| Statement France | PLANT MANUAL SECTION: | PROCEDURE/WORK PLAN TITLE: | | NO: | | |
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| ALL | EMERGENCY OPERATING | LOSS OF COOLANT/RC | PRESSURE | 1202.06 | | |
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| 4.0 FOLI | .OW-UP ACTIONS: NO F. | W. AVAILABLE | | | | |
| 4.1 | If RCP's are operati | ng, stop all but 1 RCP | per loop. | | | |
| 4.2 | Manually open turbin open the atmospheric (if one is available condensate pump is a valves and align SW follows: | e bypasses if condenser dump valves to allow f , even though the auxil vailable for OTSG feed, feed to the OTSG's thro | is under vacuum, eed from a condens iary FW pump is no fully open dump o ugh the idle EFW p | otherwise, ate pump t). If no r bypass umps as | | |
| | IF ONLY A CONDENSAT LATE SU VALVES TO F FEED TO CONTROL TEM ~ 420°F, WHEN LEVEL | CAUTION E PUMP IS AVAILABLE, CL EED SLOWLY, MONITORING PERATURE AND RCS PRESSU CONTROL MAY BE ESTABLI | OSE LO-LOAD VALVES RCS TEMPERATURE AN RE UNTIL RCS IS CO SHED. | AND MODU- D PRESSURE; OLED TO | | |
| | 4.2.1 Open SW supply valves to EFW suction and select "SW" posi- both P-7A and P-7B suction select switches. | | | | | |
| | 4.2.2 Verify both E | ves to each OTSG o | pen. | | | |
| | If RCS leakage is gr to determine EAL. | eater than normal makeu | p capacity, refer | to 1903.10 | | |
| 4.3 | Monitor RCS pressure saturation by holdir within the cooldown operating, Figure 3 | es and temperatures; mains ng RCS pressure near the pressure-temperature cu if no RCP's are operati | ntain at least 50° e minimum allowable urve (Figure 2 if R .ng). | F margin te pressure RCP's are | | |
| | If margin to saturat refer to 1903.10 to | NOTE tion is less than 20°F f determine EAL. | for greater than 5 | minutes, | | |
| 4.4 | 4 Open the ERV and its block valve (if closed) under either of the follow circumstances: | | | | | |
| | 4.4.1 No RCP's are | operating. | | | | |
| | 4.4.2 RCS re-press cooling) | urizes (indicating HPI) | flows are insuffici | ient for co | | |
| | If ES actuation occu RCS pressure recove delay restart of ac power as pressure w | NOTE urs before HPI can be ma rs, do not reset ES and tuated equipment in the ould have to fall again | anually established log channels, as th event of a loss of to actuation setpe | d and the his would f off-site pint. | | |
| | If ESAS actuates au | tomatically, refer to 1 | 903.10 to determine | e EAL. | | |
| 4.5 | If, at any time dur available, proceed | ing the ensueing steps, as follows to restore O | emergency feedwate TSG levels. | er is made | | |
| | 4.5.1 Close atmosp | heric dumps and turbine | bypasses. | | | |
| | 4.5.2 Close all EF ctor switche | W block and bypass valv s in "Manual, then clos | es by placing Auto e the block and by | /Manual sel pass valves | | |
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| adariterational Generali | ARKANSAS | NUCLEAR ONE | REVISION 11 DATE | 10/26/81 | | |
| 4 0 FOI | TOU UD ACTIONS, NO DU | | CHANGE DATE | | | |
| 4.0 FOL | LOW-OF ACTIONS: NO F. | W. AVAILABLE | | | | |
| 4.1 | II KCP's are operati | ng, stop all but 1 RCP | per loop. | | | |
| 4.2 | Manually open turbin open the atmospheric (if one is available condensate pump is a valves and align SW follows: | e bypasses if condenser dump valves to allow f , even though the auxil vailable for OTSG feed, feed to the OTSG's thro | is under vacuum, o eed from a condensa iary FW pump is not fully open dump on ugh the idle EFW pu | otherwise, ate pump :). If no : bypass umps as | | |
| | $\frac{\text{CAUTION}}{IF ONLY A CONDENSATE PUMP IS AVAILABLE, CLOSE LO-LOAD VALVES AND M LATE SU VALVES TO FEED SLOWLY; MONITORING RCS TEMPERATURE AND PRES FEED TO CONTROL TEMPERATURE AND RCS PRESSURE UNTIL RCS IS COOLED T \sim 420°F, WHEN LEVEL CONTROL MAY BE ESTABLISHED.$ | | | | | |
| | 4.2.1 Open SW supply valves to EFW suction and select "SW" posi both P-7A and P-7B suction select switches. | | | | | |
| | 4.2.2 Verify both EFW block and bypass valves to each OTSG open. | | | | | |
| | NOTE If RCS leakage is greater than normal makeup capacity, refer to 190 to determine EAL. | | | | | |
| 4.3 | Monitor RCS pressures and temperatures; maintain at least 50°F margin to saturation by holding RCS pressure near the minimum allowable pressure within the cooldown pressure-temperature curve (Figure 2 if RCP's are operating, Figure 3 if no RCP's are operating). | | | | | |
| | If margin to saturat refer to 1903.10 to | NOTE ion is less than 20°F f determine EAL. | or greater than 5 r | ninutes, | | |
| 4.4 | 4 Open the ERV and its block valve (if closed) under either of the circumstances: | | | | | |
| | 4.4.1 No RCP's are | operating. | | | | |
| | 4.4.2 RCS re-pressurizes (indicating HPI flows are insufficien cooling) <u>NOTE</u> If ES actuation occurs before HPI can be manually established at RCS pressure recovers, do not reset ES analog channels, as this delay restart of actuated equipment in the event of a loss of o power as pressure would have to fall again to actuation setpoin | | | | | |
| | | | | | | |
| | If ESAS actuates aut | omatically, refer to 19 | 03.10 to determine | EAL. | | |
| 4.5 | If, at any time duri available, proceed a | ng the ensueing steps, s follows to restore OT | emergency feedwate SG levels. | r is made | | |
| | 4.5.1 Close atmosph | eric dumps and turbine | bypasses. | | | |
| | 4.5.2 Close all EFW ctor switches | block and bypass valve in "Manual, then close | s by placing Auto/! the block and byp | fanual sele- | | |

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| | 4.5.3 Select "Cond (if CST is a both P-7A an | ensate" position on EFW vailable, otherwise, rem d P-7B. | pump suction selec ain on SW feed) fo | tors r |
| | 4.5.4 Start P-7A o monitoring R to prevent g | r P-7B; slowly open EFW CS pressure and temperat ross cooldown. | bypass valves whil ure, feeding slowl | e y |
| | 4.5.5 Establish OT if RCP's are are running and RCS cool | SG levels between 90% an not operating, or > 22" with EFW bypasses and co down with atmospheric du | d 95% operate rang S.U. range if RCP ntrol OTSG pressur mps or turbine byp | e 's e asses. |
| | 1 | NOTE | | |
| | Defended 1100 | NUIE | | |
| | 1203.13 (Natu ning. | ral Circulation Cooldown | P's running. Refe) if no RCP's are | r to run- |
| | 4.5.6 If RCP's are system press of this proc | running, attempt to clo ure to stabilize, then p edure for all further ac | se the ERV and all proceed to section tion. | ow 3.0 |
| | 4.5.7 If RCP's are of this proc | not available, proceed edure for all further ac | to section 5.0 tion. | |
| 4.6 | Continue maximum HF is >50°F subcooled. | I flow for cooldown with | nout EFW until RCS | |
| 4.7 | Monitor RB pressure building isolation and HPI and LPI act | ; if pressure reaches 4 and cooling actuation (E uation (channels 1, 2, 3 | psig, verify react C.S. channels 5 & 6 3 & 4). | or j) |
| | | NOTE | | |
| | As a back-up or in pressure, addition tion is installed. PI-2413) and a non corder (PR-2412) a C-486-2. | a case of an exceptional nal wide range (0 to 210 Two safety grade indic n-safety grade wide range are located on control pa | ly high containment PSIA) instrumenta- cators (PI-2412 & e pressure re- anels C-486-1 & | |
| 1.0 | | | | |
| | | NOTE | | |
| | Proper ES actuation components' indicat on C-26 correspond Proper flow ranges faces. Proper Pene noting all room iso | n is verified by noting t ting lamps on the ES pane to the color of the swit for HPI and LPI are mark etration Room ventilation plation damper lamps out | that the colors of els C-16, C-18, and tch nameplate. ked on the meter n is verified by , flow indicated. | i |

| | PLANT MANUAL SECTION: EMERGENCY | PROCEDURE/WORK PLAN TITLE: | | | NO: |
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Verify both emergency diesels autostart and their SW supply MOV's open. Over-ride (using E.S. manual over-ride pushbuttons) and re-open the following valves to allow continued RCP and instrument air system operation:

- 4.7.1 Nuclear loop ICW RB isolation valves CV-2233, CV-2215 and CV-2214.
- 4.7.2 Non-nuclear loop ICW valves CV-2235, CV-2234, CV-2221 and CV-2220.
- 4.7.3 SW supply valves to the ICW heat exchangers CV-3811 and CV-3820.
- 4.7.4 Verify two ICW pumps and a control rod drive booster pump running and ICW flows indicated for both loops.
- 4.8 Prepare for LPI boost to MU pump suction and RB sump recirc as follows:

4.8.1 Verify MU tank outlet MU-13 closed.

- 4.8.2 Open DH-7A and DH-7B, LPI discharge to MU pumps suction, verify MU pump suction crossover valves MU-14, MU-15, MU-16, and MU-17 open, and verify MU pump discharge crossover valv s MU-23, MU-24, MU-25, and MU-26 open.
- 4.8.3 Isolate the DH rooms by clesing both DH room floor drain valves, ABS-13 and ABS-14, securing room purge dampers CV-7621, CV-7622, CV-7637, and CV-7638 from ventilation control panel (east wall of 404' Ventilation Room) and closing watertight doors.
- 4.8.4 Verify both DH pumps operating and both LPI Mov's open (CV-1400 and CV-1401).

4.9 Once a 50°F margin to saturation is attained, continue HPI cooldown without purposefully depressarizing the RCS until operation is within the pressure/temperature cooldown curve limits (Figure 2 of this procedure). Continue with plant cooldown and depressurize by throttling HPI MOV's after achieving operation with the pressure/temperature curve limits while holding >50°F margin to saturation. Tlot cooldown rate and pressure/temperature relationship as required by 1102.10, Attachment B.

CAUTION

DO NOT DECREASE MAKEUP PUMP FLOW RATE BELOW 50 GPM WITH THE RECIRC VALVES (CV-1300 AND CV-1301) CLOSED. STOP THE ES STANDBY MAKEUP PUMP IF NECESSARY TO PREVENT GOING SOLID IN THE PRESSURIZER (MUST BE >50° SUBCOOLED).

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HPI components are not to be over-ridden unless the following criteria are met:

 The HPI system has been in operation for 20 minutes, and all hot and cold leg temperatures are at least 50°F below saturation temperature for the existing RCS pressure, or

 The RCS is > 50°F subcooled, and throttling of HPI is necessary to prevent going solid in the pressurizer (with no break detected in pzr. steam space), or

 The RCS is > 50°F subcooled, and HP1 throttling is necessary to remain within the plant cooldown pressure/temperature curve limits, or

4) D.H. or LPI has been operating for > 20 minutes with flow rates of > 2650 gpm per train, or > 3100 gpm with one train operating.

If margin to saturation drops below 50°F after HPI override, re-initiate maximum HPI until > 50°F subcooled. (Refer to figure 1.) UNDER NO CIRCUMSTANCES IS HPI TO BE OVER-RIDDEN IF RCS IS

NOT SUBCOOLED.

- 4.10 Monitor BWST level; when BWST level has fallen to ~6' indicated level, or when the corresponding BWST lo-lo-level alarm is received, verify sufficient water inventory via the RB sump (Refer to sump level indicator LI-1405 & Rx Bldg. Level indicators LI-5645 & LI-5646) and transfer suction to RB sump by verifying RB sump suction valves inside containment CV-1414 and CV-1415 open, opening RB sump suction valves outside containment CV-1405 and CV-1406 (a slight upward perturbation should be noted on pump flows indicating suction transfer); then close both BWST outlets CV-1407 and CV-1408 (Refer to 1104.04 for RCS temperature control methods). Close NaOH tank outlets CV-1616 and CV-1617. MANUAL OVERRIDE PUSHBUTTONS MUST BE DEPRESSED FOR ALL VALVE MANIPULATIONS IF ES ACTUATION HAS OCCURRED. Monitor the RB water level indicators LI-5645 and LI-5646 during the entire recirculation phase.
- 4.11 When RCS pressure is reduced to ~600 psig, continue slow depressurization (control discussed in step 4.9) and allow CFT's to discharge. Monitor HPI flows closely; maintain > 100 gpm per pump.

| 4.12 Ini 4.13 Whe and 4.1 4.1 4.1 4.1 4.1 | PERATING ARKANSAS tiate R.B. H ₂ sam n HPI flow is app align for MU and 3.1 Close LPI bo 3.2 Close suctio B to C) or (running HPI 3.3 Close runnin | LOSS OF COOLANT/RC NUCLEAR ONE pling per section 9.0 of roaching 100 gpm per loo purification as follows ost to secured HPI pump n cross-connect valve (M MU-16 or MU-17 for A to pump from the MU tank. | PRESSURE PAGE 16 of 25 REVISION 9 DATE CHANGE DATE OP 1104.33. p, stop 1 HPI pump : (DH-7A or DH-7B). U-14 or MU-15 for | 1202.06 3/17/81 |
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| 4.12 Ini 4.13 Whe and 4.1 4.1 4.1 4.1 | ARKANSAS tiate R.B. H ₂ sam n HPI flow is app align for MU and 3.1 Close LPI bo 3.2 Close suctio B to C) or (running HPI 3.3 Close runnin | NUCLEAR ONE pling per section 9.0 of roaching 100 gpm per loo purification as follows ost to secured HPI pump n cross-connect valve (M MU-16 or MU-17 for A to pump from the MU tank. | PAGE 16 of 25 REVISION 9 DATE CHANGE DATE OP 1104.33. p, stop 1 HPI pump : (DH-7A or DH-7B). U-14 or MU-15 for | 3/17/81 |
| 4.12 Ini 4.13 Whe and 4.1 4.1 4.1 | tiate R.B. H ₂ sam n HPI flow is app align for MU and 3.1 Close LPI bo 3.2 Close suctio B to C) or (running HPI 3.3 Close runnin | pling per section 9.0 of roaching 100 gpm per loo purification as follows ost to secured HPI pump n cross-connect valve (M MU-16 or MU-17 for A to pump from the MU tank. | OP 1104.33. p, stop 1 HPI pump : (DH-7A or DH-7B). U-14 or MU-15 for | , |
| 4.13 Whe and 4.1 4.1 4.1 | n HPI flow is app align for MU and 3.1 Close LPI bo 3.2 Close suctio B to C) or (running HPI 3.3 Close runnin | roaching 100 gpm per loo purification as follows ost to secured HPI pump n cross-connect valve (M MU-16 or MU-17 for A to pump from the MU tank. | p, stop 1 HPI pump : (DH-7A or DH-7B). U-14 or MU-15 for | |
| 4.1 4.1 4.1 | 3.1 Close LPI bo 3.2 Close suctio B to C) or (running HPI 3.3 Close running | ost to secured HPI pump n cross-connect valve (M MU-16 or MU-17 for A to pump from the MU tank. | (DH-7A or DH-7B). U-14 or MU-15 for | |
| 4.1 4.1 4.1 | 3.2 Close suctio B to C) or (running HPI 3.3 Close runnin | n cross-connect valve (M MU-16 or MU-17 for A to pump from the MU tank. | U-14 or MU-15 for | |
| 4.1 | 3.3 Close runnin | | B) isolating the | |
| 4.1 | (MU-21A, B o | g HPI pump`manual recirc r C). | ulation valve | |
| | 3.4 Open MU-13 (| MU tank outlet). | | |
| 4.1 | 3.5 Over-ride ES | signal and open CV-1300 | and CV-1301. | |
| 4.1 | 3.6 Over-ride ES | signal and open CV-1214 | , CV-1216 and CV-1 | 221. |
| 4.1 | 3.7 Verify ICW a | vailable and establish 1 | etdown. | |
| 4.1 | 3.8 Verify MU ta aligned for | nk level \geq 40" and start MU & P. | MU pump which was | 5 |
| 4.1 | 3.9 Stop HPI pum | p whose suction is align | ed to LPI pump dis | scharge. |
| 4.1 | 3.10 Modulate mak margin to sa | eup and letdown to contr turation cannot be maint | ol press/temp. If ained, restart HP1 | F > 50°F I pump. |
| 4.1 | 3.11 Stop the DH and align it 1104.04, | pump (which is not align s manual valves for norm | ed for boost for H al decay heat mode | HPI pump) • per |
| I f on a f | only one LPI pum the failed pump ter repairs; mean | NOTE p is operating, initiate and align it for D.H. op while, continue HPI/LPI | repairing eration cooling. | |
| 4.1 | 3.12 Continue HPI | /LPI cooldown to within | limits of decay he | at system |
| 4.1 | 3.13 Place decay and its asso | heat system in service a ciated (booster) decay h | nd stop HPI pump (eat pump, | if runnin |

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| | 4.14 | Select "Manual" and o close all steam suppl | close all emergency FW ly MOV's to P-7A to sec | feed valves and by ure emergency fee | ypass valve d. | |
| | 4.15 | Close main FW isolati | ion valves. | | | |
| | 4.16 | Close MS isolation va OTSG's are dry. | alves (if not previous) | y closed by SLBIC |) whenever | |
| 5.0 | FOLLOW-UP ACTION - No Reactor Coolant Pumps | | | | | |
| | 5.1 | 5.1 Initiate manual EFW feed to OTSG's and slowly increase levels to betwe 90% and 95% on operate range. Attempt to maintain a continuous feed while raising levels. | | | | |
| | | If RCS leakage is gre to determine EAL. | <u>NOTE</u> eater than normal makeu | p capacity, refer | to 1903.10 | |
| | | If ES actuation occur RCS pressure recovers delay restart of actu power as pressure wou | NOTE rs before HPI can be man s, do not reset ES anal- uated equipment in the uld have to fall again | nually established og channels, as tl event of a loss of to actuation setpe | d and the his would f off-site oint. | |
| | | 03.10 to determine | e EAL. | | | |
| | 5.2 | Monitor RCS pressures saturation by holding ture curve (Figure 3) | ntain at least 50' he cooldown pressi | °F margin to ure-tempera- | | |
| | | As a back-up or in ca additional wide range Two safety grade indi wide range pressure n C-486-1 & C-486-2. | NOTE ase of an exceptionally e (0 to 210 PSIA) instru- icators (PI-2412 & PI-24 recorder (PR-2412) are | high containment umentation is ins 413) and a non-sa located on contro | pressure, talled. fety grade l panels | |
| | 5.3 | Monitor RB pressure; isolation and cooling tion (channels 1, 2, | if pressure reaches 4 p g actuation (E.S. channe 3 & 4). | psig, verify reacted and HPI | tor building & LPI actu | |
| | | Proper ES actuation is indicating lamps on t the color of the swit are marked on the met verified by noting al and negative Penetrat | NOTE is verified by noting th the ES panels C-16, C-11 tch nameplate. Proper ter faces. Proper Pene 11 room isolation dampe tion Room pressure indi | hat the colors of 8 and on C-26 corr flow ranges for HI tration Room vent: r lamps out, flow cated. | components respond to PI & LPI ilation is indicated | |

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| | 4.14 | close all steam supp | close all emergency FW ly MOV's to P-7A to sec | feed valves and by ure emergency feed | rpass valves; 1. |
| | 4.15 | Close main FW isolat | ion valves. | | |
| | 4.16 | Close MS isolation v. OTSG's are dry. | alves (if not previous) | y closed by SLBIC) | whenever |
| 5.0 | FOLL | OW-UP ACTION - No Rea | ctor Coolant Pumps | | |
| | 5.1 | Initiate manual EFW 90% and 95% on operative while raising levels | feed to OTSG's and slow te range. Attempt to m. | ly increase levels aintain a continuc | to between ous feed rate |
| | | | NOTE | | |
| | | If RCS leakage is gro to determine EAL. | eater than normal makeu | p capacity, refer | to 1903.10 |
| | | | NOTE | | |
| | | If ES actuation occu RCS pressure recover delay restart of act power as pressure wo | rs before HPI can be man s, do not reset ES anal- uated equipment in the uld have to fall again | nually established og channels, as th event of a loss of to actuation setpo | l and the mir would off-site pint. |
| | | If ESAS actuates aut | omatically, refer to 19 | 03.10 to determine | EAL. |
| | 5.2 | Monitor RCS pressures saturation by holdin ture curve (Figure 3 | s and temperatures; main g RCS pressure within th) if possible. | ntain at least 50° he cooldown pressu | PF margin to are-tempera- |
| | | As a back-up or in ca additional wide range Two safety grade ind wide range pressure C-486-1 & C-486-2. | <u>NOTE</u> ase of an exceptionally e (0 to 210 PSIA) instru- icators (PI-2412 & PI-24 recorder (PR-2412) are | high containment umentation is inst 413) and a non-saf located on control | pressure, alled. ety grade panels |
| | 5.3 | Monitor RB pressure; isolation and coolin tion (channels 1, 2, | if pressure reaches 4 p g actuation (E.S. channe 3 & 4). | psig, verify react els 5 & 6 and HPI | or building & LPI actua |
| | | Proper ES actuation indicating lamps on the color of the swi are marked on the me verified by noting a and negative Penetra | NOTE is verified by noting th the ES panels C-16, C-14 tch nameplate. Proper ter faces. Proper Pene 11 room isolation dampe tion Room pressure indi | hat the colors of 8 and on C-26 corr flow ranges for HP tration Room venti r lamps out, flow cated. | components' espond to PI & LPI lation is indicated |

