

I/R	DATE	DESCRIPTION
0	12/12/13	ISSUED FOR BID OP. 838-2013

CALCIUM CHLORIDE SEQUENCE OF OPERATIONS

TRUCK FILL SYSTEM:
(A) ALL CONTROL VALVES SHALL BE NORMALLY "CLOSED" EXCEPT CV-5. PUMP P-1 SHALL BE NORMALLY "OFF".
(B) CONTROL VALVES CV-2 AND CV-4 SHALL BE ACTIVATED TO "OPEN" WHEN HAND SWITCH IS PUT TO "ON" POSITION. CONTROL VALVE CV-5 SHALL BE CLOSED. WHEN CV-2 AND CV-4 ARE FULLY OPEN AND CV-5 IS CLOSED, PUMP P-1 SHALL BE ACTIVATED. THE TIMER WILL ALLOW THE CV-2, CV-4 AND P-1 TO REMAIN ACTIVATED DURING THE ACTIVATION PERIOD (ADJUSTABLE, INITIALLY SET AT 20 MINUTES).
(C) PUMP P-1 AND CONTROL VALVES CV-2 AND CV-4 SHALL BE DEACTIVATED WHEN EITHER THE HAND SWITCH IS PUT TO "OFF" POSITION OR THE TIMER SYSTEM ACTIVATION PERIOD EXPIRES.
(D) TIMER ACTIVATION PERIOD SHALL BE RESTARTED AUTOMATICALLY EVERY TIME THE HAND SWITCH IS PUT TO "ON" POSITION.
(E) THE REMAINDER OF THE CONTROL VALVES SHALL REMAIN FULLY CLOSED DURING TRUCK FILL OPERATION.
(F) ONCE P-1 IS SHUT-OFF AND CV-2 AND CV-4 ARE CLOSED, OPEN CV-5.

STORAGE TANKS FILL SYSTEM (THROUGH PUMP P-1 OPERATION)

(A) CONTROL VALVE CV-3 SHALL BE NORMALLY "CLOSED" AND PUMP P-1 SHALL BE NORMALLY "OFF". CONTROL VALVE CV-5 SHALL BE NORMALLY OPEN.
(B) CONTROL VALVE CV-3 SHALL BE ACTIVATED TO "OPEN" WHEN HAND SWITCH IS PUT TO "ON" POSITION. WHEN CV-3 IS FULLY OPEN, PUMP P-1 SHALL BE ACTIVATED. THE TIMER WILL ALLOW THE CV-3 AND P-1 TO REMAIN ACTIVATED DURING THE ACTIVATION PERIOD (ADJUSTABLE, INITIALLY SET AT 30 MINUTES).
(C) PUMP P-1 AND CONTROL VALVE CV-3 SHALL BE DE-ACTIVATED WHEN EITHER THE HAND SWITCH IS PUT TO "OFF" POSITION, OR THE TIMER SYSTEM ACTIVATION PERIOD EXPIRES.
(D) TIMER ACTIVATION PERIOD SHALL BE RESTARTED AUTOMATICALLY EVERY TIME THE HAND SWITCH IS PUT TO "ON" POSITION.
(E) CV-2 AND CV-4 SHALL REMAIN FULLY CLOSED DURING STORAGE TANKS FILL OPERATION.
(F) CV-5 SHALL REMAIN OPEN AFTER FILLING IS COMPLETE

STORAGE TANK FILL SYSTEM (THROUGH TRUCK MOUNTED PUMPS)

(A) CONNECT HOSES TO TRUCK PUMP.
(B) OPEN MANUAL VALVE AT HOSE.
(C) START TRUCK PUMP.
(D) WHEN TRUCK IS EMPTY CLOSE MANUAL VALVE AT HOSE AND DISCONNECT FROM TRUCK.

CALCIUM CHLORIDE PERIODIC CIRCULATION SYSTEM

(A) CONTROL VALVES CV-2 SHALL BE NORMALLY "CLOSED" AND PUMP P-1 SHALL BE NORMALLY "OFF". CONTROL VALVE CV-5 SHALL BE NORMALLY OPEN.
(B) THE LIQUID DEICER PERIODIC CIRCULATION TIME CLOCK SHALL AUTOMATICALLY ACTIVATE CONTROL VALVE CV-2 TO "OPEN" IN ACCORDANCE TO USER DEFINED TIME SCHEDULE (ADJUSTABLE). WHEN CV-2 IS FULLY OPEN, PUMP P-1 SHALL BE ACTIVATED. THE TIME CLOCK SHALL ALLOW THE CV-2, CV-5 AND P-1 TO REMAIN ACTIVATED DURING THE USER DEFINED ACTIVATION PERIOD (ADJUSTABLE) PROVIDED THAT TRUCK FILLING OPERATION AND STORAGE TANK FILLING OPERATION ARE NOT TAKING PLACE. IF TRUCK FILLING OR STORAGE TANK FILLING IS TO TAKE PLACE OR IN PROCESS, PRIORITY SHALL BE GIVEN TO THESE ACTIVITIES (TRUCK FILLING OR STORAGE TANK FILLING), ANY LIQUID PERIODIC CIRCULATION IN PROCESS SHALL BE STOPPED AND WAIT FOR THE NEXT AUTOMATIC CIRCULATION PERIOD AVAILABLE.
(C) PUMP P-1 AND CV-2 SHALL BE DEACTIVATED WHEN THE TIMER ACTIVATION PERIOD EXPIRES PROVIDED THAT ALL OTHER OPERATING CONDITIONS ARE SATISFIED.
(D) CV-5 SHALL REMAIN OPEN PROVIDED ALL OTHER CONTROL VALVES ARE CLOSED. AND NO TANK FILLING IS TAKING PLACE.

PROVIDE HAND ON/AUTO/OFF SWITCHES ON THE CONTROL PANEL FOR MANUAL OVERRIDE TRUCK FILLING OPERATION, STORAGE TANK FILLING OPERATION, AND PERIODIC LIQUID CIRCULATION OPERATION. NORMALLY SET AT "AUTO".

PROVIDE SIGNAGE INDICATING PERIODIC LIQUID CIRCULATION OPERATION SYSTEM SHALL BE MANUALLY SET TO "OFF" POSITION FOR THE TIME PERIOD WHEN THE USER IS CONDUCTING STORAGE TANKS FILLING WITHOUT USING PUMP P-1 AND CV-2. USER MAY USE A LIQUID DEICER SUPPLY TRUCK WITH PUMP AND HOSE TO FILL THE STORAGE TANKS. WHEN THIS TANK FILLING ACTIVITY IS COMPLETE, THE MANUAL OVERRIDE SWITCH ON THE LIQUID CIRCULATION OPERATION SHALL BE SET BACK TO "AUTO" POSITION.

BRINE SEQUENCE OF OPERATIONS

TRUCK FILL SYSTEM:
(A) ALL CONTROL VALVES SHALL BE NORMALLY "CLOSED" EXCEPT CV-1. PUMP P-2 SHALL BE NORMALLY "OFF".
(B) CONTROL VALVES CV-1 SHALL BE ACTIVATED TO "OPEN" WHEN HAND SWITCH IS PUT TO "ON" POSITION. WHEN CV-1 IS FULLY OPEN, PUMP P-2 SHALL BE ACTIVATED. THE TIMER WILL ALLOW THE CV-1 AND P-2 TO REMAIN ACTIVATED DURING THE ACTIVATION PERIOD (ADJUSTABLE, INITIALLY SET AT 20 MINUTES).
(C) PUMP P-2 AND CONTROL VALVE CV-1 SHALL BE DEACTIVATED WHEN EITHER THE HAND SWITCH IS PUT TO "OFF" POSITION OR THE TIMER SYSTEM ACTIVATION PERIOD EXPIRES.
(D) TIMER ACTIVATION PERIOD SHALL BE RESTARTED AUTOMATICALLY EVERY TIME THE HAND SWITCH IS PUT TO "ON" POSITION.
(E) THE REMAINDER OF THE CONTROL VALVES SHALL REMAIN FULLY CLOSED DURING TRUCK FILL OPERATION.
(F) ONCE P-2 IS SHUT-OFF CLOSE CV-1.

BRINE TANK FILL AND RECIRCULATION:
BRINE TANK FILL AND RECIRCULATION SHALL BE BY THE RELOCATED BRINE GENERATOR AND CONTROL SKID.

PUMPS:

IN THE EVENT OF A PUMP FAILURE, THE OPERATIONAL PUMP SHALL BE CAPABLE OF OPERATING IN PLACE OF THE FAILED PUMP AS FOLLOWS:
(A) SWITCH FAILED PUMP TO OFF.
(B) CLOSE BALL VALVES ON EACH SIDE OF FAILED PUMP.
(C) MANUALLY OPEN VALVES V-1 AND V-2
(D) CLOSE VALVE V-3 IF PUMP P-1 FAILS. CLOSE VALVE V-4 IF PUMP P-2 FAILS.
(E) TURN OPERATIONAL PUMP ON.
(F) RUN DESIRED SEQUENCE FROM CONTROL PANEL.

