

LOSS OF NNI-X

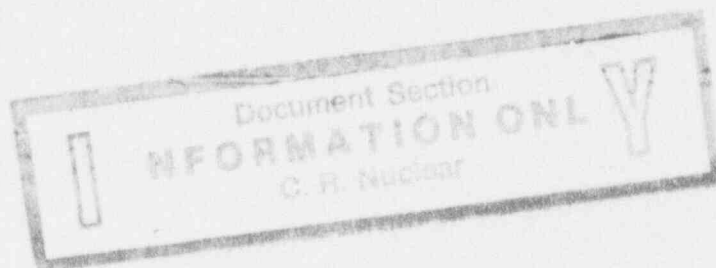
1.0 ENTRY CONDITIONS

IF a loss of NNI-X AC or DC power exists

THEN use this procedure.

2.0 IMMEDIATE ACTIONS

- o There are NO Immediate Actions in this procedure.



| | | |
|--|--------------|---------------------|
| This Procedure Addresses Safety Related Components | | |
| Approved by MNPO <i>[Signature]</i> | | Date <u>3/18/94</u> |
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3.0 FOLLOW-UP ACTIONS

ACTIONS

DETAILS

Note

Control board instrumentation may be verified with the Redundant Instrument Panel during performance of this procedure.

3.1 — Stabilize the plant with valid instruments

1. Valid instruments include:

- o RCS Press / RC-158-PI2
- o / RC-159-PI2
- o T_{hot} / RC-4A-TI4-1
- o T_{cold} / RC-5A-TI2
- o PZR Level / RC-1-LIR1
- o / RC-1-LIR3
- o FDW Flow / SP-8A-FIR1
- o Turb Hdr / SP-10A-PIR1
- o A DH Flow / DH-1-FI4-1
- o B DH Flow / DH-1-FI2

2. Position instrument selector switches to the NNI-Y powered instrument

3.2 — Verify SASS modules swapped to the alternate channel

- o A red Trip light on the SASS module indicates that the channel has swapped to the alternate instrument
-

3.3 — Control RCS pressure based on plant conditions using:

- o PZR heaters
- o PZR spray
- o PORV

For loss of NNI-X DC the following equipment is available for pressure control in the MANUAL mode:

- o — PZR htr banks D and E
- o — RCV-14
- o — RCV-10

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3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.4 — Ensure MUV-31 controller is selected to "HAND."

IF MUV-31 controller is NOT energized, THEN ensure the following:

- o VBDP-3 Bkr #38 is closed.
- o \pm 24V DC Backup Power Supply, located in NNI Cabinet 3 Top Row, is energized.

3.5 — Ensure MUV-16 controller is selected to "HAND"

Conditions for RCP Seal Injection are as follows:

- o MUV-16 will transfer to manual and maintain its prior control value
- o RCP Seal Injection flow indicators fail to mid-scale and will NOT respond to changes in flow
- o MUV-16 can be operated in "HAND"

3.6 — IF letdown isolation occurs, THEN bypass the high TEMP isolation AND re-establish letdown flow.

- o Select "MUV-49 HIGH TEMP BYPASS" switch to the "BYPASS" position.
- o Open MUV-49.

3.7 — Maintain PZR level \geq 50".

- o MUV-31 will transfer to manual and maintain its prior control value
- o Letdown flow control, MUV-51 is operable.
- o Makeup control, MUV-31 is available in "HAND."

3.8 — Notify SOTA of plant conditions.

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3.0 FOLLOW-UP ACTIONS (CONT'D)

| ACTIONS | DETAILS |
|---|--|
| 3.9 — Determine the status of NNI-X DC power. | <ul style="list-style-type: none">o Observe the 4 power supply monitor lights located in NNI Cabinet 3, Row 6, Module 15.o NNI-X DC power is energized if at least 1 POS and 1 NEG light is lit. |
| <hr/> | |
| 3.10 — <u>IF</u> NNI-X DC is energized <u>THEN</u> the following equipment is operable: | |
| <ul style="list-style-type: none">o Auto PZR spray control.o Auto PORV control.o Auto PZR heater control.o Manual PZR level control.o Manual RCP Seal Injection flow control.o OTSG "B" TBVs in "AUTO" | <ul style="list-style-type: none">o RCV-14, PZR Spray Valveo RCV-10, PORVo Banks D and Eo MUV-31 controller in "HAND"o MUV-16 controller in "HAND"o MSV-11 & MSV-14, "B" OTSG Turbine Bypass Valves |
| <hr/> | |
| 3.11 — Ensure Makeup Demineralizer protection. | <ul style="list-style-type: none">o Verify SW cooling to in service Letdown Heat Exchangers.o <u>IF</u> NNI-X AC is not energized, <u>THEN</u> Bypass the Makeup Demineralizers:<ul style="list-style-type: none">1. Open/Ensure open<ul style="list-style-type: none">___ MUV-124 ___ MUV-200___ MUV-1172. Close/Ensure closed:<ul style="list-style-type: none">___ MUV-133 ___ MUV-116o <u>IF</u> NNI-X DC is not energized, <u>THEN</u> Monitor Letdown Temperature for increasing trends.<ul style="list-style-type: none">o <u>IF</u> Letdown Temperature reaches 130°F and maintains an increasing trend, <u>THEN</u> bypass the Makeup Demineralizers:<ul style="list-style-type: none">1. Open/ensure open:<ul style="list-style-type: none">___ MUV-124 ___ MUV-200___ MUV-1172. Close/ensure closed:<ul style="list-style-type: none">___ MUV-133 ___ MUV-116 |

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3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.12 — Refer to Enclosure 2 for
unreliable instrumentation

3.13 — Ensure the conditions
maintained by the affected
interlocks are not
exceeded.

Refer to Enclosure 1.

3.14 — WHEN restoring power to
NNI-X,
THEN GO TO OP-501, Reactor
Non-Nuclear
Instrumentation, beginning
with step 4.1.1

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Enclosure 1

Interlocks Affected by a Loss of NNI-X

| <u>INTERLOCK</u> | <u>DC DE-ENERGIZED</u> | <u>AC DE-ENERGIZED</u> |
|--|--|---|
| 4 th RCP START Tc TEMPERATURE START INTERLOCK | Disabled (will not prevent start) | Activated (start prevented) |
| RCP START, SEAL INJECTION FLOW START INTERLOCK | Disabled (will not prevent start) | Disabled (will not prevent start) |
| MUV-49, HIGH LETDOWN TEMPERATURE INTERLOCK | Disabled (will not close valve) | Disabled (will not close valve) |
| MUV-112, MAKE-UP TANK LOW-LOW LEVEL INTERLOCK | Disabled (will not transfer upon LOW-LOW MUT level) | Disabled (will not transfer upon LOW-LOW MUT level) |
| PZR HEATER MODULATING BANKS | Disabled (will not control in manual or auto) | Disabled (will not control in manual or auto) |
| PZR HEATER ON/OFF BANKS | Disabled (will not control in auto) | No Effect |
| PORV | Disabled (will not Auto open) | No Effect |
| RCV-14, PZR SPRAY VALVE | Disabled (will work in manual) | No Effect |
| BORIC ACID TANKS LOW LEVEL INTERLOCK | Disabled (will not turn off htr) | Disabled (will not turn off htr) |
| BORIC ACID TANKS HIGH/LOW TEMPERATURE INTERLOCK | Disabled (will not turn htr on/off on low/high temperature) | Htr fails on when selected to "AUTO" (due to instrument string failure) |

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Enclosure 2

Unreliable Instrumentation Due to Loss of NNI-X DC Power

INSTRUMENT

TITLE

ICS PANEL

| | |
|-----------|---|
| RC-1-LI2 | Uncompensated PZR Level |
| RC-4-TI | RCS Unit T _h |
| RC-4A-TI1 | RCS Loop A NR T _h |
| RC-4B-TI1 | RCS Loop B NR T _h |
| RC-5-TI | RCS Unit T _c |
| RC-5A-TI1 | RCS Loop A WR T _c |
| RC-5B-TI1 | RCS Loop B WR T _c |
| RC-7A-TAI | Loop A T _{ave} |
| RC-7B-TAI | Loop B T _{ave} |
| RC-8-DTI | RCS Differential T _c |
| RC-12-TAI | Controlling T _{ave} |
| RC-14-FIR | RCS Total Flow |
| RC-14A-FI | Loop A RCS Flow |
| RC-14B-FI | Loop B RCS Flow |
| SP-1A-LI1 | A Steam Generator Full Range |
| SP-1A-LI2 | A Steam Generator S/U Range |
| SP-1B-LI1 | B Steam Generator Full Range |
| SP-1B-LI2 | B Steam Generator S/U Range |
| SP-3A-TI | A Steam Generator Downcomer Temperature |
| SP-3B-TI | B Steam Generator Downcomer Temperature |
| SP-5A-TI | FW Temperature to A Steam Generator |
| SP-5B-TI | FW Temperature to B Steam Generator |
| SP-6A-PI2 | A Steam Generator Pressure |
| SP-6B-PI2 | B Steam Generator Pressure |
| SP-7A-FI | Loop A S/U FW Flow |
| SP-7B-FI | Loop B S/U FW Flow |

TGF PANEL

| | |
|--------------|-----------------------------------|
| SP-4A-TI | A Main Steam Temperature |
| SP-4A-TIR(A) | A Main Steam Temperature Recorder |

PSA PANEL

| | |
|------------|-------------------------|
| CD-100-LI | Hotwell Level |
| MU-7-FI1 | RCP-1A Seal Flow |
| MU-7-FI3 | RCP-1C Seal Flow |
| MU-7-FI2 | RCP-1B Seal Flow |
| MU-7-FI4 | RCP-1D Seal Flow |
| MU-14-LIR1 | MUT Level |
| MU-17-PIR | MUT Press on MU-14-LIR1 |
| MU-24-FI | RC MU Flow |
| MU-27-FI | RCP Total Seal Flow |

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Enclosure 2

Unreliable Instrumentation Due to Loss of NNI-X DC Power

| INSTRUMENT | TITLE |
|-----------------------------------|--------------------------------|
| <u>ES PANEL</u> | |
| BS-1-FI1 | A RB Spray Flow |
| CF-1-PI1 | A CFT Pressure |
| CF-1-PI3 | B CFT Pressure |
| CF-2-LI1 | A CFT Level |
| CF-2-LI3 | B CFT Level |
| DH-1-FI1 | A LPI Flow |
| DH-2-TI1 | A DH Cooler Outlet Temperature |
| DH-6-TI1 | A DH Suction Temperature |
| DH-38-FI1 | LPI Crossover Flow |
| MU-23-FI1 | HPI Loop B-1 WR Flow |
| MU-23-FI2 | HPI Loop A-2 WR Flow |
| <u>REDUNDANT INSTRUMENT PANEL</u> | |
| DH-1-FI5 | A DHP Flow |
| RC-1-LI3 | PZR Level |
| RC-2-TI1 | PZR Temp |
| RC-3A-PI3 | Loop A WR Pressure |
| RC-4A-TI3 | Loop A WR T _h |
| RC-4B-TI3 | Loop B WR T _h |
| RC-5A-TI3 | Loop A WR T _h |
| RC-5B-TI3 | Loop B WR T _c |
| RC-131-PI2 | RCS LR Pressure |
| SP-1A-LI6 | A OTSG Oper Level |
| SP-1A-LI4 | A OTSG S/U Level |
| SP-1B-LI5 | B OTSG S/U Level |
| SP-1B-LI6 | B OTSG Operating Level |
| SP-6A-PI3 | A OTSG Pressure |
| SP-6B-PI3 | B OTSG Pressure |
| SP-7A-FI1 | Loop A S/U FW Flow |
| SP-8A-FI1 | Loop A MFW Flow |
| SP-8B-FI1 | Loop B MFW Flow |
| MU-4-FI1-1 | Letdown Flow |
| MU-14-LI1 | MUT Level |
| MU-24-FI1 | Makeup Flow |

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Enclosure 2

Unreliable Instrumentation due to Loss of NNI-X AC Power

| INSTRUMENT | TITLE |
|------------------|---|
| <u>ICS PANEL</u> | |
| RC-2-TI | PZR Temp |
| RC-4-TI | RCS Unit T _h |
| RC-4A-TI1 | RCS Loop A ^h NR T _h |
| RC-4B-TI1 | RCS Loop B NR T _h |
| RC-5-TI | RCS Unit T |
| RC-5A-TI1 | RCS Loop B ^c WR T _c |
| RC-5B-TI1 | RCS Loop B WR T _c |
| RC-7A-TAI | RCS Loop A T _{ave} |
| RC-7B-TAI | RCS Loop B T _{ave} |
| RC-8-dTI | RCS Differential T _c |
| RC-12-TAI | Controlling T _{ave} |
| RC-14A-FI | Loop A RC Flow |
| RC-14B-FI | Loop B RC Flow |
| RC-14-FIR | Total RCS Flow |
| SP-1A-LI1 | A OTSG Full Range Level |
| SP-1A-LI2 | A OTSG Startup Range Level |
| SP-1B-LI1 | B OTSG Full Range Level |
| SP-1B-LI2 | B OTSG Startup Range Level |
| SP-3A-TI | A OTSG Downcomer Temp |
| SP-3B-TI | B OTSG Downcomer Temp |
| SP-5A-TI | Loop A FW Temp |
| SP-5B-TI | Loop B FW Temp |
| SP-6A-PI2 | A OTSG Pressure |
| SP-6B-PI2 | B OTSG Pressure |
| SP-7A-FI | Loop A Startup FW Flow |
| SP-7B-FI | Loop B Startup FW Flow |
| <u>TGF PANEL</u> | |
| SP-4A-TI | A Main Steam Temp |
| SP-4B-TI | B Main Steam Temp |
| SP-4A-TIR(A) | A Main Steam Temp |
| SP-4B-TIR(B) | B Main Steam Temp |
| <u>PSA PANEL</u> | |
| MU-5-TI | Letdown Temp |
| MU-7-FI1 | RCP-1A Seal Flow |
| MU-7-FI3 | RCP-1C Seal Flow |
| MU-7-FI2 | RCP-1B Seal Flow |
| MU-7-FI4 | RCP-1D Seal Flow |
| MU-17-PIR | MUT Press on MU-14-LIR1 |
| MU-24-FI | Makeup Flow |
| MU-27-FI | RCP Total Seal Flow |

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Enclosure 2

Unreliable Instrumentation due to Loss of NNI-X AC Power

| INSTRUMENT | TITLE |
|-----------------------------------|--|
| <u>ES PANEL</u> | |
| BS-1-FI1 | A RB Spray Flow |
| CF-1-PI1 | A CFT Pressure |
| CF-1-PI3 | A CFT Pressure |
| CF-2-LI1 | A CFT Level |
| CF-2-LI3 | B CFT Level |
| DH-1-FI1 | A DH Removal Flow |
| DH-2-TI1 | DHHE-1A Suction Temp |
| DH-6-TI1 | DHP-1A Suction Temp |
| DH-38-FI | LPI Crossover Flow |
| <u>REDUNDANT INSTRUMENT PANEL</u> | |
| MU-24-FI1 | Makeup Flow |
| RC-4B-TI3 | Loop B WR T _c |
| RC-5B-TI3 | RCS Loop B WR T _c |
| RC-6B-DTI1 | RCS Loop B Differential T _c |
| SP-1A-LI6 | A OTSG Operating Level |
| SP-1B-LI6 | A OTSG Operating Level |
| SP-6A-PI3 | A OTSG Pressure |
| SP-6B-PI3 | B OTSG Pressure |
| SP-8A-FI1 | Loop A MFW Flow |
| SP-8B-FI1 | Loop B MFW Flow |