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TITLE

PRODUCTION TEST IP-412-AI:
B AND C REACTORS EXPORT SYSTEM TEST

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PRODUCTION TEST IP-412-AI:
B AND C REACTORS EXPORT SYSTEM TEST

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PRODUCTION TEST IP-412-AI:
B AND C REACTORS EXPORT SYSTEM TEST

PURPOSE

The purpose of this test is to determine more accurately the adequacy* of the export system for supplying flow to a dual reactor area under various simulated emergency** conditions. The data obtained in this test will also provide a basis for determining export system adequacy under other emergency conditions. In addition, information obtained during the test will be helpful for evaluating certain reliability aspects of the export line system and will aid in determining the scope of future tests of export system reliability.

BASIS AND JUSTIFICATION

The water coolant supply to the Hanford reactors is maintained by three separate systems. The primary water coolant supply is provided by pumping sets which are powered by the BPA electrical supply.

At the old areas when the primary supply fails, the reactor(s) is automatically scrambled and alternate pumping units, powered by steam and capable of supplying adequate shutdown reactor flow, are automatically accelerated. If the area steam supply fails, water is automatically supplied to the reactor(s) from the high tanks which last for a period of about one hour; water is then supplied to the reactor(s) from an export system. The export system is connected to B, D, F, DR, H, and C reactors; to 182 building pumping stations at B, D, F and H areas; and to 200-E, 200-W, 100-N, White Bluffs, and the central fire station. This system is designed to provide adequate flow to any reactor (except the K's) in an emergency condition where BPA power supply to Hanford has been interrupted and steam supply to one old area is lost. Under these conditions, water will be pumped from the 182 building reservoirs into the export system by the export steam pumps in the three areas where the steam supply is not interrupted, and water from the export system will be supplied to the stricken old reactor area and to the other non-reactor areas using water from the export system.

* The word "adequacy" refers to the capacity of the export system, in terms of flow and temperature, to prevent boiling in the reactor(s) (sufficient to keep the bulk outlet temperature 90°C) in an emergency where BPA power to all reactor areas has been interrupted and the steam supply to one old area has been lost. The word "reliability" refers to the degree of certainty that the export line system will function normally in an emergency and that flow to the reactor(s) will be established and maintained in the expected manner.

** The word "emergency" in this document is defined to mean that the BPA power supply to all reactor areas has been interrupted and the steam supply to one old area has been lost.

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Over the last few years, reactor power levels have been continually raised as increases in coolant flow rates and improvements in fuel element quality have allowed. In addition, the daily normal use of export water has gradually increased; this would cause a larger diversion of export water away from the stricken reactor(s) if an emergency occurred. As a result of these changes, there is no longer a large margin of safety in the capacity of the export system to supply adequate amounts of water to the reactor(s) reliably in an emergency^(1,2). Consequently, the current and future status of the export line system is being thoroughly reviewed. In order to complete these reviews, certain data and information are required which can only be obtained by testing the system.

There are numerous combinations of hydraulic supply and demand that could occur on the export system during an emergency depending on the hydraulic conditions prevailing among the various areas when the emergency occurs and depending on which area loses its steam supply. In this production test, conditions will be arranged so that the adequacy of the system for supplying flow to a stricken area will be tested under the severest situations normally expected. That is, both reactors in the dual reactor area highest in elevation (B and C reactors) will be supplied water from the export system with the 200 area valves wide open. In addition, other configurations will be tested while supplying export water to B and C reactors. These include the effect of throttling flow to 200 areas and the effect of shutting off the water being supplied to the export system at 182-D. Data collected during these tests will be used to determine the adequacy of the export system under these conditions and will provide a basis for determining the adequacy of the export system at other areas and under other conditions.

One aspect of the reliability of the export line system is the action of the surge suppressors. If, for some reason, any surge suppressor is open or opens after export water alone is being supplied to the reactor, a large quantity of water will be diverted through the open suppressor and inadequate flow to the stricken reactor(s) will probably result. During the various steps in this export system test, pressures at the surge suppressors will be recorded and other critical pressures in the system will be measured. Although the exact sequence of events that result when an emergency occurs will not be followed, the pressure data obtained will give a good indication of whether and when the surge suppressors would have opened in a real emergency. If surge suppressors do cycle during an emergency, the length of the cycle and the amplitude of the pressure transients will also have important effects on the reliability of the export system. For this reason, an attempt will be made to induce surge suppressor action by quickly opening the export Groves valves at B and C reactors during the test while flow is being supplied to the reactors from the high tanks. The surge suppressors are expected to open and the resulting pressure surges will be recorded on the high speed recorders located at the surge suppressors. These data will be helpful in determining the effect of surge suppressor action on last ditch adequacy and reliability under various emergency conditions. In addition, these data can be used to assist in scoping more comprehensive tests of the reliability of the export line system to be run at a later time.

During the initial phases of an emergency, flow to the reactor is being supplied

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by the high tanks and the export system together. Knowledge of the flow split between the two sources is important because this will affect the length of time that the high tanks are supplying water to the reactor. When the high tanks empty, export system flow to the reactor must be high enough to remove the reactor residual heat adequately. If the high tanks empty faster than is expected during an emergency, the export system alone will be supplying the reactor at an earlier time when the reactor residual heat is higher; therefore, this export system flow will have to be higher in order to be adequate. This test will be instrumented so that this flow split can be determined accurately during the test under one of the simulated emergency conditions.

TEST DETAILS

A. Test Procedures

Detailed test procedures for each test will be written by Process Engineering before the tests take place, and participants in the tests will be thoroughly familiarized with the procedures before the tests begin. A summarized outline of each test and test procedure including data to be obtained is presented below.

B. Preliminary Testing

1. General

The flow distribution in some parts of the export system will not be measured directly during the export system test because of the difficulties involved in installing proper flow instrumentation. Instead, several preliminary pump and reactor calibration tests will be run prior to the export system test. Individual pump and reactor flow rates can then be determined during the export system test by measuring the chosen related dependent pressures and by referring to calibration curves relating flow to this pressure as established in the preliminary tests. In addition, a preliminary export line flushing test will be run at C reactor. This flushing test could not be performed in conjunction with the export system test because the export line will be flushed upstream of the strainer just prior to the export system test in order to minimize the chances of washing foreign material into the reactor. The purpose of the preliminary flushing test will be to flush through the strainer (but not through the reactor) without disturbing the water in the export line prior to the flush. This will simulate an emergency situation and will help to determine the amount of strainer plugging that might occur in a real emergency. This flushing test will be performed at C reactor because there is a convenient means of flushing through the export line strainer and out of the process water piping to the drain at desired flow rates without flushing the water through the reactor.

2. 182 Building Export Steam Pump Calibration Tests

The 182-D, F, and H export steam pumps will be calibrated by the follow-

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ing method prior to the export system test, (the 182-B export steam pump will be calibrated immediately following the export system test when all 182-B export pumps will be shut down and export water will be supplied to the 200 areas from the other 100 areas. It will be more convenient at this time to continue supplying the 200 areas from the other 100 areas while 182-B is isolated and the 182-B export steam pump is calibrated):

- a. Install a flow measuring orifice in the 24-inch import line discharging into the 182 building reservoir.
- b. Install accurate pressure gauges in positions where they will measure average effective steam pump suction and discharge pressures.
- c. Close the 30-inch export line gate valve at the end of the 182 building, the 10-inch cone valve between the export and import lines, and the 14-inch steam pump discharge valve.
- d. Make arrangements to re-open the 30-inch gate valve and the 14-inch steam pump discharge valve as fast as possible in case an emergency occurs.
- e. Accelerate the steam pump to full speed and slowly open the 14-inch pump discharge valve.
- f. Measure the effective pump suction pressure, pump discharge pressure, and pump speed with the pump "dead headed." Then open the 10-inch cone valve between the import and export line and pump through the import line back into the 182 reservoir. Measure flow, pump speed, pump suction pressure, and pump discharge pressure at about 2000, 4000, 5000, 6000 gpm, and up in 1000 gpm increments up to the cavitation cutoff point.
- g. Measure the flow decay on one of the electric export pumps in the same building at one area. This will be done by shutting off the export steam pump, operating an electric export pump at about 5000 gpm, suddenly cutting power to the pump, and measuring the flow decay on a high speed recorder.

3. Export Line Flushing Test

Prior to the export system test an export line flushing test will be run at C reactor approximately as outlined below:

- a. During a C reactor outage, supply water to the reactor from the far side and isolate the near side completely so there is no water being supplied to that side.
- b. Bleed off the pressure on the near side (but keep the piping full of water), and open the manhole cover on #5 riser in the valve pit.

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- c. Put an extra pump on export system, slowly open the export line Groves valve wide open, and measure pressure up and downstream of the flow restricting orifice and up and downstream of the strainer.
- d. Flush for approximately 20 minutes, close the Groves valve, and remove and inspect the export line strainer.

4. C Reactor Low Flow Calibration Test

Prior to the export line test a low flow calibration test will be run at C reactor generally according to the procedure outlined in PT IP-326-I⁽³⁾. A detailed test procedure will be written and the test coordinated by the C reactor process engineer. Authorization for this test will be contained in a supplement to the original production test.*

C. Export System Test

1. Brief Summarized Test Procedure

The test procedure presented in the following sections is long and complex; therefore, a brief test summary is outlined as follows:

a. Pre-Test Export Pumping

Change the export pumping gradually from the normal B area electric pumping supply to the condition of four steam pumps supplying the export flow with any additional 182-B electric pumps required to maintain normal export system flow. Then gradually shut off all the 182-B export pumps. During this time, monitor the export system pressures and flows as indicated by the test procedure.

b. Simulated Emergency High Tank Flow

After three export steam pumps are running and four process water pumps are operating at each reactor, stop the process water pumps at each reactor and monitor reactor temperatures and the flow provided by the high tanks.

c. Surge Suppressor Transients and Combined High Tank and Export Flow

At a time less than 15 minutes after high tank flow to the reactors is started, open the C reactor export Groves valve quickly and monitor the pressure and flow transients produced when the 182 building surge suppressors cycle. If the surge suppressors do not cycle when the C reactor export Groves valve is opened, repeat this step by opening the B reactor export Groves valve quickly. Monitor system pressures, flows, and temperatures during the transient period and during a 15 minute period of combined stabilized high tank and export flow to B and C reactors.

* This test has been completed.

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d. Export System Capacity

Carefully close off high tank flow to C reactor and then to B reactor, and reduce export system flow to the reactors by steps to the minimum credible value. Monitor system flows, pressures, and temperatures during this time.

2. Preliminary Arrangements and Procedures for Test

- a. B and C reactors must both be shut down at least 20 hours.
- b. Monitor 25 high level, high exposure tubes on the cornpopper at each reactor. Terminate the test any time a tube outlet temperature exceeds 60°C.
- c. Monitor three calibrated high level crossheader ΔP gauges at each reactor. Terminate the test any time a ΔP of less than 22 inches at B reactor or less than 18 inches at C reactor is observed.
- d. Supply shutdown reactor flow with four process water steam pumps at B reactor and with four pumping sets at C reactor.
- e. Arrange power personnel at 190-B so they will be able to accelerate four process water steam pumps to full speed within one minute, if necessary, during the test in order to establish steam sweep-out water flow to B reactor. Also arrange two process water electric pumps for startup through the by-pass valves within two minutes should the emergency steam supply fail.
- f. Arrange power personnel at 190-C so they will be able to open the pump discharge valves within one minute on four process water pumping sets which are idling at 1000 rpm. Also arrange these four pump sets so they can be powered at that speed by either the steam turbines or the electric motors. This will ensure that sufficient coolant flow to sweep out steam will always be available to the reactor. The pump discharge valves on these pumping sets will be checked during the initial phases of the outage in order to insure that they do not leak during the test.
- g. Divert the water going to N area through the temporary line in which a flow metering orifice is installed and which empties into a temporary pit in the desert. Adjust this flow to about 1000 gpm. Arrange a fire station pumping truck to pump from the N area emergency raw water tank into the present N area water distribution system in order to maintain the N area water supply during the test.
- h. Notify White Bluffs and the central fire station that the export system test is about to begin and that their use of raw water from the export line must be restricted to normal sanitary and other normal small uses totalling less than 100 gpm until the test is completed. Provide a fire station pumper-tanker to the White Bluffs tube shop, if necessary, for supplying short-term high flow tube flushing water.

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1. Notify 282-E to open their intake valve wide open and 282-W to open their intake valve about half way. Readjust N area flow to 1000 gpm if necessary. Hereafter do not change the N area valve setting any time during the test. At this time enough 182-B pumps should be operating on the export system so the pressure in the export line is about normal (about 220 psig) for the flow demand arranged at 282-E and W.

3. Pre-Test Export Pumping

- a. Rearrange the pump configuration on the export system so the steam pump in each 182 building is pumping to the export line unthrottled. Maintain electric export pumps at 182-B as necessary to keep a flow of 1000 gpm at N area. Take the following data:
 - 1) Flow from each export pump (pump suction pressure, discharge pressure, and speed).
 - 2) Flow at N area.
 - 3) Export line pressures at the surge suppressors in each 182 building, and at the cone valves in 282-E and 282-W.
- b. Shut off all export pumps at 182-B gradually and one at a time in order to minimize the chances of opening any surge suppressors; however, all pressure recorders at the surge suppressors should be operating in case cycling does occur. Then re-take the same data listed in item a above.

4. Simulated Emergency High Tank Flow

- a. When the preceeding steps have been completed, begin this test by taking the following data at both reactors with shutdown flow supplied as specified in item 2.d, e, and f above:
 - 1) Top-of-riser pressure with calibrated Heise gauge in control room.
 - 2) Reactor flow.
 - 3) Bulk inlet and outlet water temperature.
- b. Reduce reactor water flow simultaneously at B reactor by throttling the steam supply to the steam turbines and at C reactor by closing the steam discharge valves. At the end of five minutes the steam turbines at 190-B should be completely stopped and the pumping sets previously supplying C reactor should be operating at 1000 rpm with discharge and header valves shut. At this time both reactors will be supplied by the high tanks alone and the following data will be taken simultaneously and as quickly as possible:

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- 1) Top-of-riser pressure with Wallace & Tiernan gauge, and control room Heise gauge.
- 2) High tank water levels.
- 3) Bulk inlet (high tank) and outlet water temperature.

During steps 4 and 5 while high tank water is being supplied to the reactors, the water level in the high tanks should be monitored constantly. If some unusual, unforeseen event occurs and the levels in the B high tanks drop below the bottom of the straight portion of the tank or if the levels in the C high tanks drop below the point where 200,000 gals. of water remain, adequate export system flow or 190 building backup process water flow to the reactor should be established.

5. Surge Suppressor Transients and Combined High Tank and Export Flow

- a. Start all surge suppressor pressure recorders and open the C reactor export line Groves valve suddenly.
 - 1) If the surge suppressors cycle, record the cycles on the pressure recorders, wait until the system has restabilized, and open the B reactor export line slowly so the surge suppressors will not recycle.
 - 2) If the surge suppressors do not cycle, open the B reactor export line Groves valve suddenly and record the cycles on the pressure recorders.
 - 3) While the surge suppressors are cycling at 182-B, D, F, and H, remove the power supply to the suppressors so they cannot reset and cannot inadvertently open during the remainder of the test except for high pressure relief.
- b. After the export system has restabilized and flow to both reactors is being supplied by both the high tank and export systems, take the following data at both reactors for a period of about 15 minutes.
 - 1) High tank water levels at one-minute intervals. (In order to obtain the flow rate from the high tanks.)
 - 2) Top-of-riser pressure with the Wallace & Tiernan gauge and control room Heise gauge at one-minute intervals.
 - 3) 182 building pump flows at two-minute intervals.
 - 4) N area flow at two-minute intervals.

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- 5) Export line pressures at the surge suppressor in two-minute intervals.
- 6) Export line pressures at the 282-E and 282-W cone valves in two-minute intervals.
- 7) Export line pressures up and downstream of the Groves valves and up and downstream of the strainers in two-minute intervals.
- 8) Reactor bulk inlet and outlet water temperature in two-minute intervals.

6. B and C Reactors Export System Capacity

- a. Valve off the high tanks at both reactors carefully so no severe pressure transients occur on the system (starting at C reactor). Refill the high tanks as rapidly as possible. As soon as the export system has restabilized, take the following data at both reactors:
 - 1) Top-of-riser pressure with the Wallace & Tiernan and control room Heise gauges.
 - 2) Reactor bulk inlet and outlet water temperature.
 - 3) 182 building pump flows.
 - 4) N area flow.
 - 5) Export line pressures at the surge suppressors.
 - 6) Export line pressures at the 282-E and 282-W cone valves.
 - 7) Export line pressures up and downstream of the Groves valves and up and downstream of the strainers.
- b. Shut the large cone valves at 282-E and 282-W and open the special orificed eight-inch by-pass lines to get a flow of about 2700 gpm at 282-E and about 900 gpm at 282-W. Do this carefully so no severe pressure transients occur on the system. As soon as the export system has restabilized, retake the data listed in item a above and the flow rates at 282-E and 282-W.
- c. Shut off all water being supplied to 282-E and 282-W carefully so no severe pressure transients occur on the system. As soon as the export system has restabilized, retake the data listed in item a above.

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- d. Shut off the export steam pump at 182-D carefully so no severe pressure transients occur on the system. When the export system has restabilized, retake the data listed in item a above.
- e. Reopen the special orifice eight-inch by-pass lines at 282-E and 282-W to the same position obtained in item 6.b above. Do this carefully so no severe pressure transients occur on the system. As soon as the export system has restabilized, retake the data listed in item a above and the flow rates at 282-E and 282-W.
- f. Reopen the large cone valves at 282-E and 282-W to the original position obtained in item 2.i above and close the special orificed by-pass line. Do this carefully so no severe pressure transients occur on the system. As soon as the export system has restabilized, retake the data listed in item a above.
- g. Shut off the export line water being supplied to 100-N carefully so no severe pressure transients occur on the system. As soon as the export system has restabilized, retake the data listed in item a above (except N area flow which will be shut off).

D. 182-B Export Steam Pump Calibration Test

- 1. Return normal process water flow to B and C reactors, close the export line Groves valves, and open the high tank valves. Return all surge suppressors to normal and raise export line pressure back to a normal value of about 220 psig with export pumps at D, H, and F areas. Re-establish the normal export system water supply to N area, White Bluffs, 200 areas, and the central fire station. Isolate 182-B and calibrate the export steam pump in that building according to the summarized procedure outlined in item B.2 above.
- 2. Carefully re-establish the export system water supply from 182-B and return the export system to normal.

SCHEDULE

Pump calibration tests will begin as soon as this production test is approved. The export line test will be run within one month after all pump calibration tests, export line flushing test, and C reactor low flow calibration tests have been completed; this will require a dual reactor outage with an overlap of at least 24 hours so both reactors will have been down at least 20 hours when the test is run.

COSTS

This production test authorizes use of a maximum of four hours of outage time at B reactor and a maximum of four hours of outage time at C reactor for running this test.

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The costs associated with installation of special instrumentation, piping, and other equipment for the performance of these tests will be borne by Process Technology Sub-Section.

All other costs incidental to the performance of these tests will be borne by the reactor operation involved.

HAZARDS AND PROCESS STANDARDS

A. Export Line Test

The principal hazard associated with performance of the export line test is the possibility that the export line flow to B and C reactors will be drastically reduced either by inadvertent opening of the surge suppressors or some other unforeseen event during the time the export line is supplying the reactors alone and the high tanks are valved off. Although this is not expected to happen, careful arrangements will be made to have power personnel ready in the 190 buildings to provide flow within 60 seconds to B reactor with four accelerated process water steam pumps and to C reactor with four process water pump sets operating at 1000 rpm. Four accelerated process water steam pumps will supply about 20,000 gpm to B reactor, and four process water pump sets operating at 1000 rpm will supply about 16,000 gpm to C reactor. If one of the four pumps fails to operate for some unknown reason, about 15,000 gpm will be supplied to B reactor and about 12,000 gpm will be supplied to C reactor. If the steam supply at 190-B fails, two process water electric pumps will be started and the by-pass valves opened; this will supply about 11,000 gpm to B reactor within two minutes. At 190-C the four process water pump sets backing up the water supply to C reactor will be powered by the electric motors. If the BPA power supply to these electric motors fails, the steam turbines will accelerate within a few seconds and provide at least the same flow to C reactor. Both reactors will have been down at least 20 hours when the test is performed, and a flow of 2000 gpm will be ample to keep either reactor cool. If flow to the reactor is interrupted, boiling will not start for at least two minutes, and the backup coolant sources outlined above will all provide ample flow within two minutes. If boiling does start for some unknown reason, each of the backup sources outlined above will provide enough flow to sweep out any steam formed.*

Reactor Process Standard A-080.C1 and Water Plant Process Standard 190-B-070 may be violated because the high tanks may be drained below the point where the equivalent of one full high tank is available for cooling the reactor. The high tanks will be refilled as rapidly as possible following the high tank portion of the test so the reserve storage will be replenished during the test. Also, sufficient backup will be provided throughout the test by rapid activation of process water pumps as explained above.

The intent of Reactor Process Standard A-080.02 will be violated because this test deliberately transfers the reactor cooling water supply to the export system under simulated emergency conditions. Reactor Process Standard A-080.C2 specifies that the export system shall be used to cool

* An additional hazard assumed by this test is that of no surge suppressor protection during the period of operation with just the steam pumps on the export system. See letter, SS Jones to MP Johnson, dated 9/26/61.

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the reactor only under emergency conditions. However, in order to perform the test, reactor coolant must be supplied by the export system for a long enough period of time to obtain necessary data. During the test, special backup features will be provided as explained above so there will always be sufficient water available for cooling the reactor or for sweeping out steam.

B. Export Steam Pump Calibration Tests

In order to run the export steam pump calibration tests, the export system inside each 182 building will have to be isolated by closing the 30-inch gate valve in the main export line at the end of the 182 building. During the time the export steam pump calibration test is being run, this pump will not be available as emergency backup on the export line system. In order for export system adequacy to be maintained, the export steam pump in each 182 building (B, D, F, and H) must be ready to be accelerated to full capacity within ten minutes of an emergency as specified in Water Plant Standard 190-B-070.03; i.e., there must always be three export steam pumps supplying a stricken area in an emergency. If an emergency occurs during a pump calibration test, 30 minutes to two hours will be required to open the 30-inch gate valve and to re-establish flow to the export system from the pump being tested. This does not mean that last-ditch backup flow to a stricken area would stop; there are two other export steam pumps which would be supplying the export system and the pump being tested may be restored to the system before the high tanks at the stricken area empty. Therefore, communications and personnel will be arranged during the export steam pump calibration tests so the pump being tested can be restored to the export system as soon as possible if an emergency occurs.

C. Authorization

A waiver of the process standards requirements mentioned above are authorized for this production test based on the arrangements and discussions listed above.

D. Export Line Rupture

There is a small chance that the export line pressure transients induced in this test will cause a rupture somewhere in the export piping. Ruptures in the line have occurred at B and D areas and the lines were strengthened as a result. The magnitude of pressure transients resulting from surge suppressor cycling that will be induced on this test will be less than that incurred in an emergency and less than that incurred by accident in the past when no ruptures occurred. In addition, the test will be carefully controlled so there will be little chance of incurring unusually severe pressure transients from any unforeseen incidents.

E. 200 Area Water Requirements

The difficulties attendant with scheduling B and C reactors down at the same time preclude special arrangements to perform the export system test

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when 200 area water requirements are low. Consequently, the water level in the raw water storage basins at 200-E and 200-W may be drawn down during the test. A calculation of the drop in water level at these basins has been made based on estimates of high 200 area water requirements, the amount of water that will be supplied to 200 area during the test, and the duration of the test. Water requirements at 200-E are heavier and the estimated maximum drop at that area was 3.5 feet. If completion of the test is delayed or the basin water level drops more rapidly than is expected, the test will be stopped when the water level has dropped four feet and adequate raw water flow will be restored. The basin storage capacity is 3×10^6 gallons, and a drop of four feet in the water level will correspond to a drop in storage of 1×10^6 gallons. The remaining 2×10^6 gallons would supply 200-E for at least three hours under high flow operating requirements and several times longer under emergency shutdown conditions.

Pressure transients induced by cycling the surge suppressors are not likely to be severe enough to rupture the export line as explained in item D above. However, if unforeseen high pressure transients severe enough to rupture the export line do occur, the break will probably occur in the lines leading to the reactor building. These lines could be isolated and the water supply to the 200 areas would not be seriously affected.

RESPONSIBILITIES

A. Process Technology Sub-Section will be responsible for:

1. Overall coordination of, preparation for, and performance of the pump calibration tests, export line flushing test, C reactor low flow calibration test, and the B-C export system test.
2. Preparing detailed procedures for each test.
3. Insuring that all tests are run safely and in accordance with the provisions of this production test and the process standards.
4. Issuing a preliminary report listing all numerical results of these tests.
5. Issuing a final report in conjunction with Process and Reactor Development Sub-Section describing the results of these tests, the effects of the tests on the current status of the adequacy and reliability of the last-ditch backup system, and recommendations for further action.

B. Process and Reactor Development Sub-Section will be responsible for:

1. Providing technical advice as required for test preparations and for performance of these tests.
2. Issuing a final report in conjunction with Process Technology Sub-Section describing the results of these tests, the effects of the tests on the current status of the adequacy and reliability of the last-ditch backup system, and recommendations for further action.

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C. B-C Reactors Operation will be responsible for:

1. Scheduling and assisting in performance of the export line flushing test, the B and C reactors export system test, and the 182-B export steam pump calibration test immediately following the export test.
2. Assisting in the preparation of and approving detailed procedures for the tests.
3. Ensuring that the tests are run safely.
4. Providing incidental equipment and manpower to assist in performing the tests.

D. D-DR Power Operation will be responsible for:

1. Scheduling and assisting in performance of the 182-D export steam pump calibration test.
2. Assisting in performance of the export system test.

E. H Power Operation will be responsible for:

1. Scheduling and assisting in performance of the 182-H export steam pump calibration test.
2. Assisting in performance of the export system test.

F. F Power Operation will be responsible for:

1. Scheduling and assisting in performance of the 182-F export steam pump calibration test.
2. Assisting in performance of the export system test.

Process Engineering Unit
Process Technology Sub-Section
Research and Engineering

Reactor Engineering Unit
Process and Reactor Development
Research and Engineering

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