

ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (HiHi/Hi/Lo)
CAVTEMP.SUP	RF Cavity Mag Water Supply Temp	105/95/60° f (75°f = normal)

- ACTION:**
1. Verify temp is outside limits
 2. Check that MANUAL/AUTO Switch for RF Cavity Temp. Control Valve (TCV) is in Auto position.
 - a) If not, place in AUTO and observe temp.
 3. Verify that tower water temp is within limits. 40/75 f.
 - a) If not, see that response sheet.
 4. Verify that tower water flow is within limits ≥ 700 GPM.
 - a) If not, see that response sheet.
 5. For HiTemp alarm TCV indicator should be in Max Cooling Position.
 - a) If not, place AUTO/MANUAL selector in manual and raise output in 5 psi increments until temp is 5° below hi limit.
 - b) Check that tower fan & tower pumps are in Auto and are running.
If not: Check and fill basin if necessary, place tower fans & pumps in auto and observe that the fan cycles on. If not try manual.
 - c) Observe system temp and adjust.
 - d) Advise MCR that Pumps will shut down 3 mins after system supply reaches 105° f.
 6. For lo temp alarm TCV indicator should be in the bypass position.
If not: Check that selector is in auto.
 7. Note 3 & 1

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

ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo)
CAVPRES.SUP	RF Cavity Magnet Supply Pressure	90/50 (85 psig = Normal)

- ACTION:**
1. Verify press is outside limits.
 2. Check that Selector Switch to Press. Control Valve (TCV) is in auto.
 - a) If not: place in Auto and observe press.
 3. If ≤ 50 check that man/auto selector is in auto & observe press for a few min. If still low switch to manual and lower pressure output in 5 psi increments until system press $\approx 75-85$ psig.
 4. If ≥ 90 check that selector is in auto and observe for a few min. If still high place selector in manual and increase output to valve until system press $\approx 75-85$ psig.
 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo/LoLo)
CAVLVL	RF Cavity Mag Water Level	25/9/1 inches (15"- 9"=Normal)

- ACTION:**
1. Verify level is outside Hi/Lo limits
 - a) Pumps shut down @ $\leq 1''$
 2. Inspect B1004, magnet enclosure and pump room for leaks
 3. If no leaks check that CAVMKUP.OK light is on.
 If not: Press Make-Up Reset switch for a few seconds to reset CAVMKUP.OK. Check for flow thru deionizer.
 If not: Open bypass valve at solenoid until level = 15", then close bypass valve.
 4. For Hi level check that solenoid bypass is closed.
 If not: close valve
 If level still rises, close Make-Up valve @ solenoid.
 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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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo/LoLo)
CAVFLO	RF Cavity Magnet Water Flow	700/300/175 GPM (400-600 GPM=Normal)

- ACTION:**
1. **Verify Low flow ≤ 300 GPM**
 2. **Advise MCR (Pumps will stop @ ≤ 175 GPM)**
 3. **Check B1004 Pump Room, magnet enclosure and Exp Hall for leaks.**
 4. **Check other system parameters:**
 - a) **Pressure is between 75 and 85 psig**
If less than 50: check that manual/auto selector is in Auto.
If greater than 90: check manual/auto selector is in Auto. If press remains high switch to manual and raise output press in 5 psi increments until system press ≤ 85 psi
 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
LOAIR.ALARM	Low Compressed Air	(Lo) <50 psig

- ACTION:**
1. Verify compressed air pressure with press gauge.
 2. Check that manual valves are open.
 3. Check compressor in B1004 Support Building.
 - a) If compressor is off - Call Plant Engineering Site Shift Supervisor at x4174, cell – 872-8988 or C/W desk x4284 during off hours.
 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (HiHi/Hi)
CAVMKUP.CNT	RF Cavity Mag Water Make-up Flow	100/50Gal in 10min

- ACTION:**
1. Check B1004 Pump Room, Assembly & magnet enclosure for leaks.
 2. If HiHi, advise MCR Pumps will shut off in 3 min.
 3. Advise MCR, isolate leaking device.
 4. Notes 1 & 3

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> ON/OFF
CAVMKUP	RHIC RF Cavity Water Make-up	

- 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.1004 P.R. and 4 o'clock area ring 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.
 9. 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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version by checking the document issue date on this cover sheet.*

Dec. 2003

RHIC RF PUMP ROOM ALARMS

NODE: RPC 9

ALARM CODE 817.2
RESTORE 817.3

LOCATION: BLDG. 1004C

**SYSTEM: RHIC RF POWER AMPLIFIER COMMON ALARM
(COMNALRM.PS)**

**ACTION: DETERMINE WHICH SIGNAL IS IN ALARM AND CLICK ON
ALARM RESPONSE SHEET FROM LIST BELOW**

NODE	SIGNAL NAME	DESCRIPTION	PAGE NO.
RPC 9	<u>PATEMP.SUP</u>	<u>Power Amplifier Water Supply Temp</u>	<u>817.2-1</u>
RCP 9	<u>PAPRES.SUP</u>	<u>Power Amplifier Water Supply Press</u>	<u>817.2-2</u>
RCP 9	<u>PALVL</u>	<u>Power Amplifier Water Level</u>	<u>817.2-3</u>
RCP 9	<u>PAFLO</u>	<u>Power Amplifier Water Flow</u>	<u>817.2-4</u>
RCP 9	<u>PARESIS</u>	<u>Power Amplifier Water Resistivity</u>	<u>817.2-5</u>
RCP 9	<u>PAMKUP.CNT</u>	<u>Power Amplifier Water High Mkup</u>	<u>817.2-6</u>
RCP 9	<u>REPIPING.</u>	<u>RF Outdoor Piping Lo Temp.</u>	<u>817.2-7</u>
	<u>LOTEMP.ALARM</u>		

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

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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (HiHi/Hi/Lo)
PATEMP.SUP	Power Amplifier Water Supply Temp.	105/100/50°F (≈75°F = normal)

- ACTION:**
1. Verify temp is outside limits
 2. Check that MANUAL/AUTO Switch for Power Amplifier Temp. Control Valve (TCV) is in Auto position.
a) If not, place in AUTO and observe temp.
 3. Verify that tower water temp is within limits. 40/75°F.
a) If not, see that response sheet.
 4. Verify that tower water flow is within limits ≥ 700 GPM.
a) If not, see that response sheet.
 5. For HiTemp alarm TCV indicator should be in Max Cooling Position.
a) If not, place AUTO/MANUAL selector in manual and lower output in 5 psi increments until temp is 5°F below hi limit.
b) Check that pump is in Auto and is running.
If not: NOTE 3.
c) Advise MCR that Pumps will shut down 3 mins after system supply reaches 105 f.
 6. For lo temp alarm TCV indicator should be in the closed position.
If not: Check that the manual/auto selector is in auto.
 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo)
PAPRES.SUP	Power Amplifier Water Pressure	95/50 (85 psig = Normal)

- ACTION:**
1. **Verify press is outside limits.**
 2. **Check that Selector Switch to Press. Control Valve (PCV) is in auto.**
 - a) **If not: place in Auto and observe press.**
 3. **If ≤ 50 check that man/auto selector is in auto & observe press for a few min. If still low switch to manual and lower pressure output in 5 psi increments until press ≈ 85 .**
 4. **If ≥ 95 check that selector is in auto and observe for a few min. If still high place selector in manual and increase output to valve until press ≈ 85 .**
 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo/LoLo)
PALVL	Power Amplifier Water Level	25/9/1 inches (9"-15"=Normal)

- ACTION:**
1. **Verify level is outside Hi/Lo limits**
a) **Pumps shut down @ ≤ 1 "**
 2. **Inspect B1004, pump room, Power Supply room and magnet enclosure for leaks.**
 3. **For Low Level:**
If no leaks check that PSMKUP.OK light is on.
If not: Press Make-Up Reset switch for a few seconds to reset MKUP.OK.
Check for flow thru deionizer.
If not: Open bypass valve at solenoid until level = 15", then close bypass valve.
 4. **For Hi level check that solenoid bypass is closed.**
If not: close valve
If level still rises, close Make-Up valve @ solenoid.
 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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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo/LoLo)
PAFLO	Power Amplifier Water Flow	500/200/125 (≈300 GPM Normal)

- ACTION:**
- 1. Verify low flow ≤ 200 GPM**
 - 2. Advise MCR (Pumps will stop @ ≤ 125 GPM)**
 - 3. Check B1004 Pump Rm, power supply room and magnet enclosure for major leak.**
 - 4. Check other system parameters:**
 - a) Level is ≥ 9 inches**
 - b) Pressure is between 60 and 85 psig**
 - 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
PAREISIS	Power Amplifier Water Resistivity	(Lo) .5/megohm-cm (.75-1.25=Normal)

- ACTION:**
- 1. Verify resistivity is below low limits**
 - 2. Observe that flow is thru deionizer**
 - 3. Observe deionizer output resistivity (>2 megohm-cm)**
 - 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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ALARM RESPONSE SHEET - RHIC RF

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

- ACTION:**
1. Check B1004 Pump Room and Power Supply room and magnet enclosure 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 Mech Svcs from "Call In" list

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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
RFPIPNG.. LOTEMP ALRM	RF Outdoor Piping Lo Temp	(Lo) 40°f

- ACTION:**
1. Verify temp is outside limits.
 2. Verify that heat trace is on.
 - 1) If not - raise upper temp SW setting until LED on Controller is on at location 10,5
 3. If outdoor air temp is ≤ 32 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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Dec. 2003

NODE: RPC 9

ALARM CODE 817.4

RESTORE 817.5

LOCATION: BLDG. 1004C

**SYSTEM: RHIC RF TOWER COMMON ALARM
(COMNALRM.TWR)**

**ACTION: DETERMINE WHICH SIGNAL IS IN ALARM AND CLICK ON
ALARM RESPONSE SHEET FROM LIST BELOW**

NODE	SIGNAL NAME	DESCRIPTION	PAGE NO.
RCP 9	<u>TWRTEMP.SUP</u>	<u>Tower Water Supply Temp</u>	<u>817.4-1</u>
RCP 9	<u>TWRPRES.SUP</u>	<u>Tower Water Supply Press</u>	<u>817.4-2</u>
RCP 9	<u>TWRLVL</u>	<u>Tower Water Level</u>	<u>817.4-3</u>
RCP 9	<u>TWRFLO</u>	<u>Tower Water Flow</u>	<u>817.4-4</u>
RCP 9	<u>TWRCOND</u>	<u>Tower Water Conductivity</u>	<u>817.4-5</u>
RCP 9	<u>TWRMKUP.</u>	<u>Tower Water Mkup Low Temp</u>	<u>817.4-6</u>
	<u>LOTEMP.ALARM</u>		
RCP 9	<u>TWRFAN.VIB.NI</u>	<u>Tower Fan Hi Vibration</u>	<u>817.4-7</u>

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

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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo)
TWRTEMP.SUP.	Tower Water Supply Temp	95/35°f

- 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 and observe temp
 - c) Place in HiSpeed fwd only if temp remains above 90 F
 4. For LoAlarm fans 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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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo)
TWRPRES.SUP	Tower Water Supply Pressure	75/25 (≈50 psig = Normal)

- ACTION:**
- 1. Verify press is outside limits.**
 - 2. Check that Tower Pump is running.**
 - 3. Check that flow ≈1000gpm.**
 - 4. Check that appropriate valves are open.**
 - 5. For low Press check for leaks in Pump Room and at tower.**
 - 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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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Lo/LoLo)
TWRLVL	Tower Water Level	9/6 (19"-24"=Normal)

- ACTION:**
1. Verify level is outside Lo limits
 - a) Pumps shut down @ $\leq 6''$
 2. Inspect B1004 pump room and tower for leaks.
 3. For Low Level:
If no leaks check that TWRMKUP light is on.
If not: Open bypass valve at solenoid until level = 25", then close bypass valve.
 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (Hi/Lo/LoLo)
TWRFLO	Tower Water Flow	1200/700/400 (≈1000 GPM Normal)

- ACTION:**
- 1. Verify low flow ≤ 700 GPM**
 - 2. Advise MCR (Pumps will stop @ ≤ 400 GPM)**
 - 3. Check B1004 Pump Room and Tower for major leak.**
 - 4. Check other system parameters:**
 - a) Level is ≥ 10 inches**
 - b) Pressure is between 25 and 50 psig**
 - 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 - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
TWRCOND	TOWER WATER CONDUCTIVITY	(Hi) ≥0.8 milisiemens (.5 - .7 = Normal)

- ACTION:**
1. Verify resistivity is outside limits
 2. Check that manual valve in series with solenoid valve is open
 3. If Hi Alarm remains - Note 3 the following morning.

- NOTE:**
1. Record Actions Taken
 2. MCR = Main Control Room (x4662)
 3. Call Mech Svcs from "Call In" list
 4. CAS1 = Support (x2024)

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ALARM RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u>
TWRMKUP. LOTEMP.ALARM	Cooling Tower Make-up Piping	(Lo) 40°f

- ACTION:**
1. Verify temp is outside limits.
 2. Verify that heat trace is on.
 - 2) If not - raise upper temp SW setting until LED on Controller is on at location 9,3
 3. If outdoor air temp is ≤ 32 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 RESPONSE SHEET - RHIC RF

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> ON/OFF
TWRFAN.VIB.HI	Cooling Tower Fan Vibration	

- ACTION:**
1. Verify That the fan has stopped.
 2. Advise MCR that RHIC RF cooling will be affected.
 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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RHIC RF AIR COMPRESSOR ALARM

ALARM CODE **817.6**
RESTORE **817.7**

LOCATION: **BLDG. 1004A (Service corridor - Blue Unit)**

SYSTEM: **RHIC RF AIR COMPRESSOR**

<u>SIGNAL NAME</u>	<u>DESCRIPTION</u>	<u>ALARM LIMITS</u> (High)
RHISRF.COMP	High Filter Bag Differential Pressure/Low Tower Flow	10psi

- ACTION:**
- 1. Verify RHIC RF bag filter Differential Pressure \geq 10psig.**
 - a) Verify Tower flow is normal per 817.4-4**
 - 2. Replace bag filter without interrupting flow to compressor.**
 - a) Bag filter located at rear of 1004A Pump Room opposite sink.**
 - 3. Inspect compressor. If not running – check to see if “High Air Temp.” RED lamp is on.**
 - 4. Note 3 to ensure the compressor is required. Note 2 for permission to restart compressor.**
 - a) Press STOP to reset RED lamp. Press START.**
 - b) Observe compressor until up to operating Temp. (180-205°F)
High Temp trip \approx 228°F.**
 - 5. Any problems Note 4.**

- NOTE:**
- 1. Record Actions Taken**
 - 2. MCR = Main Control Room**
 - 3. Call RF Tech from "Call In" list**
 - 4. R. Diaz x3695, pp7273, Home 631-744-9008, Cell 1-917-533-5401**