

THIS IS A BRIEF DESCRIPTION OF  
THE CIRC WATER BLOWDOWN SYSTEM  
FROM THE ROOT CAUSE REPORT FOR THE 2000 cv.

BACKGROUND INFORMATION:

The primary function of the Circ Water Blowdown System is to provide for Lake turnover to prevent undesirable chemical buildup in Lake. The secondary function of the Circ Water Blowdown System is to provide dilution for liquid releases.

The Circ Water Blowdown System (Attachment 7) is designed to return Cooling Lake water back to the Kankakee River. Processed fluids from the Sewage Treatment System and the Radwaste Treatment Systems discharge directly to the Circ Water Blowdown system where dilution occurs prior to release to the Kankakee River. The Wastewater Treatment Plant and the Demineralizer Regenerant Waste systems along with various strainer/filter backwashes are returned to the Cooling Lake and thus are indirectly returned to the Kankakee River through the Blowdown line after dilution by the Cooling Lake.

The Circ Water Blowdown system begins at the Circ Water System supply to the condenser. Two 24" carbon steel pipes tap off the Circ Water supply piping (one from each unit) and combine into a 36" common header. Motor operated isolation valves, 1/2CW018, are provided on each 24" line. The 6" Radwaste Treatment System discharge pipe connects to the 36" Blowdown header. Downstream of the Radwaste connection, the Blowdown pipe is expanded to 48" prior to connection of the 3" Sewage Treatment Plant discharge pipe. The 48" diameter Blowdown pipe is reinforced concrete pipe (RCP) and runs along owner controlled property to the Blowdown River Screen House. Eleven vacuum breaker assemblies are incorporated at the high points along the 48" diameter RCP to prevent pipe implosion. The 48" RCP is eventually split and reduced to two 24" discharge pipes at the Kankakee River. Each 24" discharge pipe was originally equipped with a motor operated spray valve, 0CW018A/B. The entire piping network is approximately 29,000 ft long and is operated at about 12,000 gpm (~2.5 ft/s).

A typical vacuum breaker is shown on attachment 4. On system startup, the vacuum breaker exhausts air from the piping system until the float assembly rises with water level to close and seal for system operation. Upon system shutdown, the vacuum breaker is designed to open as water level decreases. The air release or 'pilot' valve provides two functions. The primary pilot valve function is to release entrained air that accumulates at the high points during normal system operation, air that would increase head loss and reduce process flow if not removed. The pilot valve also facilitates earlier opening of the vacuum breaker on system shutdown. On shutdowns, air pockets that develop at high points may be at positive pressure, tending to hold the vacuum breaker on its seat even though water level is below the float assembly. However, the pilot valve will release the air and allow the vacuum breaker to open as soon as level drops. Each vacuum breaker is provided with a butterfly isolation valve to facilitate vacuum breaker maintenance.

D-11

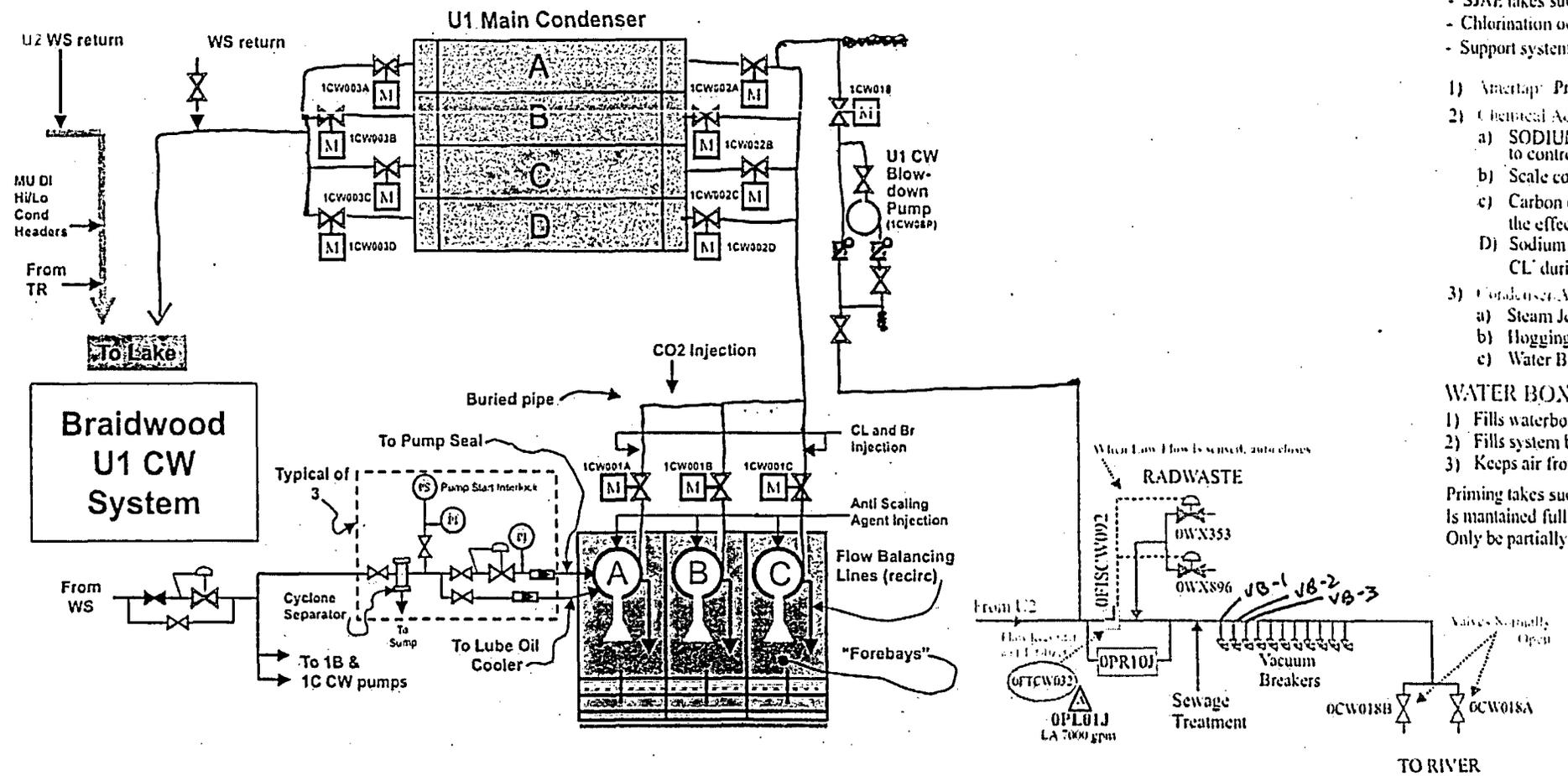
**MAIN CONDENSER**

- ~ 23°F rise in CW temp
- SIAE takes suction of
- Chlorination occurs
- Support systems to it

- 1) Amertap - Prevent
- 2) Chemical Addition
  - a) SODIUM HY to control Bio
  - b) Scale corrosion
  - c) Carbon dioxide for effectiveness
  - d) Sodium Bisulfite during chl
- 3) Condenser Air Release
  - a) Steam Jet Air Release
  - b) Hogging Vacuum
  - c) Water Box Priming

**WATER BOX PRIMING**

- 1) Fills waterboxes by
  - 2) Fills system before
  - 3) Keeps air from blar
- Priming takes suction of  
is maintained full by CV  
Only be partially filled



**PURPOSE**

- 1) Heat sink from the steam cycle and feed pump turbines.
- 2) Circ Water blowdown serves as a pathway for sending waste water to the Kankakee River.

**EPA LIMITS ON KANKAKEE RIVER WATER REMOVAL**

- 1) Maximum withdrawal of 160 Cubic feet / second
- 2) Can't fill from river if flow  $\leq$  442 Cubic feet / second

**CIRCULATING WATER PUMPS (3 per Unit)**

- 1) Each rated at 3000 H.P. and 247,000 gpm with a head pressure of 16.5 psid (38 ft. of head)
- 2) Pumps are vertical, mixed flow, dry pit, centrifugal
- 3) Pumps start as an induction motor and switch to synchronous
  - 4A 1C powered from Bus 143
  - 4B 1A & 1B powered from 144
- 4) To prevent CW pump run-out, do not run >2 waterboxes on 1 pump

**TRAVELING SCREENS**

- 2 per pump / 6 per Unit
- Modes of operation:
- AUTO**
- 1) Timer Mode
    - 15 minute wash once per 12 hours
    - Requires adequate WS press
    - Slow Speed
  - 2) Delta Level Mode
    - 6" delta level creates slow speed wash
    - 10" delta level creates fast speed wash
    - and the WS pressure interlock is defeated
- MANUAL**
- MCB switch is AUTO / ON (on is fast speed)
  - Local switch is AUTO / STOP / SLOW / FAST

**PUMP START**

- 1) Discharge valve must be closed
- 2) WS seal cooling to pump  $\geq$  20 psig

**DISCHARGE VALVE INTERLOCKS**  
(No associated control switch)

- 1) Discharge valve must be closed to start pump

**C-9 Condenser Available**

- 1) 1 of 3 CW pump Bkrs close
- 2) 23" Hg condenser vacuum

NOTE: Bypass permissible  
Light will be "da"

