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Alarm Code    931-0  
Restore        931-1

**Location:**        B 919

**Alarm Limits**

**System:**        Cooling Tower No 5 - Low Level

Lo Level (-30")\*  
LoLo Level (-42")\*  
\*(from top of basin)

**Action:**

1.    Verify that low level exists
  - a)   If Lo Level, check that tower level control is in auto
  - b)   If not, place in auto & observe that makeup light comes on
  - c)   If not, place in manual & observe light
  - d)   If not open manual bypass valve
  
2.    Fill tower until level  $\approx$  2 ft below top of basin
  - a)   Return level control to auto and close manual bypass. Note 1 & 3 the following morning
3.    If Level approaches Lo Lo level, advise MCR that pumps will be shut down and BSTR magnet cooling will be affected.
  
4.    If pumps are shut down, Note 3

**Notes:**

1. Record Actions Taken
2. MCR = Main Control Room (x 4662)
3. Call Mech Svcs from "Call In" List

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**NODE: RPC 4**

**ALARM CODE 931.2  
RESTORE 931.3**

**LOCATION: BLDG. 919**

**SYSTEM: g-2 MAGNET SYSTEM COMMON ALARM**

**ACTION: DETERMINE WHICH SIGNAL IS IN ALARM AND  
TURN TO ALARM RESPONSE SHEET FROM LIST BELOW**

<b>NODE</b>	<b>SIGNAL NAME</b>	<b>DESCRIPTION</b>	<b>PAGE NO.</b>
<a href="#">RPC 4</a>	<a href="#">MAGFLO.LO</a>	<a href="#">Magnet Water Flow</a>	<a href="#">931.2-1</a>
<a href="#">RPC 4</a>	<a href="#">MAGFLO.HI</a>	<a href="#">Magnet Water Flow</a>	<a href="#">931.2-2</a>
<a href="#">RPC 4</a>	<a href="#">MAGTEMP.SUP.LO</a>	<a href="#">Magnet Water Supply Temp.</a>	<a href="#">931.2-3</a>
<a href="#">RPC 4</a>	<a href="#">MAGTEMP.SUP.HI</a>	<a href="#">Magnet Water Supply Temp.</a>	<a href="#">931.2-3</a>
<a href="#">RPC 4</a>	<a href="#">MAGLVL.LO</a>	<a href="#">Magnet Water Level</a>	<a href="#">931.2-4</a>
<a href="#">RPC 4</a>	<a href="#">MAGLVL.HI</a>	<a href="#">Magnet Water Level</a>	<a href="#">931.2-4</a>
<a href="#">RPC 4</a>	<a href="#">MAGPRESS.SUP.LO</a>	<a href="#">Magnet Water Supply Press.</a>	<a href="#">931.2-5</a>
<a href="#">RPC 4</a>	<a href="#">MAGPRESS.SUP.HI</a>	<a href="#">Magnet Water Supply Press.</a>	<a href="#">931.2-5</a>
<a href="#">RPC 4</a>	<a href="#">MAGRESIS.LO</a>	<a href="#">Magnet Water Resistivity</a>	<a href="#">931.2-6</a>
<a href="#">RPC 4</a>	<a href="#">MKUP.CNT.HI</a>	<a href="#">Magnet Water Makeup</a>	<a href="#">931.2-7</a>
<a href="#">RPC 4</a>	<a href="#">MKUP.CNT.HIHI</a>	<a href="#">Magnet Water Makeup</a>	<a href="#">931.2-7</a>
<a href="#">RPC 4</a>	<a href="#">LOAIR.ALARM</a>	<a href="#">Control Air Lo Pressure</a>	<a href="#">931.2-8</a>
<a href="#">RPC 4</a>	<a href="#">MAGMKUP</a>	<a href="#">Magnet Water Make-up</a>	<a href="#">931.2-9</a>

**NOTE: IF COMMON ALARM IS RECEIVED - CHECK  
MAKE-UP DISPLAY FOR WATER MAKE-UP.**

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**ALARM RESPONSE SHEET - g-2**

<b><u>SIGNAL NAME</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>ALARM LIMITS</u></b>
<b>MAGFLO.LO</b>	<b>Mag Water Flow</b>	<b>(Hi/Lo/LoLo) 450/150/100</b>

- ACTION:**
- 1. Verify low flow, 150 GPM**
  - 2. Advise MCR (Pumps will stop @ 100 GPM)**
  - 3. Check 919 Pump Rm, High Bay & V Line for major leak or closed valves**
  - 4. Check other system parameters:
    - a) Pump suction press. is 9 psig**
    - b) Pressure is between 200 and 225 psig**
    - c) If actual parameters are, less than a) or outside limits of b)****
  - 5. Note 3 & 1**

- NOTE:**
- 1. Record Actions Taken**
  - 2. MCR = Main Control Room**
  - 3. Call Mech Svcs from "Call In" list**

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**ALARM RESPONSE SHEET - g-2**

<b><u>SIGNAL NAME</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>ALARM LIMITS</u></b>
<b>MAGFLO.HI</b>	<b>Magnet Water Flow</b>	<b>(Hi/Lo/LoLo) 450/150/100</b>

- ACTION:**
1. **Verify hi flow. 450 GPM**
  2. **Check 919 Pump Rm, Hi Bay, U & V lines**
  3. **Check other system parameters:**
    - a) **Suction press 9 psig**
    - b) **Pressure is between 225 and 200 psig**
    - c) **If actual parameters are less than a) or outside limits of b), note 3**
  4. **Note 3 & 1**

- NOTE:**
1. **Record Actions Taken**
  2. **MCR = Main Control Room**
  3. **Call Mech Svcs from "Call In" list**

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**ALARM RESPONSE SHEET - g-2**

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
<b>MAGTEMP.SUP. LO or HI</b>	<b>Mag Water Supply Temp.</b>	<b>(HiHi/Hi/Lo) 105/100/60F</b>

- ACTION:**
- 1. Verify temp is outside limits**
  - 2. Advise MCR that pumps will go off at 105F**
  - 3. Verify that tower water temp is within limits. 90/50F**
    - a) If not, see that response sheet**
  - 4. Verify that tower water flow is within limits. 450 GPM**
    - a) If not, see that response sheet**
  - 5. Note 3 & 1**

- NOTE:**
- 1. Record Actions Taken**
  - 2. MCR = Main Control Room**
  - 3. Call Mech Svcs from "Call In" list**

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## ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
MAGLVL.LO or HI	Mag Water Level	(Hi/Lo/LoLo) 30/9/1 psig

- ACTION:**
1. Verify level is outside Hi/Lo limits at pump suction gauge
  2. Advise MCR that pumps will shut down on pump suction. 1 psig
  3. Check LED @ controller position 10, 1
    - a) For Lo Level, fill light should be "ON"
    - b) For Hi Level, fill light should be "OFF"
  4. For LoAlarm, check that solenoid valve SV-1 & SV-2 are energized and that flow is observed in flow indicator
  5. For Hi Alarm, make sure that cold water bypass is closed.
  6. Inspect area for leaks
  7. Notes 1 & 3

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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**ALARM RESPONSE SHEET - g-2**

<b><u>SIGNAL NAME</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>ALARM LIMITS</u></b>
<b>MAGPRESS.SUP.LO</b>	<b>Magnet Water Supply Press.</b>	<b>(Hi/Lo) 300/100psig</b>
<b>MAGPRESS.SUP.HI</b>	<b>Magnet Water Supply Press.</b>	<b>(Hi/Lo) 300/100psig</b>

- ACTION:**
- 1. Verify Press. is outside limits**
  - 2. Check that Auto/Manual Switch to Press. Control Valve (PCV) is in Auto**
    - a) If not, place in Auto and observe press.**
  - 3. For HiPress. Alarm, Check for closed valves & Lo flow**
  - 4. For LoPress. Alarm, Check for HiFlow & large leak**
  - 5. Note 3 & 1**

- NOTE:**
- 1. Record Actions Taken**
  - 2. MCR = Main Control Room**
  - 3. Call Mech Svcs from "Call In" list**

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**ALARM RESPONSE SHEET - g-2**

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
MAGRESIS.LO	Mag Water Resistivity	(Hi/Lo) NA/.5 megohm-cm

- ACTION:**
1. Verify resistivity is outside limits.
  2. Check that LED on controller @ location 10, 2 is "OFF"
  3. Solenoid valves SV 3 & 4 should be de-energized and ~ 5 gpm is observed on flow indicator
  4. Observe that system resistivity rises above .5 megohm
  5. If Lo Alarm remains - Note 3 the following morning

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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931.2-7

**ALARM RESPONSE SHEET - g-2**

<b><u>SIGNAL NAME</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>ALARM LIMITS</u></b>
<b>MKUP.CNT.Hi .HiHi</b>	<b>Mag Water Make-up Flow</b>	<b>(Hi/HiHi) 50/100 GAL in 10 min</b>

- ACTION:**
- 1. Check 919 Pump Room, Hi Bay, & U & V Lines for leak(s)**
  - 2. Advise MCR that pumps will shut down after 3 min. If HiHi MKUP occurs**
  - 3. Advise MCR, isolate leaking device**
  - 4. Notes 1 & 3**

- NOTE:**
- 1. Record Actions Taken**
  - 2. MCR = Main Control Room**
  - 3. Call Mech Svcs from "Call In" list**

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**ALARM RESPONSE SHEET - g-2**

<b><u>SIGNAL NAME</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>ALARM LIMITS</u></b>
<b>LOAIR.ALARM</b>	<b>Control Air Lo Pressure</b>	<b>Lo 50psig</b>

- ACTION:**
- 1. Verify Low Air Pressure**
  - 2. Advise MCR that Mag Water Press. Control will be affected**
  - 3. Check that Magnet Water press. Is within limits (see attached response sheet)**
  - 4. Call Plant Engineering Site Shift Supervisor at x4174, cell – 872-8988 or C/W desk x4284 during off hours.**
  - 5. Note 1 & Note 3 the following morning.**

- NOTE:**
- 1. Record Actions Taken**
  - 2. MCR = Main Control Room**
  - 3. Call Mech Svcs from "Call In" list**

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ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
MAGMKUP.	g-2 Water Make-up	ON/OFF

- ACTION:**
1. Verify Make-Up is ON.
  2. Check Make-Up Totals on Control P.C.
  3. Check Level Trend for a Downward Slope.
  4. Inspect B.919 P.R., Hi Bay and V line for leaks.
  5. Isolate Leak if Possible.
  6. CAS Group to Log Make-Up Quantity in Log.
  7. Contact Water Systems Specialist from Call In List For Assistance/Advice if Necessary
  8. Advise Water Systems Group Supervisor in Morning.
- 10.If Make-up is verified follow [C-A-OPM 2.19](#)

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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**NODE: RPC 4**

**ALARM CODE 931.4  
RESTORE 931.5**

**LOCATION: BLDG. 919**

**SYSTEM: g-2 COOLING TOWER - COMMON ALARM**

**ACTION: DETERMINE WHICH SIGNAL IS IN ALARM AND  
TURN TO ALARM RESPONSE SHEET FROM LIST BELOW**

<u>RPC 4</u>	<u>TWRTEMP.SUP.LO</u>	<u>Cooling Tow. Wat. Sup. Temp.</u>	<u>931.4-1</u>
<u>RPC 4</u>	<u>TWRTEMP.SUP.HI</u>	<u>Cooling Tow. Wat. Sup. Temp</u>	<u>931.4-1</u>
<u>RPC 4</u>	<u>TWRFLO.LO</u>	<u>Cooling Tower Water Flow</u>	<u>931.4-2</u>
<u>RPC 4</u>	<u>TWRFLO.HI</u>	<u>Cooling Tower Water Flow</u>	<u>931.4-2</u>
<u>RPC 4</u>	<u>TWRLVL.LO</u>	<u>Cooling Tower Water Level</u>	<u>931.4-3</u>
<u>RPC 4</u>	<u>TWRPUMP1.LOSUCT</u>	<u>Cooling Tower Pump Suction</u>	<u>931.4-4</u>
<u>RPC 4</u>	<u>TWRPUMP2.LOSUCT</u>	<u>Cooling Tower Pump Suction</u>	<u>931.4-4</u>
<u>RPC 4</u>	<u>FANVIB.HI</u>	<u>Cooling Tower Fan Vibration</u>	<u>931.4-5</u>
<u>RPC 4</u>	<u>TWRPIPNG.</u>	<u>Cooling Tower Outdoor Piping</u>	<u>931.4-6</u>
	<u>LOTEMP.ALARM</u>		

**NOTE: IF COMMON ALARM IS RECEIVED - CHECK  
MAKE-UP DISPLAY FOR WATER MAKE-UP.**

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931.4-1

ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARMLIMITS</u>
TWRTEMP.SUP.LO & .Hi	Tower Water Supply Temp	(Hi/Lo)

- ACTION:**
1. Verify temp is outside limits
  2. Check that tower fan switch is in Auto
    - a) If not, place switch in Auto
  3. For HiAlarm fan should be in HiSpeed and water flow to top of tower
    - a) If not, redirect water to top with tower valve
    - b) If fan does not operate in Auto, place fan switch in manual, slow speed fwd and observe temp
    - c) Place in HiSpeed fwd only if temp remains above 90 F
  4. For LoAlarm fan should be off
  5. Notes 1 & 3

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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931.4-2

ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARMLIMITS</u>
TWRFLO.LO & .Hi	Tower Water Flow	(Hi/Lo/LoLo) 600/250/150 gpm

- ACTION:**
1. Verify flow is outside limits
    - a) If flow is 150 advise MCR that pump(s) will shut down
  2. Check 919 for major leak
  3. Check other system parameters @ 919
    - a) Pump discharge is between 30 & 20 psig
    - b) Pump suction is between +2 & -10 in Hg
    - c) Tower basin water level >1.5
  4. If actual parameters are outside of a) or b) or to c) advise MCR that cooling for G-2 magnets, will be affected (Note 3)
  5. Note 3 & 1

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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## 931.4-3

### ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARMLIMITS</u>
TWRLVL. LO	Cooling Tower Water Level	(Lo/LoLo) 12/6 inches

- ACTION:**
1. Verify level is outside limits
  2. Check that LED on Controller @ location 11, 3 is on
    - a) Solenoid valve SV5 should be energized
    - b) If necessary open twr mkup bypass until level ~ 20 inches; then close valve
  3. Inspect area for leaks & check that drain valves are closed
  4. Notes 1 & 3

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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931.4-4

ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARMLIMITS</u>
TWRPUMP1.LOSUCT or TWRPUMP2.LOSUCT	Cooling Tower Pump Suction	(Lo) 10"Hg

- ACTION:**
1. Verify pump suction pressure
  2. Advise Mech Services the following morning
  3. Notes 1 and 3

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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931.4-5

**ALARM RESPONSE SHEET - g-2**

<b><u>SIGNAL NAME</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>ALARMLIMITS</u></b>
<b>FANVIB.HI</b>	<b>Cooling Tower Fan</b>	<b>ON/OFF</b>

- ACTION:**
- 1. Verify that fan has stopped**
  - 2. Advise MCR that g-2 cooling will be affected**
  - 3. Notes 1 & 3**

- NOTE:**
- 1. Record Actions Taken**
  - 2. MCR = Main Control Room**
  - 3. Call Mech Svcs from "Call In" list**

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931.4-6

ALARM RESPONSE SHEET - g-2

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
TWRPIPNG.LOTEMP .ALARM	Cooling Tower Outdoor Piping	(Lo) 40F

- ACTION:**
1. Verify temp is outside limits
  2. Verify that heat trace is on
    - a) If not raise upper temp SW setting until LED on Controller is on @ location 11,1
  3. If outdoor air temp is 32F, Note 3

- NOTE:**
1. Record Actions Taken
  2. MCR = Main Control Room
  3. Call Mech Svcs from "Call In" list

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