6 | 1-HVSAD NOT IN NORMAL (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BP | 74076AJ3 | 99A-PDIS219A CONTACT ISOL CH.7 FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-AC 21-18-Z | 74236AJ3 | 362-EGSABX CKT EGSAA DG 2-1 AUTO | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|--|--------------------------------|---|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219A NO AUTO CKT EST LOP |
| 21-18-Z | 74246AJ3 | 52-2EGSAAX2 CONTACT 223 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219A NO AUTO CKT EST NO LOP |
| | | | | IF NORMAL POWER AND NO LOP MODE: 2HVS*CH219A NO AUTO CKT EST NO LOP |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219A NO AUTO CKT EST NO LOP |
| 21-18-W | 74306AJ1 | 27-RN200X1 CONTACT 113 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE |
| 21-18-W | 74316AJ3 | 27-RN200X1 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 64 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-W | 74326AJ3 | 27-RN200X CONTACT 111 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BK | 74336AJ3 | 27-RN200X COIL ENERG BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-BX | 74346AJ3 | 27-RN2200-EJSAA CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN2200-EJSAA CONTACT 1 CLOSED | |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 85 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-BV 74356A13 27-RN1200-EJSAA CONTACT 11 FAILS CLOSED PERIODIC TEST

IF LOP MODE
 AND EMERGENCY POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED

21-18-BX 74366AJ2 21-18-BZ 480V EMERG BUS 2N NO PWR AVAILABLE INDICATING LIGHT IN CONTROL ROOM

IF NO LOP MODE
 AND NORMAL POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

21-18-BX 74376AJ3 CKT-EJSAM 120V CKT FUSE C FAILS OPEN PERIODIC TEST

IF NO LOP MODE
 AND NORMAL POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 86 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|---|---------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED |
| 21-18-BX | 74386AJ3 | CKT-EJSAM 480V CKT FUSE C FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED |
| 21-18-BX | 74396AJ3 | CKT-EJSAM 480-120VAC TRANSFORMER Failure | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED |
| 21-18-BX | 74406AJ3 | 1C-ENSABX CONTACT 117 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN2200-EJSAA CONTACT 1 CLOSED |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FHFA-21-18/2 SH 87 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF LOP MODE
 AND EMERGENCY POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

21-18-BZ 74416AJ3 27-RN120A-B EJSAL PERIODIC TEST
 COIL FAILS

IF NO LOP MODE
 AND NORMAL POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED

21-18-CD 74426AJ3 1C-ENSABX1 PERIODIC TEST
 COIL ENERG
 BY SHORT CKT

IF NO LOP MODE
 AND NORMAL POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 27RN2200-EJSAA CONTACT 1 CLOSED

21-18-CD 74436AJ3 1C-ENSABX PERIODIC TEST
 CONTACT 313
 FAILS CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 27RN2200-EJSAA CONTACT 1 CLOSED

| | | | | |
|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 88 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-18-BZ | 74446AJ3 | 27-RN1200B C EJSAL COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN200-EJSAA CONTACT 11 CLOSED | |
| 21-18-BZ | 74456AJ3 | 1A-EJSABX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN200-EJSAA CONTACT 11 CLOSED | |
| 21-18-CJ | 74466AJ3 | 1A-EJSABX2 COIL ENERG BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN200-EJSAA CONTACT 11 CLOSED | |

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12291 FHEA-21-18/2 SH 89 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-CJ 74476AJ3 1A-EJSABX CONTACT 113 FAILS CLOSED PERIODIC TEST
 IF LOP MODE AND EMERGENCY POWER:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF NORMAL POWER AND NO LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF EMERGENCY POWER AND LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF NO LOP MODE AND NORMAL POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

21-18-CJ 74486AJ3 1A-EJSAB CONTACT 3 FAILS CLOSED PERIODIC TEST
 IF LOP MODE AND EMERGENCY POWER:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF NORMAL POWER AND NO LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF EMERGENCY POWER AND LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF NO LOP MODE AND NORMAL POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

21-18-CJ 74496AJ3 1A-EJSABX OP COIL ENERG BY SHORT CKT PERIODIC TEST
 IF LOP MODE AND EMERGENCY POWER:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF NORMAL POWER AND NO LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF EMERGENCY POWER AND LOP MODE:
 27RN200-EJSAA CONTACT 11 CLOSED
 IF NO LOP MODE AND NORMAL POWER:
 27RN200-EJSAA CONTACT 11 CLOSED

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FNEA-21-18/2 SH 90 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN200-EJSAA CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN200-EJSAA CONTACT 11 CLOSED | |
| 21-18-CD | 74506AJ3 | 1C-ENSABX OPERATE COIL ENERGIZED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21 18-CD | 74516AJ3 | 1C-ENSABX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RN2200-EJSAA CONTACT 1 CLOSED | |
| 21-18-BV | 74526AJ3 | 69-ENSA CONTACT 317 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 69-ENSA CONTACT 317 CLOSED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF LOP MODE
 AND EMERGENCY POWER:
 69-ENSAA CONTACT 317 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 69-ENSAA CONTACT 317 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 69-ENSAA CONTACT 317 CLOSED

21-18-BV 74536AJ3 69-ENSAA PERIODIC TEST
 OPERATE COIL
 ENERGIZED BY
 Short Circuit

IF NO LOP MODE
 AND NORMAL POWER:
 69-ENSAA CONTACT 317 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 69-ENSAA CONTACT 317 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 69-ENSAA CONTACT 317 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 69-ENSAA CONTACT 317 CLOSED

21-18-CB 74546AJ3 52-EGPAA PERIODIC TEST
 CONTACT 73
 FAILS CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 69-ENSAA ENERGIZING CKT ESTABLISHED

IF LOP MODE
 AND EMERGENCY POWER:
 69-ENSAA ENERGIZING CKT ESTABLISHED

IF NORMAL POWER
 AND NO LOP MODE:
 69-ENSAA ENERGIZING CKT ESTABLISHED

IF EMERGENCY POWER
 AND LOP MODE:
 69-ENSAA CONTACT 317 CLOSED

21-18-CL 74556AJ3 52-ENSAC PERIODIC TEST
 CONTACT 75
 FAILS CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 52-ENSAC CONTACT 75 CLOSED

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-18/2 SH 92 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|--|---------------|---|
| | | | | IF LOP MODE AND EMERGENCY POWER: 52-ENSAC CONTACT 75 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 52-ENSAC CONTACT 75 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 52-ENSAC CONTACT 75 CLOSED |
| 21-18-CL | 74566AJ3 | ACB 2E7 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 52-ENSAC CONTACT 75 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 52-ENSAC CONTACT 75 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 52-ENSAC CONTACT 75 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 52-ENSAC CONTACT 75 CLOSED |
| 21-18-CL | 74576AJ3 | 99X-52-NNSAC CONTACT 14 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 99X-52-NNSAC CONTACT 14 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 99X-52-NNSAC CONTACT 14 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 99X-52-NNSAC CONTACT 14 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 99X-52-NNSAC CONTACT 14 CLOSED |
| 21-18-CL | 74586AJ3 | 99-52-NNSAC CONTACT FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 99X-52-NNSAC CONTACT 14 CLOSED |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-18/2 SH 93 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-CL 74596AJ3 99X-52-NNSAC PERIODIC TEST
 COIL ENERGIZED
 BY SHORT CKT

IF LOP MODE
 AND EMERGENCY POWER:
 99X-52-NNSAC CONTACT 14 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 99X-52-NNSAC CONTACT 14 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 99X-52-NNSAC CONTACT 14 CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 99X-52-NNSAC CONTACT 14 CLOSED

21-18-CK 74606AJ3 162-ENSAA PERIODIC TEST
 CONTACT 5
 FAILS CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 99X-52-NNSAC CONTACT 14 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 99X-52-NNSAC CONTACT 14 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 99X-52-NNSAC CONTACT 14 CLOSED

21-18-CK 74616AJ3 162-ENSAA PERIODIC TEST
 COIL FAILURE

IF NO LOP MODE
 AND NORMAL POWER:
 162-ENSAA CONTACT 5 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 162-ENSAA CONTACT 5 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 69-ENSAA CONTACT 317 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 162-ENSAA CONTACT 5 CLOSED

21-18-CK 74616AJ3 162-ENSAA PERIODIC TEST
 COIL FAILURE

IF NO LOP MODE
 AND NORMAL POWER:
 162-ENSAA CONTACT 5 CLOSED

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FNEA-21-18/2 SH 94 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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|----------|----------|-------------------------------------|---------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 162-ENSAA CONTACT 5 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 49-ENSAA CONTACT 317 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 162-ENSAA CONTACT 5 CLOSED |
| 21-18-CK | 74626AJ3 | 99-INNSAC CONTACT FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 162-ENSAA CONTACT 5 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 162-ENSAA CONTACT 5 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 69-ENSAA CONTACT 317 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 162-ENSAA CONTACT 5 CLOSED |
| 21-18-CK | 74636AJ3 | 99-INNSAC COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 162-ENSAA CONTACT 5 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 162-ENSAA CONTACT 5 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 69-ENSAA CONTACT 317 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 162-ENSAA CONTACT 5 CLOSED |
| 21-18-X | 74726AJ3 | 1-HVSDN CONTACT 11 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-18/2 SH 95 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|

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|----------|----------|---|---------------------|---|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-X | 74736AJ6 | 1-HVSD NOT IN NORMAL (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BS | 74746AJ3 | 99B-PDIS219B CONTROL ISOL CKT FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AA | 74916AJ3 | CKT EGSBA DG 2-2 AUTO LOAD SYSTEM FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST NO LOP | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST NO LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219B NO AUTO CKT EST NO LOP | |
| 21-18-AA | 74926AJ3 | 52-EGSBAX2 CONTACT 223 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST NO LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST NO LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: 2HVS*CH219B NO AUTO CKT EST NO LOP | |
| 21-18-AE | 74936AJ3 | 99B-MS21B CONTROL ISOL FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF LOP MODE AND EMERGENCY POWER: 2HVS*CH219B NO AUTO CKT EST LOP | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-AD | 74946AJ3 | 99A-MS21A CONTROL ISOL FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 97 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-AX 75016AJ3 27-RP200X1 PERIODIC TEST
 CONTACT 113
 FAILS OPEN

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH A FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 2HVS*CH219A NO AUTO CKT EST LOP

IF EMERGENCY POWER
 AND LOP MODE:
 2HVS*CH219A NO AUTO CKT EST LOP

21-18-AX 75016AJ3 27-RP200X1 PERIODIC TEST
 CONTACT 113
 FAILS OPEN

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AX 75026AJ3 27-RP200X1 PERIODIC TEST
 COIL ENERGIZED
 BY SHORT CKT

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

IF LOP MODE
 AND EMERGENCY POWER:
 FILTERED AIR PATH B FAILURE

IF NORMAL POWER
 AND NO LOP MODE:
 FILTERED AIR PATH B FAILURE

IF EMERGENCY POWER
 AND LOP MODE:
 FILTERED AIR PATH B FAILURE

21-18-AX 75036AJ3 27-RP200X PERIODIC TEST
 CONTACT 111
 FAILS CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 FILTERED AIR PATH B FAILURE

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 98 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

| | | | | |
|----------|----------|---|---------------|---|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-BN | 75046AJ3 | 27-RP200X COIL ENERG BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE |
| 21-18-8Y | 75056AJ3 | 27-RP2200-EJSBA CONTACT 2 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| 21-18-BW | 75066AJ3 | 27-RP120C-EJSBA CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-21-18/2 SH 99 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-BY 75076AJ2 480 EMERG INDICATING LIGHT IF NO LOP MODE
 21-18-CA BUS 2P NO PWR IN CONTROL ROOM AND NORMAL POWER:
 AVAILABLE 27RP1200-EJSBA CONTACT 11 CLOSED
 27RP2200-EJSBA CONTACT 11 CLOSED
 27RP2200-EJSBA CONTACT 11 CLOSED

21-18-BY 75086AJ3 CKT EJSBH PERIODIC TEST IF LOP MODE
 120VAC CKT FUSE C AND EMERGENCY POWER:
 FAILS OPEN 27RP2200-EJSBA CONTACT 1 CLOSED
 27RP2200-EJSBA CONTACT 1 CLOSED
 27RP2200-EJSBA CONTACT 1 CLOSED

21-18-BY 75096AJ3 CKT EJSBH PERIODIC TEST IF LOP MODE
 480 CKT FUSE C AND EMERGENCY POWER:
 FAILS OPEN 27RP2200-EJSBA CONTACT 1 CLOSED
 27RP2200-EJSBA CONTACT 1 CLOSED
 27RP2200-EJSBA CONTACT 1 CLOSED

21-18-BY 75096AJ3 CKT EJSBH PERIODIC TEST IF LOP MODE
 480 CKT FUSE C AND EMERGENCY POWER:
 FAILS OPEN 27RP2200-EJSBA CONTACT 1 CLOSED
 27RP2200-EJSBA CONTACT 1 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 100 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|---|---------------|---|
| 21-18-BY | 75106AJ3 | CKT EJSBM 480-120VAC TRANSFORMER | PERIODIC TEST | IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NO LOP MODE AND NORMAL POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| 21-18-BY | 75116AJ3 | 1C-ENSBBX1 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| 21-18-CA | 75126AJ3 | 27-RP1200 A-B EJSBL COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |

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|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-1C/2 SH 101 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------|--|--|-----------------------------|--|---------------|
| 21-18-CE 75136AJ3 | 1C-ENSBBX1 COIL ENERG BY SHORT CKT | 1C-ENSBBX1 COIL ENERG BY SHORT CKT | PERIODIC TEST | IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED | |
| 21-18-CE 75146AJ3 | 1C-ENSBBX CONTACT 313 FAILS CLOSED | 1C-ENSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP2200-EJSBA CONTACT 1 CLOSED IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED | |
| 21-18-CA 75166AJ3 | 27-RP1200 B-C EJSBL COIL FAILS | 27-RP1200 B-C EJSBL COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED | |

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|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-18/2 SH 102 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|--|---------------|---|
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED |
| 21-18-CA | 75176AJ3 | 1A-EJSBBX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED |
| 21-18-C6 | 75186AJ3 | 1A-EJSBBX2 COIL ENERG BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED |
| 21-18-C6 | 75196AJ3 | 1A-EJSBBX CONTACT 311 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 103 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------|----------------------|----------------------------|-----------------------------|------------------|---------------|
| ***** | ***** | ***** | ***** | ***** | ***** |

| | | | | | |
|----------|----------|---------------------------------------|---------------|---|--|
| 21-18-CG | 75206AJ3 | 1A-EJSBB CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED | |
|----------|----------|---------------------------------------|---------------|---|--|

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|----------|----------|--|---------------|--|--|
| 21-18-CG | 75216AJ3 | 1A-EJSBBX OP COIL ENERG BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP1200-EJSBA CONTACT 11 CLOSED IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED | |
|----------|----------|--|---------------|--|--|

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|----------|----------|--|---------------|---|--|
| 21-18-CE | 75226AJ3 | 1C-ENSEBX OP COIL ENERG BY SHORT CKT | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP2200-EJSBA CONTACT 1 CLOSED IF LOP MODE AND EMERGENCY POWER: 27RP1200-EJSBA CONTACT 11 CLOSED IF NORMAL POWER AND NO LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED IF EMERGENCY POWER AND LOP MODE: 27RP1200-EJSBA CONTACT 11 CLOSED | |
|----------|----------|--|---------------|---|--|

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 104 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|--|---------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| 21-18-CE | 75236AJ3 | 1C-ENSBB CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 27RP2200-EJSBA CONTACT 1 CLOSED |
| 21-18-CC | 75246AJ3 | 52-EGPBA CONTACT 73 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 69-ENSBA ENERGIZING CKT ESTABLISHED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 69-ENSBA CONTACT 317 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 69-ENSBA ENERGIZING CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 69-ENSBA ENERGIZING CKT ESTABLISHED |
| 21-18-CH | 75256AJ3 | 52-ENSBC CONTACT 75 FAILS CLOSED | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 52-ENSBC CONTACT 75 CLOSED |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | J.O. 12241 FHEA-21-18/2 SH 10C |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-CH 75266AJ3 ACB 2F7 PERIODIC TEST
 FAILS CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 52-ENSBC CONTACT 75 CLOSED

 IF NORMAL POWER
 AND NO LOP MODE:
 52-ENSBC CONTACT 75 CLOSED

 IF EMERGENCY POWER
 AND LOP MODE:
 52-ENSBC CONTACT 75 CLOSED

 IF NO LOP MODE
 AND NORMAL POWER:
 52-ENSBC CONTACT 75 CLOSED

21-18-CH 75276AJ3 99X-52-NNSDC PERIODIC TEST
 CONTACT 14
 FAILS CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 52-ENSBC CONTACT 75 CLOSED

 IF NORMAL POWER
 AND NO LOP MODE:
 52-ENSBC CONTACT 75 CLOSED

 IF EMERGENCY POWER
 AND LOP MODE:
 52-ENSBC CONTACT 75 CLOSED

 IF NO LOP MODE
 AND NORMAL POWER:
 99X-52-NNSDC CONTACT 14 CLOSED

 IF LOP MODE
 AND EMERGENCY POWER:
 99X-52-NNSDC CONTACT 14 CLOSED

 IF NORMAL POWER
 AND NO LOP MODE:
 99X-52-NNSDC CONTACT 14 CLOSED

 IF EMERGENCY POWER
 AND LOP MODE:
 99X-52-NNSDC CONTACT 14 CLOSED

21-18-CH 75286AJ3 99-52-NNSDC PERIODIC TEST
 CONTACT
 FAILS CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 99X-52-NNSDC CONTACT 14 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-18/2 SH 106 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF LOP MODE
 AND EMERGENCY POWER:
 99X-52-NNSDC CONTACT 14 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 99X-52-NNSDC CONTACT 14 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 99X-52-NNSDC CONTACT 14 CLOSED

21-18-CH 75296AJ3 99X-52-NNSDC PERIODIC TEST
 COIL ENERGIZED
 BY SHORT CKT

IF NO LOP MODE
 AND NORMAL POWER:
 99X-52-NNSDC CONTACT 14 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 99X-52-NNSDC CONTACT 14 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 99X-52-NNSDC CONTACT 14 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 99X-52-NNSDC CONTACT 14 CLOSED

21-18-BM 75306AJ3 69-ENSBA PERIODIC TEST
 CONTACT 317
 FAILS CLOSED

IF NO LOP MODE
 AND NORMAL POWER:
 69-ENSBA CONTACT 317 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 69-ENSBA CONTACT 317 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 69-ENSBA CONTACT 317 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 69-ENSBA CONTACT 317 CLOSED

21-18-BM 75316AJ3 69-ENSBA OP COIL PERIODIC TEST
 ENERG BY
 SHORT CKT

IF NO LOP MODE
 AND NORMAL POWER:
 69-ENSBA CONTACT 317 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 107 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-18-CF 75326AJ3 162-ENSBA
 CONTACT 5
 FAILS CLOSED PERIODIC TEST

IF LOP MODE
 AND EMERGENCY POWER:
 69-ENSBA CONTACT 317 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 69-ENSBA CONTACT 317 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 69-ENSBA CONTACT 317 CLOSED

21-18-CF 75336AJ3 162-ENSBA COIL
 FAILURE PERIODIC TEST

IF LOP MODE
 AND EMERGENCY POWER:
 162-ENSBA CONTACT 5 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 162-ENSBA CONTACT 5 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 162-ENSBA CONTACT 5 CLOSED

21-18-CF 75346AJ3 99-1NNSDC CONTACT
 FAILS OPEN PERIODIC TEST

IF NO LOP MODE
 AND NORMAL POWER:
 69-ENSBA CONTACT 317 CLOSED

IF LOP MODE
 AND EMERGENCY POWER:
 162-ENSBA CONTACT 5 CLOSED

IF NORMAL POWER
 AND NO LOP MODE:
 162-ENSBA CONTACT 5 CLOSED

IF EMERGENCY POWER
 AND LOP MODE:
 162-ENSBA CONTACT 5 CLOSED

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-21-18/2 SH 108 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION SYSTEM *****

| | | | | |
|----------|----------|--|---------------------|--|
| | | | | IF LOP MODE AND EMERGENCY POWER: 162-ENSBA CONTACT 5 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 162-ENSBA CONTACT 5 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 162-ENSBA CONTACT 5 CLOSED |
| 21-18-CF | 75356AJ3 | 99-INNSDC COIL FAILS | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 69-ENSBA CONTACT 317 CLOSED |
| | | | | IF LOP MODE AND EMERGENCY POWER: 162-ENSBA CONTACT 5 CLOSED |
| | | | | IF NORMAL POWER AND NO LOP MODE: 162-ENSBA CONTACT 5 CLOSED |
| | | | | IF EMERGENCY POWER AND LOP MODE: 162-ENSBA CONTACT 5 CLOSED |
| 21-18-T | 75406AJ6 | 1-HVSAD IN PULL TO LOCK (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE |
| 21-18-T | 75416AJ3 | 1-HVSAD CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH A FAILURE |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| SUPPLEMENTARY LEAK COLLECTION SYS | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-18/2 SH 109 | | | | | |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSH IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-----------------|------------------------|--|-----------------------------|---|---------------|
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH A FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH A FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH A FAILURE | |
| 21-18-V | 75436AJ6 | 1-HVSBD IN PULL-TO-LOCK (OPERATOR ERROR) | PERIODIC INSPECTION | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-V | 75446AJ3 | 1-HVSBD CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF LOP MODE AND EMERGENCY POWER: FILTERED AIR PATH B FAILURE | |
| | | | | IF NORMAL POWER AND NO LOP MODE: FILTERED AIR PATH B FAILURE | |
| | | | | IF EMERGENCY POWER AND LOP MODE: FILTERED AIR PATH B FAILURE | |
| 21-18-BB | 75456CG3 | 2HVS*PDS24A SIGNAL FAILURE | PERIODIC TEST | IF NO LOP MODE AND NORMAL POWER: 2HVS*MOD202A-201A NO AUTO CKT ESTABLISHED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | SUPPLEMENTARY LEAK COLLECTION SYS |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-18/2 SH 110 |

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*****
FTSK  COMPONENT  COMPONENT AND  METHOD OF  EFFECT ON SYSTEM  OTHER  REMARKS
IDENTIFIER  FAILURE MODE  FAILURE DETECTION
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                IF LOP MODE
                AND EMERGENCY POWER:
                2HVS*MOD202A-201A NO AUTO CKT
                ESTABLISHED

                IF NORMAL POWER
                AND NO LOP MODE:
                2HVS*MOD202A-201A NO AUTO CKT
                ESTABLISHED

                IF EMERGENCY POWER
                AND LOP MODE:
                2HVS*MOD202A-201A NO AUTO CKT
                ESTABLISHED

21-18-BE  75466CH3  2HVS*PDS24B  PERIODIC TEST
SIGNAL FAILURE

                IF NO LOP MODE
                AND NORMAL POWER:
                2HVS*MOD202B NO AUTO CKT
                ESTABLISHED

                IF LOP MODE
                AND EMERGENCY POWER:
                2HVS*MOD202B NO AUTO CKT
                ESTABLISHED

                IF NORMAL POWER
                AND NO LOP MODE:
                2HVS*MOD202B NO AUTO CKT
                ESTABLISHED

                IF EMERGENCY POWER
                AND LOP MODE:
                2HVS*MOD202B NO AUTO CKT
                ESTABLISHED

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| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--|----------------------|--|----------------------------------|--------------------------------------|---------------|
| 21-19-D | Z1016AU2 | 2CAB*RCBPB-05 FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2HVR*MOD21B OPEN | |
| 21-19-D | Z1026AU2 | CKT-HVRBK SHORT CKT | INDICATING LIGHT IN CONTROL ROOM | 2HVR*MOD23B OPEN | |
| 21-19-C 21-19-E | Z0016UA2 | 2HVR*MOD23A NO 480V OPER POWER AVAIL TO MCC 2E13 | INDICATING LIGHT IN CONTROL ROOM | 2HVR*MOD23A OPEN | |
| 21-19-C | Z0026UA3 | CKT HVRAK 480-120V CONTRL POWER XFMR FAILS | PERIODIC TEST | 2HVR*MOD23A OPEN | |
| 21-19-C | Z0036UA3 | 42C-HVRAK COIL FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A OPEN | |
| 21-19-C | Z0046UA3 | 420-HVRAK INTL CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A OPEN | |
| 21-19-H | Z0056UA3 | LMS-HVRAK CONTACT0 FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A NO AUTO CLOS F CKT ESTD | |
| 21-19-H | Z0066UA3 | 2HVR*RQI104A HIRAD CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A NO AUTO CLOSE CKT ESTD | |
| 21-19-C 21-19-E 21-19-H 21-19-K | Z0076UA3 | 2HVR*RQI104A HI RAD SIGNAL FAILURE | PERIODIC TEST | 2HVR*MOD23A NO AUTO CLOSE CKT ESTD | |
| 21-19-H | Z0086UA3 | 1-HVRAK CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-H | Z0096UA6 | 1-HVRAK CONTACT L1 NOT IN CLOSE (OPER.ERROR) | PERIODIC INSPECTION | 2HVR*MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-H | Z0106UA3 | LMS-HVRAK CONTACT1 FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-H | Z0116UA3 | HVRAK-TQS-C FAILS OPEN | PERIODIC TEST | 2HVR*MOD23A NO MANUAL CLOSE CKT ESTD | |

Amendment 3

September 1984

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|----|---|---|-----------------|------------------------------------|
| | | | 4-19-84 12/1/82 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | RG | CONTAINMENT PURGE AIR SYSTEM |
| 14 | 3 | 2 | 1 | J.O. 12241 FMEA-21-19/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--|----------------------|--|-----------------------------|---|---------------|
| 21-19-M | Z0126UA3 | 2HVR*MOD23A EXCESSIVE TORQUE | PERIODIC TEST | 2HVR*MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-C | Z0136UA6 | 1-HVRAK CONTACT R1 IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 1-HVRAK CONTACT R1 CLOSED | |
| 21-19-C | Z0146UA3 | 2HVR*RQI104A BLOCKING CONTACT FAILS CLOSED | PERIODIC TEST | 2HVR*RQI104A BLOCKING CONTACT CLOSED | |
| 21-19-B | Z0176UA3 | CKT.HVRBK 480-120 CNTRL POWER XFR FAILS | PERIODIC TEST | 2HVR*MOD23B OPEN | |
| 21-19-B | Z0186UA3 | 42C-HVRBK COIL FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B OPEN | |
| 21-19-B | Z0196UA3 | 420-HVRBK INTL CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B OPEN | |
| 21-19-J | Z0206UA3 | LHS-HVRBK CONTACT8 FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B NO AUTO CLOSE CKT ESTD | |
| 21-19-J | Z0216UA3 | 2HVR*RQI104B HIRAD CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B NO AUTO CLOSE CKT ESTD | |
| 21-19-F 21-19-G 21-19-J 21-19-L | Z0226UA3 | 2HVR*RQI104B FAILS NO HIRAD SIGNAL | PERIODIC TEST | 2HVR*MOD23B NO AUTO CLOSE CKT ESTD | |
| 21-19-N | Z0236UA3 | 1-HVRBK CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-N | Z0246UA3 | LHS-HVRBK CONTACT1 FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-N | Z0256UA3 | HVRBK TQS-C FAILS OPEN | PERIODIC TEST | 2HVR*MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-N | Z0266UA3 | 2HVR*MOD23B EXCESSIVE TORQUE | PERIODIC TEST | 2HVR*MOD23B NO MANUAL CLOSE CKT ESTD | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTAINMENT PURGE AIR SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-19/2 SH 2 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---------------------------------------|---------------|
| 21-19-F | Z0276UA3 | 1-HVRBK CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-HVRBK CONTACT R1 CLOSED | |
| 21-19-F | Z0286UA6 | 1-HVRBK CONTACT R1 IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 1-HVRBK CONTACT R1 CLOSED | |
| 21-19-F | Z0296UA3 | 2HVR* RQI104B BLOCKING CONTACT FAILS CLOSED | PERIODIC TEST | 2HVR* RQI104B BLOCKING CONTACT CLOSED | |
| 21-19-R | Z0616UA3 | 49X-HVRAK CONTACTS FAILS OPEN | PERIODIC TEST | 2HVR* MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-R | Z0626UA3 | 49X-HVRAK COIL FAILS OPEN | PERIODIC TEST | 2HVR* MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-R | Z0636UA3 | 49-HVRAK CONTACT FAILS OPEN | PERIODIC TEST | 2HVR* MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-R | Z0646UA3 | 2HVR* MOD23A OVERLOAD | PERIODIC TEST | 2HVR* MOD23A NO MANUAL CLOSE CKT ESTD | |
| 21-19-S | Z0656UA3 | 49X-HVRBK CONTACTS FAILS OPEN | PERIODIC TEST | 2HVR* MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-S | Z0666UA3 | 49X-HVRBK COIL FAILS OPEN | PERIODIC TEST | 2HVR* MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-S | Z0676UA3 | 49-HVRBK CONTACT FAILS OPEN | PERIODIC TEST | 2HVR* MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-S | Z0686UA3 | 2HVR* MOD23B OVERLOAD | PERIODIC TEST | 2HVR* MOD23B NO MANUAL CLOSE CKT ESTD | |
| 21-19-C | Z0776UA3 | 1-HVRAK CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-HVRAK CONTACT R1 CLOSED | |
| 21-19-N | Z0786UA6 | 1-HVRBK CONTACT L1 NOT IN CLOSE (OPER.ERROR) | PERIODIC INSPECTION | 2HVR* MOD23B NO MANUAL CLOSE CKT ESTD | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTAINMENT PURGE AIR SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-19/2 SH 3 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 21-19-E | Z0326UB3 | CKT HVRAJ 480-120V CONTRL POWER XFHR FAILS | PERIODIC TEST | 2HVR*MOD25A OPEN | |
| 21-19-E | Z0336UB3 | 42C-HVRAJ COIL FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A OPEN | |
| 21-19-E | Z0346UB3 | 420-HVRAJ INTL CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A OPEN | |
| 21-19-K | Z0356UB3 | LMS-HVRAJ CONTACT8 FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A NO AUTO CLOSE CKT ESTD | |
| 21-19-K | Z0366UB3 | 2HVR*RQI104A HIRAD CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A NO AUTO CLOSE CKT ESTD | |
| 21-19-P | Z0386UB3 | 1-HVRAJ CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-P | Z0396UB3 | LMS-HVRAJ CONTACT1 FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-P | Z0406UB3 | HVRAJ TQS-C FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-P | Z0416UB3 | 2HVR*MOD25A EXCESSIVE TORQUE | PERIODIC TEST | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-E | Z0426UB3 | 1-HVRAJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-HVRAJ CONTACT R1 CLOSED | |
| 21-19-E | Z0436UB6 | 1-HVRAJ CONTACT R1 IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 1-HVRAJ CONTACT R1 CLOSED | |
| 21-19-E | Z0446UB3 | 2HVR*RQI104A BLOCKING CONTACT FAILS CLOSED | PERIODIC TEST | 2HVR*RQI104A BLOCKING CONTACT CLOSED | |
| 21-19-D | Z0476UB3 | CKT HVRBJ 480-120V CONTRL POWER XFHR FAILS | PERIODIC TEST | 2HVR*MOD25B OPEN | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CONTAINMENT PURGE AIR SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-19/2 SH 4 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--------------------------------------|---------------|
| 21-19-D | Z0486UB3 | 420-HVRBJ INTL CONTACT FAILS OPEN | PERIODIC TEST | 2HVR#MOD25B OPEN | |
| 21-19-L | Z0496UB3 | LHS-HVRBJ CONTACT8 FAILS OPEN | PERIODIC TEST | 2HVR#MOD25B NO AUTO CLOSE CKT ESTD | |
| 21-19-L | Z0506UB3 | 2HVR#RQI104B HIRAD CONTACT FAILS OPEN | PERIODIC TEST | 2HVR#MOD25B NO AUTO CLOSE CKT ESTD | |
| 21-19-Q | Z0526UB3 | 1-HVRBJ CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVR#MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-Q | Z0536UB4 | 1-HVRBJ CONTACT L1 NOT IN CLOSE (OPER.ERROR) | PERIODIC INSPECTION | 2HVR#MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-Q | Z0546UB3 | LHS-HVRBJ CONTACT1 FAILS OPEN | PERIODIC TEST | 2HVR#MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-Q | Z0556UB3 | HVRBJ TQS-C FAILS OPEN | PERIODIC TEST | 2HVR#MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-Q | Z0566UB3 | HVR#MOD25B EXCESSIVE TORQUE | PERIODIC TEST | 2HVR#MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-G | Z0576UB3 | 1-HVRBJ CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-HVRBJ CONTACT R1 CLOSED | |
| 21-19-G | Z0586UB4 | 1-HVRBJ CONTACT R1 IN OPEN (OPER.ERROR) | PERIODIC INSPECTION | 1-HVRBJ CONTACT R1 CLOSED | |
| 21-19-G | Z0596UB3 | 2HVR#RQI104B BLOCKING CONTACT FAILS CLOSED | PERIODIC TEST | 2HVR#RQI104B BLOCKING CONTACT CLOSED | |
| 21-19-T | Z0696UB3 | 49X-HVRAJ CONTACT3 FAILS OPEN | PERIODIC TEST | 2HVR#MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-T | Z0706UB3 | 49X-HVRAJ COIL FAILS OPEN | PERIODIC TEST | 2HVR#MOD25A NO MANUAL CLOSE CKT ESTD | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTAINMENT PURGE AIR SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12291 FMEA-21-19/2 SH 5 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|---|-------------------------------------|---|---------------|
| 21-19-T | Z0716UB3 | 49-HVRAJ CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-T | Z0726UB3 | 2HVR*25A OVERLOAD | PERIODIC TEST | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-U | Z0736UB3 | 49X-HVRBJ CONTACT3 FAILS OPEN | PERIODIC TEST | 2HVR*MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-U | Z0746UB3 | 49X-HVRBJ COIL FAILS OPEN | PERIODIC TEST | 2HVR*MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-U | Z0756UB3 | 49-HVRBJ CONTACT FAILS OPEN | PERIODIC TEST | 2HVR*MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-U | Z0766UB3 | 2HVR*MOD25B OVERLOAD | PERIODIC TEST | 2HVR*MOD25B NO MANUAL CLOSE CKT ESTD | |
| 21-19-P | Z0796UB6 | 1-HVRAJ CONTACT L1 NOT IN CLOSE (OPER.ERROR) | PERIODIC INSPECTION | 2HVR*MOD25A NO MANUAL CLOSE CKT ESTD | |
| 21-19-D | Z0806UB3 | 42C-HVRBJ COIL FAILS OPEN | PERIODIC TEST | 2HVR*MOD25B OPEN | |
| 21-19-D 21-19-D | Z1046UB2 | 2HVR*MOD23B-25B NO 480V PWR AVAIL TO MCC 2E14 | INDICATING LIGHT IN CONTROL ROOM | 2HVR*MOD23B OPEN | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CONTAINMENT PURGE AIR SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-21-19/2 SH 6 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|--|---------------|
| 21-23-M | 301110P1 | CKT HVHAB NO PWR AVAILABLE FROM PNLWAC2-E5 | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL | |
| 21-23-M | 301210P1 | CKT HVHAB SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL | |
| 21-23-M | 301310P1 | CKT HVHAB CKT BKR FAILS | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL | |
| 21-23-R | 301410P3 | 1-HVMAA CONT R1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: NONE IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: NONE IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: NONE | |

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September 1984

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | INTAKE STRUCTURE VENTILATION SYSTEM |
| 14 | 3 | 2 | 1 | | | J.O. 12241 HEA-21-23/2 SH 1 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-23-R 30151DP3 1-HV'AA PERIODIC TEST IF FN 257A IN SERVICE
 CONT L1 FAILS AND FN 257B IN SERVICE:
 OPEN 2HVN*MOD21A NO AUTO CKT ESTABLISHED

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 2HVN*MOD21A NO AUTO CKT ESTABLISHED

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 2HVN*MOD21A NO AUTO CKT ESTABLISHED

21-23-M 30161DP3 2HVN*MOD21A PERIODIC TEST IF FN 257A IN SERVICE
 MOTOR FAILS AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 FN 257A OR MOD21A FAIL

21-23-M 30171DP3 HVHAB RV SOLENOID PERIODIC TEST IF FN 257A IN SERVICE
 FAILS AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 FN 257A OR MOD21A FAIL

21-23-M 30181DP3 HVHAB LMS CONT PERIODIC TEST IF FN 257A IN SERVICE
 FAILS AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 FN 257A OR MOD21A FAIL

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | INTAKE STRUCTURE VENTILATION SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-23/2 SH 2 |

| FTSN | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|---------------|
| 21-23-R | 301910P3 | 2HVN*TH23A FAILS | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVN*HOD21A NO AUTO CKT ESTABLISHED | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: 2HVN*HOD21A NO AUTO CKT ESTABLISHED | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: 2HVN*HOD21A NO AUTO CKT ESTABLISHED | |
| 21-23-R | 302010P3 | 2HVN*TH23A CONT 1A FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVN*HOD21A NO AUTO CKT ESTABLISHED | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: 2HVN*HOD21A NO AUTO CKT ESTABLISHED | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: 2HVN*HOD21A NO AUTO CKT ESTABLISHED | |
| 21-23-N | 303210P1 | CKT HV*BB SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: FN 257B OR MOD21B FAIL | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| 21-23-N | 303310P1 | CKT HV*BB NO PHR AVAILABLE FROM PNL*AC2-E6 | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: FN 257B OR MOD21B FAIL | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |

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|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | INTAKE STRUCTURE VENTILATION SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-23/2 SH 3 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION *****

21-23-N 30341DP1 CKT HVMBB CKT BKR ANNUNCIATED IN IF FN 257A IN SERVICE
 FAILS CONTROL ROOM AND FN 257B IN SERVICE
 PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257B OR MOD21B FAIL
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

21-23-S 30351DP3 1-HVMSA PERIODIC TEST IF FN 257A IN SERVICE
 CONT L1 FAILS AND FN 257B IN SERVICE:
 OPEN 2HVMSA MOD21B NO AUTO CKT ESTABLISHED

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 2HVMSA MOD21B NO AUTO CKT ESTABLISHED
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 2HVMSA MOD21B NO AUTO CKT ESTABLISHED

21-23-N 30361DP3 2HVMSA MOD21B PERIODIC TEST IF FN 257A IN SERVICE
 MOTOR FAILS AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257B OR MOD21B FAIL
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

21-23-N 30371DP3 HVMBB RV SOLENOID PERIODIC TEST IF FN 257A IN SERVICE
 FAILS AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257B OR MOD21B FAIL
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

| | | | | |
|---|---|---|---|-------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | INTAKE STRUCTURE VENTILATION SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-23/2 SH 4 |

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*****
FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
IDENTIFIER FAILURE MODE FAILURE DETECTION
*****
21-23-H 30381DP3 HVHBB LHS CONT PERIODIC TEST IF FN 257A IN SERVICE
FAILS AND FN 257B IN SERVICE:
PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
AND FN 257C IN SERVICE ON MCC#2-E02:
FN 257B OR MOD21B FAIL

IF FN 257C IN SERVICE ON MCC#2-E01
AND FN 257B IN SERVICE:
PATH B VENT SYSTEM FAILS

21-23-S 30391DP3 2HVH*TH23B FAILS PERIODIC TEST IF FN 257A IN SERVICE
AND FN 257B IN SERVICE:
2HVH*MOD21B NO AUTO CKT ESTABLISHED

IF FN 257A IN SERVICE
AND FN 257C IN SERVICE ON MCC#2-E02:
2HVH*MOD21B NO AUTO CKT ESTABLISHED

IF FN 257C IN SERVICE ON MCC#2-E01
AND FN 257B IN SERVICE:
2HVH*MOD21B NO AUTO CKT ESTABLISHED

21-23-S 30401DP3 2HVH*TH23B PERIODIC TEST IF FN 257A IN SERVICE
CONT 1A AND FN 257B IN SERVICE:
FAILS OPEN 2HVH*MOD21B NO AUTO CKT ESTABLISHED

IF FN 257A IN SERVICE
AND FN 257C IN SERVICE ON MCC#2-E02:
2HVH*MOD21B NO AUTO CKT ESTABLISHED

IF FN 257C IN SERVICE ON MCC#2-E01
AND FN 257B IN SERVICE:
2HVH*MOD21B NO AUTO CKT ESTABLISHED

21-23-S 30411DP3 1-HVHBB PERIODIC TEST IF FN 257A IN SERVICE
CONT R1 FAILS AND FN 257B IN SERVICE:
OPEN NONE

IF FN 257A IN SERVICE
AND FN 257C IN SERVICE ON MCC#2-E02:
NONE

IF FN 257C IN SERVICE ON MCC#2-E01
AND FN 257B IN SERVICE:
NONE

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
|-------------------------------------|---|---|---|--|
| INTAKE STRUCTURE VENTILATION SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FNEA-21-23/2 SH 5 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-23-P 30531DP1 CKT HVNCC 480-
 120V XFMR FROM
 MCC#2-E01 FAILS ANNUNCIATED IN
 CONTROL ROOM IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257C OR MOD21C FAIL
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

21-23-Q 30541DP3 2HVM#MOD21C
 MOTOR FAILS PERIODIC TEST IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH B VENT SYSTEM FAILS
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

21-23-Q 30551DP3 HVNCC LMS
 CONT FAILS PERIODIC TEST IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH B VENT SYSTEM FAILS
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

21-23-Q 30561DP3 HVNCC RV SOLENOID
 FAILS PERIODIC TEST IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH B VENT SYSTEM FAILS
 IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-23-P 30591DP1 CKT HVNCC ANNUNCIATED IN IF FN 257A IN SERVICE
 MCC*2-E01 CONTROL ROOM AND FN 257B IN SERVICE:
 SHORT CKT FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 FN 257C OR MOD21C FAIL

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

21-23-P 30601DP1 CKT HVNCC ANNUNCIATED IN IF FN 257A IN SERVICE
 MCC*2-E01 FUSE CONTROL ROOM AND FN 257B IN SERVICE:
 FAILS OPEN FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 FN 257C OR MOD21C FAIL

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

21-23-Q 31111DP1 CKT HVNCC ANNUNCIATED IN IF FN 257A IN SERVICE
 MCC*2-E02 490- CONTROL ROOM AND FN 257B IN SERVICE:
 120V XFMR FAILS FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 PATH B VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

21-23-Q 31121DP1 CKT HVNCC ANNUNCIATED IN IF FN 257A IN SERVICE
 MCC*2-E02 CONTROL ROOM AND FN 257B IN SERVICE:
 FUSE FAILS OPEN FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC*2-E02:
 PATH B VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC*2-E01
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

| | | | | | |
|---|---|---|---|--|-------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | INTAKE STRUCTURE VENTILATION SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-21-23/2 SH 7 |

 FTS# COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-23-Q 31131DP1 CKT HVHCC ANNUNCIATED IN IF FN 257A IN SERVICE
 MCC#2-E02 CONTROL ROOM AND FN 257B IN SERVICE:
 SHORT CKT FN 257C OR MOD21C FAIL

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH B VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 FN 257C OR MOD21C FAIL

21-23-D 30016EX3 42-HVHAA PERIODIC TEST IF FN 257A IN SERVICE
 COIL FAILS AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 FN 257A OR MOD21A FAIL

21-23-D 30046EX1 CKT HVHAA ANNUNCIATED IN IF FN 257A IN SERVICE
 120 CONT PHR CONTROL ROOM AND FN 257B IN SERVICE:
 XFMR FAILS PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 FN 257A OR MOD21A FAIL

21-23-D 30056EX1 NO 480V ANNUNCIATED IN IF FN 257A IN SERVICE
 21-23-E PHR AVAILABLE CONTROL ROOM AND FN 257B IN SERVICE:
 21-23-P FROM MCC#2-E01 PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

| | | | | | | |
|---|---|---|---|--|-------------------------------------|--|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | | INTAKE STRUCTURE VENTILATION SYSTEM | |
| 4 | 3 | 2 | 1 | | | |
| | | | | | J.O. 12241 FMEA-21-23/2 SH 8 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|------------------------------------|-----------------------------|---|---------------|
| 21-23-D | 30066EX1 | CKT HVNAA FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | <p>IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL</p> | |
| 21-23-D | 30076EX1 | CKT HVNAA SHORT CKT | ANNUNCIATED IN CONTROL ROOM | <p>IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL</p> | |
| 21-23-D | 30086EX3 | 49-HVNAA CONT FAILS OPEN | PERIODIC TEST | <p>IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL</p> | |
| 21-23-D | 30096EX1 | 2HVH#FN257A MOTOR THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | <p>IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH A VENT SYSTEM FAILS</p> <p>IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257A OR MOD21A FAIL</p> | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

21-23-D 30106EX3 HVMAA CONT C PERIODIC TEST IF FN 257A IN SERVICE
 FAILS OPEN AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH A VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 FN 257A OR MOD21A FAIL

21-23-F 30226EX3 42-HVH9A PERIODIC TEST
 COIL FAILS

IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257B OR MOD21B FAIL

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

21-23-F 30256EX1 CKT HVH9A ANNUNCIATED IN
 480-120V CONTROL ROOM
 XFHR FAILS

IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257B OR MOD21B FAIL

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

21-23-F 30266EX1 NO 480V ANNUNCIATED IN
 21-23-G PWR AVAILABLE CONTROL ROOM
 21-23-Q ON MCC#2-E02

IF FN 257A IN SERVICE
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 PATH B VENT SYSTEM FAILS

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH B VENT SYSTEM FAILS

| | | | | |
|-------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| INTAKE STRUCTURE VENTILATION SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-23/2 SH 10 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|--------------------------------|--|---------------|
| 21-23-F | 30276EX1 | CKT HV1BA SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257B OR MOD21B FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| 21-23-F | 30286EX3 | 49-HV1BA CONT FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257B OR MOD21B FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| 21-23-F | 30296EX1 | 2HV#FN257B MOTOR THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257B OR MOD21B FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| 21-23-F | 30306FX3 | HV#BA-LHO CONT C FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257B OR MOD21B FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------|----------------------------------|---|---------------|
| 21-23-F | 3316EX1 | CKT HVVCA FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257B OR MOD21B FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH B VENT SYSTEM FAILS | |
| 21-23-E | 30446EX3 | 42-HVCA COIL FAILS | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-J | 30456EX3 | 1A-HVCA CONT L1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVW*FN257C CKT HVVCA NO AUTO CKT ESTAB IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: 2HVW*FN257C CKT HVVCA NO AUTO CKT ESTAB IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: 2HVW*FN257C CKT HVVCA NO AUTO CKT ESTAB | |
| 21-23-P | 30466EX2 | CKT HVVCA 43-4 CONTS FAIL OPEN | INDICATING LIGHT IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |

| | | | | | |
|---|---|---|---|-------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | INTAKE STRUCTURE VENTILATION SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FHEA-21-23/2 SH 12 | |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSH | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|-------------------------------------|--|---------------|
| 21-23-P | 30476EX2 | CKT HVNCA 43-3 CONTS FAIL OPEN | INDICATING LIGHT IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-E | 30486EX1 | CKT HVNCA 480-120V XFHR FAILS | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-E | 30496EX1 | CKT HVNCA SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-E | 30506EX1 | CKT HVNCA 120V FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|--|--------------------------------|--|---------------|
| 21-23-E | 30516EX3 | 49-HVHCA CONT FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-E 21-23-G | 30526EX1 | 2HVH*FN257C THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-J | 30576EX3 | 2HVH*TH23C FAILS | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVH*FN257C CKT HVHCA NO AUTO CKT ESTAB IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: 2HVH*FN257C CKT HVHCA NO AUTO CKT ESTAB IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: 2HVH*FN257C CKT HVHCA NO AUTO CKT ESTAB | |
| 21-23-J | 30586EX3 | 2HVH*TH23C HI TEMP CONT FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVH*FN257C CKT HVHCA NO AUTO CKT ESTAB IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: 2HVH*FN257C CKT HVHCA NO AUTO CKT ESTAB | |

| | | | | | |
|---|---|---|---|-------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | INTAKE STRUCTURE VENTILATION SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-21-23/2 SH 14 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|--------------------------------|--|---------------|
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: 2HVH*FN257C CKT HVNCA NO AUTO CKT ESTAB | |
| 21-23-G | 30616EX3 | 49-HVNCB CONT FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-G | 30626EX3 | 42-HVNCB COIL FAILS | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-G | 30646EX1 | CKT HVNCB SHORT CKT | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-G | 30656EX1 | CKT HVNCB 120V FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------|-----------------------------|--|---------------|
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-L | 30676EX3 | 1-HVHCB CONT L1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVM*FN257C CKT HVHCB NO AUTO CKT ESTAB | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: 2HVM*FN257C CKT HVHCB NO AUTO CKT ESTAB | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: 2HVM*FN257C CKT HVHCB NO AUTO CKT ESTAB | |
| 21-23-G | 30686EX1 | CKT HVHCB 480-120V XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-J | 31006EX3 | 1-HVNCA CONTACT R1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: NONE | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: NONE | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: NONE | |
| 21-23-H | 31016EX3 | 62-HVNCA CONTACT S1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL | |

| | | | | |
|-------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| INTAKE STRUCTURE VENTILATION SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-21-23/2 SH 16 | | | | |

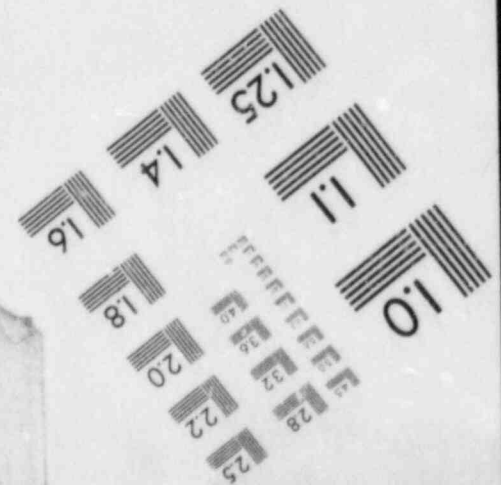
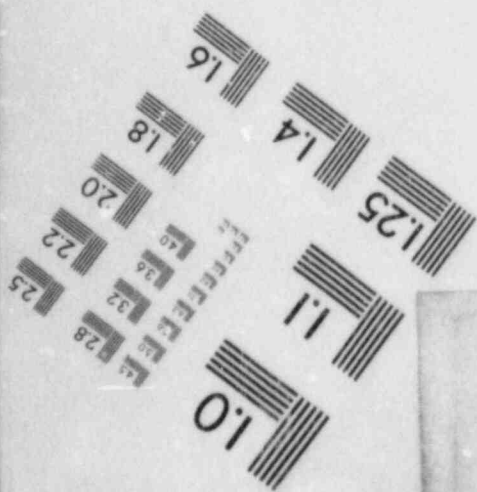
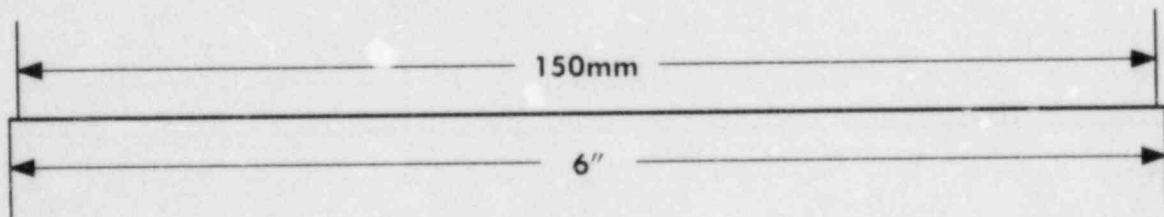
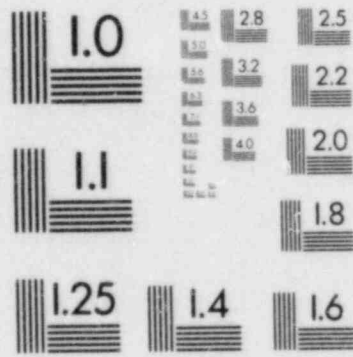
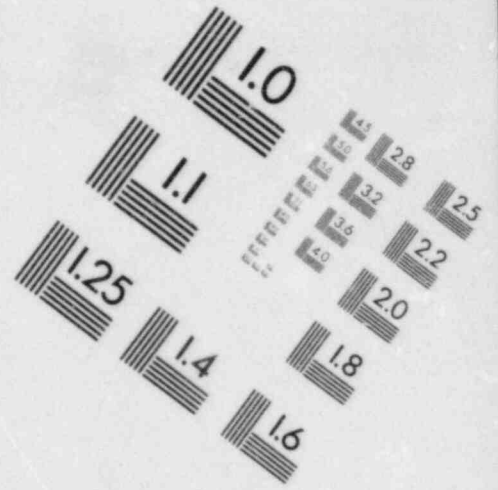
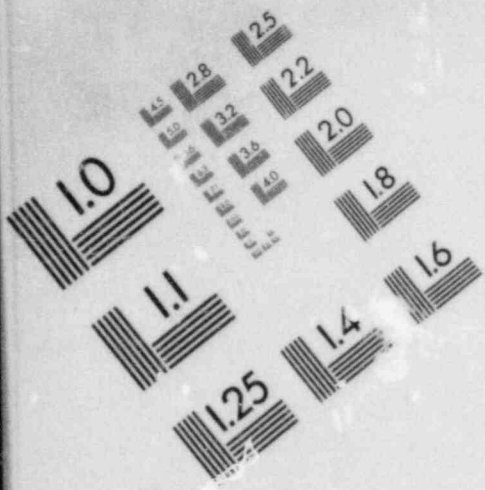
| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-H | 31026EX3 | 62-HVHCA COIL FAILS | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-H | 31036EX3 | 2HVH#MOD21C LO2 CONT C FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: PATH A VENT SYSTEM FAILS | |
| 21-23-L | 31046EX3 | 1-HVMCB CONTACT R1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: NONE | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: NONE | |
| | | | | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: NONE | |
| 21-23-H | 31056EX3 | 62-HVMCB CONTACT B1 FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 21-23-K | 31066EX3 | 62-HVNCB COIL FAILS | PERIODIC TEST | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-K | 31076EX3 | 2HVH*TH23C1 CONTACT 1A FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |
| 21-23-L | 31086EX3 | 2HVH*TH23C1 HI TEMP CONTACT FAILS OPEN | PERIODIC TEST | IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: PATH B VENT SYSTEM FAILS | |
| 21-23-L | 31096EX3 | 2HVH*TH23C1 FAILS | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: 2HVH*FN257C CKT HVHCB NO AUTO CKT ESTAB IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC#2-E02: 2HVH*FN257C CKT HVHCB NO AUTO CKT ESTAB IF FN 257C IN SERVICE ON MCC#2-E01 AND FN 257B IN SERVICE: 2HVH*FN257C CKT HVHCB NO AUTO CKT ESTAB | |

| | | | | |
|-------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| INTAKE STRUCTURE VENTILATION SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-23/2 5H 18 | | | | |

IMAGE EVALUATION
TEST TARGET (MT-3)



 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-----------------|------------------------|---|-------------------------------------|---|---------------|
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: 2HVN*FN257C CKT HVNCB NO AUTO CKT ESTAB | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: 2HVN*FN257C CKT HVNCB NO AUTO CKT ESTAB | |
| 21-23-K | 31106EX3 | 2HVN*MOD21C LO1 CONT C FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-Q | 31146EX2 | BRKR 43-2 CONTS FAIL OPEN | INDICATING LIGHT IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-Q | 31156EX2 | BRKR 43-1 CONTS FAIL OPEN | INDICATING LIGHT IN CONTROL ROOM | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| | | | | IF FN 257A IN SERVICE AND FN 257C IN SERVICE ON MCC*2-E02: PATH B VENT SYSTEM FAILS | |
| | | | | IF FN 257C IN SERVICE ON MCC*2-E01 AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |
| 21-23-H | 31166EX3 | 2HVN*TH23C CONTACT 1A FAILS OPEN | PERIODIC TEST | IF FN 257A IN SERVICE AND FN 257B IN SERVICE: FN 257C OR MOD21C FAIL | |

| | | | | |
|-------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| INTAKE STRUCTURE VENTILATION SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-21-23/2 SH 19 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF FN 257A IN SERVICE
 AND FN 257C IN SERVICE ON MCC#2-E02:
 FN 257C OR MOD21C FAIL

IF FN 257C IN SERVICE ON MCC#2-E01
 AND FN 257B IN SERVICE:
 PATH A VENT SYSTEM FAILS

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|-------------------------------------|-----------------------------|---|-----------------------------|
| 21-34-C | V0011DS3 | 2HVD*MOD23A MOTOR FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-H | V0021DS3 | 42-HVDAA CONTACT 2 FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-C 21-34-H | V0031DS3 | 2HVD*TC21A FAILS LOW | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-H | V0041DS3 | 2HVD*MOD22A MOTOR FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-H | V0051DS1 | CKT HVDAD NO 120VAC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-H | V0061DS1 | CKT HVDAD 120VAC ACB OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-H | V0071DS1 | CKT HVDAD SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-E | V0201DS3 | 2HVD*MOD21A MOTOR FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-E | V0211DS3 | 42-HVDAA CONTACT 7 FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-E | V0221DS1 | CKT HVDAC NO 120VAC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-E | V0231DS1 | CKT HVDAC 120VAC ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-E | V0241DS1 | CKT HVDAC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-K | V2011DS3 | 42-HVDAE SEAL-IN CONT 7 FAILS OPEN | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |
| 21-34-K | V2021DS3 | 2HVD*TH22A CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |

Amendment 3

September 1984

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|---|---|---|---------|-----------|-----|------------------------------------|
| | | | 6/18/84 | AO3/12/84 | 2 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | 2001 | 2001 | | DIESEL GENERATOR BLDG VENT SYSTEM |
| 4 | 3 | 2 | RG | 1 | RRP | |
| | | | | | | J.O. 12241 FMEA-21-34/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|-----------------------------|
| 21-34-K | V2031DS3 | 2HVD*TH22A SIGNAL FAILURE | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |
| 21-34-E | V2121DS3 | 2HVD*HOD21A LHS CONTACT FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-E | V2131DS3 | 2HVD*HOD21A RV SOLENOID FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-H | V2161DS3 | 2HVD*HOD22A RV SOLENOID FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-C | V2171DS3 | 2HVD*HOD23 RV SOLENOID FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2201DS1 | CKT HVDAE NO 480VAC OPER PHR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2211DS1 | CKT HVDAE SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2221DS1 | CKT HVDAE 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2231DS3 | 42-HVDAE COIL FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2241DS3 | 49-HVDAE CONTACT FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2251DS3 | 2HVD*FN271A THERMAL OVERLOAD | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-D | V2261DS3 | 1-HVDAE CONTACT R1 FAILS OPEN | PERIODIC TEST | 1-HVDAE MANUAL CONTACT R1 OPEN | |
| 21-34-D | V2271DS6 | 1-HVDAE NOT IN START OPERATOR ERROR | PERIODIC INSPECTION | 1-HVDAE MANUAL CONTACT R1 OPEN | |
| 21-34-K | V2281DS3 | 1-HVDAE CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| DIESEL GENERATOR BLDG VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-34/2 SH 2 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|---|--------------------------------|--|--------------------------------|
| 21-34-K | V2291DS6 | 1-HVDAE NOT IN AUTO OPERATOR ERROR | PERIODIC INSPECTION | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |
| 21-34-K | V2301DS3 | 3-HVDAD CONTACT 14 FAILS OPEN | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |
| 21-34-K | V2311DS3 | 2HVD*TH22A CONTACT 2A FAILS OPEN | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |
| 21-34-K | V2321DS3 | 2HVD*TH22A FAILURE | PERIODIC TEST | 2HVD*FN271A NO AUTO START CKT ESTABLISHED | |
| 21-34-B | V0351DT3 | 2HVD*MOD23B MOTOR FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-J | V0361DT3 | 42-HVDBA CONTACT 2 FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-B 21-34-J | V0371DT3 | 2HVD*TC21B FAILS LOW | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-J | V0381DT3 | 2HVD*MOD22B MOTOR FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-J | V0391DT1 | CKT HVDBD NO 120VAC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-J | V0401DT1 | CKT HVDBD 120VAC ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | NONE | |
| 21-34-J | V0411DT1 | CKT HVDBD SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NONE | |
| 21-34-G | V0541DT3 | 2HVD*MOD21B MOTOR FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-G | V0551DT3 | 42-HVDBA CONTACT 7 FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-G | V0561DT1 | CKT HVDBC NO 120VAC POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| DIESEL GENERATOR BLDG VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-34/2 SH 3 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|--|--------------------------------|
| 21-34-G | V0571DT1 | CKT HVDBC 120VAC ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-G | V0561DT1 | CKT HVDBC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-L | V2061DT3 | 2HVD*TH22B CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-L | V2071DT3 | 2HVD*TH22A CONTACT 1A SIGNAL FAILURE | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-G | V2141DT3 | 2HVD*HOD21B LMS CONTACT FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-G | V2151DT3 | 2HVD*HOD21B RV SOLENOID FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-J | V2161DT3 | 2HVD*HOD22B RV SOLENOID FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-B | V2191DT3 | 2HVD*HOD23B RV SOLENOID FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-F | V2331DT1 | CKT HVDBE NO 480VAC OPER PHR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-F | V2341DT1 | CKT HVDBE SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-F | V2351DT1 | CKT HVDBE 480-120ACV XFHR FAILS | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-F | V2361DT3 | 42-HVDBE COIL FAILS | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-F | V2371DT3 | 49-HVDBE CONTACT FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-F | V2381DT3 | 2HVD*FN271B THERMAL OVERLOAD | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | DIESEL GENERATOR BLDG VENT SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-21-34/2 SH 4 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 21-34-F | V2391DT3 | 1-HVDBE CONTACT R1 FAILS OPEN | PERIODIC TEST | 1-HVDBE MANUAL CONT R1 OPEN | |
| 21-34-F | V2401DT6 | 1-HVDBE NOT IN START OPERATOR ERROR | PERIODIC INSPECTION | 1-HVDBE MANUAL CONT R1 OPEN | |
| 21-34-L | V2411DT3 | 1-HVDBE CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-L | V2421DT6 | 1-HVDBE NOT IN AUTO OPERATOR ERROR | PERIODIC INSPECTION | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-L | V2431DT3 | 3-HVDBD CONTACT 14 FAILS OPEN | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-L | V2441DT3 | 2HVD*TH22B CONTACT 2A FAILS OPEN | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-L | V2451DT3 | 2HVD*TH22A FAILURE | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-L | V3011DT3 | 42-HVDBE SEAL-IN CONT 7 FAILS OPEN | PERIODIC TEST | 2HVD*FN271B NO AUTO START CKT ESTABLISHED | |
| 21-34-V | V08512A3 | 3-EGSAAX1 COIL FAILS | PERIODIC TEST | 3-EGSAAX1 CONTACT 221 OPEN | |
| 21-34-W | V08612A3 | 3-EGSAAX2 COIL FAILS | PERIODIC TEST | 3-EGSAAX2 CONTACT 221 OPEN | |
| 21-34-V | V08712A3 | CKT EGSAA CONTACT ES-1 FAILS OPEN | PERIODIC TEST | NONE | |
| 21-34-W | V08812A1 | CKT EGSAA NO 125VDC CONT PWR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-W | V08912A3 | CKT EGSAA CONTACT TSR FAILS OPEN | PERIODIC TEST | 3-EGSAAX2 CONTACT 221 OPEN | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| DIESEL GENERATOR BLDG VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-34/2 SH 5 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|--------------------------------|--|---------------|
| 21-34-M | V09012A3 | DIESEL GEN 2-1 NO TEST START SIGNAL | PERIODIC TEST | 3-EGSAAX2 CONTACT 221 OPEN | |
| 21-34-V | V09112A3 | CKT EGSAA CONTACT ES-2 FAILS OPEN | PERIODIC TEST | CKT EGSAA CONTACT ES-2 OPEN | |
| 21-34-V | V09212A7 | DIESEL GEN 2-1 NO EMERGENCY START | PERIODIC TEST | CKT EGSAA CONTACT ES-2 OPEN | |
| 21-34-M | V09312A1 | CKT EGSAA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-M | V09412A1 | CKT EGSAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-M | V09512A1 | CKT EGSAA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-X | V09612B3 | 3-EGSBAX1 COIL FAILS | PERIODIC TEST | 3-EGSBAX1 CONTACT 221 OPEN | |
| 21-34-Y | V09712B3 | 3-EGSBAX2 COIL FAILS | PERIODIC TEST | 3-EGSBAX2 CONTACT 221 OPEN | |
| 21-34-X | V09812B3 | CKT EGSBA CONTACT ES-1 FAILS OPEN | PERIODIC TEST | NONE | |
| 21-34-Y | V09912B1 | CKT EGSBA NO 120VDC CONT PHR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-Y | V10012B3 | CKT EGSBA CONTACT TSR FAILS OPEN | PERIODIC TEST | 3-EGSBAX2 CONTACT 221 OPEN | |
| 21-34-Y | V10112B3 | DIESEL GEN 2-2 NO TEST START | PERIODIC TEST | 3-EGSBAX2 CONTACT 221 OPEN | |
| 21-34-X | V10212B3 | CKT EGSBA CONTACT ES-2 FAILS OPEN | PERIODIC TEST | CKT EGSBA CONTACT ES-2 OPEN | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | DIESEL GENERATOR BLDG VENT SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-21-34/2 SH 6 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---------------------------------------|-----------------------------|---|-----------------------------|
| 21-34-X | V10312B3 | DIESEL GEN 2-2 NO EMERGENCY START | PERIODIC TEST | CKT EGSBA CONTACT ES-2 OPEN | |
| 21-34-Y | V10412B1 | CKT EGSBA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-Y | V10512B1 | CKT EGSBA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-Y | V10612B1 | CKT EGSBA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-M | V0086EP1 | CKT HVDA A NO 480VAC OPER PHR AVAIL | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-M | V0106EP3 | 42-HVDA A COIL FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-M | V0116EP1 | 49-HVDA A CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-M | V0126EP1 | 2HVD*FN270A MOTOR OVERLOAD | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-M | V0136EP3 | 1-HVDA A CONTACT R1 FAILS OPEN | PERIODIC TEST | 1-HVDA A CONTACT R1 OPEN | |
| 21-34-M | V0146EP6 | 1-HVDA A NOT IN START OPERATOR ERROR | PERIODIC INSPECTION | 1-HVDA A CONTACT R1 OPEN | |
| 21-34-R | V0166EP3 | 1-HVDA A CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-R | V0176EP6 | 1-HVDA A NOT IN AUTO OPERATOR ERROR | PERIODIC INSPECTION | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-R | V0186EP3 | 3-EGSAAX1 CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-EGSAAX1 CONTACT 221 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|-----------------------------|---|-----------------------------|
| 21-34-R | V0196EP3 | 3-EGSAAX2 CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-EGSAAX2 CONTACT 221 OPEN | |
| 21-34-N | V0426EP1 | CKT HVDBA NO 480VAC OP PHR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-N | V0446EP3 | 42-HVDBA COIL FAILS OPEN | PERIODIC TEST | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-N | V0456EP1 | 49-HVDBA CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-N | V0466EP1 | 2HVD*FN270B MOTOR OVERLOAD | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-N | V0476EP3 | 1-HVDBA CONTACT R1 FAILS OPEN | PERIODIC TEST | 1-HVDBA CONTACT R1 OPEN | |
| 21-34-N | V0486EP6 | 1-HVDBA NOT IN START OPERATOR ERROR | PERIODIC INSPECTION | 1-HVDBA CONTACT R1 OPEN | |
| 21-34-S | V0506EP3 | 1-HVDBA CONTACT L1 FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-S | V0516EP6 | 1-HVDBA NOT IN AUTO OPERATOR ERROR | PERIODIC INSPECTION | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-S | V0526EP3 | 3-EGSBAX1 CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-EGSBAX1 CONTACT 221 OPEN | |
| 21-34-S | V0536EP3 | 3-EGSBAX2 CONTACT 221 FAILS OPEN | PERIODIC TEST | 3-EGSBAX2 CONTACT 221 OPEN | |
| 21-34-P | V2036EP1 | CKT HVDA 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-P | V2046EP1 | CKT HVDA FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-P | V2056EP1 | CKT HVDA SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM A VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| DIESEL GENERATOR BLDG VENT SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-21-34/2 SH 8 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|--------------------------------|--|--------------------------------|
| 21-34-Q | V2086EP1 | CKT HVDBA 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-Q | V2096EP1 | CKT HVDBA FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-Q | V2106EP1 | CKT HVDBA SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | DIESEL GEN BLDG ROOM B VENT FAILURE | ONE OF TWO REDUNDANT TRAINS |
| 21-34-R | V2466EP3 | 3-HVDAA CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-T | V2475EP3 | 3-HVDAA COIL FAILS | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-T | V2486EP3 | 3-HVDAA SEAL-IN CONT B1 FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-Z | V2496EP3 | 74-HVDAA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-T | V2506EP3 | 2HVD*TS120A CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-T | V2516EP3 | 2HVD*TS120B CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-T | V2526EP3 | 2HVD*TS120C CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-T | V2536EP3 | 2HVD*TS120D CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-Z | V2546EP1 | 1-HVDAA CONTACT L2 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |
| 21-34-Z | V2556EP1 | 1-HVDAA CONTACT R2 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|---|---------------|
| 21-34-S | V2566EP3 | 3-HVDBA CONTACT 1 FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-U | V2576EP3 | 3-HVDBA COIL FAILS | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-AA | V2586EP3 | 74-HVDBA CONTACT 5 FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-U | V2596EP3 | 3-HVDBA SEAL-IN COMT B1 FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-AA | V2606EP1 | 74-HVDBA ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-AA | V2616EP1 | 1-HVDBA CONTACT L2 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-AA | V2626EP1 | 1-HVDBA CONTACT R2 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-U | V2636EP3 | 2HVD*TS121A CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-U | V2646EP3 | 2HVD*TS121B CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-U | V2656EP3 | 2HVD*TS121C CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-U | V2666EP3 | 2HVD*TS121D CONTACT 1A FAILS OPEN | PERIODIC TEST | 2HVD*FN270B NO AUTO START CKT ESTABLISHED | |
| 21-34-Z | V2676EP3 | 74-HVDAA CONTACT 5 FAILS OPEN | PERIODIC TEST | 2HVD*FN270A NO AUTO START CKT ESTABLISHED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | DIESEL GENERATOR BLDG VENT SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-21-34/2 SH 10 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|--------------------------------|---|---------------|
| 22-5/-B | E0011AQ5 | BUS 2AE LOAD FAULTS NOT ISOLATED | ANALOG INDICATION | EMERGENCY BUS 2AE NO VOLTAGE | |
| 22-5/-B | E0021AQ3 | BUS 2AE BUS FAULT | PERIODIC TEST | EMERGENCY BUS 2AE NO VOLTAGE | |
| 22-5/-A | E0031AQ3 | BUS 2DF LOAD FAULTS NOT ISOLATED | PERIODIC TEST | EMERGENCY BUS 2DF NO VOLTAGE | |
| 22-5/-A | E0041AQ3 | BUS 2DF BUS FAULT | PERIODIC TEST | EMERGENCY BUS 2DF NO VOLTAGE | |
| 22-5/-B | E0051AQ3 | NORMAL BUS 2A NO NORMAL SUPPLY VOLTAGE | PERIODIC TEST | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-B | E0061AQ3 | AUX DIESEL GEN 2-1 FAILURE | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-C | E0071AQ3 | NORMAL BUS 2D NO NORMAL SUPPLY VOLTAGE | PERIODIC TEST | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-C | E0081AQ3 | AUX DIESEL GEN 2-2 FAILURE | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-B | E0091AQ3 | ACB 2A10 FAILS OPEN | PERIODIC TEST | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-C | E0101AQ3 | ACB 2D10 FAILS OPEN | PERIODIC TEST | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-D | E0115DA1 | ACB 2E7 TRIP COIL ENER BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-D | E0125DA1 | 1A-ENSAC CONTACT 3 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-D | E0135DA1 | 50-VE207X CONTACT 11 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-K | E0145DA1 | 27-VL200X4 CONTACT 113 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |

Amendment 3

September 1984

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| 4-18-84 17-2-82 | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| B/S | | | | CLASS 1E AC POWER SYSTEM | |
| 4 | 3 | 2 | 1 | 1 | 1 |
| | | | | J.O. 12241 | FHEA-22-5/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|-------------------------------|---------------|
| 22-5/-D | E0155DA1 | 51-VE207X CONTACT 11 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-J | E0165DA1 | 87-VE207X CONTACT 1 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-D | E0175DA6 | 1A-ENSAC IN TRIP (OPER ERROR) | PERIODIC INSPECTION | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-K | E0185DA1 | 27-VE200X4 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-BB | E0195DA1 | 51-VE207 0A OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-BB | E0205DA1 | 51-VE207 0B OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-BB | E0215DA1 | 51-VE207 0C OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-D | E0225DA3 | 525-ECFAA CONTACT 51 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-K | E0235DA1 | 27-VE3200X CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-BB | E0245DA1 | 51-VE207G GND OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-J | E0255DA1 | 87-VE207X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-J | E0265DA1 | 87-VE207 0A FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CLASS 1E AC POWER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-22-5/2 SH 2 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|-------------------------------|---------------|
| 22-5/-J | E0275DA1 | 87-VE207 0B FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AB | E0285DA1 | 27-VE3200X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-J | E0295DA1 | 87-VE207 0C FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-BZ | E0305DA1 | CKT ENSAA NO 125 VDC CNT PHR AVAIL | ANNUNCIATED IN CONTROL ROOM | 69-ENSAA CONTACT 425 CLOSED | |
| 22-5/-L | E0315DA3 | 18-ENSAC CONTACT 3 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-BZ | E0325DA1 | CKT ENSAA 125V(+)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 69-ENSAA CONTACT 425 CLOSED | |
| 22-5/-BZ | E0335DA1 | CKT ENSAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 69-ENSAA CONTACT 425 CLOSED | |
| 22-5/-BZ | E0345DA1 | CKT ENSAA 125V(-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 69-ENSAA CONTACT 425 CLOSED | |
| 22-5/-L | E0355DA3 | 43-ENSACK CONTACT 4 FAILS CLOSED | PERIODIC TEST | 43-ENSACK CONTACT 4 CLOSED | |
| 22-5/-L | E0365DA1 | 43-ENSACK ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 43-ENSACK CONTACT 4 CLOSED | |
| 22-5/-L | E0375DA1 | PB-ENSAC CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 43-ENSACK CONTACT 4 CLOSED | |
| 22-5/-AH | E0385DA3 | 50-VE207 0A CONTACT 11 FAILS CLOSED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-BA | E0395DA3 | 50-VE207 0B CONTACT 11 FAILS CLOSED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|------------------------------|---------------|
| 22-5/-AM | E0405DA3 | 50-VE207 0C CONTACT 11 FAILS CLOSED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-AM | E0415DA3 | 67-VE207 DIR 0 CURR DEV FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-AM | E0425DA3 | 50-VE207 0A OVERCURRENT DEVICE FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-BA | E0435DA3 | 50-VE207 0B OVERCURRENT DEVICE FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-AM | E0445DA3 | 50-VE207 0C OVERCURRENT DEVICE FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-AM | E0455DA3 | 67-VE1207 DIR 0 CURR DEV FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-BA | E0465DA3 | 67-VE207 DIR 0 CURR DEV FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-BA | E0475DA3 | 67-VE1207 DIR 0 CURR DEV FAILS ACTUATED | PERIODIC TEST | 50-VE207 CONTACT 11 CLOSED | |
| 22-5/-AG | E0485DA3 | 27-VE200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | 27-VE3200 CONTACT 11 CLOSED | |
| 22-5/-AB | E0495DA3 | 69-ENSA A CONTACT 425 FAILS CLOSED | PERIODIC TEST | 69-ENSA A CONTACT 425 CLOSED | |
| 22-5/-AF | E0505DA3 | 27-VE1200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | 27-VE1200 CONTACT 11 CLOSED | |
| 22-5/-AL | E0515DA3 | 69-ENSA A ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | 69-ENSA A CONTACT 425 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CLASS 1E AC POWER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-22-5/2 SH 4 | | | | | |

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FTSK   COMPONENT   COMPONENT AND   METHOD OF   EFFECT ON   OTHER
IDENTIFIER   FAILURE MODE   FAILURE DETECTION   ON SYSTEM   REMARKS
*****
22-5/-AG E0525DA3  27-VE3200     PERIODIC TEST   27-VE3200 CONTACT 11 CLOSED
A-B COIL FAILS
22-5/-AG E0535DA3  27-VE3200     PERIODIC TEST   27-VE3200 CONTACT 11 CLOSED
B-C COIL FAILS
22-5/-AL E0545DA3  162-ENSAA     PERIODIC TEST   69-ENSAA CONTACT 425 CLOSED
CONTACTS
FAILS CLOSED
22-5/-AF E0555DA3  27-VE1200     PERIODIC TEST   27-VE1200 CONTACT 11 CLOSED
A-B COIL FAILS
22-5/-AF E0565DA3  27-VE1200     PERIODIC TEST   27-VE1200 CONTACT 11 CLOSED
B-C COIL FAILS
22-5/-BZ E0575DA3  162-ENSAA     PERIODIC TEST   69-ENSAA CONTACT 425 CLOSED
FAILS
22-5/-BZ E0585DA3  99-1NNSAC     PERIODIC TEST   69-ENSAA CONTACT 425 CLOSED
FAILS
22-5/-BZ E0595DA3  99-1NNSAC     PERIODIC TEST   69-ENSAA CONTACT 425 CLOSED
CONTACT
FAILS OPEN
22-5/-CA E0605DA5  PT CIRCUIT 2AE ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
120V SIDE FUSE A
FAILS OPEN
22-5/-CB E0615DA5  PT CIRCUIT 2AE ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
120V SIDE FUSE C
FAILS OPEN
22-5/-CA E0625DA5  PO XFMR 2AE   ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
A-B SIDE
FAILS OPEN
22-5/-CB E0635DA5  PO XFMR 2AE   ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
B-C SIDE
FAILS OPEN
22-5/-CA E0645DA5  PT CIRCUIT    ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
4KV SIDE FUSE A
FAILS OPEN
22-5/-CA E0655DA5  PT CIRCUIT    ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
4KV SIDE FUSE AB
FAILS OPEN
22-5/-CB E0665DA5  PT CIRCUIT    ANALOG INDICATION 27-VE3200 CONTACT 11 CLOSED
4KV SIDE FUSE BC
FAILS OPEN

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-22-5/2 SH 5 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| 22-5/-CB | E0675DA5 | PT CIRCUIT 4KV SIDE FUSE B FAILS OPEN | ANALOG INDICATION | 27-VE3200 CONTACT 11 CLOSED | |
| 22-5/-BX | E1255DA3 | 21-VE210 A-B SIDE FAIL ACTUATED | PERIODIC TEST | 21-VE210 OR 21-EGSADX ACTUATED | |
| 22-5/-E | E1365DA3 | 52-ENSAC CONTACT FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-E | E1375DA1 | CKT ENSAC NO 4KV OPERAT PWR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-E | E1385DA3 | ACB 2A7 TRIP COIL FAILURE | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-E | E1395DA3 | HL-ENSAC FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-E | E1405DA1 | CKT ENSAC 125 VDC CNT PWR NOT AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-E | E1415DA1 | CKT ENSAC 125 V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-E | E1425DA1 | CKT ENSAC 125 V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-V | E1435DA6 | 1A-ENSAC NOT IN TRIP (OPER ERROR) | PERIODIC INSPECTION | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-V | E1445DA3 | 43-ENSACX CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-E | E1455DA1 | CKT ENSAC CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-V | E1465DA3 | 1A-ENSAC CONTACT 3 FAILS OPEN | PERIODIC TEST | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| 22-5/-V | E1475DA3 | 43-ENSACK CONTACT 9 FAILS OPEN | PERIODIC TEST | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-V | E1485DA1 | PB-ENSAC CONTACT TRANS FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-V | E1495DA1 | 43-ENSACK ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-N | E1505DA3 | 87-VE207X CONTACT 1 FAILS OPEN | PERIODIC TEST | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-Z | E1515DA3 | 1A-ENSAC CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-BD | E1525DA1 | 87-VE207X CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-BD | E1535DA1 | 87-VE207X COIL FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-Z | E1545DA3 | 27-VE200X4 CONTACT 113 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-BD | E1555DA1 | 287-VE207 COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-Z | E1565DA3 | 27-VE200X4 COIL FAILURE | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-BD | E1575DA1 | CKT ENSAE 125 VDC (+) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-BD | E1585DA1 | CKT ENSAE 125 VDC (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-BD | E1595DA1 | CKT ENSAE 125 VDC (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|---------------------------------|---------------|
| 22-5/-BD | E1605DA1 | CKT ENSAE NO125VDC CONT PWR AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 87-VE207X CONTACT 1 OPEN | |
| 22-5/-BK | E1615DA1 | 87-VE207 FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE A NO DIFF VOLT | |
| 22-5/-BK | E1625DA1 | CKT ENSAE C T XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE B NO DIFF VOLT | |
| 22-5/-BK | E1635DA1 | 87-VE207 FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE B NO DIFF VOLT | |
| 22-5/-BK | E1645DA1 | CKT ENSAE AUX POT XFH (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE B NO DIFF VOLT | |
| 22-5/-BK | E1655DA1 | CKT ENSAE C T XFMS(2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE C NO DIFF VOLT | |
| 22-5/-BK | E1665DA1 | 87-VE207 FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE C NO DIFF VOLT | |
| 22-5/-BK | E1675DA1 | CKT ENSAE AUX XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE C NO DIFF VOLT | |
| 22-5/-BK | E1685CA1 | CKT ENSAE C T XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE A NO DIFF VOLT | |
| 22-5/-BK | E1695DA1 | CKT ENSAAF AUX POT XFH(2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VE207 PHASE A NO DIFF VOLT | |
| 22-5/-AH | E1705DA3 | 27-VE3200X CONTACT 221 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AH | E1715DA3 | 1A-ENSABX CONTACT 225 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AH | E1725DA3 | 1A-ENSAB CONTACT 9 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AH | E1735DA3 | 1A-ENSABX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |

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|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CLASS 1E AC POWER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-22-5/2 SH 8 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|---------------------------------|---------------|
| 22-5/-AH | E1745DA3 | 1A-ENSAB CONTACT 3 FAILS CLOSED | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1755DA1 | CKT ENSAA NO125VDC CONT PHR AVAIL | ANNUNCIATED IN CONTROL ROOM | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1765DA1 | CKT ENSAA 125VDC (+)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1775DA1 | CKT ENSAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1785DA1 | CKT ENSAA 125VDC (-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AN | E1795DA3 | 69-ENSAA CONTACT 425 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1805DA3 | 162-ENSAA CONTACT 5 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1815DA3 | 52-ENAC CONTACT 75 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-CN | E1825DA3 | 162-ENSAA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AP | E1835DA3 | 99X-52-NSSAC CONTACT 14 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-CN | E1845DA3 | 99-1-NNSAC CONTACT FAILS CLOSED | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-CR | E1855DA3 | 99X-52-NSSAC FAILS | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |
| 22-5/-AN | E1865DA3 | 27-VE3200 CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV CKT NOT ESTAB. | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|------------------|-----------------|
| 22-5/-AN | E1875DA3 | 27-VE1200 CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CJ | E1865DA3 | 27-VE3200 2-3 FAILS TO DROP OUT | PERIODIC TEST | 27-VE3200 2-3 | NOT DROPPED OUT |
| 22-5/-CJ | E1895DA3 | 27-VE3200 3-4 FAILS TO DROP OUT | PERIODIC TEST | 27-VE3200 3-4 | NOT DROPPED OUT |
| 22-5/-CK | E1905DA3 | 27-VE1200 2-3 FAILS TO DROP OUT | PERIODIC TEST | 27-VE1200 2-3 | NOT DROPPED OUT |
| 22-5/-CK | E1915DA3 | 27-VE1200 3-4 FAILS TO DROP OUT | PERIODIC TEST | 27-VE1200 3-4 | NOT DROPPED OUT |
| 22-5/-CJ | E1925DA3 | 1C-ENSABX1 CONTACT 113 FAILS OPEN | PERIODIC TEST | 27-VE3200 2-3 | NOT DROPPED OUT |
| 22-5/-CJ | E1935DA3 | 1C-ENABX1 CONTACT 117 FAILS OPEN | PERIODIC TEST | 27-VE3200 3-4 | NOT DROPPED OUT |
| 22-5/-CK | E1945DA3 | 1C-ENABX1 CONTACT 223 FAILS OPEN | PERIODIC TEST | 27-VE1200 2-3 | NOT DROPPED OUT |
| 22-5/-CQ | E1955DA3 | 1C-ENSABX1 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CN | E1965DA3 | ACB 2A10 FAILS TO TRIP | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CN | E1975DA3 | 99-1-MNSAC ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CR | E1985DA3 | 99-52-NSSAC CONTACT FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CQ | E1995DA3 | 1C-ENSABX CONTACT 313 FAILS CLOSED | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |

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|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | CLASS 1E AC POWER SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12291 FMEA-22-5/2 SH 10 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|---|----------------|
| 22-5/-CQ | E2005DA3 | 1C-ENSAB CONTACT 3 FAILS CLOSED | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CR | E2015DA3 | 99-52-NSSAC FAILURE | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CR | E2025DA3 | 52S-NISAC CONTACT FAILS OPEN | PERIODIC TEST | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-CR | E2035DA2 | CKT NISAC NO125 VDC BLK CONT PWR AVAIL | INDICATING LIGHT IN CONTROL ROOM | CKT ENSAC BUS UV | CKT NOT ESTAB. |
| 22-5/-K | E3985DA1 | 27-VE200X CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AB | E3995DA1 | 27-V3200X UV DE-GRADE BUS FAILURE | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AL | E3995DA3 | 52-ENSAC CONTACT 73 FAILS CLOSED | PERIODIC TEST | 69-ENSAA CONTACT 425 CLOSED | |
| 22-5/-CQ | E4045DA3 | 1C-ENSA3X1 CONTACT 227 FAILS OPEN | PERIODIC TEST | 27-VE1200 3-4 NOT DROPPED OUT | |
| 22-5/-V | E4125DA3 | 43-CESN8X2 CONTACT 12 FAILS OPEN | PERIODIC TEST | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-V | E4135DA3 | 43-CES18X2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-V | E4145DA3 | CKT-CES18K PB 2 FAILS CLOSED | PERIODIC TEST | CKT ENSAC NO MANUAL TRIP CIRCUIT ESTAB. | |
| 22-5/-L | E5015DA3 | 43-ENSACKX CONTACT 1 FAILS CLOSED | PERIODIC TEST | 43-ENSACKX CONTACT 1 CLOSED | |
| 22-5/-U | E0685DB1 | CKT EGPAA NO 4KV OPER POWER AVAIL | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|---|---------------|
| 22-5/-U | E0695DB1 | ACB 2E10 CLOSING MECH FAILS | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-M | E0705DB3 | 2EXC-A CONTACT HSR(LTR) FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-U | E0715DB1 | CKT EGPAA NO 125 VDC AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AR | E0725DB3 | 27-VE210 CONTACT 9 FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-M | E0735DB3 | 43-EGPAA CONTACT 9 FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-U | E0745DB1 | CKT EGPAA 125V(-)ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-U | E0755DB1 | CKT EGPAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AR | E0765DB3 | 27-VE210 A-B FAILS | PERIODIC TEST | 27-VE210 A-B DROPPED OUT | |
| 22-5/-AR | E0775DB3 | 27-VE210 B-C FAILS | PERIODIC TEST | 27-VE210 B-C COIL DROPPED OUT | |
| 22-5/-BH | E0785DB5 | PT CIRCUIT 2E10 120V SIDE FUSE A FAILS OPEN | ANALOG INDICATION | 27-VE210 A-B DROPPED OUT | |
| 22-5/-BJ | E0795DB5 | PT CIRCUIT 2E10 120V SIDE FUSE C FAILS OPEN | ANALOG INDICATION | 27-VE210 B-C COIL DROPPED OUT | |
| 22-5/-BH | E0805DB5 | POT XFMR 2E10 A-B SIDE FAILS OPEN | ANALOG INDICATION | 27-VE210 A-B DROPPED OUT | |
| 22-5/-BJ | E0815DB5 | POT XFMR 2E10 B-C SIDE FAILS OPEN | ANALOG INDICATION | 27-VE210 B-C COIL DROPPED OUT | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CLASS 1E AC POWER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-22-5/2 SH 12 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--------------------------------------|---------------|
| 22-5/-BH | E0825DB5 | PT CIRCUIT 4KV SID FUSE A FAILS OPEN | ANALOG INDICATION | 27-VE210 A-B DROPPED OUT | |
| 22-5/-BH | E0835DB5 | PT CIRCUIT 4KV SID FUSE AB FAILS OPEN | ANALOG INDICATION | 27-VE210 A-B DROPPED OUT | |
| 22-5/-BJ | E0845DB5 | PT CIRCUIT 4KV SID FUSE BC FAILS OPEN | ANALOG INDICATION | 27-VE210 B-C COIL DROPPED OUT | |
| 22-5/-BJ | E0855DB5 | PT CIRCUIT 4KV SID FUSE B FAILS OPEN | ANALOG INDICATION | 27-VE210 B-C COIL DROPPED OUT | |
| 22-5/-AQ | E0865DB3 | 52S-ENSAC CONTACT 69 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO MANUEL CKT ESTABLISHED | |
| 22-5/-AQ | E0875DB3 | 1A-EGPAA CONTACT 1 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO MANUEL CKT ESTABLISHED | |
| 22-5/-AQ | E0885DB6 | 1A-EGPAA IN TRIP (OPER ERROR) | PERIODIC INSPECTION | ACB 2E10 NO MANUEL CKT ESTABLISHED | |
| 22-5/-AQ | E0895DB3 | 43-EGPAAX CONTACT 10 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO MANUEL CKT ESTABLISHED | |
| 22-5/-BC | E0905DB1 | 43-EGPAAX COIL ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BC | E0915DB1 | PB-EGPAA TRANS PB CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AX | E0925DB3 | 62-VE210 FAILS TO ACTUATE | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AX | E0935DB3 | 32-EGS DX CONTACT 1 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AX | E0945DB3 | 1A-EGPAA CONTACT 7 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--------------------------------------|---------------|
| 22-5/-BC | E0955DB3 | 43-EGPAAX CONTACT 12 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BB | E0965DB3 | 51-VE207X CONTACT 1 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AX | E0975DB3 | 27-VE200X4 CONTACT 223 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AX | E0985DB6 | 1A-EGPAA NOT IN AUTO OPER ERROR | PERIODIC INSPECTION | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AX | E0995DB3 | 27-VE200X4 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BR | E1005DB3 | 27-VE3200X CONTACT 221 FAILS CLOSED | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BR | E1015DB3 | 27-VE3200X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BR | E1025DB3 | 27-VE3200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BR | E1035DB3 | 27-VE3200 SPURIOUS ACTUATION | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BR | E1045DB3 | 27-VE1200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BR | E1055DB3 | 27-VE1200 SPURIOUS ACTUATION | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-F | E1065DB1 | ZEXC-A CONTACT 5ALTR FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-22-5/2 SH 14 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--------------------------------------|---------------|
| 22-5/-F | E1075DB1 | ACB 2E10 TRIP COIL ENERG BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-F | E1085DB1 | 1-EGPAA CONTACT 3 FAILED CLOSED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-F | E1095DB6 | 1-EGPAA IN TRIP (OPER ERROR) | PERIODIC INSPECTION | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-F | E1105DB1 | 32-EGSADX CONTACT 11 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AX | E1115DB1 | 32-EGSADX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BQ | E1125DB1 | 50-VE210 CONTACT 12 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BQ | E1135DB1 | 59-VE210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BQ | E1145DB1 | 59-VE1210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BQ | E1155DB1 | 87-VE210 0A FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BQ | E1165DB1 | 87-VE210 0B FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BQ | E1175DB1 | 87-VE210 0C FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BX | E1185DB3 | 51-VE210 0A FAILS ACTUATED | PERIODIC TEST | 51-VE210 OR 50-VE210 ACTUATED | |
| 22-5/-BX | E1195DB3 | 51-VE210 0B FAILS ACTUATED | PERIODIC TEST | 51-VE210 OR 50-VE210 ACTUATED | |
| 22-5/-BX | E1205DB3 | 51-VE210 0C FAILS ACTUATED | PERIODIC TEST | 51-VE210 OR 50-VE210 ACTUATED | |
| 22-5/-BX | E1215DB3 | 21-EGSADX FAILS ACTUATED | PERIODIC TEST | 21-VE210 OR 21-EGSADX ACTUATED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CLASS 1E AC POWER SYSTEM | | | | | |
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| J.O. 12241 FHEA-22-5/2 SH 15 | | | | | |

| FTSK IDENTIFIER | COMPONENT IDENTIFIER | CL/PC/NT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-----------------|----------------------|-----------------------------------|-----------------------------|--------------------------------------|---------------|
| 22-5/-BX | E1225083 | 57-VE210 6A FAILS ACTUATED | PERIODIC TEST | 51-VE210 OR 50-VE210 ACTUATED | |
| 22-5/-BX | E1235083 | 50-VE210 6C FAILS ACTUATED | PERIODIC TEST | 51-VE210 OR 50-VE210 ACTUATED | |
| 22-5/-BX | E1245083 | 50-VE210 6C FAILS ACTUATED | PERIODIC TEST | 51-VE210 OR 50-VE210 ACTUATED | |
| 22-5/-BX | E1265083 | 21-VE210 B-C SIDE FAILS ACTUATED | PERIODIC TEST | 21-VE210 OR 21-EGSADX ACTUATED | |
| 22-5/-BV | E1275083 | 52-ENSAC CONTACT 51 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-BV | E1285083 | 32-VE210 FAILS ACTUATED | PERIODIC TEST | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-BW | E1295083 | 51-VE210G FAILS ACTUATED | PERIODIC TEST | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-BW | E1305081 | 76-VE210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-BW | E1315081 | 64-VE210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-CC | E1325083 | 62-EGSAD CONTACT 2 FAILS CLOSED | PERIODIC TEST | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-CC | E1335083 | 62-EGSAD FAILS ACTUATED | PERIODIC TEST | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-CC | E1345081 | 40-VE210 A-B SIDE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-CC | E1355081 | 40-VE210 B-C SIDE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSAD GRP 11 RELAYS ACTUATED | |
| 22-5/-U | E4005081 | CKT EGPAA 125VI + IACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E4005083 | 43-CESN0X1 CONTACT 10 FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |

| FAILURE MODES AND EFFECTS ANALYSIS | |
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| CLASS 1E AC POWER SYSTEM | |
| 1 | |
| 2 | |
| 3 | 11 |
| 4 | 11 |
| J.O. 12291 FMEA-22-5/2 SH 16 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|---|---------------|
| 22-5/-AT | E4015DB3 | 43-CESNXX1 ENERGIZED BY SHORT CKT | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AT | E4025DB3 | PB1-CESNXX1 TRANS P B CONTACT FAILS CLOSED | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-M | E4035DB3 | 43-EGPAAX CONTACT (3C) FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-M | E4045DB3 | 43EGPAAX CONTACT (4C) FAILS OPEN | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AT | E4055DB3 | EGPAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-AU | E4065DB3 | 1B-EGPAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AT | E4075DB3 | 43-CESNXX1 CONTACT 4 FAILS CLOSED | PERIODIC TEST | 43-CESNXX1 CONTACT 4 CLOSED | |
| 22-5/-AT | E4085DB3 | 43-CESNXX1 CONTACT 1 FAILS CLOSED | PERIODIC TEST | 43-CESNXX1 CONTACT 1 CLOSED | |
| 22-5/-AU | E4095DB3 | 43-EGPAAX CONTACT 4 FAILS CLOSED | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AU | E4105DB3 | 43-EGPAAX COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AX | E4115DB3 | 1525-ENSAC CONTACT 81 FAILS OPEN | PERIODIC TEST | ACB 2E10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AU | E4205DB3 | CKT-EGPAA TRANSFER P B FAILS CLOSED | PERIODIC TEST | 2AE EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-G | E2045EA1 | ACB2F7 TRIP COIL ENER BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
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| CLASS 1E AC POWER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-22-5/2 SH 17 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|-------------------------------|---------------|
| 22-5/-G | E2055EA1 | 1A-ENSBC CONTACT 3 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-G | E2065EA1 | 50-VF207X CONTACT 1L FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-Q | E2075EA1 | 27-VF200X4 CONTACT 113 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-G | E2085EA1 | 51-VF 207X CONTACT 11 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-P | E2095EA1 | 87-VF207X CONTACT 1 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-G | E2105EA6 | 1A-ENSBC IN TRIP OPER ERROR | PERIODIC INSPECTION | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-Q | E2115EA1 | 27-VF200X4 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AD | E2125EA1 | 51-VF207 0A OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AD | E2135EA1 | 51-VF207 0B OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AD | E2145EA1 | 51-VF207 0C OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-G | E2155EA3 | 52S-EGPBA CONTACT 51 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-Q | E2165EA1 | 27-VF3200X CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-22-5/2 SH 18 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|-------------------------------|---------------|
| 22-5/-AD | E2175EA1 | 51-VF2076 GND OVERCURRENT DEVICE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-P | E2185EA1 | 87-VF207X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-P | E2195EA1 | 87-VF2070A FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-P | E2205EA1 | 87-VF2070B FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-AC | E2215EA1 | 27-VF3200X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | NORMAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-CD | E2225EA1 | CKT ENSBA NO125 VDC CNT PWR AVAIL | ANNUNCIATED IN CONTROL ROOM | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-R | E2235EA3 | 1B-ENSBC CONTACT 3 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-CD | E2245EA1 | CKT ENSBA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-CD | E2255EA1 | CKT ENSBA CONTROL PWR SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-CD | E2265EA1 | CKT ENSBA 125 V (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-R | E2275EA3 | 43-ENSBCX CONTACT 4 FAILS CLOSED | PERIODIC TEST | 43-ENSBCX CONTACT 4 CLOSED | |
| 22-5/-R | E2285EA1 | 43-ENSBCX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 43-ENSBCX CONTACT 4 CLOSED | |
| 22-5/-R | E2295EA1 | PB-ENSBC CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 43-ENSBCX CONTACT 4 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|---|-----------------------------|-----------------------------|---------------|
| 22-5/-AY | E2305EA3 | 50-VF207 0A CONTACT 11 FAILS CLOSED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-BE | E2315EA3 | 50-VF207 0B CONTACT 11 FAILS CLOSED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-AY | E2325EA3 | 50-VF207 0C CONTACT 11 FAILS CLOSED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-AY 22-5/-BE | E2335EA3 | 67-VF207 DIR OCURR DEV FAILS ACTUATED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-AY | E2345EA3 | 50-VF207 0A OVERCURRENT DEVICE FAILS ACTUATED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-BE | E2355EA3 | 50-VF207 0B OVERCURRENT DEVICE FAILS ACTUATED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-AY | E2365EA3 | 50-VF207 0C OVERCURRENT DEVICE FAILS ACTUATED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-AY 22-5/-BE | E2375EA3 | 67-VF1207 DIR OCURR DEV FAILS ACTUATED | PERIODIC TEST | 50-VF207 CONTACT 11 CLOSED | |
| 22-5/-AK | E2385EA3 | 27-VF3200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-AC | E2395EA3 | 69-ENSBA CONTACT 425 FAILS CLOSED | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-AJ | E2405EA3 | 27-VF1200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | 27-VF1200 CONTACT 11 CLOSED | |
| 22-5/-AH | E2415EA3 | 69-ENSBA ENERGIZE BY SHORT CIRCUIT | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | |
| CLASS 1E AC POWER SYSTEM | | | |
| 4 | 3 | 2 | 1 |
| J.O. 12241 FMEA-22-5/2 SH 20 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|---|---------------|
| 22-5/-AK | E2425EA3 | 27-VF3200 A-B COIL FAILS | PERIODIC TEST | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-AK | E2435EA3 | 27-VF3200 B-C COIL FAILS | PERIODIC TEST | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-AH | E2445EA3 | 162-ENSBA CONTACT 15 FAILS CLOSED | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-AJ | E2455EA3 | 27-VF1200 A-B COIL FAILS | PERIODIC TEST | 27-VF1200 CONTACT 11 CLOSED | |
| 22-5/-AJ | E2465EA3 | 27-VF1200 B-C COIL FAILS | PERIODIC TEST | 27-VF1200 CONTACT 11 CLOSED | |
| 22-5/-CD | E2475EA3 | 162-ENSBA FAILS | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-CD | E2485EA3 | 99-INNSBC FAILS | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-CD | E2495EA3 | 99-INNSBC CONTACT FAILS OPEN | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-H | E3295EA3 | 52-ENSBC CONTACT FAILS OPEN | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E3305EA1 | CKT ENSBC NO 4KV OP POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E3315EA3 | ACB 2F7 TRIP COIL FAILURE | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E3325EA3 | HL-ENSBC FAILS OPEN | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E3335EA1 | CKT ENSBC 125VDC CNT PWR NOT AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E3345EA1 | CKT ENSBC 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-H | E3355EA1 | CKT ENSBC 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
|------------------------------------|---|---|---|--|
| CLASS 1E AC POWER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-22-5/2 SH 21 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 22-5/-AV | E3365EA6 | 1A-ENSBC NOT IN TRIP (OPER ERROR) | PERIODIC INSPECTION | CKT ENSBC NO MANUAL TRIP CIRCUIT ESTAB | |
| 22-5/-AV | E3375EA3 | 43-ENSBCX CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSBC NO MANUAL TRIP CIRCUIT ESTAB | |
| 22-5/-H | E3385EA1 | CKT ENSBC 125 VDC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AV | E3395EA3 | 1A-ENSBC CONTACT 3 FAILS OPEN | PERIODIC TEST | CKT ENSBC NO MANUAL TRIP CIRCUIT ESTAB | |
| 22-5/-AV | E3405EA3 | 43-ENSBCX CONTACT 9 FAILS OPEN | PERIODIC TEST | CKT ENSBC NO MANUAL TRIP CIRCUIT ESTAB | |
| 22-5/-AV | E3415EA1 | PB-ENSBC CONTACT TRANS FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | CKT ENSBC NO MANUAL TRIP CIRCUIT ESTAB | |
| 22-5/-AV | E3425EA1 | 43-ENSBCX ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | CKT ENSBC NO MANUAL TRIP CIRCUIT ESTAB | |
| 22-5/-AS | E3435EA3 | 87-VF207X CONTACT 1 FAILS OPEN | PERIODIC TEST | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-AZ | E3445EA3 | 1A-ENSBC CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-BG | E3455EA1 | 87-VF207X CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-BG | E3465EA1 | 87-VF207X COIL FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-AZ | E3475EA3 | 27-VF200X4 CONTACT 113 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-BG | E3485EA1 | 287-VF207 COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-AZ | E3495EA3 | 27-VF200X4 COIL FAILURE | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-22-5/2 SH 22 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--------------------------------|---------------|
| 22-5/-BG | E3505EA1 | CKT ENSBE 125 VDC (+) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-BG | E3515EA1 | CKT ENSBE CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-BG | E3525EA1 | CKT ENSBE 125 VDC (-) FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-BG | E3535EA1 | CKT ENSBE NO125 VDC CONT POWER AVAILABLE | ANNUNCIATED IN CONTROL ROOM | 87-VF207X CONTACT 1 OPEN | |
| 22-5/-BP | E3545EA1 | 37-VF207 FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE A NO DIFF VOLT | |
| 22-5/-BP | E3555EA1 | CKT ENSBE CT XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE B NO DIFF VOLT | |
| 22-5/-BP | E3565EA1 | 87-VF207 FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE B NO DIFF VOLT | |
| 22-5/-BP | E3575EA1 | CKT ENSBE AUX POT XFM (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE B NO DIFF VOLT | |
| 22-5/-BP | E3585EA1 | CKT ENSBE CT XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE C NO DIFF VOLT | |
| 22-5/-BP | E3595EA1 | 87-VF207 FAILS | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE C NO DIFF VOLT | |
| 22-5/-BP | E3605EA1 | CKT ENSBE AUX XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE C NO DIFF VOLT | |
| 22-5/-BP | E3615EA1 | CKT ENSBE CT XFMS (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE A NO DIFF VOLT | |
| 22-5/-BP | E3625EA1 | CKT ENSBE AUX POT XFM (2) FAIL | ANNUNCIATED IN CONTROL ROOM | 87-VF207 PHASE A NO DIFF VOLT | |
| 22-5/-BU | E3665EA3 | 27-VF3200X CONTACT 221 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--------------------------------|---------------|
| 22-5/-BU | E3675EA3 | 1A-ENSBBX CONTACT 225 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-BY | E3685EA3 | 1A-ENSBB CONTACT 9 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-BU | E3695EA3 | 1A-ENSBBX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-BU | E3705EA3 | 1A-ENSBB CONTACT 3 FAILS CLOSED | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CG | E3715EA1 | CKT ENSBA 125V(-1) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CG | E3725EA1 | CKT ENSBA NO125 VDC CONT PHR AVAIL | ANNUNCIATED IN CONTROL ROOM | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CG | E3735EA1 | CKT ENSBA 125 V(+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CH | E3745EA3 | 162-ENSBA CONTACT 5 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CH | E3755EA3 | 52-ENBC CONTACT 75 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CP | E3765EA3 | 162-ENSBA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CH | E3775EA3 | 99X-52-NSSBC CONTACT 14 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CP | E3785EA3 | 99-1-NNSDC CONTACT FAILS CLOSED | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CT | E3795EA3 | 99-52-NSSDC FAILS | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| CLASS 1E AC POWER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-22-5/2 SH 24 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--------------------------------|---------------|
| 22-5/-BY | E3805EA3 | 27-VF3200 CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-BY | E3815EA3 | 27-VF1200 CONTACT 11 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CL | E3825EA3 | 27-V3200 2-3 FAILS TO DROP OUT | PERIODIC TEST | 27-VF3200 2-3 NOT DROPPED OUT | |
| 22-5/-CL | E3835EA3 | 27-VF3200 3-4 FAILS TO DROP OUT | PERIODIC TEST | 27-VF3200 3-4 NOT DROPPED OUT | |
| 22-5/-CH | E3845EA3 | 27-VF1200 2-3 FAILS TO DROP OUT | PERIODIC TEST | 27-VF1200 2-3 NOT DROPPED OUT | |
| 22-5/-CH | E3855EA3 | 27-VF1200 3-4 FAILS TO DROP OUT | PERIODIC TEST | 27-VF1200 3-4 NOT DROPPED OUT | |
| 22-5/-CL | E3865EA3 | 1B-ENSBBX CONTACT 113 FAILS OPEN | PERIODIC TEST | 27-VF3200 2-3 NOT DROPPED OUT | |
| 22-5/-CL | E3875EA3 | 1B-ENBBX1 CONTACT 117 FAILS OPEN | PERIODIC TEST | 27-VF3200 3-4 NOT DROPPED OUT | |
| 22-5/-CH | E3885EA3 | 1B-ENBBX1 CONTACT 223 FAILS OPEN | PERIODIC TEST | 27-VF1200 2-3 NOT DROPPED OUT | |
| 22-5/-CS | E3895EA3 | 1B-ENSBBX1 CONTACT 227 FAILS OPEN | PERIODIC TEST | 27-VF1200 3-4 NOT DROPPED OUT | |
| 22-5/-CS | E3905EA3 | 1B-ENSBBX1 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CP | E3915EA3 | ACB 2B10 FAILS TO TRIP | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CP | E3925EA3 | 99-1-NMSBC ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--------------------------------|---------------|
| 22-5/-CT | E3935EA3 | 99-52-NSSBC CONTACT FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CS | E3945EA3 | 1C-ENSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CS | E3955EA3 | 1C-ENSEB CONTACT 3 FAILS CLOSED | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CT | E3965EA3 | 99-52-NSSBC FAILURE | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CT | E3975EA3 | 52S-NNSBC CONTACT FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-CT | E3985EA2 | CKT NNSBC NO125 VDC BLACK CONT PWR AVAIL | INDICATING LIGHT IN CONTROL ROOM | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-Q | E4005EA1 | 27-VF200X CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | NORHAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-Q | E4015EA1 | 27-VF3200X UV DE-GRADE BUS FAILURE | ANNUNCIATED IN CONTROL ROOM | NORHAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-P | E4025EA1 | 87-VF207 OC FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | NORHAL SUPPLY VOLTAGE FAILURE | |
| 22-5/-BY | E4085EA3 | 69-ENSBA CONTACT 425 FAILS OPEN | PERIODIC TEST | CKT ENSBC BUS UV CKT NOT ESTAB | |
| 22-5/-AM | E4155EA3 | 52-ENSBA CONTACT 73 FAILS CLOSED | PERIODIC TEST | 69-ENSBA CONTACT 425 CLOSED | |
| 22-5/-CE | E2505EB5 | PT CIRCUIT 120V SIDE FUSE A FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-CF | E2515EB5 | PT CIRCUIT 120V SIDE FUSE C FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-22-5/2 SH 26 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--------------------------------------|---------------|
| 22-5/-CE | E2525EB5 | POT XFMR A-B SIDE FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-CF | E2535EB5 | POT XFMR B-C SIDE FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-CE | E2545EB5 | PT CIRCUIT 4 KV SIDE FUSE A FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-CE | E2555EB5 | PT CIRCUIT 4 KV SIDE FUSE AB FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-CF | E2565EB5 | PT CIRCUIT 4 KV SIDE FUSE BC FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-CF | E2575EB5 | PT CIRCUIT 4 KV SIDE FUSE B FAILS OPEN | ANALOG INDICATION | 27-VF3200 CONTACT 11 CLOSED | |
| 22-5/-T | E2585EB1 | CKT EGPBA NO 4KV OPER POWER AVAIL | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-T | E2595EB1 | ACB 2F 10 CLOSING MECH FAILS | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-T | E2605EB3 | 2 XC-B CONTACT HSR LTR FAILS OPEN | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-T | E2615EB2 | CKT EGPBA NO 125 VDC AVAILABLE | INDICATING LIGHT IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-X | E2625EB3 | 27-VF210 CONTACT 9 FAILS OPEN | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-W | E2635EB3 | 43-EGPBAX CONTACT 9 FAILS OPEN | PERIODIC TEST | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-T | E2645EB2 | CKT EGPBA 125V (+) ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| CLASS 1E AC POWER SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-22-5/2 SH 27 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-------------------------------------|---|---------------|
| 22-5/-T | E2655EB2 | CKT EGPBA 125V (-) ACB FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | 20F EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-T | E2665EB2 | CKT EGPBA CONTROL POWER SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | 20F EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-X | E2675EB3 | 27-VF210 A-B FAILS | PERIODIC TEST | 27-VF210 A-B DROPPED OUT | |
| 22-5/-X | E2685EB3 | 27-VF210 B-C FAILS | PERIODIC TEST | 27-VF210 B-C COIL DROPPED OUT | |
| 22-5/-BL | E2695EB5 | PT CIRCUIT 2F10 120V SIDE FUSE A FAILS OPEN | ANALOG INDICATION | 27-VF210 A-B DROPPED OUT | |
| 22-5/-BM | E2705EB5 | PT CIRCUIT 2F10 120V SIDE FUSE C FAILS OPEN | ANALOG INDICATION | 27-VF210 B-C COIL DROPPED OUT | |
| 22-5/-BL | E2715EB5 | POT XFMR 2F10 A-B SIDE FAILS OPEN | ANALOG INDICATION | 27-VF210 A-B DROPPED OUT | |
| 22-5/-BM | E2725EB5 | POT XFMR 2F10 B-C SIDE FAILS OPEN | ANALOG INDICATION | 27-VF210 B-C COIL DROPPED OUT | |
| 22-5/-BL | E2735EB5 | PT CIRCUIT 4KV SIDE FUSE A FAILS OPEN | ANALOG INDICATION | 27-VF210 A-B DROPPED OUT | |
| 22-5/-BL | E2745EB5 | PY CIRCUIT 4KV SIDE FUSE AB FAILS OPEN | ANALOG INDICATION | 27-VF210 A-B DROPPED OUT | |
| 22-5/-BM | E2755EB5 | PT CIRCUIT 4KV SIDE FUSE BC FAILS OPEN | ANALOG INDICATION | 27-VF210 B-C COIL DROPPED OUT | |
| 22-5/-BM | E2765EB5 | PT CIRCUIT 4KV SIDE FUSE B FAILS OPEN | ANALOG INDICATION | 27-VF210 B-C COIL DROPPED OUT | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CLASS 1F AC POWER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.D. 12261 FMEA-22-5/2 SH 28 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--------------------------------------|---------------|
| 22-5/-Y | E2775EB3 | 52S-ENSBC CONTACT 69 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO MANUAL CKT ESTABLISHED | |
| 22-5/-Y | E2785EB3 | 1A-EGPBA CONTACT 1 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO MANUAL CKT ESTABLISHED | |
| 22-5/-Y | E2795EB6 | 1A-EGPBA IN TRIP (OPER ERROR) | PERIODIC INSPECTION | ACB 2F10 NO MANUAL CKT ESTABLISHED | |
| 22-5/-Y | E2805EB3 | 43-EGPBAX CONTACT 10 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO MANUAL CKT ESTABLISHED | |
| 22-5/-AE | E2815EB1 | 43-EGPBAX COIL ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AE | E2825EB1 | PB-EGPBA TRANS PB CONT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-AA | E2835EB3 | 52S-ENSBC CONTACT 81 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AA | E2845EB3 | 62-VF210 FAILS TO ACTUATE | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AA | E2855EB3 | 32-EGSBDX CONTACT 1 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AA | E2865EB3 | 1A-EGPBA CONTACT 7 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AE | E2875EB3 | 43-EGPBAX CONTACT 12 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AD | E2885EB3 | 51-VF207X CONTACT 1 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AA | E2895EB3 | 27-VF200X4 CONTACT 223 FAILS OPEN | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|---|---------------|
| 22-5/-AA | E2905EB6 | 1A-EGPBA NOT IN AUTO (OPER ERROR) | PERIODIC INSPECTION | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-AA | E2915EB3 | 27-VF200X4 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BS | E2925EB3 | 27-VF3200X CONTACT 221 * FAILS CLOSED | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BS | E2935EB3 | 27-VF3200X ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BS | E2945EB3 | 27-VF3200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BS | E2955EB3 | 27-VF3200 SPURIOUS ACTUATION | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BS | E2965EB3 | 27-VF1200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-BS | E2975EB3 | 27-VF1200 SPURIOUS ACTUATION | PERIODIC TEST | ACB 2F10 NO AUTO CKT ESTABLISHED | |
| 22-5/-S | E2985EB1 | 2EXC-B CONTACT 5A LTR FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-S | E2995EB1 | ACB 2F10 TRIP COIL ENERG BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-S | E3005EB1 | 1-EGPBA CONTACT 3 FAILED CLOSED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-S | E3015EB6 | 1-EGPBA IN TRIP (OPER ERROR) | PERIODIC INSPECTION | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-S | E3025EB1 | 32-EGSBDX CONTACT 11 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-22-5/2 SH 30 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--------------------------------------|---------------|
| 22-5/-S | E3045EB1 | 32-EGSBDX COIL ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BF | E3055EB1 | 50-VF210 CONTACT 12 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BF | E3065EB1 | 59-VF210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BF | E3075EB1 | 59-VF1210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BF | E3085EB1 | 87-VF210 0A FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BF | E3095EB1 | 87-VF210 0B FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BF | E3105EB1 | 87-VF210 0C FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | 2DF EMERGENCY SUPPLY VOLTAGE FAILURE | |
| 22-5/-BT | E3115EB3 | 51-VF210 0A FAILS ACTUATED | PERIODIC TEST | 51-VF210 OR 50-VF210 ACTUATED | |
| 22-5/-BT | E3125EB3 | 51-VF210 0B FAILS ACTUATED | PERIODIC TEST | 51-VF210 OR 50-VF210 ACTUATED | |
| 22-5/-BT | E3135EB3 | 51-VF210 0C FAILS ACTUATED | PERIODIC TEST | 51-VF210 OR 50-VF210 ACTUATED | |
| 22-5/-BT | E3145EB3 | 21-EGSBDX FAILS ACTUATED | PERIODIC TEST | 21-VF210 OR 21-EGSDX ACTUATED | |
| 22-5/-BT | E3155EB3 | 50-VF210 0A FAILS ACTUATED | PERIODIC TEST | 51-VF210 OR 50-VF210 ACTUATED | |
| 22-5/-BT | E3165EB3 | 50-VF210 0B FAILS ACTUATED | PERIODIC TEST | 51-VF210 OR 50-VF210 ACTUATED | |
| 22-5/-BT | E3175EB3 | 50-VF210 0C FAILS ACTUATED | PERIODIC TEST | 51-VF210 OR 50-VF210 ACTUATED | |
| 22-5/-BT | E3185EB3 | 21-VF210 A-B SIDE FAIL ACTUATED | PERIODIC TEST | 21-VF210 OR 21-EGSDX ACTUATED | |
| 22-5/-BT | E3195EB3 | 21-VF210 B-C SIDE FAILS ACTUATED | PERIODIC TEST | 21-VF210 OR 21-EGSDX ACTUATED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| CLASS 1E AC POWER SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-22-5/2 SH 31 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|----------------------------------|-----------------------------|----------------------------------|---------------|
| 22-5/-BN | E3205EB3 | 52-ENSBC CONTACT 51 FAILS CLOSED | PERIODIC TEST | NONE | |
| 22-5/-BN | E3215EB3 | 32-VF210 FAILS ACTUATED | PERIODIC TEST | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3225EB3 | 51-VF210G FAILS ACTUATED | PERIODIC TEST | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3235EB1 | 76-VF210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3245EB1 | 64-VF210 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3255EB3 | 62-EGSBD CONTACT 2 FAILS CLOSED | PERIODIC TEST | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3265EB3 | 62-EGSBD FAILS ACTUATED | PERIODIC TEST | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3275EB1 | 40-VF210 A-B SIDE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSBD GRP 11 RELAYS ACTUATED | |
| 22-5/-BN | E3285EB1 | 40-VF210 B-C SIDE FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | CKT EGSBD GRP 11 RELAYS ACTUATED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | CLASS 1E AC POWER SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O 12241 FMEA-22-5/2 SH 32 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|----------------------------------|-----------------------|
| 25-4/-F | Y0485AF3 | CKT-RCSAA K109 CONTACT K FAILS CLOSED | PERIODIC TEST | CKT-RCSAA K-109 CONTACT K CLOSED | |
| 25-4/-F | Y0495AF3 | CKT-RCSAA K109 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSAA K-109 CONTACT K CLOSED | (K109=NSSS INTERFACE) |
| 25-4/-F | Y0505AF3 | CKT-RCSAA (V591) CONT H FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-F | Y0515AF3 | CKT-RCSAA K111 CONTACT G FAILS CLOSED | PERIODIC TEST | CKT-RCSAA K111 CONTACT G CLOSED | |
| 25-4/-F | Y0525AF3 | CKT-RCSAA K111 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSAA K111 CONTACT G CLOSED | (K111=NSSS INTERFACE) |
| 25-4/-F | Y0535AF3 | CKT-RCSAA (V590) CONT L FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-F | Y0545AF3 | CKT-RCSAA 2RCS-PS417 CONTACT FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-G | Y0575AF3 | CKT-RCSBA K209 CONTACT K FAILS CLOSED | PERIODIC TEST | CKT-RCSBA K209 CONTACT K CLOSED | |
| 25-4/-G | Y0585AF3 | CKT-RCSBA K209 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSBA K209 CONTACT K CLOSED | (K209=NSSS INTERFACE) |
| 25-4/-G | Y0595AF3 | CKT-RCSBA (V593)CONT H FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-G | Y0605AF3 | CKT-RCSBA K211 CONTACT G FAILS CLOSED | PERIODIC TEST | CKT-RCSBA K211 CONTACT G CLOSED | |
| 25-4/-G | Y0615AF3 | CKT-RCSBA K211 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSBA K211 CONTACT G CLOSED | (K211=NSSS INTERFACE) |

Amendment 3

September 1984

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| 15-8-84-19-02 | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| RCS-PUMP HOT-COLD LEG BYPASS ISOL | | | | | | | |
| 4 | 3 | 2 | 1 | 1 | 1 | 1 | 1 |
| J.O. 12241 | | | | FMEA-25-4/2 SH 1 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---------------------------------|-----------------------|
| 25-4/-G | Y0625AF3 | CKT-RCSBA (V592) CONT L FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-G | Y0635AF3 | CKT-RCSBA 2RCS-P427 CONTACT FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-B | Y1035AF3 | CKT-RCSAA 1SC CONT 13 FAILS CLOSED | PERIODIC TEST | CKT-RCSAA 1SC-CONTACT 13 CLOSED | |
| 25-4/-B | Y1045AF6 | CKT-RCSAA 1SC CONT 13 CLOSED (OP ERROR) | PERIODIC INSPECTION | CKT-RCSAA 1SC-CONTACT 13 CLOSED | |
| 25-4/-J | Y1055AF3 | CKT-RCSAA K110 CONT K2 FAILS CLOSED | PERIODIC TEST | CKT-RCSAA K110 CONT K2 CLOSED | |
| 25-4/-J | Y1065AF3 | CKT-RCSAA K110 ERRONEOUS SIGNAL | PERIODIC TEST | CKT-RCSAA K110 CONT K2 CLOSED | (K110=NSSS INTERFACE) |
| 25-4/-J | Y1075AF3 | CKT-RCSAA K113 CONT G FAILS CLOSED | PERIODIC TEST | CKT-RCSAA K113 CONT G CLOSED | |
| 25-4/-J | Y1085AF3 | CKT-RCSAA K113 ERRONEOUS SIGNAL | PERIODIC TEST | CKT-RCSAA K113 CONT G CLOSED | (K113=NSSS INTERFACE) |
| 25-4/-E | Y1095AF3 | CKT-RCSBA 1SC CONT 13 FAILS CLOSED | PERIODIC TEST | CKT-RCSBA 1SC CONT 13 CLOSED | |
| 25-4/-E | Y1105AF6 | CKT-RCSBA 1SC CONT 13 CLOSED (OP ERROR) | PERIODIC INSPECTION | CKT-RCSBA 1SC CONT 13 CLOSED | |
| 25-4/-K | Y1115AF3 | CKT-RCSBA K210 CONT K2 FAILS CLOSED | PERIODIC TEST | CKT-RCSBA K210 CONT K2 CLOSED | |
| 25-4/-K | Y1125AF3 | CKT-RCSBA K210 ERRONEOUS SIGNAL | PERIODIC TEST | CKT-RCSBA K210 CONT K2 CLOSED | (K210=NSSS INTERFACE) |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RCS-PUMP HOT-COLD LEG BYPASS ISOL |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FHEA-25-4/2 SH 2 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---------------------------------|-----------------------|
| 25-4/-K | Y1135AF3 | CKT-RCSBA K213 CONT G FAILS CLOSED | PERIODIC TEST | CKT-RCSBA K213 CONT G CLOSED | |
| 25-4/-K | Y1145AF3 | CKT-RCSBA K213 ERRONEOUS SIGNAL | PERIODIC TEST | CKT-RCSBA K213 CONT G CLOSED | (K213=NSSS INTERFACE) |
| 25-4/-H | Y0665BF3 | CKT-RCSCA K309 CONTACT K FAILS CLOSED | PERIODIC TEST | CKT-RCSCA K309 CONTACT K CLOSED | |
| 25-4/-H | Y0675BF3 | CKT-RCSCA K309 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSCA K309 CONTACT K CLOSED | (K209=NSSS INTERFACE) |
| 25-4/-H | Y0685BF3 | CKT-RCSCA (V595)CONT H FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-H | Y0695BF3 | CKT-RCSCA K311 CONT G FAILS CLOSED | PERIODIC TEST | CKT-RCSCA K311 CONTACT G CLOSED | |
| 25-4/-H | Y0705BF3 | CKT-RCSCA K311 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSCA K311 CONTACT G CLOSED | (K311=NSSS INTERFACE) |
| 25-4/-H | Y0715BF3 | CKT-RCSCA (V594)CONT L FAILS OPEN | PERIODIC TEST | NONE | |
| 25-4/-H | Y0725BF3 | CKT-RCSCA 2RCS-PS437 CONTACT FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-D | Y1155BF3 | CKT-RCSCA 15C CONT 13 FAILS CLOSED | PERIODIC TEST | CKT-RCSCA 15C-CONT 13 CLOSED | |
| 25-4/-D | Y1165BF6 | CKT-RCSCA 15C CONT 13 CLOSED (CP ERROR) | PERIODIC INSPECTION | CKT-RCSCA 15C-CONT 13 CLOSED | |
| 25-4/-L | Y1175BF3 | CKT-RCSCA K310 CONT K2 FAILS CLOSED | PERIODIC TEST | CKT-RCSCA K310 CONT K2 CLOSED | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RCS-PUMP HOT-COLD LEG BYPASS ISOL |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-25-4/2 SH 3 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|-----------------------|
| 25-4/-L | Y1185BF3 | CKT-RCSCA K310 ERRONEOUS SIGNAL | PERIODIC TEST | CKT-RCSCA K310 CONT K2 CLOSED | (K310=NSSS INTERFACE) |
| 25-4/-L | Y1195BF3 | CKT-RCSCA K313 CONT G FAILS CLOSED | PERIODIC TEST | CKT-RCSCA K313 CONT G CLOSED | |
| 25-4/-L | Y1205BF3 | CKT-RCSCA K313 ERRONEOUS SIGNAL | PERIODIC TEST | CKT-RCSCA K313 CONT G CLOSED | (K313=NSSS INTERFACE) |
| 25-4/-A | Y0096FA3 | CKT-RCSAC 420 SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | REACTOR COOLANT SYSTEM COLD LEG ISOL FAILURE | |
| 25-4/-N | Y0106FA3 | RCSAC CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-RCSAC CONTACT R1 CLOSED | |
| 25-4/-N | Y0116FA6 | 1-RCSAC IN CLOSE (OPER ERROR) | PERIODIC INSPECTION | 1-RCSAC CONTACT R1 CLOSED | |
| 25-4/-N | Y0126FA3 | CKT-RCSAC TIMER 101 CONTACT 2 FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-N | Y0136FA3 | CKT-RCSAC K108 CONT G FAILS CLOSED | PERIODIC TEST | CKT-RCSAC K108 CONTACT G CLOSED | |
| 25-4/-N | Y0146FA3 | CKT-RCSAC K108 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSAC K108 CONTACT G CLOSED | (K108=NSSS INTERFACE) |
| 25-4/-N | Y0156FA3 | CKT-RCSAC K108 CONT L FAILS CLOSED | PERIODIC TEST | CKT-RCSAC K108 CONTACT L CLOSED | |
| 25-4/-N | Y0166FA3 | CKT-RCSAC K108 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSAC K108 CONTACT L CLOSED | (K108=NSSS INTERFACE) |
| 25-4/-A | Y0176FA3 | CKT-RCSBC 420 SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | REACTOR COOLANT SYSTEM COLD LEG ISOL FAILURE | |
| 25-4/-P | Y0186FA3 | 1-RCSBC CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-RCSBC CONTACT R1 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS-PUMP HOT-COLD LEG BYPASS ISOL | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-4/2 SH 4 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|-----------------------|
| 25-4/-P | Y0196FA6 | 1-RCSBC IN CLOSE (OPER ERROR) | PERIODIC INSPECTION | 1-RCSBC CONTACT R1 CLOSED | |
| 25-4/-P | Y0206FA3 | CKT-RCSBC TIMER 102 CONTACT 2 FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-P | Y0216FA3 | CKT-RCSBC K208 CONTACT G FAILS CLOSED | PERIODIC TEST | CKT-RCSBC K208 CONTACT G CLOSED | |
| 25-4/-P | Y0226FA3 | CKT-RCSBC K208 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSBC K208 CONTACT G CLOSED | (K208=NSSS INTERFACE) |
| 25-4/-P | Y0236FA3 | CKT-RCSCC K208 CONTACT L FAILS CLOSED | PERIODIC TEST | CKT-RCSBC K208 CONTACT L CLOSED | |
| 25-4/-P | Y0246FA3 | CKT-RCSCC K208 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSBC K208 CONTACT L CLOSED | (K208=NSSS INTERFACE) |
| 25-4/-A | Y1226FA3 | 420-RCSAC ENERGIZED BY SHORT CKT | PERIODIC TEST | REACTOR COOLANT SYSTEM COLD LEG ISOL FAILURE | |
| 25-4/-A | Y1236FA3 | 420-RCSBC ENERGIZED BY SHORT CKT | PERIODIC TEST | REACTOR COOLANT SYSTEM COLD LEG ISOL FAILURE | |
| 25-4/-A | Y0016FB3 | CKT RCSCC 420 SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | REACTOR COOLANT SYSTEM COLD LEG ISOL FAILURE | |
| 25-4/-M | Y0026FB3 | 1-RCSCC CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-RCSCC CONTACT R1 CLOSED | |
| 25-4/-M | Y0036FB6 | 1-RCSCC IN CLOSE (OPER ERROR) | PERIODIC INSPECTION | 1-RCSCC CONTACT R1 CLOSED | |
| 25-4/-M | Y0046FB3 | CKT-RCSCC TIMER 301 CONTACT 2 FAILS CLOSED | PERIODIC TEST | NONE | |
| 25-4/-M | Y0056FB3 | CKT-RCSCC K308 CONT G FAILS CLOSED | PERIODIC TEST | CKT-RCSCC K308 CONTACT G CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|----------------------------------|--|-----------------------|
| 25-4/-M | Y0066FB3 | CKT-RCSCC K308 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSCC K308 CONTACT G CLOSED | (K308=NSSS INTERFACE) |
| 25-4/-M | Y0076FB3 | CKT-RCSCC K308 CONT L FAILS CLOSED | PERIODIC TEST | CKT-RCSCC K308 CONTACT L CLOSED | |
| 25-4/-M | Y0086FB3 | CKT-RCSCC K308 ACTUATION SIGNAL | PERIODIC TEST | CKT-RCSCC K308 CONTACT L CLOSED | (K308=NSSS INTERFACE) |
| 25-4/-C | Y0326FB2 | CKT-RCSAD 420 SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | REACTOR COOLANT SYSTEM HOT LEG ISOL FAILURE | |
| 25-4/-R | Y0336FB3 | 1-RCSAD CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-RCSAD CONTACT R1 CLOSED | |
| 25-4/-R | Y0346FB6 | 1-RCSAD IN CLOSE (OPER ERROR) | PERIODIC INSPECTION | 1-RCSAD CONTACT R1 CLOSED | |
| 25-4/-R | Y0356FB3 | CKT-RCSAD K102 CONTACT G FAILS CLOSED | PERIODIC TEST | CKT RCSAD K102 CONTACT G CLOSED | |
| 25-4/-R | Y0366FB3 | CKT-RCSAD K102 ACTUATION SIGNAL | PERIODIC TEST | CKT RCSAD K102 CONTACT G CLOSED | (K102=NSSS INTERFACE) |
| 25-4/-R | Y0376FB3 | CKT-RCSAD K102 CONTACT L FAILS CLOSED | PERIODIC TEST | CKT RCSAD K102 CONTACT L CLOSED | |
| 25-4/-R | Y0386FB3 | CKT-RCSAD K102 ACTUATION SIGNAL | PERIODIC TEST | CKT RCSAD K102 CONTACT L CLOSED | (K102=NSSS INTERFACE) |
| 25-4/-A | Y1216FB3 | 420-RCSCC ENERGIZED BY SHORT CKT | PERIODIC TEST | REACTOR COOLANT SYSTEM COLD LEG ISOL FAILURE | |
| 25-4/-C | Y1256FB3 | 420-RCSAD ENERGIZED BY SHORT CKT | PERIODIC TEST | REACTOR COOLANT SYSTEM HOT LEG ISOL FAILURE | |
| 25-4/-C | Y0256FC2 | CKT-RCSCD 420 SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | REACTOR COOLANT SYSTEM HOT LEG ISOL FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RCS-PUMP HOT-COLD LEG BYPASS ISOL | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FHEA-25-4/2 SH 6 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|-----------------------|
| 25-4/-Q | Y0266FC3 | 1-RCSCD CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-RCSCD CONTACT R1 CLOSED | |
| 25-4/-Q | Y0276FC6 | 1-RCSCD IN CLOSE (OPER ERROR) | PERIODIC INSPECTION | 1-RCSCD CONTACT R1 CLOSED | |
| 25-4/-Q | Y0286FC3 | CKT-RCSCD K302 CONTACT G FAILS CLOSED | PERIODIC TEST | CKT RCSCD K302 CONTACT G CLOSED | |
| 25-4/-Q | Y0296FC3 | CKT-RCSCD K302 ACTUATION SIGNAL | PERIODIC TEST | CKT RCSCD K302 CONTACT G CLOSED | (K302=NSSS INTERFACE) |
| 25-4/-Q | Y0306FC3 | CKT-RCSCD K302 CONTACT L FAILS CLOSED | PERIODIC TEST | CKT RCSCD K302 CONTACT L CLOSED | |
| 25-4/-Q | Y0316FC3 | CKT-RCSCD K302 ACTUATION SIGNAL | PERIODIC TEST | CKT RCSCD K302 CONTACT L CLOSED | (K302=NSSS INTERFACE) |
| 25-4/-C | Y0396FC3 | CKT-RCSBD 420 SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | REACTOR COOLANT SYSTEM HOT LEG ISOL FAILURE | |
| 25-4/-S | Y0406FC3 | 1-RCSBD CONTACT R1 FAILS CLOSED | PERIODIC TEST | 1-RCSBD CONTACT R1 CLOSED | |
| 25-4/-S | Y0416FC6 | 1-RCSBD IN CLOSE (OPER ERROR) | PERIODIC INSPECTION | 1-RCSBD CONTACT R1 CLOSED | |
| 25-4/-S | Y0426FC3 | CKT-RCSBD K202 CONTACT G FAILS CLOSED | PERIODIC TEST | CKT RCSBD K202 CONTACT G CLOSED | |
| 25-4/-S | Y0436FC3 | CKT-RCSBD K202 ACTUATION SIGNAL | PERIODIC TEST | CKT RCSBD K202 CONTACT G CLOSED | (K202=NSSS INTERFACE) |
| 25-4/-S | Y0446FC3 | CKT-RCSBD K202 CONTACT L FAILS CLOSED | PERIODIC TEST | CKT RCSBD K202 CONTACT L CLOSED | |
| 25-4/-S | Y0456FC3 | CKT-RCSBD K202 ACTUATION SIGNAL | PERIODIC TEST | CKT RCSBD K202 CONTACT L CLOSED | (K202=NSSS INTERFACE) |
| 25-4/-C | Y1246FC3 | 420-RCSCD ENERGIZED BY SHORT CKT | PERIODIC TEST | REACTOR COOLANT SYSTEM HOT LEG ISOL FAILURE | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RCS-PUMP HOT-COLD LEG BYPASS ISOL |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-25-4/2 SH 7 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---|---------------|
| 25-4/-C | Y1266FC3 | 420-RCSBD ENERGIZED BY SHORT CKT | PERIODIC TEST | REACTOR COOLANT SYSTEM HOT LEG ISOL FAILURE | |
| 25-4/-B | Y0736KS3 | 62-RCSAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | 62-RCSAA CONTACT 3 CLOSED | |
| 25-4/-T | Y0746KS3 | 62-RCSAA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 62-RCSAA CONTACT 3 CLOSED | |
| 25-4/-T | Y0756KS3 | 42-RCSAA CONTACT 7 FAILS CLOSED | PERIODIC TEST | 62-RCSAA CONTACT 3 CLOSED | |
| 25-4/-T | Y0766KS3 | 42-RCSAA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 62-RCSAA CONTACT 3 CLOSED | |
| 25-4/-H | Y0776KS3 | CKT-RCSAA CONTACT R1 FAILS CLOSED | PERIODIC TEST | 62-RCSAA CONTACT 3 CLOSED | |
| 25-4/-H | Y0786KS6 | CKT-RCSAA CONTACT R1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | 62-RCSAA CONTACT 3 CLOSED | |
| 25-4/-H | Y0796KS3 | CKT RCSAA CONTACT L1 FAILS CLOSED | PERIODIC TEST | CKT-RCSAA CONTACT L1 CLOSED | |
| 25-4/-H | Y0806KS6 | CKT RCSAA CONTACT L1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | CKT-RCSAA CONTACT L1 CLOSED | |
| 25-4/-H | Y0816KS3 | CKT-RCSAA CONTACT IC 1 FAILS CLOSED | PERIODIC TEST | CKT-RCSAA CONTACT IC1 CLOSED | |
| 25-4/-H | Y0826KS6 | CKT-RCSAA CONTACT IC 1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | CKT-RCSAA CONTACT IC1 CLOSED | |
| 25-4/-E | Y0836KS3 | 62-RCSBA CONTACT 3 FAILS CLOSED | PERIODIC TEST | 62-RCSBA CONTACT 3 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-----------------------------|------------------------------|---------------|
| 25-4/-U | Y0846KS3 | 62-RCSBA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 62-RCSBA CONTACT 3 CLOSED | |
| 25-4/-U | Y0856KS3 | 42-RCSBA CONTACT 7 FAILS CLOSED | PERIODIC TEST | 62-RCSBA CONTACT 3 CLOSED | |
| 25-4/-U | Y0866KS3 | 42-RCSBA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 62-RCSBA CONTACT 3 CLOSED | |
| 25-4/-X | Y0876KS3 | CKT-RCSBA CONTACT R1 FAILS CLOSED | PERIODIC TEST | 62-RCSBA CONTACT 3 CLOSED | |
| 25-4/-X | Y0886KS6 | CKT-RCSBA CONTACT R1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | 62-RCSBA CONTACT 3 CLOSED | |
| 25-4/-X | Y0896KS3 | CKT-RCSBA CONTACT L1 FAILS CLOSED | PERIODIC TEST | CKT-RCSBA CONTACT L1 CLOSED | |
| 25-4/-X | Y0906KS6 | CKT-RCSBA CONTACT L1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | CKT-RCSBA CONTACT L1 CLOSED | |
| 25-4/-X | Y0916KS3 | CKT-RCSBA CONTACT IC 1 FAILS CLOSED | PERIODIC TEST | CKT-RCSBA CONTACT IC1 CLOSED | |
| 25-4/-X | Y0926KS6 | CKT-RCSBA CONTACT IC 1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | CKT-RCSBA CONTACT IC1 CLOSED | |
| 25-4/-D | Y0936KS3 | 62-RCSCA CONTACT 3 FAILS CLOSED | PERIODIC TEST | 62-RCSCA CONTACT 3 CLOSED | |
| 25-4/-V | Y0946KS3 | 62-RCSCA COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | 62-RCSCA CONTACT 3 CLOSED | |
| 25-4/-V | Y0956KS3 | 42-RCSCA CONTACT 7 FAILS CLOSED | PERIODIC TEST | 62-RCSCA CONTACT 3 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|------------------------------|---------------|
| 25-4/-V | Y0966KS3 | 42-RCSCJACOIL ENER BY SHORT CKT | PERIODIC TEST | 62-RCSCA CONTACT 3 CLOSED | |
| 25-4/-Y | Y0976KS3 | CKT-RCSCA CONTACT R1 FAILS CLOSED | PERIODIC TEST | 62-RCSCA CONTACT 3 CLOSED | |
| 25-4/-Y | Y0986KS6 | CKT-RCSCA CONTACT R1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | 62-RCSCA CONTACT 3 CLOSED | |
| 25-4/-Y | Y0996KS3 | CKT-RCSCA CONTACT L1 FAILS CLOSED | PERIODIC TEST | CKT-RCSCA CONTACT L1 CLOSED | |
| 25-4/-Y | Y1006KS6 | CKT-RCSCA CONTACT L1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | CKT-RCSCA CONTACT L1 CLOSED | |
| 25-4/-Y | Y1016KS3 | CKT-RCSCA CONTACT IC 1 FAILS CLOSED | PERIODIC TEST | CKT-RCSCA CONTACT IC1 CLOSED | |
| 25-4/-Y | Y1026KS6 | CKT-RCSCA CONTACT IC 1 CLOSED (OPER ERROR) | PERIODIC INSPECTION | CKT-RCSCA CONTACT IC1 CLOSED | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RCS-PUMP HOT-COLD LEG BYPASS ISOL |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-25-4/2 SH 10 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|--|-------------------------------------|---|---------------|
| 25-6/-D | W11611L2 | CKT RCSNB NO 125VDC PWR AVAILABLE FROM PNL#DC2-02 | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-D | W11711L3 | 2RCS#PCV455C COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-D | W11811L3 | CKT RCSNB CKT BKR P0 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-D | W11911L3 | CKT RCSNB CKT BKR P1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-D | W12011L3 | CKT RCSNB CKT BKR N0 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-D | W12111L3 | CKT RCSNB CKT BKR N1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-D | W12211L3 | CKT RCSNB SHORT CIRCUIT | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-P | W12311L3 | 4-RCSNB CONTACT 111 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-P | W12411L3 | 4-RCSNB CONTACT 221 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-P | W12511L3 | 4-RCSNB CONTACT 113 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-E 25-6/-F | W12611L2 | CKT RCSNA NO 125VDC PWR AVAILABLE FROM PNL#DC2-03 | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-K | W12711L3 | 2RCS#PCV456 COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-J | W12811L3 | CKT RCSNA CKT BKR P3 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |

Amendment 3

September 1984

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|---|---|---|---|--------|---------|------------------------------------|
| | | | | 5-1-84 | 6-22-83 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RG | JIP | RCS PRESSURIZER CONTROL SYSTEM |
| 4 | 3 | 2 | 1 | RG | JIP | |
| | | | | - | - | J.O. 12241 FMEA-25-6/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | ACT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|---------------|---|
| 25-6/-J | W12911L3 | CKT RCSNA CKT PKR P5 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN D FAILURE |
| 25-6/-J | W13011L3 | CKT RCSNA CKT BKR(BKR) FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-J | W13111L3 | CKT RCSNA CKT BKR(BKR1) FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-J | W13211L3 | CKT RCSNA SHORT CIRCUIT | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-K | W13311L3 | 4-RCSNA CONTACT 111 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-K | W13411L3 | 4-RCSNA CONTACT 221 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-K | W13511L3 | 4-RCSNA CONTACT 113 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-K | W13611L3 | 4-RCSNA CONTACT 223 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE |
| 25-6/-F | W13811L3 | 2RCS+PCV455D COIL FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE |
| 25-6/-F | W13911L3 | CKT RCSNC CKT BKR P1 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE |
| 25-6/-F | W14011L3 | CKT RCSNC CKT BKR P2 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE |
| 25-6/-F | W14111L3 | CKT RCSNC CKT BKR N1 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE |
| 25-6/-F | W14211L3 | CKT RCSNC CKT BKR N2 FAILS OPEN | PERIODIC TEST | | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RCS PRESSURIZER CONTROL SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-25-6/2 SH 2 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 25-6/-F | W14311L3 | CKT RCSNC SHORT CIRCUIT | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-S | W14411L3 | 4-RCSNC CONTACT 111 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-S | W14511L3 | 4-RCSNC CONTACT 221 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-S | W14611L3 | 4-RCSNC CONTACT 113 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-S | W14711L3 | 4-RCSNC CONTACT 223 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-S | W17011L3 | 4-RCSNC COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17111L3 | 1-RCSNC CONTACT R1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17211L6 | 1-RCSNC NOT IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17311L3 | CKT RCSNC CLOSE CONTACT PRZR PRESS HI FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17411L3 | CKT RCSNC PRZR PRESS HI SIGNAL FAILURE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17511L3 | 1-RCSNC CONTACT L1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17611L6 | 1-RCSNC IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-AB | W17711L3 | K647A TN A CONTACT 1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-6/2 SH 3 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---|---------------------------------|
| 25-6/-AB | W17811L3 | K647A TN A ERRONEOUS SIGNAL | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | (K647A TN A =NSSS INTERFACE) |
| 25-6/-P | W17911L3 | 4-RCSNB COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-Y | W18011L3 | 1-RCSNB CONTACT R1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-Y | W18111L6 | 1-RCSNB IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-Y | W18211L3 | 1-RCSNB CONTACT L1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-Y | W18311L6 | 1-RCSNB IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-W | W18411L3 | 4-2CSNA COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-W | W18511L3 | 43-CESNF7 CONTACT 10 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AA | W18611L3 | 1-RCSNA CONTACT R1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AA | W18711L6 | 1-RCSNA IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AA | W18811L3 | 1-RCSNA CONTACT L1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AA | W18911L6 | 1-RCSNA IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-E | W19011L3 | 43-CESNFX7 CONTACT 9 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-E | W19111L3 | 43-CESNFX7 CONTACT 11 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RCS PRESSURIZER CONTROL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-25-6/2 SH 4 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|------------------------------|
| 25-6/-E | W19211L3 | 43-CESNFX7 CONTACT 12 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-W | W19311L1 | 43-CESNFX7 COIL ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-W | W19411L1 | PB7-CESNFX7 TRANSFER PB FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AC | W19511L3 | K642B TN B CONTACT 1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-AC | W19611L3 | K642B TN B SIGNAL FAILURE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | (K642B TN B =NSSS INTERFACE) |
| 25-6/-AC | W19711L3 | 1B-RCSNB CONTACT L2 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-AC | W19811L6 | 1B-RCSNB IN BLOCK (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-AC | W19911L3 | K646B TN B CONTACT 1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-AC | W20011L3 | K646B TN B ERRONEOUS SIGNAL | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | (K646B TN B =NSSS INTERFACE) |
| 25-6/-AC | W20111L3 | CKT RCSNB CLOSE PRESS HI CONTACT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-AC | W20211L3 | CKT RCSNB SIGNAL FAILURE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-AD | W20311L3 | K642A TN A CONTACT 1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AD | W20411L3 | K642A TN A SIGNAL FAILURE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|------------------------------|
| 25-6/-AD | W0511L3 | 1B-RCSNA CONTACT L2 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AD | W20611L6 | 1B-RCSNA IN BLOCK (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AD | W20711L3 | K646A TN A CONTACT 1 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AD | W20811L3 | K646A TN A ERRONEOUS SIGNAL | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | (K646A TN A= NSSS INTERFACE) |
| 25-6/-AD | W20911L3 | CKT RCSNA CLOSE PRESS HI CONTACT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-AD | W21011L3 | CKT RCSNA SIGNAL FAILURE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-P | W21111L3 | 4-RCSNB CONTACT 223 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-M | W0296FG2 | 2RCS*MOV537 NO 480V OPER PWR FROM MOC*2-E06 | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-M | W0306FG2 | CKT RCSNF 480V-120V CONT PWR XFMR FAILS | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-R | W0326FG3 | 420-RCSNF COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-R | W0336FG3 | 42C-RCSNF INTERLOCK CONT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-R | W0346FG3 | LMS-RCSNF CONTACT 4 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-R | W0366FG3 | LMS-RCSNF CONTACT 5 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-6/2 SH 6 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|--------------------------------------|----------------------------------|--|------------------------------|
| 25-6/-V | H0376FG3 | 1-RCSNF CONTACT R1 FAILS OPEN | PERIODIC TEST | 420-RCSNF NO MANUAL CKT ESTABLISHED | |
| 25-6/-V | H0386FG6 | 1-RCSNF NOT IN OPEN (OPERATOR ERROR) | PERIODIC INSPECTION | 420-RCSNF NO MANUAL CKT ESTABLISHED | |
| 25-6/-R | H0396FG3 | CKT RCSNF TQS-0 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-R | H0406FG3 | 2RCS#NOV537 EXCESSIVE TORQUE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-H | H1146FG3 | 49-RCSNF CONTACT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-H | H1156FG3 | 2RCS#NOV537 THERMAL OVERLOAD | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-V | H1626FG3 | 1-RCSNF CONTACT L2 FAILS OPEN | PERIODIC TEST | 420-RCSNF NO AUTO CKT ESTABLISHED | |
| 25-6/-L 25-6/-V | H1636FG6 | 1-RCSNF IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-V | H1646FG3 | H649A TN A CONTACT 1 FAILS OPEN | PERIODIC TEST | 420-RCSNF NO AUTO CKT ESTABLISHED | |
| 25-6/-L 25-6/-V | H1656FG3 | H649A TN A ERRONEOUS SIGNAL | PERIODIC TEST | 420-RCSNF NO AUTO CKT ESTABLISHED | (H649A TN A= NSSS INTERFACE) |
| 25-6/-L | H1666FG2 | 1-RCSNF CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN C FAILURE | |
| 25-6/-L | H1676FG3 | H649A TN A CONTACT 3 FAILS CLOSED | PERIODIC TEST | H649A TN A CONTACT 3 CLOSED | |
| 25-6/-L | H1686FG3 | 1-RCSNF CONTACT R2 FAILS CLOSED | PERIODIC TEST | 1-RCSNF CONTACT R2 CLOSED | |
| 25-6/-L | H1696FG6 | 1-RCSNF IN AUTO (OPERATOR ERROR) | PERIODIC INSPECTION | 1-RCSNF CONTACT R2 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-6/2 SH 7 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---|-------------------------------------|---|---------------|
| 25-6/-G | W0016HZ2 | 2RCS*MOV535 NO 480V OPER PWR FROM HCC*2-E05 | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-G | W0026HZ2 | CKT RCSNJ 480-120V CONTROL PWR XFMR FAILS | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-N | W0046HZ3 | 420-RCSNJ COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-N | W0056HZ3 | 42C-RCSNJ INTERLOCK CONT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-N | W0066HZ3 | LHS-RCSNJ CONTACT 4 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-N | W0086HZ3 | LMS-RCSNJ CONTACT 5 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-N | W0116HZ3 | CKT RCSNJ TQS-0 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-N | W0126HZ3 | 2RCS*MOV535 EXCESSIVE TORQUE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-C | W0136HZ1 | 42C-RCSNJ COIL ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-C | W0146HZ1 | 3-RCSNJ CONTACT 16 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-H | W0156HZ2 | 2RCS*MOV536 NO 480V OPER PWR FROM HCC*2-E06 | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-H | W0166HZ2 | CKT RCSNH 480V-120V CONTROL PWR XFMR FAILS | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-Q | W0186HZ3 | 420-RCSNH COIL FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-6/2 SH 8 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|---------------------------------------|----------------------------------|--|---------------|
| 25-6/-Q | W0196HZ3 | 42C-RCSNK INTERLOCK CNT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-Q | W0206HZ3 | LMS-RCSNK CONTACT 4 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-U | W0216HZ3 | 3-RCSNK CONTACT 14 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-Q | W0226HZ3 | LMS-RCSNK CONTACT 5 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-Q | W0256HZ3 | CKT RCSNK TQS-0 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-Q | W0266HZ3 | 2RCS*MOV536 EXCESSIVE TORQUE | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-B | W0276HZ1 | 42C-RCSNK COIL ENERGIZED BY SHORT CKT | ANNUNCIATED IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-B | W0286HZ1 | 269E-RCSNK CONTACT 16 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-G | W1026HZ2 | CKT RCSNJ SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-T | W1036HZ3 | 3-RCSNJ COIL FAILS | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-T | W1046HZ3 | 3-RCSNJ CONTACT 14 FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-T | W1056HZ3 | 1-RCSNJ CONTACT R1 FAILS OPEN | PERIODIC TEST | 3-RCSNJ NO MANUAL CKT ESTABLISHED | |
| 25-6/-T | W1066HZ6 | 1-RCSNJ NOT IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | 3-RCSNJ NO MANUAL CKT ESTABLISHED | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-6/2 SH 9 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------|----------------------|--|-------------------------------------|---|---------------|
| 25-6/-H 25-6/-H | W1076HZ2 | 2CAB*RCFBP-04 CONTACT 52 FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-U | W1096HZ3 | 1-RCSNK CONTACT R1 FAILS OPEN | PERIODIC TEST | 3-RCSNK NO MANUAL CKT ESTABLISHED | |
| 25-6/-U | W1106HZ6 | 1-RCSNK IN CLOSE (OPERATOR ERROR) | PERIODIC INSPECTION | 3-RCSNK NO MANUAL CKT ESTABLISHED | |
| 25-6/-U | W1116HZ3 | 3-RCSNK COIL FAILS | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-H | W1126HZ3 | 49-RCSNK CONTACT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-H | W1136HZ3 | 2RCS*MOV536 THERMAL OVERLOAD | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN B FAILURE | |
| 25-6/-X | W1486HZ3 | 1-RCSNJ CONTACT L1 FAILS OPEN | PERIODIC TEST | 3-RCSNJ NO AUTO CKT ESTABLISHED | |
| 25-6/-X | W1496HZ6 | 1-RCSNJ IN TRIP (OPERATOR ERROR) | PERIODIC INSPECTION | 3-RCSNJ NO AUTO CKT ESTABLISHED | |
| 25-6/-G | W1506HZ3 | 49-RCSNJ CONTACT FAILS OPEN | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-G | W1516HZ3 | 2RCS*MOV535 THERMAL OVERLOAD | PERIODIC TEST | PRESSURIZER RELIEF SAFETY SYSTEM TRAIN A FAILURE | |
| 25-6/-X | W1526HZ3 | 1B-RCSNJ CONTACT L1 FAILS OPEN | PERIODIC TEST | 1B-RCSNJ CONTACT L1 OPEN | |
| 25-6/-X | W1536HZ6 | 1B-RCSNJ NOT IN ARM (OPERATOR ERROR) | PERIODIC INSPECTION | 1B-RCSNJ CONTACT L1 OPEN | |
| 25-6/-X | W1546HZ3 | K648B TN B CONTACT 1 FAILS OPEN | PERIODIC TEST | K648B TN B CONTACT 1 OPEN | |
| 25-6/-Z | W1566HZ3 | 1-RCSNK CONTACT L1 FAILS OPEN | PERIODIC TEST | 3-RCSNK NO AUTO CKT ESTABLISHED | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-6/2 SH 10 | | | | | |

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*****
FTSK   COMPONENT   COMPONENT AND   METHOD OF   EFFECT ON   SYSTEM   OTHER   REMARKS
IDENTIFIER   FAILURE MODE   FAILURE DETECTION
*****
25-6/-Z  W1576HZ6  1-RSCNK IN OPEN  PERIODIC INSPECTION  3-RCSNK NO AUTO CKT ESTABLISHED
(OOPERATOR ERROR)
25-6/-Z  W1586HZ3  1B-RSCNK        PERIODIC TEST        1B-RSCNK CONTACT L1 OPEN
CONTACT L1
FAILS OPEN
25-6/-Z  W1596HZ6  1B-RSCNK NOT IN  PERIODIC INSPECTION  1B-RSCNK CONTACT L1 OPEN
ARM OPEN
(OOPERATOR ERROR)
25-6/-Z  W1606HZ3  K648A TN A      PERIODIC TEST        K648A TN A CONTACT 1 OPEN
CONTACT
FAILS OPEN
25-6/-Z  W1616HZ3  K648A TN A      PERIODIC TEST        K648A TN A CONTACT 1 OPEN      (K648A TN A=
PRESSURE SENSOR ERRONEOUS SIGNAL  NSSS INTERFACE)
25-6/-X  W2126HZ3  K648B TN B      PERIODIC TEST        K648B TN B CONTACT 1 OPEN      (K648B TN B=
PRESSURE SENSOR ERRONEOUS SIGNAL  NSSS INTERFACE)

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RCS PRESSURIZER CONTROL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-6/2 SH 11 | | | | | |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-C D001XXX3 RHR RETN PATH A PERIODIC TEST
 CHECK VALVE
 FAILS OPEN

IF RHR#HOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#HOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR#HOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#HOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#HOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#HOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#HOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#HOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

25-7/-B D002XXX3 RHR RETN PATH B PERIODIC TEST
 CHECK VALVE
 FAILS OPEN

IF RHR#HOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#HOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR#HOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#HOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#HOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#HOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#HOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#HOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

Amendment 3

September 1984

| | | | | | |
|---|---|---|----------|---------|------------------------------------|
| | | | 4-6-84 | 11-5-81 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | RG | RRP | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 11/11/83 | | |
| | | | | | J.O. 12231 FMEA-25-7/2 SH 1 |

FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS

IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-C D0956RU2 420-RHSAB INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT

IF RHR*NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*NOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*NOV720A INADVERTENTLY OPENED

IF RHR*NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*NOV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*NOV720A INADVERTENTLY OPENED

IF RHR*NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*NOV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*NOV720A INADVERTENTLY OPENED

IF RHR*NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*NOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*NOV720A INADVERTENTLY OPENED

25-7/-C D0956RU2 420-RHSAB INDICATING LIGHT
 SEAL IN CONTACT IN CONTROL ROOM
 FAILS CLOSED

IF RHR*NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*NOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*NOV720A INADVERTENTLY OPENED

IF RHR*NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*NOV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*NOV720A INADVERTENTLY OPENED

IF RHR*NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*NOV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*NOV720A INADVERTENTLY OPENED

IF RHR*NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*NOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*NOV720A INADVERTENTLY OPENED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-25-7/2 5/1 2 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-J D0976RU3 PB440-1 CONTACT 7 PERIODIC TEST
 FAILS CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 PB440-1 CONTACT 7 CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 PB440-1 CONTACT 7 CLOSED

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 PB440-1 CONTACT 7 CLOSED

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 PB440-1 CONTACT 7 CLOSED

25-7/-R D0986RU3 1B-RHSAB PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

| | | | | | | |
|----|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 14 | 3 | 2 | 1 | | | J.O. 12241 FHCA-25-7/2 SH 3 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#1'OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#1'OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#1'OV720A 1#B OR SDP OPEN
 CKT ESTD

25-7/-R D0516RU4 43-CESAFX2 MORE CONTACTS MUST
 CONTACT 1 FAIL TO BE DETECTABLE
 FAILS CLOSED

IF RHR#1'OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#1'OV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#1'OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#1'OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#1'OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#1'OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#1'OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#1'OV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 1 CLOSED

25-7/-R D0526RU4 43-CESAFX2 MORE CONTACTS MUST
 CONTACT 2 FAIL TO BE DETECTABLE
 FAILS CLOSED

IF RHR#1'OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#1'OV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 2 CLOSED

IF RHR#1'OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#1'OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 2 CLOSED

IF RHR#1'OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#1'OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 2 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-25-7/2 SH 5 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-R D0536RU1 43-CESAFX2
 ENERGIZED BY
 SHORT CIRCUIT ANNUNCIATED IN
 CONTROL ROOM

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 2 CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 1 CLOSED

25-7/-R D0546RU1 PB2-CESAF CONTACT
 FAILS CLOSED ANNUNCIATED IN
 CONTROL ROOM

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX2 CONTACT 1 CLOSED

| | | | | | | | |
|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RESIDUAL HEAT REMOVAL SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12201 FHEA-25-7/2 SH 6 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX2 CONTACT 1 CLOSED

25-7/-B 00756RU2 420-RHSEB INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT
 IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV720B INADVERTENTLY OPENED

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV720B INADVERTENTLY OPENED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV720B INADVERTENTLY OPENED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV720B INADVERTENTLY OPENED

25-7/-B 00766RU2 420-RHSD9 INDICATING LIGHT
 SEAL IN CONTACT IN CONTROL ROOM
 FAILS CLOSED
 IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV720B INADVERTENTLY OPENED

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV720B INADVERTENTLY OPENED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV720B INADVERTENTLY OPENED

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-7/2 SH 7 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-K D0776RU3 PB441 CONTACT 7 PERIODIC TEST
 FAILS CLOSED

IF RHR#110V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PHR
 MODE(ORANGE):
 2RHS#110V720B INADVERTENTLY OPENED

IF RHR#110V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PHR
 MODE(ORANGE):
 PB441 CONTACT 7 CLOSED

IF RHR#110V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 7 CLOSED

IF RHR#110V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 7 CLOSED

IF RHR#110V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PHR
 MODE(ORANGE):
 PB441 CONTACT 7 CLOSED

25-7/-S D0786RU3 1B-RHS0B PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR#110V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR#110V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#110V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PHR
 MODE(PURPLE):
 NONE

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-7/2 SH 8 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|--|---------------------|--|
| | | | | IF RHR#NOV702A IN ALT PHR MODE(ORANGE) AND RHR#NOV701B IN NORM PHR MODE(ORANGE): NONE |
| 25-7/-K | D0796RU3 | 1A-RHSE3 CONTACT R1 FAILS CLOSED | PERIODIC TEST | IF RHR#NOV702A IN NORM PHR MODE(PURPLE) AND RHR#NOV701B IN NORM PHR MODE(ORANGE): 2RHS#NOV720B HB OR SDP OPEN CKT ESTD IF RHR#NOV702A IN NORM PHR MODE(PURPLE) AND RHR#NOV701B IN ALT PHR MODE(PURPLE): 2RHS#NOV720B HB OR SDP OPEN CKT ESTD IF RHR#NOV702A IN ALT PHR MODE(ORANGE) AND RHR#NOV701B IN ALT PHR MODE(PURPLE): 2RHS#NOV720B HB OR SDP OPEN CKT ESTD IF RHR#NOV702A IN ALT PHR MODE(ORANGE) AND RHR#NOV701B IN NORM PHR MODE(ORANGE): 2RHS#NOV720B HB OR SDP OPEN CKT ESTD |
| 25-7/-K | D0806RU6 | 1A-RHSBB IN OPEN (CP. ERROR) | PERIODIC INSPECTION | IF RHR#NOV702A IN NORM PHR MODE(PURPLE) AND RHR#NOV701B IN NORM PHR MODE(ORANGE): 2RHS#NOV720B HB OR SDP OPEN CKT ESTD IF RHR#NOV702A IN NORM PHR MODE(PURPLE) AND RHR#NOV701B IN ALT PHR MODE(PURPLE): 2RHS#NOV720B HB OR SDP OPEN CKT ESTD |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|

25-7/-S D0816RU4 43-CESBFX2 CONTACT 1 FAILS CLOSED

MORE CONTACTS MUST FAIL TO BE DETECTABLE

IF RHR#110V702A IN ALT PWR MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR MODE(PURPLE):
 2RHS#110V720B HB OR SDP OPEN CKT ESTD

IF RHR#110V702A IN ALT PWR MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR MODE(ORANGE):
 2RHS#110V720B HB OR SDP OPEN CKT ESTD

IF RHR#110V702A IN NORM PWR MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR MODE(ORANGE):
 43-CESBFX2 CONTACT 1 CLOSED

IF RHR#110V702A IN NORM PWR MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR MODE(PURPLE):
 43-CESBFX2 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR MODE(PURPLE):
 43-CESBFX2 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR MODE(ORANGE):
 43-CESBFX2 CONTACT 1 CLOSED

25-7/-S D0826RU4 43-CESBFX2 CONTACT 2 FAILS CLOSED

MORE CONTACTS MUST FAIL TO BE DETECTABLE

IF RHR#110V702A IN NORM PWR MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR MODE(ORANGE):
 43-CESBFX2 CONTACT 2 CLOSED

IF RHR#110V702A IN NORM PWR MODE(PURPLE)
 AND RHR#110V702B IN ALT PWR MODE(PURPLE):
 43-CESBFX2 CONTACT 2 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-25-7/2 SH 10 |

 FTS# COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|---|--------------------------------|---|
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX2 CONTACT 2 CLOSED |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN NORTH PWR MODE(ORANGE): 43-CESBFX2 CONTACT 2 CLOSED |
| 25-7/-S | D0836RUI | 43-CESBFX2 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF RHR#MOV702A IN NORTH PWR MODE(PURPLE) AND RHR#MOV701B IN NORTH PWR MODE(ORANGE): 43-CESBFX2 CONTACT 1 CLOSED |
| | | | | IF RHR#MOV702A IN NORTH PWR MODE(PURPLE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX2 CONTACT 1 CLOSED |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX2 CONTACT 1 CLOSED |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN NORTH PWR MODE(ORANGE): 43-CESBFX2 CONTACT 1 CLOSED |
| 25-7/-S | D0846RUI | PB2-CESBF CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF RHR#MOV702A IN NORTH PWR MODE(PURPLE) AND RHR#MOV701B IN NORTH PWR MODE(ORANGE): 43-CESBFX2 CONTACT 1 CLOSED |
| | | | | IF RHR#MOV702A IN NORTH PWR MODE(PURPLE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX2 CONTACT 1 CLOSED |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|

| | | | | | |
|---------|----------|--------------------------------|---------------|--|--|
| 25-7/-J | D0866RU3 | PB440-1 SFURIOUS ACTUATION SIG | PERIODIC TEST | | |
|---------|----------|--------------------------------|---------------|--|--|

IF RHR#10V702A IN ALT PHR
MODE(ORANGE)
AND RHR#10V701B IN ALT PHR
MODE(PURPLE):
43-CESBFX2 CONTACT 1 CLOSED

IF RHR#10V702A IN ALT PHR
MODE(ORANGE)
AND RHR#10V701B IN NORM PHR
MODE(ORANGE):
43-CESBFX2 CONTACT 1 CLOSED

IF RHR#10V702A IN NORM PHR
MODE(PURPLE)
AND RHR#10V701B IN NORM PHR
MODE(ORANGE):
PB440-1 CONTACT 7 CLOSED

IF RHR#10V702A IN NORM PHR
MODE(PURPLE)
AND RHR#10V701B IN ALT PHR
MODE(PURPLE):
PB440-1 CONTACT 7 CLOSED

IF RHR#10V702A IN ALT PHR
MODE(ORANGE)
AND RHR#10V701B IN ALT PHR
MODE(PURPLE):
PB440-1 CONTACT 7 CLOSED

IF RHR#10V702A IN ALT PHR
MODE(ORANGE)
AND RHR#10V701B IN NORM PHR
MODE(ORANGE):
PB440-1 CONTACT 7 CLOSED

| | | | | | |
|---------|----------|----------------------------------|---------------|--|--|
| 25-7/-H | D0996RU3 | 1C-RHSAB CONTACT R1 FAILS CLOSED | PERIODIC TEST | | |
|---------|----------|----------------------------------|---------------|--|--|

IF RHR#10V702A IN NORM PHR
MODE(PURPLE)
AND RHR#10V701B IN NORM PHR
MODE(ORANGE):
NONE

IF RHR#10V702A IN NORM PHR
MODE(PURPLE)
AND RHR#10V701B IN ALT PHR
MODE(PURPLE):
NONE

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
|------------------------------------|---|---|---|--|
| RESIDUAL HEAT REMOVAL SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-25-7/2 SH 12 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORH PHR
 MODE(ORANGE):
 NONE

25-7/-H D1006RU3 43-CESNGX1
 CONTACT 2
 FAILS CLOSED PERIODIC TEST

IF RHR#11OV702A IN NORH PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORH PHR
 MODE(ORANGE):
 43-CESNGX1 CONTACT 2 CLOSED

IF RHR#11OV702A IN NORH PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX1 CONTACT 2 CLOSED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX1 CONTACT 2 CLOSED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORH PHR
 MODE(ORANGE):
 43-CESNGX1 CONTACT 2 CLOSED

25-7/-H D1016RU3 43-CESNGX1
 CONTACT 1
 FAILS CLOSED PERIODIC TEST

IF RHR#11OV702A IN NORH PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORH PHR
 MODE(ORANGE):
 43-CESNGX1 CONTACT 1 CLOSED

IF RHR#11OV702A IN NORH PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX1 CONTACT 1 CLOSED

| | | | | | |
|----|----|----|----|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 14 | 13 | 12 | 11 | | |
| | | | | | J.O. 12241 FMEA-25-7/2 SH 13 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CES#GX1 CONTACT 1 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN NORM PHR
 MODE(ORANGE):
 43-CES#GX1 CONTACT 1 CLOSED

25-7/-H D1026RU3 43-CES#GX1 PERIODIC TEST
 COIL ENERGIZED
 BY SHORT CKT

IF RHR#10V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#10V701B IN NORM PHR
 MODE(ORANGE):
 43-CES#GX1 CONTACT 2 CLOSED

IF RHR#10V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CES#GX1 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CES#GX1 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN NORM PHR
 MODE(ORANGE):
 43-CES#GX1 CONTACT 2 CLOSED

25-7/-H D1036RU3 CKT-CES#S PERIODIC TEST
 TRANSFER PB 1
 FAILS CLOSED

IF RHR#10V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#10V701B IN NORM PHR
 MODE(ORANGE):
 43-CES#GX1 CONTACT 2 CLOSED

IF RHR#10V702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CES#GX1 CONTACT 2 CLOSED

| | | | |
|------------------------------------|----|----|----|
| FAILURE MODES AND EFFECTS ANALYSIS | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | |
| 14 | 13 | 12 | 11 |
| J.O. 12241 FHEA-25-7/2 SH 14 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|--|-------------------------------------|---|
| | | | | IF RHR#MOV702A IN ALT PHR MODE(ORANGE) AND RHR#MOV701B IN ALT PHR MODE(PURPLE): 43-CESNGX1 CONTACT 2 CLOSED |
| | | | | IF RHR#MOV702A IN ALT PHR MODE(ORANGE) AND RHR#MOV701B IN NORM PHR MODE(ORANGE): 43-CESNGX1 CONTACT 2 CLOSED |
| 25-7/-C | D0036RV2 | 420-RHSAC ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF RHR#MOV702A IN NORM PHR MODE(PURPLE) AND RHR#MOV701B IN NORM PHR MODE(ORANGE): 2RHS#MOV701A INADVERTENTLY OPENED |
| | | | | IF RHR#MOV702A IN NORM PHR MODE(PURPLE) AND RHR#MOV701B IN ALT PHR MODE(PURPLE): 2RHS#MOV701A INADVERTENTLY OPENED |
| | | | | IF RHR#MOV702A IN ALT PHR MODE(ORANGE) AND RHR#MOV701B IN ALT PHR MODE(PURPLE): 2RHS#MOV701A INADVERTENTLY OPENED |
| | | | | IF RHR#MOV702A IN ALT PHR MODE(ORANGE) AND RHR#MOV701B IN NORM PHR MODE(ORANGE): 2RHS#MOV701A INADVERTENTLY OPENED |
| 25-7/-C | D0046RV2 | 420-RHSAC SEAL IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF RHR#MOV702A IN NORM PHR MODE(PURPLE) AND RHR#MOV701B IN NORM PHR MODE(ORANGE): 2RHS#MOV701A INADVERTENTLY OPENED |
| | | | | IF RHR#MOV702A IN NORM PHR MODE(PURPLE) AND RHR#MOV701B IN ALT PHR MODE(PURPLE): 2RHS#MOV701A INADVERTENTLY OPENED |

| | | | | | | |
|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FHFA-25-7/2 SH 15 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-G 00056RV3 PB403-1 SPURIOUS PERIODIC TEST
 25-7/-V ACTUATE SIGNAL

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 2RHS#110V701A INADVERTENTLY OPENED
 IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 2RHS#110V701A INADVERTENTLY OPENED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 PB403-1 CONTACT 1 CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 PB403-1 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 PB403-1 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 PB403-1 CONTACT 1 CLOSED

25-7/-G 00066RV3 PB403-1 CONTACT PERIODIC TEST
 FAILS CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 PB403-1 CONTACT 1 CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 PB403-1 CONTACT 1 CLOSED

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-7/2 SH 16 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 PB403-1 CONTACT 1 CLOSED

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 PB403-1 CONTACT 1 CLOSED

25-7/-H 00076RV3 1B-RHSAC PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

25-7/-G 00086RV3 1A-RHSAC PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#NOV701A MB OR SDP OPEN
 CKT ESTD

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#NOV701A MB OR SDP OPEN
 CKT ESTD

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#MOV701A HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#MOV701A HB OR SDP OPEN
 CKT ESTD

25-7/-G 00096RV6 1A-RHSAC IN OPEN PERIODIC INSPECTION
 (OP. ERROR)

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#MOV701A HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#MOV701A HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#MOV701A HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#MOV701A HB OR SDP OPEN
 CKT ESTD

25-7/-M 00106RV4 43-CESAFX3 MORE CONTACTS MUST
 CONTACT 1 FAIL TO BE DETECTABLE
 FAILS CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 1 CLOSED

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12291 FHEA-25-7/2 SH 18 | | | | | |

 FTS# COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#10V702A IN NORTH PHR
 MODE(PURPLE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN NORTH PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 1 CLOSED

25-7/-H D0116RV4 43-CESAFX3
 CONTACT 2
 FAILS CLOSED

MORE CONTACTS MUST
 FAIL TO BE DETECTABLE

IF RHR#10V702A IN NORTH PHR
 MODE(PURPLE)
 AND RHR#10V701B IN NORTH PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 2 CLOSED

IF RHR#10V702A IN NORTH PHR
 MODE(PURPLE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#10V701B IN NORTH PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 2 CLOSED

25-7/-H D0126RV1 43-CESAFX3
 ENERGIZED BY
 SHORT CIRCUIT

ANNUNCIATED IN
 CONTROL ROOM

IF RHR#10V702A IN NORTH PHR
 MODE(PURPLE)
 AND RHR#10V701B IN NORTH PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 1 CLOSED

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 1 CLOSED

25-7/-H D0136RV1 FB3-CESAF CONTACT INDICATED IN
 FAILS CLOSED CONTROL ROOM

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX3 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX3 CONTACT 1 CLOSED

25-7/-E D0556RV2 420-RHSBC INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#MOV701B INADVERTENTLY OPENED

| | | | | | |
|----|----|----|----|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 14 | 38 | 12 | 11 | | |
| | | | | | J.O. 12241 FMEA-25-7/2 SH 20 |

 FASH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-E D0566RV2

420-RHSBC
 SEAL IN CONTACT
 FAILS CLOSED

INDICATING LIGHT
 IN CONTROL ROOM

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV701B INADV OPENED
 NORM CONTRL MODE

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV701B INADV OPENED
 NORM CONTRL MODE

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#NOV701B INADVERTENTLY OPENED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#NOV701B INADVERTENTLY OPENED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV701B INADV OPENED
 NORM CONTRL MODE

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV701B INADV OPENED
 NORM CONTRL MODE

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#NOV701B INADVERTENTLY OPENED

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-7/2 SH 21 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-Z D0616RV4 43-CESAFX4
 CONTACT 1 FAILS CLOSED
 MORE CONTACTS MUST FAIL TO BE DETECTABLE

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#NOV701B MB OR SDP OPEN
 CKT ESTD

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX4 CONTACT1 CLOSED

25-7/-Z D0626RV4 43-CESAFX4
 CONTACT 2 FAILS CLOSED
 MORE CONTACTS MUST FAIL TO BE DETECTABLE

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX4 CONTACT2 CLOSED

IF RHR#NOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX4 CONTACT2 CLOSED

IF RHR#NOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX4 CONTACT2 CLOSED

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-7/2 SH 24 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-Z D0636RV1 43-CESAFX4 ANNUNCIATED IN
 ENERGIZED BY CONTROL ROOM
 SHORT CIRCUIT

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX4 CONTACT2 CLOSED

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX4 CONTACT1 CLOSED

25-7/-Z D0646RV1 PB4-CESAF CONTACT ANNUNCIATED IN
 FAILS CLOSED CONTROL ROOM

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESAFX4 CONTACT1 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-25-7/2 SH 25 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-E D0656RV2 420-RHSBH INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT

IF RHR*11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*11OV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX4 CONTACT1 CLOSED

IF RHR*11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*11OV701B INADV OPENED
 ALT CNTL MODE

IF RHR*11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*11OV701B INADVERTENTLY OPENED

IF RHR*11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*11OV701B INADVERTENTLY OPENED

IF RHR*11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*11OV701B INADV OPENED
 ALT CNTL MODE

25-7/-E D0666RV2 420-RHSBH INDICATING LIGHT
 SEAL IN CONTACT IN CONTROL ROOM
 FAILS CLOSED

IF RHR*11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*11OV701B IN NORM PHR
 MODE(ORANGE):
 2PHS*11OV701B INADV OPENED
 ALT CNTL MODE

IF RHR*11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*11OV701B INADVERTENTLY OPENED

IF RHR*11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS*11OV701B INADVERTENTLY OPENED

| | | | | |
|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-25-7/2 SH 26 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 2RHS#110V701B INADV OPENED
 ALT CNTRL MODE

25-7/-U 00676RV3 FB402-1 CONTACT 9 PERIODIC TEST
 FAILS CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 PB402-1 CONTACT9 CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 PB402-1 CONTACT9 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 PB402-1 CONTACT9 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 FB402-1 CONTACT9 CLOSED

25-7/-Y 00606RV3 1B-RHSEN PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 NONE

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 NONE

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 NONE

| | | | | |
|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-25-7/2 SH 27 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-U D0696RV3 1A-RHSBH PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 NONE

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 2RHS#110V701B HB OR SDP OPEN

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 2RHS#110V701B HB OR SDP OPEN

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 2RHS#110V701B HB OR SDP OPEN

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 2RHS#110V701B HB OR SDP OPEN

25-7/-U D0706RV6 1A-RHSBH IN OPEN PERIODIC INSPECTION
 (OP. ERROR)

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 2RHS#110V701B HB OR SDP OPEN

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 2RHS#110V701B HB OR SDP OPEN

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 2RHS#110V701B HB OR SDP OPEN

| | | | | |
|---|---|---|---|------------------------------------|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-25-7/2 SH 28 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
|---------|----------|---|---|---|--|
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 2RHS#MOV701B 1'B OR SDP OPEN | |
| 25-7/-Y | D0716RV4 | 43-CESBFX5 CONTACT 1 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESBFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESBFX5 CONTACT 1 CLOSED | |
| 25-7/-Y | D0726RV4 | 43-CESBFX5 CONTACT 2 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESBFX5 CONTACT 2 CLOSED | |
| | | | | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX5 CONTACT 2 CLOSED | |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESBFX5 CONTACT 2 CLOSED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-Y D0736RV1 43-CESBFX5 ANNUNCIATED IN
 ENERGIZED BY CONTROL ROOM
 SHORT CIRCUIT

IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX5 CONTACT 2 CLOSED

IF RHR#11OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX5 CONTACT 1 CLOSED

IF RHR#11OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX5 CONTACT 1 CLOSED

IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX5 CONTACT 1 CLOSED

IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX5 CONTACT 1 CLOSED

25-7/-Y D0746RV1 PB5-CESEF CONTACT ANNUNCIATED IN
 FAILS CLOSED CONTROL ROOM

IF RHR#11OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX5 CONTACT 1 CLOSED

IF RHR#11OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX5 CONTACT 1 CLOSED

IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX5 CONTACT 1 CLOSED

| | | | | | |
|---|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RESIDUAL HEAT REMOVAL SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-25-7/2 SH 30 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESBFX5 CONTACT 1 CLOSED

25-7/-U D0886RV3 PB402-1 SFURIOUS PERIODIC TEST
 ACTUATION SIG
 IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 PB402-1 CONTACT9 CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 PB402-1 CONTACT9 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 PB402-1 CONTACT9 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 PB402-1 CONTACT9 CLOSED

25-7/-F D0896RV3 1C-RHSAC PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-25-7/2 SH 31 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIF. ? FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 NONE

25-7/-F 00906RV3 43-CESNGX7 PERIODIC TEST
 CONTACT 2
 FAILS CLOSED
 IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 2 CLOSED

25-7/-F 00916RV3 43-CESNGX7 PERIODIC TEST
 CONTACT 1
 FAILS CLOSED
 IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 1 CLOSED

| | | | | | | |
|---|---|---|---|--|--|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FHEA-25-7/2 SH 32 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-F D0926RV3 43-CESNGX7
 ENERGIZED
 BY SHORT CKT PERIODIC TEST

IF RHR#10V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#10V701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 1 CLOSED

IF RHR#10V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#10V701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#10V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#10V701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#10V701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#10V701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 2 CLOSED

25-7/-F D0936RV3 CKT-CESNG
 TRANSFER PB 7
 FAILS CLOSED PERIODIC TEST

IF RHR#10V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#10V701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#10V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#10V701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 2 CLOSED

IF RHR#10V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#10V701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX7 CONTACT 2 CLOSED

| | | | | | |
|----|----|----|----|--|------------------------------------|
| | | | | | FATIGUE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 14 | 15 | 12 | 11 | | J.O. 12241 FMEA-25-7/2 SH 33 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-B 00146RH2 420-RHSBD INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 43-CE516X7 CONTACT 2 CLOSED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#NOV702B INADVERTENTLY OPENED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV702B INADVERTENTLY OPENED

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV702B INADVERTENTLY OPENED

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#NOV702B INADVERTENTLY OPENED

25-7/-B 00156RH2 420-RHSBD INDICATING LIGHT
 SEAL IN CONTACT IN CONTROL ROOM
 FAILS CLOSED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#NOV702B INADVERTENTLY OPENED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV702B INADVERTENTLY OPENED

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#NOV702B INADVERTENTLY OPENED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12231 FMEA-25-7/2 SH 34 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV702B INADVERTENTLY OPENED

25-7/-K D0166RH3 PB441 PERIODIC TEST
 25-7/-L SPURIOUS ACTN
 25-7/-N SIGNAL

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 PB441 CONTACT 7 CLOSED

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 7 CLOSED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 7 CLOSED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 PB441 CONTACT 7 CLOSED

25-7/-L D0176RH3 PB441 CONTACT 3 PERIODIC TEST
 FAILS CLOSED

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 PB441 CONTACT 3 CLOSED

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 3 CLOSED

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 3 CLOSED

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-7/2 SH 35 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 2RNS#MOV702B HB OR SDP OPEN
 CKT ESTD

25-7/-L D0206RH6 1A-RHSBD IN OPEN PERIODIC INSPECTION
 (OP. ERROR)
 IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 2RNS#MOV702B HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 2RNS#MOV702B HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 2RNS#MOV702B HB OR SDP OPEN
 CKT ESTD

IF RHR#MOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 2RNS#MOV702B HB OR SDP OPEN
 CKT ESTD

25-7/-T D0216RH9 43-CESBFX3 MORE CONTACTS MUST
 CONTACT 1 FAIL TO BE DETECTABLE
 FAILS CLOSED
 IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 1 CLOSED

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESEFX3 CONTACT 1 CLOSED

25-7/-T D0226RH4 43-CESBFX3 MORE CONTACTS MUST
 CONTACT 2 FAIL TO BE DETECTABLE
 FAILS CLOSED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 2 CLOSED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 2 CLOSED

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 2 CLOSED

IF RHR#NOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 2 CLOSED

25-7/-T D0236RH1 43-CESBFX3 ANNUNCIATED IN
 ENERGIZED BY CONTROL ROOM
 SHORT CIRCUIT

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#NOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#NOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 1 CLOSED

| | | | | | |
|----|---|---|---|------------------------------------|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RESIDUAL HEAT REMOVAL SYSTEM | |
| 14 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-25-7/2 SH 38 | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 1 CLOSED

25-7/-T D0246RH1 FB3-CESDF CONTACT ASSOCIATED IN
 FAILS CLOSED CONTROL ROOM

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX3 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX3 CONTACT 1 CLOSED

25-7/-D D0256RH2 420-RHSAD INDICATING LIGHT
 ENERGIZED BY IN CONTROL ROOM
 SHORT CIRCUIT

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN NORM PWR
 MODE(ORANGE):
 2RHS#110V702A INADVERTENTLY OPENED

IF RHR#110V702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#110V701B IN ALT PWR
 MODE(PURPLE):
 2RHS#110V702A INADVERTENTLY OPENED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 1224 FMEA-25-7/2 SH 39 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|---------|----------|--|-------------------------------------|---|
| | | | | IF RHR#110V702A IN ALT PWR MODE(ORANGE) AND RHR#110V701B IN ALT PWR MODE(PURPLE): 2RHS#110V702A INADV OPENED NORM CNTL MODE |
| | | | | IF RHR#110V702A IN ALT PWR MODE(ORANGE) AND RHR#110V701B IN NORM PWR MODE(ORANGE): 2RHS#110V702A INADV OPENED NORM CNTL MODE |
| 25-7/-J | D0266RH2 | 420-RHSAD SEAL IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF RHR#110V702A IN NORM PWR MODE(PURPLE) AND RHR#110V701B IN NORM PWR MODE(ORANGE): 2RHS#110V702A INADVERTENTLY OPENED |
| | | | | IF RHR#110V702A IN NORM PWR MODE(PURPLE) AND RHR#110V701B IN ALT PWR MODE(PURPLE): 2RHS#110V702A INADVERTENTLY OPENED |
| | | | | IF RHR#110V702A IN ALT PWR MODE(ORANGE) AND RHR#110V701B IN ALT PWR MODE(PURPLE): 2RHS#110V702A INADV OPENED NORM CNTL MODE |
| | | | | IF RHR#110V702A IN ALT PWR MODE(ORANGE) AND RHR#110V701B IN NORM PWR MODE(ORANGE): 2RHS#110V702A INADV OPENED NORM CNTL MODE |
| 25-7/-N | D0276RH3 | FB991 CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF RHR#110V702A IN NORM PWR MODE(PURPLE) AND RHR#110V701B IN NORM PWR MODE(ORANGE): FB991 CONTACT 1 CLOSED |

| | | | |
|------------------------------------|---|---|---|
| FAILURE MODES AND EFFECTS ANALYSIS | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | |
| 4 | 3 | 2 | 1 |
| J.O. 12241 FHEA-25-7/2 SH 40 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 1 CLOSED

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 PB441 CONTACT 1 CLOSED

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 PB441 CONTACT 1 CLOSED

25-7/-H 00286RH3 1B-RHSAD PERIODIC TEST
 CONTACT R2
 FAILS CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

25-7/-H 00296RH3 1A-RHS CONTACT R1 PERIODIC TEST
 FAILS CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS*MOV702A 1B OR SUP OPEN
 CHT ESTD

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-7/2 SH 41 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

25-7/-H D0306RH6 1A-RHS IN OPEN PERIODIC INSPECTION
 (OP. ERROR)

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

IF RHR#11OV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PHR
 MODE(PURPLE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

IF RHR#11OV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#11OV702A HB OR SDP OPEN
 CKT ESTD

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-25-7/2 SH 42 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-H D0316RH4 43-CESBFX4 MORE CONTACTS MUST
 CONTACT 1 FAIL TO BE DETECTABLE
 FAILS CLOSED
 IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX4 CONTACT 1 CLOSED

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX4 CONTACT 1 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX4 CONTACT 1 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX4 CONTACT 1 CLOSED

25-7/-H D0326RH4 43-CESBFX4 MORE CONTACTS MUST
 CONTACT 2 FAIL TO BE DETECTABLE
 FAILS CLOSED

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX4 CONTACT 2 CLOSED

IF RHR#1'OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX4 CONTACT 2 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN ALT PWR
 MODE(PURPLE):
 43-CESBFX4 CONTACT 2 CLOSED

IF RHR#1'OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#1'OV701B IN NORM PWR
 MODE(ORANGE):
 43-CESBFX4 CONTACT 2 CLOSED

| | | | | | |
|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-25-7/2 SH 43 | | | | | |

FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-H D0336RH1 43-CESBFX4 ANNUNCIATED IN
ENERGIZED BY CONTROL ROOM
SHORT CIRCUIT

IF RHR#110V702A IN NORM PHR
MODE(PURPLE)
AND RHR#110V701B IN NORM PHR
MODE(ORANGE):
43-CESBFX4 CONTACT 1 CLOSED

IF RHR#110V702A IN NORM PHR
MODE(PURPLE)
AND RHR#110V701B IN ALT PHR
MODE(PURPLE):
43-CESBFX4 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PHR
MODE(ORANGE)
AND RHR#110V701B IN ALT PHR
MODE(PURPLE):
43-CESBFX4 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PHR
MODE(ORANGE)
AND RHR#110V701B IN NORM PHR
MODE(ORANGE):
43-CESBFX4 CONTACT 1 CLOSED

25-7/-H D0346RH1 PB4-CESEF CONTACT ANNUNCIATED IN
FAILS CLOSED CONTROL ROOM

IF RHR#110V702A IN NORM PHR
MODE(PURPLE)
AND RHR#110V701B IN NORM PHR
MODE(ORANGE):
43-CESBFX4 CONTACT 1 CLOSED

IF RHR#110V702A IN NORM PHR
MODE(PURPLE)
AND RHR#110V701B IN ALT PHR
MODE(PURPLE):
43-CESBFX4 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PHR
MODE(ORANGE)
AND RHR#110V701B IN ALT PHR
MODE(PURPLE):
43-CESBFX4 CONTACT 1 CLOSED

IF RHR#110V702A IN ALT PHR
MODE(ORANGE)
AND RHR#110V701B IN NORM PHR
MODE(ORANGE):
43-CESBFX4 CONTACT 1 CLOSED

| | | | | | |
|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-25-7/2 SH 44 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-D 00356RH2 420-RHSAH INDICATING LIGHT IF RHR#11OV702A IN NORM PWR
 ENERGIZED BY IN CONTROL ROOM MODE(PURPLE)
 SHORT CIRCUIT AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#11OV702A INADVERTENTLY OPENED

 IF RHR#11OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#11OV702A INADVERTENTLY OPENED

 IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#11OV702A INADVERTENTLY OPENED

 IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#11OV702A INADVERTENTLY OPENED

25-7/-D 00366RH2 420-RHSAH INDICATING LIGHT IF RHR#11OV702A IN NORM PWR
 SEAL IN CONTACT IN CONTROL ROOM MODE(PURPLE)
 FAILS CLOSED AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#11OV702A INADVERTENTLY OPENED

 IF RHR#11OV702A IN NORM PWR
 MODE(PURPLE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#11OV702A INADVERTENTLY OPENED

 IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN ALT PWR
 MODE(PURPLE):
 2RHS#11OV702A INADVERTENTLY OPENED

 IF RHR#11OV702A IN ALT PWR
 MODE(ORANGE)
 AND RHR#11OV701B IN NORM PWR
 MODE(ORANGE):
 2RHS#11OV702A INADVERTENTLY OPENED

| | | | | | | |
|----|--|---|--|----|---|------------------------------------|
| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RESIDUAL HEAT REMOVAL SYSTEM |
| 14 | | 3 | | 12 | 1 | J O. 12241 FHEA-25-7/2 SH 45 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|

25-7/-Q D0376RH3 PB440 CONTACT 9 FAILS OPEN PERIODIC TEST

IF RHR#110V702A IN NORM PWR
MODE(PURPLE)
AND RHR#110V701B IN NORM PWR
MODE(ORANGE):
PB440 CONTACT 9 CLOSED

IF RHR#110V702A IN NORM PWR
MODE(PURPLE)
AND RHR#110V701B IN ALT PWR
MODE(PURPLE):
PB440 CONTACT 9 CLOSED

IF RHR#110V702A IN ALT PWR
MODE(ORANGE)
AND RHR#110V701B IN ALT PWR
MODE(PURPLE):
PB440 CONTACT 9 CLOSED

IF RHR#110V702A IN ALT PWR
MODE(ORANGE)
AND RHR#110V701B IN NORM PWR
MODE(ORANGE):
PB440 CONTACT 9 CLOSED

25-7/-X D0386RH3 1B-RHSAH CONTACT R1 FAILS CLOSED

PERIODIC TEST

IF RHR#110V702A IN NORM PWR
MODE(PURPLE)
AND RHR#110V701B IN NORM PWR
MODE(ORANGE):
NONE

IF RHR#110V702A IN NORM PWR
MODE(PURPLE)
AND RHR#110V701B IN ALT PWR
MODE(PURPLE):
NONE

IF RHR#110V702A IN ALT PWR
MODE(ORANGE)
AND RHR#110V701B IN ALT PWR
MODE(PURPLE):
NONE

IF RHR#110V702A IN ALT PWR
MODE(ORANGE)
AND RHR#110V701B IN NORM PWR
MODE(ORANGE):
NONE

| | | | | |
|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-25-7/2 5H 46 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 2RHS#MOV702A HS OR SDP OPEN
 CKT ESTD

25-7/-X D0416RH4 43-CESAFX CONTACT 1 FAILS CLOSED MORE CONTACTS MUST FAIL TO BE DETECTABLE
 IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX5 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX5 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX5 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX5 CONTACT 1 CLOSED

25-7/-X D0426RH4 43-CESAFX5 CONTACT 2 FAILS CLOSED MORE CONTACTS MUST FAIL TO BE DETECTABLE
 IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFX5 CONTACT 2 CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX5 CONTACT 2 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESAFX5 CONTACT 2 CLOSED

| | | | | |
|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-25-7/2 SH 48 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-----------------|------------------------|---------------------------------------|-----------------------------|---|---------------|
| 25-7/-X | D0436RH1 | 43-CESAFX5 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESAFX5 CONTACT 2 CLOSED | |
| | | | | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESAFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESAFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESAFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESAFX5 CONTACT 1 CLOSED | |
| 25-7/-X | D0446RH1 | FB5-CESAF CONTACT FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN NORM PWR MODE(ORANGE): 43-CESAFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN NORM PWR MODE(PURPLE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESAFX5 CONTACT 1 CLOSED | |
| | | | | IF RHR#MOV702A IN ALT PWR MODE(ORANGE) AND RHR#MOV701B IN ALT PWR MODE(PURPLE): 43-CESAFX5 CONTACT 1 CLOSED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-Q D0956RH3 PB440 SPURIOUS PERIODIC TEST
 ACTUATION SIG

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESAFXS CONTACT 1 CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 PB440 CONTACT 9 CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 PB440 CONTACT 9 CLOSED

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 PB440 CONTACT 9 CLOSED

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 PB440 CONTACT 9 CLOSED

25-7/-P D0946RH3 IC-RHSAH PERIODIC TEST
 CONTACT R1
 FAILS CLOSED

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

IF RHR*MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

IF RHR*MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR*MOV701B IN ALT PHR
 MODE(PURPLE):
 NONE

| | | | | |
|------------------------------------|---|---|---|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RESIDUAL HEAT REMOVAL SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-25-7/2 SH 50 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 NONE

25-7/-P D0956RH3 43-CESNGX11
 CONTACT 1
 FAILS CLOSED

PERIODIC TEST

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 1 CLOSED

25-7/-P D0966RH3 43-CESNGX11
 CONTACT 2
 FAILS CLOSED

PERIODIC TEST

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN NORM PHR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 2 CLOSED

IF RHR#MOV702A IN NORM PHR
 MODE(PURPLE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 2 CLOSED

IF RHR#MOV702A IN ALT PHR
 MODE(ORANGE)
 AND RHR#MOV701B IN ALT PHR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 2 CLOSED

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

25-7/-P D0976RH3 43-CESNGX11 PERIODIC TEST
 COIL ENERGIZED BY SHORT CKT

IF RHRXMOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHRXMOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 2 CLOSED

IF RHRXMOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHRXMOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHRXMOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHRXMOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHRXMOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHRXMOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHRXMOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHRXMOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 1 CLOSED

25-7/-P D0986RH3 CKT-CESNG PERIODIC TEST
 TRANSFER PB 11 FAILS CLOSED

IF RHRXMOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHRXMOV701B IN NORM PWR
 MODE(ORANGE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHRXMOV702A IN NORM PWR
 MODE(PURPLE)
 AND RHRXMOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 1 CLOSED

IF RHRXMOV702A IN ALT PWR
 MODE(ORANGE)
 AND RHRXMOV701B IN ALT PWR
 MODE(PURPLE):
 43-CESNGX11 CONTACT 1 CLOSED

| | | | | | | |
|---|---|---|---|--|------------------------------------|-------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | | RESIDUAL HEAT REMOVAL SYSTEM | |
| 4 | 3 | 2 | 1 | | J.O. 12241 | FHEA-25-7/2 SH 52 |



| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 27-1/-G | R0010001 | NO SERVICE WATER TRAIN A LOOP SUPPLY | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-J | R0020001 | NO SERVICE WATER TRAIN B LOOP SUPPLY | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-DR | R78407A3 | 1A-ENSABX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-DP | R78507A3 | 1A-ENSABX1 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED | |
| 27-1/-DR | R78607A3 | 1A-ENSABX2 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-EF | R78707A3 | 1A-ENSABX1 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED | |

Amendment 3

September 1984

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|---|---|------------|----------|------|------|------------------------------------|
| | | 06/04/1984 | 10/18/82 | 1984 | 1984 | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | RG | 1 | 1 | J.O. 12241 FHEA-27-1/2 SH 1 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-EF | R78807A3 | 1A-ENSABX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-EF | R78907A3 | 1A-ENSABX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-EF | R79007A3 | 1A-ENSAB CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-EE | R79107A3 | 1A-EJSABX1 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-ED | R79207A3 | 1C-ENSABX2 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FC | R79307A3 | 1A-EJSABX1 ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |

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|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 2 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 27-1/-FE | R79407A3 | 1C-ENSABX2 ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-FC | R79507A3 | 1A-EJSABX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FE | R79607A3 | 1C-ENSABX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-FC | R79707A3 | 1A-EJABX1 CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FC | R79807A3 | 1A-EJABX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FE | R79907A3 | 1C-ENSABX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 3 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-FE | R80007A3 | 1C-ENSABX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-BQ | R80107A3 | 1C-ENSABX1 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BP | R80207A3 | 1C-ENSABX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-FB | R80307A3 | 1C-ENSABX1 ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FB | R80407A3 | 1C-ENSABX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FB | R80507A3 | 1C-ENSABX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 4 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 27-1/-FB | R80607A3 | 1C-ENSABX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-DS | R80707B3 | 1A-ENSBBX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-DQ | R80807B3 | 1A-ENSBBX1 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 27-1/-DS | R80907B3 | 1A-ENSBBX2 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-EJ | R81007B3 | 1A-ENSBBX1 ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 27-1/-EJ | R81107B3 | 1A-ENSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 5 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 27-1/-EJ | R81207B3 | 1A-ENS9BX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-EJ | R81307B3 | 1A-ENS8B CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-EH | R81407B3 | 1A-EJCBBX CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EG | R81507B3 | 1C-ENSBBX2 CONTACT 117 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FH | R81607B3 | 1A-EJSBBX2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FK | R81707B3 | 1C-ENSBBX2 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 6 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 27-1/-FH | R81807B3 | 1A-EJSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FH | R81907B3 | 1C-ENSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-FH | R82007B3 | 1A-EJSBBX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FH | R82107B3 | 1A-EJSBBX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FK | R82207B3 | 1C-ENSBBX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-FK | R82307B3 | 1C-ENSBBX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 27-1/-BS | R82407B3 | 1C-ENSBBX1 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BR | R82507B3 | 1C-ENSBBX2 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AF AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-FG | R82607B3 | 1C-ENSBBX1 COIL ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FG | R82707B3 | 1C-ENSBBX CONTACT 313 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FG | R82807B3 | 1C-ENSBBX CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FG | R82907B3 | 1C-ENSBBX ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 8 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|--|-----------------------------|--|---------------|
| 27-1/-AP | R40712A3 | 362-EGSAAX CONTACT 221 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AP | R42312A3 | 52-EGSAAX2 CONTACT 225 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AQ | R42812B3 | 362-EGSBAX CONTACT 221 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AQ | R44312B3 | 52-EGSBAX2 CONTACT 225 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AP 27-1/-AR | R58650A3 | 362-EGSAAX DG2-1 AUTO LOAD STEP 5 FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|---|--------------------------------|--|---------------|
| 27-1/-AP 27-1/-AR | R5875DA3 | 52-EGSAAX2 DG2-1 AUTO LOAD FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AE | R0035DQ3 | 2RSS*P21A ACB CLOSING MECH FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AE | R0055DQ1 | CKT RSSAA NO 125VDC CONTROL POWER | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AE | R0065DQ1 | CKT RSSAA 125V(+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AE | R0075DQ1 | CKT RSSAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AE | R0085DQ1 | CKT RSSAA 125V(-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RECIRCULATION SPRAY SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FHEA-27-1/2 SH 10 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|-----------------------------|--|---------------|
| 27-1/-AE | R00950Q3 | 1-RSSAA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSAA CONTACT 1 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSAA CONTACT 1 OPEN | |
| 27-1/-AE | R01050Q6 | 1-RSSAA NOT IN START (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSAA CONTACT 1 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSAA CONTACT 1 OPEN | |
| 27-1/-AP | R01570Q3 | 62-RSSAA CONTACT 3 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AP | R01650Q3 | 50-VE213X CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AT | R01750Q3 | 27-VE200X3 CONTACT 227 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-DC | R01850Q3 | 62-RSSAA TIMER FAILS | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AD | R0215DQ1 | 2RSS*P21A TC ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AY | R0225DQ1 | 50-VE213X CONTACT 13 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AX | R0235DQ1 | 27-VE200X3 CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AY | R0245DQ1 | 50-VE213X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AD | R0265DQ3 | 1-RSSAA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSAA CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSAA CONTACT 3 CLOSED | |
| 27-1/-AD | R0275DQ6 | 1-RSSAA IN STOP (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSAA CONTACT 3 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 12 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSAA CONTACT 3 CLOSED | |
| 27-1/-AD | R0205DQ3 | 62-RSSAA CONTACT 10 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62-RSSAA CONTACT 10 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62-RSSAA CONTACT 10 CLOSED | |
| 27-1/-AY | R0295DQ1 | 50-VE213G FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-AY | R0305DQ1 | 51-BE213 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-DC | R5015DQ3 | 1-RSSAA CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-DC | R5025DQ6 | 1-RSSAA IN PULL-TO-LOCK (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|--|
| 27-1/-DC | R5035DQ3 | K644A TN A CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-DC | R5045DQ3 | K644A TN A NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | (K644A=N555 INTERFACE) (K644A=N555 INTERFACE) |
| 27-1/-DC | R5055DQ3 | 62-RSSAA CONTACT 8 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-DC | R5065DQ3 | 52S-RSSAA CONTACT 81 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21A NO AUTO START CIRCUIT EST'D | |
| 27-1/-AD | R5075DQ3 | K644XA TN A CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K644XA TN A CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K644XA TN A CONTACT 1 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 14 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|--|
| 27-1/-AD | R5085DQ3 | K644XA TN A NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K644XA TN A CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K644XA TN A CONTACT 1 CLOSED | (K644XA=NSSS INTERFACE) (K644XA=NSSS INTERFACE) |
| 27-1/-AJ | R0465DR3 | 2R55+P21C CLOSING HECH (ACB)FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AJ | R0485DR1 | CKT R55CA NO 125VDC CONTROL POWER | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AJ | R0505DR1 | CKT R55CA 125V(+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AJ | R0515DR1 | CKT R55CA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AJ | R0525DR1 | CKT R55CA 125V(-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|-----------------------------|--|---------------|
| 27-1/-AJ | R0535DR3 | 1-RSSCA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSCA CONTACT 1 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSCA CONTACT 1 OPEN | |
| 27-1/-AJ | R0545DR6 | 1-RSSCA NOT IN START (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSCA CONTACT 1 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSCA CONTACT 1 OPEN | |
| 27-1/-AR | R0595DR3 | 62-RSSCA CONTACT 3 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-AR | R0605DR3 | 50-VE217X CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-AV | R0615DR3 | 27-VE200X4 CONTACT 115 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-DG | R0625DR3 | 62-RSSCA TNER FAILS | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 16 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

27-1/-AH R0655DR1 2RSS*P21C
 TC ENERGIZED BY
 SHORT CIRCUIT ANNUNCIATED IN
 CONTROL ROOM IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*P21C NO AUTO START
 CIRCUIT EST'D

27-1/-BD R0665DR1 50-VE217X
 CONTACT 13
 FAILS CLOSED ANNUNCIATED IN
 CONTROL ROOM IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BD R0665DR1 50-VE217X
 CONTACT 13
 FAILS CLOSED ANNUNCIATED IN
 CONTROL ROOM IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BD R0665DR1 50-VE217X
 CONTACT 13
 FAILS CLOSED ANNUNCIATED IN
 CONTROL ROOM IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BC R0675DR3 27-VE200X4
 CONTACT 221
 FAILS CLOSED PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BC R0675DR3 27-VE200X4
 CONTACT 221
 FAILS CLOSED PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BD R0685DR1 50-VE217X
 ENERGIZED BY
 SHORT CIRCUIT ANNUNCIATED IN
 CONTROL ROOM IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BD R0685DR1 50-VE217X
 ENERGIZED BY
 SHORT CIRCUIT ANNUNCIATED IN
 CONTROL ROOM IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-BD R0685DR1 50-VE217X
 ENERGIZED BY
 SHORT CIRCUIT ANNUNCIATED IN
 CONTROL ROOM IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN B PART C FAILURE

27-1/-AH R0705DR3 1-RSSCA CONTACT 3
 FAILS CLOSED PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 1-RSSCA CONTACT 3 CLOSED

27-1/-AH R0705DR3 1-RSSCA CONTACT 3
 FAILS CLOSED PERIODIC TEST IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 1-RSSCA CONTACT 3 CLOSED

27-1/-AH R0715DR6 1-RSSCA IN STOP
 (OP ERROR) PERIODIC INSPECTION IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 1-RSSCA CONTACT 3 CLOSED

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-27-1/2 SH 17 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSCA CONTACT 3 CLOSED | |
| 27-1/-AH | R0725DR3 | 62-RSSCA CONTACT 10 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AF AND NORMAL POWER BUS 2DF: 62-RSSCA CONTACT 10 CLOSED | |
| 27-1/-BD | R0735DR1 | 50-VE217G FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62-RSSCA CONTACT 10 CLOSED | |
| | | | | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BD | R0745DR1 | 51-VE217 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| | | | | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AR | R4615DR3 | 52-EGSAAX2 CONTACT 227 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| | | | | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-AR | R4625DR3 | 362-EGSAAX CONTACT 223 FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| | | | | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
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| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 18 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|------------------------------------|-----------------------------|--|------------------------|
| 27-1/-DG | R5095DR3 | 1-RSSCA CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-DG | R5105DR6 | 1-RSSCA IN PULL-TO-LOCK (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-DG | R5115DR3 | K645A TN A CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-DG 27-1/-BB | R5125DR3 | K645A TN A NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | (K645A=NSSS INTERFACE) |
| 27-1/-DG | R5135DR3 | 62-RSSCA CONTACT 8 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | (K645A=NSSS INTERFACE) |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------------|----------------------|---------------------------------------|-----------------------------|--|-------------------------|
| 27-1/-DG | R5145DR3 | 52S-RSSCA CONTACT 81 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21C NO AUTO START CIRCUIT EST'D | |
| 27-1/-AH | R5155DR3 | K645XA TN A CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XA TN A CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XA TN A CONTACT 7 CLOSED | |
| 27-1/-Z 27-1/-AA 27-1/-AH | R5165DR3 | K645XA TN A NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XA TN A CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XA TN A CONTACT 3 CLOSED | (K645XA=NSSS INTERFACE) |
| 27-1/-AX | R6195DU1 | 27-VE200X3 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BC | R6205DU1 | 27-VE200X4 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AX | R6215DU1 | 27-VE200X CONTACT 115 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

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|---|---|---|---|------------------------------------|--|--|--|
| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FHEA-27-1/2 SH 20 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 27-1/-AX | R6225DU1 | 27-VE3200X CONTACT 115 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BK | R6235DU1 | 27-VE200X CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BC | R6245DU1 | 27-VE3200X CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BK | R6255DU1 | 27-VE200X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-DH | R6265DU1 | 27-VE3200X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BK | R6275DU1 | 62-ENSA A CONTACT TDP U FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 27-1/-BK | R6285DU1 | 62-ENSAA ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-DM | R6295DU3 | 27-VE3200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-DM | R6305DU3 | 69-ENSAA CONTACT 425 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED | |
| 27-1/-DP | R6315DU3 | 27-VE1200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED | |
| 27-1/-BM | R6325DU3 | 69-ENSAA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED | |
| 27-1/-DU | R6335DU3 | 27-VE3200 A-B COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|--|---------------|
| 27-1/-DT | R6345DU3 | 27-VE3200 B-C COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE3200 CONTACT 11 CLOSED | |
| 27-1/-DX | R6355DU3 | 27-VE1200 A-B COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED | |
| 27-1/-DW | R6365DU3 | 27-VE1200 B-C COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE1200 CONTACT 11 CLOSED | |
| 27-1/-DV | R6375DU3 | 52-EGPAA CONTACT 73 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: NONE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: NONE | |
| 27-1/-BH | R6385DU3 | 69-ENSAA CONTACT 423 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 423 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 69-ENSAA CONTACT 423 CLOSED | |
| 27-1/-EW | R6395DU3 | 162-ENSAA CONTACT 5 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 23 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-EH | R6405DU3 | 162-ENSAA COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 27-1/-EE | R6415DU3 | 27-RN200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-ED | R6425DU3 | 27-RN2200 A-B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 27-1/-EH | R6435DU3 | 99-INNSAC FAILS | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 27-1/-EH | R6445DU3 | 99-INNSAC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 27-1/-ED | R6455DU3 | 27-RN2200 A-B COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RECIRCULATION SPRAY SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 24 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-----------------------------------|-----------------------------|--|---------------|
| 27-1/-EU | R6465DU1 | 27-RN200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-ET | R6475DU1 | 27-RN200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-BQ | R6485DU3 | 27-VE200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BP | R6495DU3 | 27-VE4200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-BQ | R6505DU1 | 27-VE200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BQ | R6515DU1 | 27-VE200 B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 27-1/-BP | R6525DU1 | 27-VE4200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-BP | R6535DU1 | 27-VE4200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-EK | R6545DU1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-DU | R6555DU1 | PT CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-DU | R6565DU1 | PT CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-DT | R6575DU1 | PT CKT 120V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AF AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.C. 12241 FMEA-27-1/2 SH 26 |

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FTSK   COMPONENT   COMPONENT AND   METHOD OF   EFFECT ON SYSTEM   OTHER REMARKS
IDENTIFIER FAILURE MODE   FAILURE DETECTION
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27-1/-DT R6585DU1 PT CKT 120V SIDE ANNUNCIATED IN IF NORMAL POWER BUS 2AE
FUSE C FAILS OPEN CONTROL ROOM AND NORMAL POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

IF EMERGENCY POWER BUS 2AE
AND EMERGENCY POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

27-1/-EL R6595DU1 POTENTIAL XFMR ANNUNCIATED IN IF NORMAL POWER BUS 2AE
B-C SIDE CONTROL ROOM AND NORMAL POWER BUS 2DF:
FAILS OPEN 27-VE4200 CONTACT11 CLOSED

IF EMERGENCY POWER BUS 2AE
AND EMERGENCY POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

27-1/-EK R6605DU1 PT CKT 4KV SIDE ANNUNCIATED IN IF NORMAL POWER BUS 2AE
FUSE A FAILS OPEN CONTROL ROOM AND NORMAL POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

IF EMERGENCY POWER BUS 2AE
AND EMERGENCY POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

27-1/-EK R6615DU1 PT CKT ANNUNCIATED IN IF NORMAL POWER BUS 2AE
4KV SIDE A-B CONTROL ROOM AND NORMAL POWER BUS 2DF:
SHORT CIRCUIT 27-VE4200 CONTACT11 CLOSED

IF EMERGENCY POWER BUS 2AE
AND EMERGENCY POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

27-1/-EK R6625DU1 PT CKT 4KV SIDE ANNUNCIATED IN IF NORMAL POWER BUS 2AE
FUSE A-B CONTROL ROOM AND NORMAL POWER BUS 2DF:
FAILS OPEN 27-VE4200 CONTACT11 CLOSED

IF EMERGENCY POWER BUS 2AE
AND EMERGENCY POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

27-1/-EL R6635DU1 PT CKT ANNUNCIATED IN IF NORMAL POWER BUS 2AE
4KV SIDE B-C CONTROL ROOM AND NORMAL POWER BUS 2DF:
SHORT CIRCUIT 27-VE4200 CONTACT11 CLOSED

IF EMERGENCY POWER BUS 2AE
AND EMERGENCY POWER BUS 2DF:
27-VE4200 CONTACT11 CLOSED

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|----------------------------|
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 27 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 27-1/-EL | R6645DU1 | PT CKT 4KV SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-EL | R6655DU1 | PT CKT 4KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT11 CLOSED | |
| 27-1/-EH | R6665DU1 | POTENTIAL XMFR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-DX | R6675DU1 | PT CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-DX | R6685DU1 | PT CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-DW | R6695DU1 | PT CKT 120V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| 27-1/-DW | R6705DU1 | PT CKT 120V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EN | R6715DU1 | POTENTIAL XMFR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EM | R6725DU1 | PT CKT 4KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EM | R6735DU1 | PT CKT 4KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EM | R6745DU1 | PT CKT 4KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EN | R6755DU1 | PT CKT 4KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| 27-1/-EN | R6765DU1 | PT CKT 4KV SIDE FUSE B-C FAIL OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EN | R6775DU1 | PT CKT 4KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FM | R6785DU1 | POTENTIAL XMFR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-EU | R6795DU1 | PT CKT 120 SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-EU | R6805DU1 | PT CKT 120 SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-ET | R6815DU1 | PT CKT 120 SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 30 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-ET | R6825DU1 | PT CKT 480V SIDE B-C NO VOLTAGE | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FN | R6835DU1 | POTENTIAL XFMR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FM | R6845DU1 | PT CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FM | R6855DU1 | PT CKT 480V A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FM | R6865DU1 | PT CKT 480V SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FN | R6875DU1 | PT CKT 480V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-FN | R6885DU1 | PT CKT 480V SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FN | R6895DU1 | PT CKT 480V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 CONTACT 11 CLOSED | |
| 27-1/-FD | R6905DU1 | POTENTIAL XHFR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED | |
| 27-1/-EV | R6915DU1 | PT CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED | |
| 27-1/-EV | R6925DU1 | PT CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED | |
| 27-1/-EV | R6935DU1 | PT CKT 120V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN200 A-B CONTACT 1 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RECIRCULATION SPRAY SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 32 | |

| FT | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 27-1/-FD | R6945DU1 | PT CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FD | R6955DU1 | PT CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FD | R6975DU1 | PT CKT 480V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RN2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FF | R6985DU1 | CKT ENSAA NO 125VDC CONTL PWR AVAIL | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 27-1/-FF | R6995DU1 | CKT ENSAA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 27-1/-FF | R7005DU1 | CKT ENSAA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------|----------------------|--|--------------------------------|--|---------------|
| 27-1/-FF | R7015DU1 | CKT ENSAA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSAA CONTACT 425 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSAA CONTACT 5 CLOSED | |
| 27-1/-AQ 27-1/-AS | R5895EA3 | 52-EGSBAX2 DG2-2 AUTO LOAD FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AQ 27-1/-AS | R5885EB3 | 362-EGSBAX DG2-2 AUTO LOAD STEP 5 FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AG | R0765EQ3 | 2RSS*P21B ACB CLOSING MECH FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AM | R0775EQ1 | 1-RSSBA CONTACT 7 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AG | R0785EQ1 | CKT RSSBA NO 125VDC CONTROL POWER | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-27-1/2 SH 34 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AG | R0795EQ1 | CKT RSSBA 125V(+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AG | R0805EQ1 | CKT RSSBA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AG | R0815EQ1 | CKT RSSBA 125V(-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AG | R0825EQ3 | 1-RSSBA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSBA CONTACT 1 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSBA CONTACT 1 OPEN | |
| 27-1/-AG | R0835EQ6 | 1-RSSBA NOT IN START (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSBA CONTACT 1 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSBA CONTACT 1 OPEN | |
| 27-1/-AQ | R0895EQ3 | 62-RSSBA CONTACT 3 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
|------------------------------------|---|---|---|--|--|
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 35 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AQ | R0905EQ3 | 50-VF213X CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AU | R0915EQ3 | 27-VF200X3 CONTACT 227 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-DE | R0925EQ3 | 62-RSSBA TIMER FAILS | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AF | R0955EQ3 | 2RSS*P21B TC ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BA | R0965EQ1 | 50-VF213X CONTACT 13 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-27-1/2 SH 36 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-AZ | R0975EQ1 | 27-VF200X3 CONTACT 221 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BA | R0985EQ1 | 50-VF213X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-AF | R1005EQ3 | 1-RSSBA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSBA CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSBA CONTACT 3 CLOSED | |
| 27-1/-AF | R1015EQ6 | 1-RSSBA IN STOP (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSBA CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSBA CONTACT 3 CLOSED | |
| 27-1/-AF | R1025EQ3 | 62-RSSBA CONTACT 10 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62-RSSBA CONTACT 10 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62-RSSBA CONTACT 10 CLOSED | |
| 27-1/-BA | R1035EQ1 | 50-VF213G FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 37 | | | | | |

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FTSK  COMPONENT  COMPONENT AND  METHOD OF  EFFECT ON  SYSTEM  OTHER  REMARKS
      IDENTIFIER  FAILURE MODE  FAILURE DETECTION  DETECTION  ON  SYSTEM  REMARKS
*****  *****  *****  *****  *****  *****  *****
27-1/-BA  R1045EQ1  51-VF213  ANNUNCIATED IN  IF NORMAL POWER BUS 2AE
      FAILS ACTUATED  CONTROL ROOM  AND NORMAL POWER BUS 2DF:
      RECIRC SPRAY TN A PART D FAILURE

      IF EMERGENCY POWER BUS 2AE
      AND EMERGENCY POWER BUS 2DF:
      RECIRC SPRAY TN A PART D FAILURE

27-1/-AM  R4495EQ6  1-R55BA  PERIODIC INSPECTION  IF NORMAL POWER BUS 2AE
      IN PULL TO LOCK  AND NORMAL POWER BUS 2DF:
      (OP ERROR)  RECIRC SPRAY TN A PART D FAILURE

      IF EMERGENCY POWER BUS 2AE
      AND EMERGENCY POWER BUS 2DF:
      RECIRC SPRAY TN A PART D FAILURE

27-1/-DE  R5175EQ3  1-R55BA CONTACT 7  PERIODIC TEST  IF NORMAL POWER BUS 2AE
      FAILS OPEN  AND NORMAL POWER BUS 2DF:
      2R55*P21B NO AUTO START
      CIRCUIT EST'D

      IF EMERGENCY POWER BUS 2AE
      AND EMERGENCY POWER BUS 2DF:
      2R55*P21B NO AUTO START
      CIRCUIT EST'D

27-1/-DE  R5185EQ6  1-R55BA  PERIODIC INSPECTION  IF NORMAL POWER BUS 2AE
      IN PULL-TO-LOCK  AND NORMAL POWER BUS 2DF:
      (OP ERROR)  2R55*P21B NO AUTO START
      CIRCUIT EST'D

      IF EMERGENCY POWER BUS 2AE
      AND EMERGENCY POWER BUS 2DF:
      2R55*P21B NO AUTO START
      CIRCUIT EST'D

27-1/-DE  R5195EQ3  K644B TN B  PERIODIC TEST  IF NORMAL POWER BUS 2AE
      CONTACT 1  AND NORMAL POWER BUS 2DF:
      FAILS OPEN  2R55*P21B NO AUTO START
      CIRCUIT EST'D

      IF EMERGENCY POWER BUS 2AE
      AND EMERGENCY POWER BUS 2DF:
      2R55*P21B NO AUTO START
      CIRCUIT EST'D

27-1/-DE  R5205EQ3  K644B TN B  PERIODIC TEST  IF NORMAL POWER BUS 2AE
      NO ACTUATION  AND NORMAL POWER BUS 2DF:
      SIGNAL  2R55*P21B NO AUTO START
      CIRCUIT EST'D

      (K644B=NS55 INTERFACE)

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 38 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION: *****
 ***** ** / ***** ***** *****

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION: | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|------------------------------|--|--|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | (K644B=NSSS INTERFACE) |
| 27-1/-DE | R5215EQ3 | 62-RSSBA CONTACT 8 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-DE | R5225EQ3 | 52-RSSBA CONTACT 81 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21B NO AUTO START CIRCUIT EST'D | |
| 27-1/-AF | R5235EQ3 | K644XB TN B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K644XB TN B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K644XB TN B CONTACT 1 CLOSED | |
| 27-1/-AF | R5245EQ3 | K644XB TN B NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K644XB TN B CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K644XB TN B CONTACT 1 CLOSED | (K644XB=NSSS INTERFACE) (K644XB=NSSS INTERFACE) |
| 27-1/-AL | R1205ER3 | 2RSS*P21D ACB CLOSING MECH FAILURE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------------|-----------------------------|--|---------------|
| 27-1/-AN | R1215ER1 | 1-RSSDA CONTACT 7 FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AL | R1225ER1 | CKT RSSDA NO 125VDC CONTROL POWER | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AL | R1235ER1 | CKT RSSDA 125V(+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AL | R1245ER1 | CKT RSSDA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AL | R1255ER1 | CKT RSSDA 125V(-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AL | R1265ER3 | 1-RSSDA CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSAAD CONTACT 1 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSAAD CONTACT 1 OPEN | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 40 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

27-1/-AL R1275ER6 1-RSSDA NOT IN START (OP ERROR) PERIODIC INSPECTION IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSAAD CONTACT 1 OPEN

IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSAAD CONTACT 1 OPEN

27-1/-AS R1325ER3 62-RSSDA CONTACT 3 FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

27-1/-AS R1335ER3 50-VF217X CONTACT 1 FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

27-1/-AW R1345ER3 27-VF200X4 CONTACT 115 FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

27-1/-DH R1355ER3 62-RSSDA TIMER FAILS PERIODIC TEST IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 41 | | | | | |

| FTSM | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|--|---------------|
| 27-1/-AK | R1385ER1 | 2RSS*P21D TC ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-BG | R1395ER1 | 50-VF217X CONTACT 13 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-BF | R1405ER1 | 27-VF200X4 CONTACT 111 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-BG | R1415ER1 | 50-VF217X ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AK | R1435ER3 | 1-RSSDA CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSDA CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSDA CONTACT 3 CLOSED | |
| 27-1/-AK | R1445ER6 | 1-RSSDA IN STOP (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-RSSDA CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-RSSDA CONTACT 3 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | |
| RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 |
| J.O. 12241 FMEA-27-1/2 SH 42 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| 27-1/-AK | R1455ER3 | 62-RSSDA CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62-RSSDA CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62-RSSDA CONTACT 7 CLOSED | |
| 27-1/-BG | R1465ER1 | 50-VF217G FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-BG | R1475ER1 | 51-VF217 FAILS ACTUATED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AN | R4505ER6 | 1-RSSDA IN PULL TO LOCK (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AS | R4635ER3 | 52-EGSBAX2 CONTACT 227 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-AS | R4645ER3 | 362-EGSAAX CONTACT 223 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 43 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------------------------------|----------------------|------------------------------------|-----------------------------|---|------------------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-DH | R5255ER3 | 1-RSSDA CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-DH | R5265ER6 | 1-RSSDA IN PULL-TO-LOCK (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-DH | R5275ER3 | K645B TN B CONTACT 1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-U 27-1/-DH 27-1/-BE | R5285ER3 | K645B TN B NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | (K645B=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | (K645B=NSSS INTERFACE) |
| 27-1/-DH | R5295ER3 | 52S-RSSDA CONTACT 81 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-27-1/? SH 44 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|---------------------------------------|-----------------------------|---|-------------------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-DH | R5305ER3 | 62-RSSDA CONTACT 8 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*P21D NO AUTO START CIRCUIT EST'D | |
| 27-1/-AK | R5315ER3 | K645XB TN B CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XB TN B CONTACT 7 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XB TN B CONTACT 7 CLOSED | |
| 27-1/-AB 27-1/-AC 27-1/-AK | R5325ER3 | K645XB TN B NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XB TN B CONTACT 3 CLOSED | (K645XB=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XB TN B CONTACT 3 CLOSED | (K645XB=NSSS INTERFACE) |
| 27-1/-AZ | R7025EU1 | 27-VF200X4 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BF | R7035EU1 | 27-VF200X4 ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AZ | R7045EU1 | 27-VF200X CONTACT 115 FAILS CLOSED | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 45 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BL | R7115EU1 | 62-ENSBA ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-DN | R7125EU3 | 27-VF3200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-DN | R7135EU3 | 69-ENSBA CONTACT 425 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 27-1/-DQ | R7145EU3 | 27-VF1200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 27-1/-BN | R7155EU3 | 69-ENSBA ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 69-ENSBA CONTACT 425 CLOSED | |
| 27-1/-DZ | R7165EU3 | 27-VF3200 A-B COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 47 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|------|----------------------|----------------------------|-----------------------------|------------------|---------------|
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| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-DY | R7175EU3 | 27-VF3200 B-C COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF3200 CONTACT 11 CLOSED | |
| 27-1/-EC | R7185EU3 | 27-VF1200 A-B COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 27-1/-EB | R7195EU3 | 27-VF1200 B-C COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF1200 CONTACT 11 CLOSED | |
| 27-1/-EA | R7205EU3 | 52-EGPBA CONTACT 73 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: NONE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: NONE | |
| 27-1/-BN | R7215EU3 | 69-ENSBA CONTACT 423 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62-ENSBA CONTACT 423 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62-ENSBA CONTACT 423 CLOSED | |
| 27-1/-FA | R7225EU3 | 162-ENSBA CONTACT 5 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 69-ENSBA CONTACT 425 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FHEA-27-1/2 SH 48 | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 162-ENSBA CONTACT 5 CLOSED | |
| 27-1/-FA | R7235EU3 | 162-ENSBA COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: NONE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: NONE | |
| 27-1/-EH | R7245EU3 | 27-RP200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EG | R7255EU3 | 27-RP2200 A-B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FA | R7265EU3 | 99-INNSDC FAILS | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 99-INNSDC CONTACT OPEN | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 99-INNSDC CONTACT OPEN | |
| 27-1/-FA | R7275EU3 | 99-INNSDC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 99-INNSDC CONTACT OPEN | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 99-INNSDC CONTACT OPEN | |
| 27-1/-EG | R7285EU1 | 27-RP2200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 A-B CONTACT 1 CLOSED | |
| 27-1/-EY | R7295EU1 | 27-RP200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EX | R7305EU1 | 27-RP200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-BS | R7315EU3 | 27-VE200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BR | R7325EU3 | 27-VF4200 CONTACT 11 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VF4200 CONTACT 11 CLOSED | |
| 27-1/-BS | R7335EU1 | 27-VF200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BS | R7345EU1 | 27-VF200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | |
| RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 |
| J.O. 12241 FMEA-27-1/2 SH 50 | | | |

| FYSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-BR | R7355EU1 | 27-VF4200 A-B COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-BR | R7365EU1 | 27-VF4200 B-C COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-EP | R7375EU1 | POTENTIAL XMFR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-DZ | R7385EU1 | PT CKT 120 SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-DZ | R7395EU1 | PT CKT 120 SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-DY | R7405EU1 | PT CKT 120 SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-DY | R7415EU1 | PT CKT 120 SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-EQ | R7425EU1 | POTENTIAL XMFR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-EP | R7435EU1 | PT CKT 4KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-EP | R7445EU1 | PT CKT 4KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-EP | R7455EU1 | PT CKT 4KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |
| 27-1/-EQ | R7465EU1 | PT CKT 4KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE4200 CONTACT 11 CLOSED | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
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| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
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 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 27-VE4200 CONTACT 11 CLOSED

27-1/-EQ R7475EU1 PT CKT 4KV SIDE ANNUNCIATED IN
 FUSE B-C CONTROL ROOM
 FAILS OPEN

IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 27-VE4200 CONTACT 11 CLOSED

27-1/-EQ R7485EU1 PT CKT 4KV SIDE ANNUNCIATED IN
 FUSE C FAILS OPEN CONTROL ROOM

IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 27-VE4200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 27-VE4200 CONTACT 11 CLOSED

27-1/-ER R7495EU1 POTENTIAL XFMR ANNUNCIATED IN
 A-B SIDE CONTROL ROOM
 FAILS OPEN

IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

27-1/-EC R7505EU1 PT CKT 120V SIDE ANNUNCIATED IN
 FUSE A FAILS OPEN CONTROL ROOM

IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

27-1/-EC R7515EU1 PT CKT ANNUNCIATED IN
 120V SIDE A-B CONTROL ROOM
 SHORT CIRCUIT

IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

27-1/-EB R7525EU1 PT CKT ANNUNCIATED IN
 120V SIDE B-C CONTROL ROOM
 SHORT CIRCUIT

IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 27-VE200 CONTACT 11 CLOSED

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-EB | R7535EU1 | PT CKT 120V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ES | R7545EU1 | POTENTIAL XFMR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ER | R7555EU1 | PT CKT 4KV SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ER | R7565EU1 | PT CKT 4KV SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ER | R7575EU1 | PT CKT 4KV SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ES | R7585EU1 | PT CKT 4KV SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-27-1/2 SH 54 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|-------------------------------------|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ES | R7595EU1 | PT CKT 4KV SIDE FUSE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-ES | R7605EU1 | PT CKT 4KV SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-VE200 CONTACT 11 CLOSED | |
| 27-1/-FP | R7615EU1 | POTENTIAL XFHR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EY | R7625EU1 | PT CKT 120V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EY | R7635EU1 | PT CKT 120V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EX | R7645EU1 | PT CKT 120V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 55 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-EX | R7655EU1 | PT CKT 120V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FQ | R7635EU1 | POTENTIAL XFMR B-C SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FP | R7675EU1 | PT CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FP | R7685EU1 | PT CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FP | R7695EU1 | PT CKT 480V SIDE FUSE A-B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FQ | R7705EU1 | PT CKT 480V SIDE B-C SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |

| FYSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FQ | R7715EU1 | PT CKT 480V SIDE B-C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FQ | R7725EU1 | PT CKT 480V SIDE FUSE C FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP200 CONTACT 11 CLOSED | |
| 27-1/-FJ | R7735EU1 | POTENTIAL XFMR A-B SIDE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-EZ | R7745EU1 | PT CKT 120 SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-EZ | R7755EU1 | PT CKT 120 SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-EZ | R7765EU1 | PT CKT 120 SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|--------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FJ | R7775EU1 | PT CKT 480V SIDE FUSE A FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FJ | R7785EU1 | PT CKT 480V SIDE A-B SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FJ | R7795EU1 | PT CKT 480V SIDE FUSE B FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 27-RP2200 A-B CONTACT 1 CLOSED | |
| 27-1/-FL | R7805EU1 | CKT ENSBA NO 125VDC CONTL PWR AVAIL | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| 27-1/-FL | R7815EU1 | CKT ENSBA 125V (+) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| 27-1/-FL | R7825EU1 | CKT ENSBA CONTROL POWER SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 58 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| 27-1/-FL | R7835EU1 | CKT ENSBA 125V (-) ACB FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: CKT ENSBA NO 125VDC CONTROL POWER | |
| 27-1/-BY | R3376GF2 | 42C-SHSAD ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BX | R3396GF3 | LMS-SHSAD CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BX | R3406GF1 | CKT-SHSAD CONT'L PHR XFMR FAILURE | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BX | R3416GF3 | 420-SHSAD COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BX | R3426GF3 | 42C-SHSAD INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BY | R3446GF3 | 1-SHSAD CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-SHSAD CONT 1 OR 42C-SHSAD SEAL-IN CONT CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-SHSAD CONT 1 OR 42C-SHSAD SEAL-IN CONT CLOSED | |
| 27-1/-BY | R3456GF6 | 1-SHSAD IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-SHSAD CONT 1 OR 42C-SHSAD SEAL-IN CONT CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-SHSAD CONT 1 OR 42C-SHSAD SEAL-IN CONT CLOSED | |
| 27-1/-BX | R3466GF3 | K643A TN A CONTACT 3 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643A TN A CONTACT 3 OPEN | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643A TN A CONTACT 3 OPEN | |
| 27-1/-CT | R3476GF3 | 1-SHSAD CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS#110V103A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS#110V103A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CT | R3486GF6 | 1-SHSAD NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS#110V103A NO MANUAL OPEN CIRCUIT EST'D | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 60 |

 FTSH COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-DD R3496GF3 49X-SHSAD CONTACT PERIODIC TEST
 FAILS OPEN
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CT R3506GF3 LMS-SHSAD PERIODIC TEST
 CONTACT 5
 FAILS OPEN
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-DD R3516GF2 49X-SHSAD INDICATING LIGHT
 COIL FAILS OPEN IN CONTROL ROOM
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CT R3526GF3 TQS-0-SHSAD PERIODIC TEST
 CONTACT
 FAILS OPEN
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CT R3536GF3 2SHS*HOV103A PERIODIC TEST
 EXCESS TORQUE
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2SHS*HOV103A NO MANUAL OPEN
 CIRCUIT EST'D

| | | | | | |
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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-27-1/2 SH 61 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DD | R3546GF2 | 49-SHSAD CONTACT FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DD | R3556GF2 | 2SHS*MOV103A THERMAL OVERLOAD | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CC | R3566GF2 | 42C-SHSBD ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-CB | R3586GF3 | LMS-SHSBD CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-CB | R3606GF3 | 420-SHSBD COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 62 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| 27-1/-CB | R3616GF3 | 42C-SHSBD INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-CC | R3636GF3 | 1-SHSBD CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-SHSBD CONT L1 OR 42C-SHSAD SEAL-IN CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-SHSBD CONT L1 OR 42C-SHSAD SEAL-IN CLOSED | |
| 27-1/-CC | R3646GF6 | 1-SHSBD IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 1-SHSBD CONT L1 OR 42C-SHSAD SEAL-IN CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 1-SHSBD CONT L1 OR 42C-SHSAD SEAL-IN CLOSED | |
| 27-1/-CB | R3656GF3 | K643B TN B CONTACT 3 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643B TN B CONTACT 3 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643B TN B CONTACT 3 OPEN | |
| 27-1/-CH | R3666GF3 | 1-SHSBD CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CH | R3676GF6 | 1-SHSBD NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | J.O. 12241 FMEA-27-1/2 SH 63 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DF | R3686GF3 | 49X-SHSBD CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CH | R3696GF3 | LMS-SHSBD CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DF | R3706GF1 | 49X-SHSBD COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CH | R3716GF3 | TQS-0-SHSBD CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CH | R3726GF3 | 2SHS*MOV103B EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*MOV103B NO MANUAL OPEN CIRCUIT EST'D | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FHEA-27-1/2 SH 64 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DF | R3736GF2 | 49-SHSBD CONTACT FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DF | R3746GF2 | 2SHS*HOV103B THERMAL OVERLOAD | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CT | R4596GF3 | 420-SHSAD SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*HOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*HOV103A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CH | R4606GF3 | 420-SHSBD SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2SHS*HOV103B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-BY | R5766GF3 | K643XA TN A CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XA TN A CONTACT 1 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XA TN A CONTACT 1 CLOSED | |
| 27-1/-CH | R5776GF2 | CKT SHAD FUSE FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-CH | R5786GF2 | CKT SHAD SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-CH | R5796GF2 | CKT SHAD NO 480VAC PWR AVAIL MCC#02-E04 | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-CH | R5806GF2 | CKT SHAD 480-120VAC XFMR FAILS | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-CC | R5816GF3 | K643XA TN B CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XB TN B CONTACT 1 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XB TN B CONTACT 1 CLOSED | |
| 27-1/-CL | R5826GF2 | CKT SHAD FUSE FAILS OPEN | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| | | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | | J.O. 12241 FMEA-27-1/2 SH 66 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-CL R5836GF2 CKT SHBD INDICATING LIGHT
 SHORT CIRCUIT IN CONTROL ROOM
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-CL R5846GF2 CKT SHBD INDICATING LIGHT
 NO 480VAC PWR IN CONTROL ROOM
 AVAIL MCC#02-E04
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-CL R5856GF2 CKT SHBD INDICATING LIGHT
 480-120VAC IN CONTROL ROOM
 XFMR FAILS
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-CC R8316GF3 42C-SHSBD PERIODIC TEST
 SEAL-IN CONT 1-SHSBD CONT L1 OR 42C-SHSAD
 FAILS CLOSED SEAL-IN CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 1-SHSBD CONT L1 OR 42C-SHSAD
 SEAL-IN CLOSED

27-1/-BY R8416GF3 42C-SHSAD PERIODIC TEST
 SEAL-IN CONT 1-SHSAD CONT 1 OR 42C-SHSAD
 FAILS CLOSED SEAL-IN CONT CLOSED

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 1-SHSAD CONT 1 OR 42C-SHSAD
 SEAL-IN CONT CLOSED

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 67 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-------------------------------------|--|---------------|
| 27-1/-B | R3756GH2 | 42C-SHSAE SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-B | R3766GH2 | 42C-SHSAE ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-D | R3776GH2 | 42C-SHSBE SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-D | R3786GH2 | 42C-SHSBE ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-B | R3796GH2 | 1-SHSAE CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-B | R3806GH6 | 1-SHSAE IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RECIRCULATION SPRAY SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 68 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--|---------------|
| 27-1/-D | R3816GH2 | 1-SWSBE CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-D | R3826GH6 | 1-SWSBE IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BT | R3836GJ2 | 42C-SWSCE SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BT | R3846GJ2 | 42C-SWSCE ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BU | R3856GJ2 | 42C-SHSDA SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-BU | R3866GJ2 | 42C-SHSDA ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 14 | 3 | 2 | 1 | | J.O. 12241 FMEA-27-1/2 SH 69 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|--|---------------|
| 27-1/-BT | R3876GJ2 | 1-SHSCE CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BT | R3886GJ6 | 1-SHSCE IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-BU | R3896GJ2 | 1-SHSDA CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-BU | R3906GJ6 | 1-SHSDA IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-B | R3916GH2 | 42C-SHSAF SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-B | R3926GH2 | 42C-SHSAF ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 70 | | | | | |

| FTSH | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|----------------------------------|--|---------------|
| 27-1/-D | R3936GK2 | 42C-SWSBF SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-D | R3946GK2 | 42C-SWSBF ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-B | R3956GK2 | 1-SHSAF CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-B | R3966GK6 | 1-SHSAF IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-D | R3976GK2 | 1-SHSBF CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-D | R3986GK6 | 1-SHSBF IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|----------------------------------|--|---------------|
| 27-1/-G | R3996GL2 | 42C-SHSCF SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-G | R4006GL2 | 42C-SHSCF ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-J | R4016GL2 | 42C-SHSDB SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-J | R4026GL2 | 42C-SHSDB ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-G | R4036GL2 | 1-SHSCF CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-G | R4046GL6 | 1-SHSCF IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
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| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-27-1/2 SH 72 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--------------------------------------|----------------------------------|--|---------------|
| 27-1/-J | R4056GL2 | 1-SMSDB CONTACT L1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-J | R4066GL6 | 1-SMSDB IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-C | R1496HA1 | 42C-RSSAB ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-K | R1516HA3 | LHS-RSSAB CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-K | R1536HA3 | 420-RSSAB COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-K | R1546HA3 | 42C-RSSAB INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 73 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------------------|----------------------|---|-----------------------------|--|------------------------|
| 27-1/-V | R1576HA3 | 42-RSSAB SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-K | R1586HA3 | K643A TN A CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643A TN A CONTACT 7 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643A TN A CONTACT 7 OPEN | |
| 27-1/-K 27-1/-L 27-1/-R | R1596HA3 | NO K643A TN A ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643A TN A CONTACT 7 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643A TN A CONTACT 7 OPEN | (K643A=NSSS INTERFACE) |
| 27-1/-V | R1606HA3 | 1-RSSAB CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A MANUAL CLOSE CIRCUIT EST'D | (K643A=NSSS INTERFACE) |
| 27-1/-V | R1616HA6 | 1-RSSAB IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-CF | R1626HA3 | 1-RSSAB CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 74 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | | |
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| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CF | R1636HA6 | 1-?SSAB NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CR | R1646HA3 | 49X-RSSAB CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CF | R1656HA3 | LHS-RSSAB CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CR | R1666HA1 | 49X-RSSAB COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CF | R1676HA3 | TQS-0-RSSAB CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CF | R1686HA3 | 2RSS*MOV155A EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CR | R1696HA1 | 49-RSSAB CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CR | R1706HA1 | 2RSS*MOV155A THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-E | R1716HA1 | 42C-RSSBB ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-M | R1736HA3 | LMS-RSSBB CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | | | |
| | | | | RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 | | | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 76 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------------------|----------------------|---|-----------------------------|--|--|
| 27-1/-M | R1756HA3 | 420-RCSBB COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-M | R1766HA3 | 42C-RSSBB INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-X | R1786HA3 | 42-RSSBB SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS#HOV155B MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#HOV155B MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-M | R1806HA3 | K643B TN B CONTACT 7 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643B TN B CONTACT 7 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643B TN B CONTACT 7 OPEN | |
| 27-1/-M 27-1/-N 27-1/-CB | R1816HA3 | NO K643B TN B ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643B TN B CONTACT 7 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643B TN B CONTACT 7 OPEN | (K643B=NSSS INTERFACE) (K643B=NSSS INTERFACE) |
| 27-1/-X | R1826HA3 | 1-RSSBB CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS#HOV155B MANUAL CLOSE CIRCUIT EST'D | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FHEA-27-1/2 SH 77 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155B MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-X | R1836HA6 | 1-RSSBB IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155B MANUAL CLOSE CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155B MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-CJ | R1846HA3 | 1-RSSBB CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CJ | R1856HA6 | 1-RSSBB NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CU | R1866HA3 | 49X-RSSBB CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CJ | R1876HA3 | LMS-RSSBB CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155B NO MANUAL OPEN CIRCUIT EST'D | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-27-1/2 SH 78 | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| | | | | |
|----------|----------|--------------------------------------|--------------------------------|--|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| 27-1/-CU | R1886HA1 | 49X-RSSBB COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| 27-1/-CJ | R1896HA3 | TQS-0-RSSBB CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| 27-1/-CJ | R1906HA3 | 2RSS*HOV155B EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| 27-1/-CU | R1916HA1 | 49-RSSBB CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |
| 27-1/-CU | R1926HA1 | 2RSS*HOV155B THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D |

| FTDA | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------------------|----------------------|--------------------------------------|-----------------------------|---|-------------------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CF | R4516HA3 | 420-RSSAB SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CJ | R4536HA3 | 420-RSSBB SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-V | R5336HA3 | 52-RSSAA CONTACT 61 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSAA CONTACT 61 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSAA CONTACT 61 CLOSED | |
| 27-1/-V | R5346HA3 | K643XA TN A CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XA TN A CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XA TN A CONTACT 3 CLOSED | |
| 27-1/-W 27-1/-V 27-1/-BY | R5356HA3 | K643XA TN A NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XA CONTACT 7 CLOSED | (K643XA=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XA CONTACT 7 CLOSED | (K643XA=NSSS INTERFACE) |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 14 | 13 | 12 | 11 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 80 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|--------------------------------|----------------------|--|--------------------------------|--|--|
| 27-1/-BV | R5366HA1 | CKT RSSAB FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BV | R5376HA1 | CKT RSSAB SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BV | R5386HA1 | CKT RSSAB NO 480VAC PWR AVAIL MCC#02-E11 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BV | R5396HA1 | CKT RSSAB 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-X | R5406HA3 | K643XB TN B CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XB TN B CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XB TN B CONTACT 3 CLOSED | |
| 27-1/-Y 27-1/-X 27-1/-CC | R5416HA3 | K643XB TN B NO ACTUATION SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XB TN B CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XB TN B CONTACT 7 CLOSED | (K643XB=NSSS INTERFACE) (K643XB=NSSS INTERFACE) |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 27-1/-BZ | R5426HA1 | CKT RSSBB FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BZ | R5436HA1 | CKT RSSBB SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BZ | R5446HA1 | CKT RSSBB NO 480VAC PWR AVAIL MCC*02-E12 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-BZ | R5456HA1 | CKT RSSBB 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-X | R5466HA3 | 52-RSSBA CONTACT 61 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSBA CONTACT 61 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSBA CONTACT 61 CLOSED | |
| 27-1/-F | R1936HB1 | 42C-RSSCB ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 82 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|--|---------------|
| 27-1/-R | R1956HB3 | LMS-RSSCB CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-R | R1976HB3 | 420-RSSCB COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-R | R1986HB3 | 42C-RSSCB INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AA | R2006HB3 | 42C-RSSCB SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*NOV155C MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*NOV155C MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-R | R2016HB3 | K643A TR A CONTACT 13 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643A TN A CONTACT 13 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643A TN A CONTACT 13 OPEN | |
| 27-1/-AA | R2026HB3 | 1-RSSCB CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*NOV155C MANUAL CLOSE CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155C MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-AA | R2036HB6 | 1-RSSCB IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155C MANUAL CLOSE CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155C MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-CN | R2046HB3 | 1-RSSCB CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CN | R2056HB6 | 1-RSSCB NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CZ | R2066HB3 | 49X-RSSCB CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CN | R2076HB3 | LMS-RSSCB CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV155C NO MANUAL OPEN CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 84 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CZ R2086HB1 49X-RSSCB ANNUNCIATED IN
 COIL FAILS OPEN CONTROL ROOM
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CN R2096HB3 TQS-0-RSSCB PERIODIC TEST
 CONTACT
 FAILS OPEN
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CN R2106HB3 2RSS*MOV155C PERIODIC TEST
 EXCESS TORQUE
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CZ R2116HB1 49-RSSCB CONTACT ANNUNCIATED IN
 FAILS OPEN CONTROL ROOM
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CZ R2126HB1 2RSS*MOV155C ANNUNCIATED IN
 THERMAL OVERLOAD CONTROL ROOM
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155C NO MANUAL OPEN
 CIRCUIT EST'D

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#HOV155C NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-H | R2136HB1 | 42C-RSSDB ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-U | R2156HB3 | LMS-RSSDB CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-U | R2176HB3 | 420-RSSDB COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-U | R2186HB3 | 42C-RSSDB INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AC | R2206HB3 | 42C-RSSDB SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS#HOV155D MANUAL CLOSE CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#HOV155D MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-U | R2216HB3 | K643B TN B CONTACT 13 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643B TN B CONTACT 13 OPEN | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 86 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT OR SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 K643B TN B CONTACT 13 OPEN

27-1/-AC R2226HB3 1-RSSDB PERIODIC TEST
 CONTACT L1
 FAILS CLOSED
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155D MANUAL CLOSE
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155D MANUAL CLOSE
 CIRCUIT EST'D

27-1/-AC R2236HB6 1-RSSDB IN CLOSE PERIODIC INSPECTION
 (OP ERROR)
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155D MANUAL CLOSE
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155D MANUAL CLOSE
 CIRCUIT EST'D

27-1/-CQ R2246HB3 1-RSSDB PERIODIC TEST
 CONTACT R1
 FAILS OPEN
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155D NO MANUA'. OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155D NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-CQ R2256HB6 1-RSSDB PERIODIC INSPECTION
 NOT IN OPEN
 (OP ERROR)
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155D NO MANUAL OPEN
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*MOV155D NO MANUAL OPEN
 CIRCUIT EST'D

27-1/-DB R2266HB3 49X-RSSDB CONTACT PERIODIC TEST
 FAILS OPEN
 IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*MOV155D NO MANUAL OPEN
 CIRCUIT EST'D

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-27-1/2 SH 87 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CQ | R2276HB3 | LHS-RSSDB CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DB | R2286HB1 | 49X-RSSDB COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CQ | R2296HB3 | TQS-O-RSSDB CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CQ | R2306HB3 | 2RSS*HOV155D EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DB | R2316HB1 | 49-RSSDB CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | |

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|---|---|---|---|--|------------------------------------|
| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 88 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION FAILURE DETECTION *****

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|----------|----------|--|--------------------------------|--|--|--|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | | |
| 27-1/-DB | R2326HB1 | 2RSS*HOV155D THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | | |
| 27-1/-CN | R4566HB3 | 420-RSSCB SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155C NO MANUAL OPEN CIRCUIT EST'D | | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155C NO MANUAL OPEN CIRCUIT EST'D | | |
| 27-1/-CQ | R4566HB3 | 420-RSSDB SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV155D NO MANUAL OPEN CIRCUIT EST'D | | |
| 27-1/-CD | R5476HB1 | CKT RSSCB FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | | |
| 27-1/-CD | R5486HB1 | CKT RSSCB SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | | |

| FAILURE MODES AND EFFECTS ANALYSIS | | | |
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| RECIRCULATION SPRAY SYSTEM | | | |
| 4 | 3 | 2 | 1 |
| J.O. 12241 FMEA-27-1/2 SH 89 | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 27-1/-CD | R5496HB1 | CKT RSSCB NO 480VAC PWR AVAIL MCC#02-E11 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-CD | R5506HB1 | CKT RSSCB 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-AA | R5516HB3 | 52 -RSSCA CONTACT 61 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSCA CONTACT 61 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSCA CONTACT 61 CLOSED | |
| 27-1/-AA | R5526HB3 | K605XA TN A CONTACT 1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XA TN A CONTACT 1 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XA TN A CONTACT 1 CLOSED | |
| 27-1/-CE | R5536HB1 | CKT RSSDB SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-CE | R5546HB1 | CKT RSSDB NO 480VAC PWR AVAIL MCC#02-E12 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 90 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|---------------|
| 27-1/-L | R2376HC3 | 420-RSSAC COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-L | R2386HC3 | 42C-RSSAC INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-W | R2406HC3 | 42C-RSSAC SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-L | R2416HC3 | K643A TN A CONTACT 9 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643A TN A CONTACT 9 OPEN IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643A TN A CONTACT 9 OPEN | |
| 27-1/-W | R2426HC3 | 1-RSSAC CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-W | R2436HC6 | 1-RSSAC IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A MANUAL CLOSE CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 92 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK IDENTIFIER | COMPONENT FAILURE MODE | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|-------------------|--------------------------------|----------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-CG R2456HC3 | 1-RSSAC CONTACT R1 FAILS OPEN | | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CG R2466HC6 | 1-RSSAC NOT IN OPEN (OP ERROR) | | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CS R2476HC3 | 49X-RSSAC CONTACT FAILS OPEN | | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CG R2486HC3 | LMS-RSSAC CONTACT 5 FAILS OPEN | | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CS R2496HC1 | 49X-RSSAC COIL FAILS OPEN | | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CG | R2506HC3 | TQS-0-RSSAC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CG | R2516HC3 | 2RSS*MOV155A EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CS | R2526HC1 | 49-RSSAC CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CS | R2536HC1 | 2RSS*MOV155A THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156A NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-E | R2546HC3 | 42C-RSSBC ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 94 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-N R2566HC3 LMS-RSSBC
 CONTACT 4
 FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-N R2586HC3 420-RSSBC
 COIL FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-N R2596HC3 42C-RSSBC
 INTLK CONTACT
 FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 RECIRC SPRAY TN A PART D FAILURE

27-1/-Y R2616HC3 42C-RSSBC
 SEAL-IN CONTACT
 FAILS CLOSED PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*HOV156B MANUAL CLOSE
 CIRCUIT EST'D

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 2RSS*HOV156B MANUAL CLOSE
 CIRCUIT EST'D

27-1/-N R2626HC3 K643B TN B
 CONTACT 9
 FAILS OPEN PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 K643B TN B CONTACT 9 OPEN

IF EMERGENCY POWER BUS 2AE
 AND EMERGENCY POWER BUS 2DF:
 K643B TN B CONTACT 9 OPEN

27-1/-Y R2636HC3 1-RSSBC
 CONTACT L1
 FAILS CLOSED PERIODIC TEST IF NORMAL POWER BUS 2AE
 AND NORMAL POWER BUS 2DF:
 2RSS*HOV156B MANUAL CLOSE
 CIRCUIT EST'D

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 95 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-Y | R2646HC6 | 1-RSSBC IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B MANUAL CLOSE CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-CK | R2656HC3 | 1-RSSBC CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CK | R2666HC6 | 1-RSSBC NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CV | R2676HC3 | 49X-RSSBC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CK | R2686HC3 | LMS-RSSBC CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 96 | | | | | |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CV | R2696HC1 | 49X-RSSBC COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CK | R2706HC3 | TQS-0-RSSBC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CK | R2716HC3 | 2RSS*HOV155B EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CV | R2726HC1 | 49-RSSBC CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-CV | R2736HC1 | 2RSS*HOV155B THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156B NO MANUAL OPEN CIRCUIT EST'D | |

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|------------------------------------|---|---|---|--|--|
| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 97 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 27-1/-BW | R5616HC1 | CKT RSSAC NO 480VAC PWR AVAIL MCC#02-E11 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-BW | R5626HC1 | CKT RSSAC 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART A FAILURE | |
| 27-1/-W | R5636HC3 | 52-RSSAA CONTACT 77 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSAA CONTACT 77 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSAA CONTACT 77 CLOSED | |
| 27-1/-Y | R5646HC3 | K643XB TN B CONTACT 7 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K643XB TN B CONTACT 7 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K643XB TN B CONTACT 7 CLOSED | |
| 27-1/-CA | R5656HC1 | CKT RSSBC FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-CA | R5666HC1 | CKT RSSBC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--------------------------------|--|---------------|
| 27-1/-CA | R5676HC1 | CKT RSSBC NO 480VAC PWR AVAIL MCC#02-E12 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-CA | R5686HC1 | CKT RSSBC 480-120VAC XFMR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN A PART D FAILURE | |
| 27-1/-Y | R5696HC3 | 52-RSSBA CONTACT 77 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSBA CONTACT 77 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSBA CONTACT 77 CLOSED | |
| 27-1/-Q | R2746HD1 | 42C-RSSCC ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-P | R2766HD3 | LMS-RSSCC CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-P | R2786HD3 | 420-RSSCC COIL FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-27-1/2 SH 100 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--|--|---------------|
| 27-1/-P | R2796HD3 | 42C-RSSCC INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-Z | R2816HD3 | 42C-RSSCC SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-Q | R2826HD4 | 3-RSSAD CONTACT 117 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 3-RSSAD CONTACT 117 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 3-RSSAD CONTACT 117 CLOSED | |
| 27-1/-CM | R2836HD4 | LMS-SISAP CONTACT 2 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: LMS-SISAP CONTACT 2 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: LMS-SISAP CONTACT 2 CLOSED | |
| 27-1/-Z | R2856HD3 | 1-RSSCC CONTACT L1 FAILS CLOSE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C MANUAL CLOSE CIRCUIT EST'D IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-Z | R2866HD6 | 1-RSSCC IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C MANUAL CLOSE CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 101 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C MANUAL CLOSE CIRCUIT EST'D | |
| 27-1/-BH | R2876HD3 | 1-RSSCC CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| 27-1/-BH | R2886HD6 | 1-RSSCC NOT IN OPEN OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| 27-1/-CY | R2896HD3 | 49X-RSSCC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| 27-1/-BH | R2906HD3 | LMS-RSSCC CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| 27-1/-CY | R2916HD1 | 49X-RSSCC COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FHEA-27-1/2 SH 102 |

 FTSK COMPONENT COMPONENT AND METHOD OF EFFECT ON SYSTEM OTHER REMARKS
 IDENTIFIER FAILURE MODE FAILURE DETECTION

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|----------|----------|--|--------------------------------|--|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| 27-1/-BH | R2926HD3 | TQS-0-RSSCC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| 27-1/-BH | R2936HD3 | 2RSS*HOV156C EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| 27-1/-CY | R2946HD1 | 49-RSSCC CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| 27-1/-CY | R2956HD1 | 2RSS*HOV156C THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO MANUAL OPEN CKT ESTABLISHED |
| 27-1/-T | R3056HD1 | 42C-RSSDC ENERGIZED BY SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE |

| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
|------------------------------------|---|---|---|--|
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FHEA-27-1/2 SH 103 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|--|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-S | R3076HD3 | LMS-RSSDC CONTACT 4 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-S | R3096HD3 | 420-RSSDC COIL FAILS OPEN | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-S | R3106HD3 | 42C-RSSDC INTLK CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-AB | R3126HD3 | 42C-RSSDC SEAL-IN CONTACT FAILS CLOSED | PERIODIC TEST | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-T | R3136HD4 | 3-RSSBD CONTACT 117 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 3-RSSBD CONTACT 117 CLOSED | |
| 27-1/-CP | R3146HD4 | LMS-SISBP CONTACT 2 FAILS CLOSED | MORE CONTACTS MUST FAIL TO BE DETECTABLE | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 3-RSSBD CONTACT 117 CLOSED | |
| | | | | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS#MOV156D MANUAL CLOSE SIGNAL EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#MOV156D MANUAL CLOSE SIGNAL EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 104 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: LMS-SISBP CONTACT 2 FAILS CLOSED | |
| 27-1/-AB | R3166HD3 | 1-RSSDC CONTACT L1 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D MANUAL CLOSE SIGNAL EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D MANUAL CLOSE SIGNAL EST'D | |
| 27-1/-AB | R3176HD6 | 1-RSSDC IN CLOSE (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D MANUAL CLOSE SIGNAL EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D MANUAL CLOSE SIGNAL EST'D | |
| 27-1/-BJ | R3186HD3 | 1-RSSDC CONTACT R1 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-BJ | R3196HD6 | 1-RSSDC NOT IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DA | R3206HD3 | 49X-RSSDC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-BJ | R3216HD3 | LMS-RSSDC CONTACT 5 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DA | R3226HD1 | 49X-RSSDC COIL FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-BJ | R3236HD3 | TQS-O-RSSDC CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-BJ | R3246HD3 | 2RSS*HOV155D EXCESS TORQUE | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DA | R3256HD1 | 49-RSSDC CONTACT FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO MANUAL OPEN CIRCUIT EST'D | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 106 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-DA | R3266HD1 | 2RSS*MOV156D THERMAL OVERLOAD | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-BH | R4556HD3 | 420-RSSCC SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO MANUAL OPEN CKT ESTABLISHED | |
| 27-1/-BJ | R4576HD3 | 420-RSSDC SEAL IN CONTACT FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO MANUAL OPEN CIRCUIT EST'D | |
| 27-1/-Z | R5706HD3 | K645XA TN A CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XA TN A CONTACT 3 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XA TN A CONTACT 3 CLOSED | |
| 27-1/-Z | R5716HD3 | 52-RSSCA CONTACT 77 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSCA CONTACT 77 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSCA CONTACT 77 CLOSED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--------------------------------------|-----------------------------|--|---------------|
| 27-1/-AB | R5736HD3 | K645XB TN B CONTACT 3 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K645XB TN B CONTACT 3 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K645XB TN B CONTACT 3 CLOSED | |
| 27-1/-AB | R5746HD3 | 52-RSSDA CONTACT 77 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 52-RSSDA CONTACT 77 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 52-RSSDA CONTACT 77 CLOSED | |
| 27-1/-CX | R5916HD3 | 62X-RSSAD CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED | |
| 27-1/-DJ | R5926HD3 | 62X-RSSAD ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED | |
| 27-1/-DJ | R5936HD3 | 62-RSSAD ENERGIZED BY SHORT CIRCUIT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED | |
| 27-1/-DJ | R5946HD3 | K608A TN A CONTACT 15 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSAD CONTACT 113 CLOSED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 108 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|------------------------------------|-----------------------------|--|---------------|
| 27-1/-DK | R5956HD3 | 62X-RSSBD CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED | |
| 27-1/-DL | R5966HD3 | 62X-RSSBD ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED | |
| 27-1/-DL | R5976HD3 | 62-RSSBD ENERGIZED BY SHORT CKT | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED | |
| 27-1/-DL | R5986HD3 | K608B TN B CONTACT 15 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED | |
| 27-1/-BB | R5996HD3 | 3-RSSAD CONTACT 317 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-BB | R6006HD3 | K645A TN A CONTACT 13 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|-------------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-BB | R6016HD3 | LMS-SISAP 2SIS*MOV8811A CONTACT 6 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CX | R6026HD2 | 3-RSSAD ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CX | R6036HD3 | K617A TN A CONTACT 113 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K617A TN A CONTACT 13 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K617A TN A CONTACT 13 CLOSED | |
| 27-1/-CX | R6046HD3 | K617A TN A SPURIOUS ACTUAT SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K617A TN A CONTACT 13 CLOSED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K617A TN A CONTACT 13 CLOSED | |
| 27-1/-BE | R6056HD3 | 3-RSSBD CONTACT 317 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | | |
| 4 | 3 | 2 | 1 | | |
| J.O. 12241 FMEA-27-1/2 SH 110 | | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|---|----------------------------------|--|---------------|
| 27-1/-BE | R6066HD3 | K645B TN B CONTACT 13 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-BE | R6076HD3 | LHS-SISBP 2SIS*MOV8811 CONTACT 6 FAILS OPEN | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-DK | R6086HD2 | 3-RSSBD ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-DK | R6096HD3 | K617B TN B CONTACT 13 FAILS CLOSED | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K617B TN B CONTACT 13 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K617B TN B CONTACT 13 CLOSED | |
| 27-1/-DK | R6106HD3 | K617B TN B SPURIOUS ACTUAT SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: K617B TN B CONTACT 13 CLOSED IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: K617B TN B CONTACT 13 CLOSED | |
| 27-1/-P | R6116HD1 | CKT RSSCC FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |

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| | | | | FAILURE MODES AND EFFECTS ANALYSIS | |
| | | | | RECIRCULATION SPRAY SYSTEM | |
| 4 | 3 | 2 | 1 | | |
| | | | | J.O. 12241 FMEA-27-1/2 SH 111 | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|---------|----------------------|--|-----------------------------|--|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-P | R6126HD1 | CKT RSSCC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-P | R6136HD1 | CKT RSSCC NO 480VAC PWR AVAIL MCC*02-E11 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-P | R6146HD1 | CKT RSSCC 480-120VAC XFHR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART C FAILURE | |
| 27-1/-S | R6156HD1 | CKT RSSDC FUSE FAILS OPEN | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-S | R6166HD1 | CKT RSSDC SHORT CIRCUIT | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-S | R6176HD1 | CKT RSSDC NO 480VAC PWR AVAIL MCC*02-E12 | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 112 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-S | R6186HD1 | CKT RSSDC 480-120VAC XFHR FAILS | ANNUNCIATED IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: RECIRC SPRAY TN B PART B FAILURE | |
| 27-1/-CM | R2966QH2 | 420-SISAP ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CM | R2976JH2 | 420-SISAP SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CM | R2986QH2 | K608A TN A CONTACT 3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CM | R2996QH2 | 1-SISAP CONTACT R1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*MOV156C NO AUTO OPEN CKT ESTABLISHED | |

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| FAILURE MODES AND EFFECTS ANALYSIS | | | | |
| RECIRCULATION SPRAY SYSTEM | | | | |
| 4 | 3 | 2 | 1 | |
| J.O. 12241 FMEA-27-1/2 SH 113 | | | | |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------|----------------------|--|----------------------------------|---|---------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CH | R3006QH6 | 1-SISAP IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156C NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156C NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CP | R3276QH2 | 420-SISBP ENERGIZED BY SHORT CIRCUIT | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CP | R3286QH2 | 420-SISBP SEAL-IN CONTACT FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CP | R3296QH2 | K608B TN B CONTACT 3 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CP | R3306QH2 | 1-SISBP CONTACT R1 FAILS CLOSED | INDICATING LIGHT IN CONTROL ROOM | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS*HOV156D NO AUTO OPEN CKT ESTABLISHED | |

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| | | | | | FAILURE MODES AND EFFECTS ANALYSIS |
| | | | | | RECIRCULATION SPRAY SYSTEM |
| 4 | 3 | 2 | 1 | | |
| | | | | | J.O. 12241 FMEA-27-1/2 SH 114 |

| FTSK | COMPONENT IDENTIFIER | COMPONENT AND FAILURE MODE | METHOD OF FAILURE DETECTION | EFFECT ON SYSTEM | OTHER REMARKS |
|----------------------------------|----------------------|-----------------------------------|-----------------------------|---|------------------------|
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CP | R3316QH6 | 1-SISBP IN OPEN (OP ERROR) | PERIODIC INSPECTION | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS#HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#HOV156D NO AUTO OPEN CKT ESTABLISHED | |
| 27-1/-CM 27-1/-CP 27-1/-DJ | R5726QH3 | K608A TN A SPURIOUS ACTUAT SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 2RSS#HOV156C NO AUTO OPEN CKT ESTABLISHED | (K608A=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 2RSS#HOV156C NO AUTO OPEN CKT ESTABLISHED | (K608A=NSSS INTERFACE) |
| 27-1/-DL | R5756QH3 | K608B TN B SPURIOUS ACTUAT SIGNAL | PERIODIC TEST | IF NORMAL POWER BUS 2AE AND NORMAL POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED | (K608B=NSSS INTERFACE) |
| | | | | IF EMERGENCY POWER BUS 2AE AND EMERGENCY POWER BUS 2DF: 62X-RSSBD CONTACT 113 CLOSED | (K608B=NSSS INTERFACE) |