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# C-A WATER GROUP ALARM MANUAL

**Dicom Alarm No: 961**

**Location: Bldg. 930**

**Systems: Transport Cooling System**

**Pages 1 through**

| #   | ALARM | RESET | STATUS | ALARM DESCRIPTION                                 |
|-----|-------|-------|--------|---|
| 961 | 0     | 1     | @      | <u>R.F. SYSTEM COMMON – CRITICAL ALARM -</u>      |
| 961 | 2     | 3     | @      | <u>TRANSPORT SYSTEM COMMON ALARM - CRITICAL -</u> |
| 961 | 4     | 5     | @      | <u>LINAC TOWER COMMON ALARM</u>                   |
| 961 | 6     | 7     | SPARE  |   |
| 961 | 8     | 9     | @      | <u>AUX SYSTEM – UTILITY AIR LOW PRESSURE</u>      |
| 961 | F     | C     | SPARE  |   |

**Revision Date**

**February 2008**

**CHECK PUMP ROOM PC FOR FAULT AND CLICK BELOW FOR RESPONSE:**

**RF Lo Press – This page**

[RF High Press](#) 961-0-1

[RF Lo Flow](#) 961-0-2

[RF Lo Resistivity](#) 961-0-3

[RF High Temp](#) 961-0-4

[RF Lo Level](#) 961-0-5

**Alarm Code** 960-0

**Restore** 960-1

**Location:** B 930 - Linac Bldg

**Alarm Limits**

**(lo/LoLo)**

**75/50 psig**

**System:** RF Cooling System - Lo Press

- Action:**
1. Verify Lo Press.
  2. Advise LCR, MCR, pump may trip off at 50psig.
    - a) Investigate upper equipment bay and 930A and isolate leak.
    - b) Note 1 & 3.

- Notes:**
1. Record Actions Taken
  2. MCR = Main Control Room (x 4662)
  3. Call Mech Svcs from "Call In" List
  4. LCR = Linac Control Room (x4592)

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961-0-1

**Alarm Code**      **961-0**  
**Restore**            **961-1**

**Location:**      **B 930 - Linac Bldg**

**Alarm Limits**  
**≥ 100 psig**

**System:**      **RF Cooling System - Hi Press**

**Action:**      **1.    Verify hi press condition.**  
**2.    Note 3.**

**Notes:**      **1.    Record Actions Taken**  
**2.    MCR = Main Control Room (x 4662)**  
**3.    Call Mech Svcs from "Call In" List**  
**4.    LCR = Linac Control Room (x4592)**

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961-0-2

Alarm Code 961-0

Restore 961-1

**Location:** B 930 - Linac Bldg

**Alarm Limits**  
**(Lo/LoLo)**  
**1500/500 GPM**

**System:** RF Power Supply System - LoFlow

- Action:**
1. Verify Lo flow <1500GPM.
  2. Advise LCR, MCR, pump may turnoff at 500GPM.
  3. Investigate upper equipment bay and 930A for leak and isolate.
  4. Note 1 & 3.

- Notes:**
1. Record Actions Taken
  2. MCR = Main Control Room (x 4662)
  3. Call Mech Svcs from "Call In" List
  4. LCR = Linac Control Room (x4592)

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961-0-3

Alarm Code 961-0  
Restore 961-1

**Location:** B 930 - Linac Bldg

**Alarm Limits**  
**≤ 6 megohm**

**System:** RF Cooling System - Lo Resistivity  
(6-10 = Normal)

**Action:**

1. Verify lo resistivity condition.
2. Advise LCR.
3. Note 3 the following workday.

**Notes:**

1. Record Actions Taken
2. MCR = Main Control Room (x 4662)
3. Call Mech Svcs from "Call In" List
4. LCR = Linac Control Room (x4592)

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961-0-4

Alarm Code 961-0  
Restore 961-1

**Location:** B 930 - Linac Bldg

**Alarm Limits**  
**(HiHi/Hi/Lo)**  
**105/100/70°F**

**System:** RF Power Supply System - Hi Temp

- Action:**
1. Verify Hi temp condition.
  2. Check that tower water is on and  $\leq 85^\circ\text{F}$ .
    - a) If not, see alarm response 962-0.
  3. If successful, Note 1 & 3 the following workday.
  4. If not, Note 1 & 3.

- Notes:**
1. Record Actions Taken
  2. MCR = Main Control Room (x 4662)
  3. Call Mech Svcs from "Call In" List
  4. LCR = Linac Control Room (x4592)

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961-0-5

Alarm Code 961-0

Restore 961-1

**Location:** B 930 - Linac Bldg

**Alarm Limits**  
**(Hi/Lo/LoLo)**  
**25/6/1”**

**System:** RF Cooling System - Water Level  
(9-15” = Normal)

**Action:**

1. Verify Lo Level.
2. If low level and return pressure <6 psig.
  - a) Open manual bypass around auto make-up valve until return pressure =15 psig.
  - b) If level remains steady, Note 1 & 3 the following workday.
  - c) If level falls, advise LCR & MCR, turn off pumps & close make-up valve.
  - d) Note 1 & 3.
  - e) Investigate upper equipment bay (UEB) and 930A for leaks and isolate.
  - f) If Make-up is verified follow [C-A-OPM 2.19](#)

**Notes:**

1. Record Actions Taken
2. MCR = Main Control Room (x 4662)
3. Call Mech Svcs from "Call In" List
4. LCR = Linac Control Room (x4592)

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## ALARM RESPONSE SHEET – TRANSPORT SYSTEM

**NODE: RC21**

**ALARM CODE        961.2**  
**RESTORE            961.3**

**LOCATION:    BLDG. 930**

**SYSTEM:        TRANSPORT SYSTEM COMMON ALARM - **CRITICAL** -  
(COMNALRM.TRANS)**

|             |                      |  | <b>Page:</b>   |
|-------------|----------------------|--|----------------|
| <b>RC21</b> | <b>TRANSLVL</b>      | <b>Water Level</b>                     | <b>961.2-1</b> |
| <b>RC21</b> | <b>TRANSFLO..</b>    | <b>Low Flow</b>                        | <b>961.2-2</b> |
| <b>RC21</b> | <b>TRANS.RESIS</b>   | <b>Low Resistivity</b>                 | <b>961.2-3</b> |
| <b>RC21</b> | <b>TRANSMKUP.CNT</b> | <b>System Water high Make-up count</b> | <b>961.2-4</b> |
| <b>RC21</b> | <b>TRANSMKUP.</b>    | <b>System Water Make-up</b>            | <b>961.2-5</b> |
| <b>RC21</b> | <b>TRANSPRES.SUP</b> | <b>Supply Pressure</b>                 | <b>961.2-6</b> |
| <b>RC21</b> | <b>TRANSTEMP.SUP</b> | <b>Supply Temp.</b>                    | <b>961.2-7</b> |

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

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <u>SIGNAL NAME</u> | <u>DESCRIPTION</u>             | <u>ALARM LIMITS</u>           |
|--------------------|--------------------------------|-------------------------------|
| <u>TRANSLVL..</u>  | Water Level<br>(9"-15"=Normal) | (Hi/Lo/LoLo)<br>25/6/1 inches |

**ACTION:**

1. Verify level is outside Hi/Lo limits.
  - a) Pumps shut down @  $\leq 1$ ".
2. Inspect Linac & pump room.
3. Press Make-Up Reset switch for a few seconds to reset TRANSMKUP.OK. Check for flow thru deionizer.
4. If not: Open bypass valve at solenoid until level = 15", then close bypass valve.
5. For Hi level check that solenoid bypass is closed. If not: close valve. If level still rises, close Make-Up valve @ solenoid.
6. Notes 1 & 3.

**NOTE:**

1. Record Actions Taken
2. MCR = Main Control Room
3. Call Water Systems from "Call In" list

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <b><u>SIGNAL NAME</u></b> | <b><u>DESCRIPTION</u></b>       | <b><u>ALARM LIMITS</u></b>                        |
|---------------------------|---------------------------------|---|
| <b><u>TRANSFLO</u></b>    | <b>Transport System-Lo Flow</b> | <b>Alarm Limits<br/>(LO/LO LO)<br/>125/50 GPM</b> |

**Action:**

- 1. Verify Low flow <125 GPM.**
- 2. Verify that pump is running.**
  - a) If not, Note 3.**
- 3. If pump is running.**
  - a) Advise MCR that pumps may trip off @ 50 GPM.**
  - b) Investigate for major leak and isolate.**
- 4. Verify if system pressure is between 110 - 130 psig,**
  - a) Note 1, 3 the following workday.**
  - b) If not, Note 3.**

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

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <b><u>SIGNAL NAME</u></b> | <b><u>DESCRIPTION</u></b>                                  | <b><u>ALARM LIMITS</u></b>   |
|---------------------------|--|------------------------------|
| <b><u>TRANS.RESIS</u></b> | <b>Transport Water Resistivity<br/>(.60 - .80 =Normal)</b> | <b>(Lo)<br/>.5/megohm-cm</b> |

- ACTION:**
- 1. Verify resistivity is below low limits.**
  - 2. Observe deionizer output resistivity (>2 megohm-cm).**
  - 3. Observe that system resistivity rises above .5 megohm.**
  - 4. If Lo Alarm remains - Note 3 the following morning.**

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

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <b><u>SIGNAL NAME</u></b>   | <b><u>DESCRIPTION</u></b>         | <b><u>ALARM LIMITS</u></b>               |
|-----------------------------|-----------------------------------|--|
| <b><u>TRANSMKUP.CNT</u></b> | <b>Magnet Water Make-up count</b> | <b>(Hi/HiHi)<br/>25/50 GAL in 10 min</b> |

- ACTION:**
- 1. Check Linac Pump Room, HEBT & LEBT tunnels and 930UEB for leaks.**
  - 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 Water Systems from "Call In" list**

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <b><u>SIGNAL NAME</u></b><br><b><u>LIMITS</u></b> | <b><u>DESCRIPTION</u></b> | <b><u>ALARM</u></b> |
|---|---------------------------|---------------------|
|---|---------------------------|---------------------|

|  |                                |        |
|--|--------------------------------|--------|
| <b><u>TRANSMKUP.</u></b><br><b><u>ALRM</u></b> | Transport System Water Make-up | ON/OFF |
|--|--------------------------------|--------|

**ACTION:**

1. Verify Make-Up is ON on Water Group PC.
2. If Make-up is verified follow [C-A-OPM 2.19](#).

**NOTE:**

1. Record Actions Taken
2. MCR = Main Control Room
3. Call Water Systems from "Call In" list

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <b><u>SIGNAL NAME</u></b>    | <b><u>DESCRIPTION</u></b>            | <b><u>ALARM LIMITS</u></b> |
|------------------------------|--------------------------------------|----------------------------|
| <b><u>TRANSPRESS.SUP</u></b> | <b>Transport Water Supply Press.</b> | <b>(Lo)<br/>100psig</b>    |

**ACTION:**

- 1. Verify Press. is outside limits.**
- 2. Check for LOAIR.ALARM.**
- 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 Water Systems from "Call In" list**

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**ALARM RESPONSE SHEET – TRANSPORT SYSTEM**

| <b><u>SIGNAL NAME</u></b>    | <b><u>DESCRIPTION</u></b>          | <b><u>ALARM LIMITS</u></b>           |
|------------------------------|------------------------------------|--------------------------------------|
| <b><u>TRANSTEMP.SUP.</u></b> | <b>TransportWater Supply Temp.</b> | <b>(HiHi/Hi/Lo)<br/>105/100/65°F</b> |

- ACTION:**
- 1. Verify temp is outside limits.**
  - 2. Advise MCR that pumps will go off at 105°F.**
  - 3. Verify that tower water temp is within limits. 55/85°F.  
a) If not, see that response sheet.**
  - 4. Note 3 & 1.**

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

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**NODE: RC 21**

**ALARM CODE**

**961.4**

**RESTORE**

**961.5**

**LOCATION: BLDG. 930**

**SYSTEM: LINAC TOWER COMMON ALARM  
(Comnalarm\_TWR)**

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

| <b><u>NODE</u></b> | <b><u>SIGNAL NAME</u></b> | <b><u>DESCRIPTION</u></b> | <b><u>PAGE NO.</u></b> |
|--------------------|---------------------------|---------------------------|------------------------|
| RC 21              | TWRTEMP.SUP               | Tower Water Supply Temp   | 961.4-1                |
| RC 21              | TWRPRES.SUP               | Tower Water Supply Press  | 961.4-2                |
| RC 21              | TWRLVL                    | Tower Water Level         | 961.4-3                |
| RC 21              | TWRFLO                    | Tower Water Flow          | 961.4-4                |
| RC 21              | TWRFAN1.VIB.HI            | Tower Fan 1 Hi Vibration  | 961.4-5                |
| RC 21              | TWRFAN2.VIB.HI            | Tower Fan 2 Hi Vibration  | 961.4- 6               |
| RC 21              | TWRPIPNG_LOTEMP_ALRM      | Tower Piping Lo Temp      | 961.4- 7               |

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## 961.4-1

### ALARM RESPONSE SHEET - LINAC

| <u>SIGNAL NAME</u> | <u>DESCRIPTION</u>      | <u>ALARM LIMITS</u> |
|--------------------|-------------------------|---------------------|
| TWRTEMP.SUP.       | Tower Water Supply Temp | (Hi/Lo)<br>80/50°f  |

- ACTION:**
1. Verify temp is outside limits.
  2. If temp. is >80°F, notify MCR that high tower water temp will affect cooling of the RF system at Linac.
  3. Check that tower fan 1 & 2 switches are in Auto.
    - a) If not, place switch in Auto.
  4. For Hi Alarm both fans should be in Hi Speed 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 and observe temp.
    - c) Place in HiSpeed fwd only if temp remains above 80°F.
  5. For LoAlarm fans should be off. Tower temps below 65°F will cause chiller problems.
  6. 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 - LINAC**

| <b><u>SIGNAL NAME</u></b> | <b><u>DESCRIPTION</u></b>                                  | <b><u>ALARM LIMITS</u></b> |
|---------------------------|--|----------------------------|
| <b>TWRPRES.SUP</b>        | <b>Tower Water Supply Pressure<br/>(≈45 psig = Normal)</b> | <b>(Lo)<br/>25</b>         |

- ACTION:**
- 1. Verify press is outside limits.**
  - 2. If pressure is <25psig. notify MCR that the cooling system is out of normal parameters and cooling may be effected.**
  - 3. Check that Tower Pump is running.**
  - 4. Check that flow >3500gpm.**
  - 5. Check that appropriate valves are open.**
  - 3. For low Press check for leaks in Pump Room and at tower.**
  - 7. 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 - LINAC**

| <b><u>SIGNAL NAME</u></b> | <b><u>DESCRIPTION</u></b>                     | <b><u>ALARM LIMITS</u></b>  |
|---------------------------|---|-----------------------------|
| <b>TWRLVL</b>             | <b>Tower Water Level<br/>(30"-32"=Normal)</b> | <b>(Lo/LoLo)<br/>22/12"</b> |

- ACTION:**
- 1. Verify level is outside Lo limits  
a) Pumps shut down @  $\leq 12"$ .**
  - 2. If level is  $< 22"$  notify MCR that a low level condition exists and that they should monitor the system for possible automatic shutdown if level reaches 12".**
  - 3. Inspect B930 pump room and tower for leaks.**
  - 4. For Low Level:  
If no leaks check that TWRMKUP light is on in PLC rack.  
If not: Open bypass valve next to solenoid at tower until level  $\approx 32"$ , then leave valve half open to keep level up.**
  - 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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961.4-4

ALARM RESPONSE SHEET - LINAC

| <u>SIGNAL NAME</u> | <u>DESCRIPTION</u>                     | <u>ALARM LIMITS</u>    |
|--------------------|--|------------------------|
| TWRFLO             | Tower Water Flow<br>(≈4000 GPM Normal) | (Lo/LoLo)<br>2000/1000 |

- ACTION:**
1. Verify low flow  $\leq 2000$  GPM.
  2. If flow is  $< 2000$  gpm. notify MCR that a low flow condition exists and that they should monitor the system for possible automatic shutdown if flow reaches 1000gpm.
  3. Advise MCR (Pumps will stop @  $\leq 1000$  GPM).
  4. Check Linac Pump Room and Tower for major leak.
  5. Check other system parameters:
    - a) Level is  $\geq 22$  inches.
    - b) Pressure is between 40 and 60 psig.
  6. 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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## 961.4-5&6

### ALARM RESPONSE SHEET - LINAC

| <u>SIGNAL NAME</u>               | <u>DESCRIPTION</u>          | <u>ALARM LIMITS</u> |
|----------------------------------|-----------------------------|---------------------|
| TWRFAN1.VIB.HI<br>TWRFAN2.VIB.HI | Cooling Tower Fan Vibration | ON/OFF              |

- ACTION:**
1. Verify that the fan has stopped.
  2. If fan vibration alarm is received notify MCR that the tower temperature may be affected and potentially affect the temperature control of other systems.
  3. Note 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 - LINAC**

| <b><u>SIGNAL NAME</u></b>        | <b><u>DESCRIPTION</u></b>           | <b><u>ALARM LIMITS</u></b> |
|----------------------------------|-------------------------------------|----------------------------|
| <b>TWRPIPNG.LOTEMP.<br/>ALRM</b> | <b>Cooling Tower Make-up Piping</b> | <b>(Lo)<br/>40°f</b>       |

- ACTION:**
- 1. Verify temp is outside limits.**
  - 2. Verify that heat trace is on by looking at LED indicators on tower piping (2 each).**
  - 3. If not, raise upper temp switch setting on the two thermostats closest to the building.**
  - 4. Also check power feed to and from the mini-power zone located behind the tower pumps.**
  - 5. If outdoor air temp is  $\leq 32^{\circ}\text{f}$ , Note 3.**

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

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**Alarm Code**      961-8  
**Restore**            961-9

**Location:**            B 930 - Linac Bldg.

**Alarm Limits**  
**≤ 70 psig**

**System:**             Utility Air - Lo Press

- Action:**
1.    **Verify lo pressure condition**
  2.    **Call Plant Engineering Site Shift Supervisor at x4174, cell – 872-8988 or C/W desk x4284 during off hours.**
  3.    **Note 1 & 3 the following workday**

- Notes:**
1.    **Record Actions Taken**
  2.    **MCR = Main Control Room (x 4662)**
  3.    **Call Mech Svcs from "Call In" List**
  4.    **LCR = Linac Control Room (x4592)**

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