

## Operation of the CDF Electronics Cooling Water System

This procedure outlines the steps needed to commission and operate the CDF electronics cooling water (ECW) system.

---

Editorial Hand-Processed Changes Other Than Spelling  
Require Department Head Approval

HPC Number	Date	Section Number	Initials
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____

---

### Approvals

---

\_\_\_\_\_  
(CDF Department Head)

\_\_\_\_\_  
(Date)

**1.0 Controlled Copies of this procedure.**

At least three controlled copy of this procedure will exist.

One will be held in the CDF Department Office Library.

The others will be on the CDF web page at  
<http://www-cdf.fnal.gov/cdfsafecdfproclist.html>

and at

ADMIN.CDF / ES&H / PROCEDURES

All other copies will be marked, " INFORMATIONAL COPY ONLY "

## **2.0 The Procedure.**

The proper execution of this procedure will consist of following one of the checklists below, as appropriate for the maintenance needed:

- 2.1 Pressure and leak testing.
  - (a) All new portions of the system must be pressure tested per ES&H Chapter 5034 to 225 psig.
  - (b) Testing may be pneumatic or hydraulic as determined by the system engineer.
  - (c) A test is successful when no leaks are found with either bubble testing or static pressure drop for ten minutes.
- 2.2 Pump operation
  - (a) Either of the two pumps may be used for normal operations. The other pump is configured as a backup.
  - (b) If the lead pump fails, the backup will be started and a warning message displayed. The pumps will not switch back automatically.
  - (c) Normally both pump starters are set to 'auto' and operation is controlled from FIX picture CDF/ECW. Select one of the pumps to open the pump control picture.
  - (d) Pressing the 'Start ECW' button will start the lead pump and enable control valve CV5.
  - (e) Pressing one of the 'Lead Pump' buttons will make it the lead. This may be done with either pump running.
- 2.3 Temperature control
  - (a) Temperatures can be displayed by opening CDF/WATER/ECW. The temperature control loop functions may be viewed or changed by selecting the heat exchanger 3 on this picture.
  - (b) The temperature is normally set at 55F. If the dew point in the collision hall, the first floor or second floor counting rooms approaches the ECW temperature, it will automatically be raised to prevent condensation. The set point source is displayed on the top of CDF/WATER/ECW.
  - (c) Valve CV5 closes when neither ECW pump is running.
- 2.4 Flow requirements and balancing.
  - (a) Bypass Filter and UV stabilizer flow should be about 50 GPM. And pressure at the stabilizer must not exceed 50 psig. Restrict flow at the inlet to the stabilizer if necessary.
  - (b) The general plan is to leave all other balancing valves wide open. If a minimum flow somewhere is not achieved, then balancing will become necessary.
  - (c) Individual racks in the first and second floor counting rooms with three heat exchangers have minimum flow of 4 GPM.
  - (d) The clock rack, 2RR22I, has a minimum flow of 2.6 GPM.
  - (e) Repeater card sections have a minimum of 2 GPM.
  - (f) COT and End Plug racks with four heat exchangers have a minimum of 5 GPM.
  - (g) End plug coolers have a minimum of 6 GPM per circuit.(1 GPM per cooler)
  - (h) The SVX racks with three heat exchangers have a minimum 4 GPM.

2.5 Expansion tank level

- (a) Do not allow the expansion tank to become empty.
- (b) The air vent on the expansion tank is normally to remain open.
- (c) When a good correlation between system temperatures and tank level is determined an alarm will be configured for unexpected water losses.

2.6 Bypass Filter and UV stabilizer

- (a) To start or stop flow through the bypass, open the stabilizer inlet valve last and close it first. Open it slowly to keep stabilizer pressure below 50 psig.

2.7 Air Separator

- (a) The air separator is equipped with a float type vent valve. At intervals depending on operational status the manual valve under it should be opened and air released. We have not left the block valve open indefinitely since the float valve sometimes leaks water.
- (b) If large amounts of air are in the system, makeup from the expansion tank may not keep up. If air begins to suck into the air vent line close the block valve immediately. Wait two minutes and reopen. Repeat as necessary.

2.8 Using a portable chiller

- (a) Follow the chiller operating manual.
- (b) Connect it to a properly phased and grounded outlet.

2.9 If a leak occurs:

- (a) Close the nearest manual supply and return valves around the leak. If the location is uncertain, close the main valves.
- (b) Use rags, buckets or deflectors to protect sensitive equipment.
- (c) Drain the offending portion of the piping. See CDF-II Procedure 415.
- (d) Mop up the area.
- (e) Inform the Operations Manager.
- (f) See CDF-II Procedure 415 regarding repair, leak checking and refilling.

### **3.0 Checklist**

No additional "Procedure Execution Form" is required for this procedure. Any unusual events should be recorded in the control room logbook.

### **4.0 Deviations from the Procedure**

All deviations from the above procedure must be approved by the Department Head with consultation with: ECW system manager, the ECW system engineer, the head of the I&I group or their deputies.

### **5.0 Required Training and Authorized Training Personnel**

There is no prerequisite training for this procedure.

Authorized training personnel are listed below:

Mike Starr, ID# 6919  
Rich Schmitt, ID# 6918

Either a procedure practice run led by an authorized trainer or a verbal discussion with an authorized trainer is the only required training. This choice depends on the specific procedure being performed and experience of the trainee.

### **6.0 Training Materials**

A copy of this procedure.

**7.0 List of Trained People for this procedure.**

The list of trained people for this procedure will exist in written form in the CDF Department copy of this procedure. Only CDF technicians will be trained in the procedure.

Name	Date	ECW Systems Engineer or Manager Signature	Comments
Bruce Vollmer			
Dean Beckner			
Dave Haynie			
Cutchlow Cahill			
Craig Olson			
John Voirin			

**8.0 References and Supporting Documentation.**

Done required