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August 3, 1979

Mr. O. D. Parr, Chief
Light Water Reactors - Branch 3
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: LaSalle County Station Units 1 and 2
Initial Test Program Requirements
NRC Docket Nos. 50-373 and 50-374

Dear Mr. Parr:

Enclosed are the Commonwealth Edison responses to NRC questions informally submitted to this applicant regarding the subject Initial Test Program. These responses represent the culmination of an effort which involved numerous meetings in your offices and telephone conferences between members of your staff and the LaSalle County operations staff. We have been led to believe by the NRC reviewer (Mr. B. Clayton) that the enclosed responses fulfill all existing requirements applicable to LaSalle County Units 1 and 2 in this area. On the basis of this belief we are proceeding to complete the test program.

As you must well appreciate, it is vital to the expeditious completion of the Initial Test Program, and more specifically the Preoperational Test Program, that your concurrence in our planned approach be formalized. We expect, therefore, that the open item (No. 63 in the latest summary provided by Mr. A. Bournia on July 26, 1979 and documented in the O. D. Parr letter to L. O. DelGeorge dated January 22, 1979) will be formally closed.

Eight (8) copies of the responses to your informal questions are enclosed for your use. Appropriate revisions either have been made or will be included in Amendment 46 of the LaSalle County FSAR to document the resolution of your concerns. The material contained in the FSAR amendments will have been submitted in 40 copies as required.

If you have any additional questions in this regard, please communicate them as quickly as possible. It is now vitally important that your concurrence in this matter be appropriately communicated to the Regional Office of Inspection and Enforcement.

Very truly yours,

L. O. DelGeorge

L. O. DelGeorge
Nuclear Licensing Administrator
Boiling Water Reactors

enclosure

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1. Safety/Relief Valve Control System - Commonwealth Edison's November 11, 1977 letter to Region III stated that the design of the control system would be finalized at some later dated. The staff will need to review testing proposed for the final design. Accordingly, the information provided in Section 14 of your FSAR on this matter should be updated and/or corrected after the system design is finalized.

Response:

The design is finalized and a descriptive package is being organized for submittal in a future amendment. Commonwealth Edison will perform appropriate testing as necessary when installation of the Safety/Relief Valve Control System is completed. A description of this test will be provided in a later amendment to the FSAR.

Six (6) pages to Brent Clayton from Bob Bishop, La Salle County Station

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2. The information provided in Section 14 should be updated and/or corrected for systems and components that will be relied on to mitigate anticipated transients without scram (ATWS) after the ATWS system design is finalized.

Response:

Concerning ATWS on the LaSalle docket, Edison committed to the installation of the Alternate Reactor Scram System for LSCS by letter of Sept. 30, 1976 from R.L. Bolger to Ed Case. This fix includes safety-dedicated narrow-range pressure sensors, a redundant channeled back-up scram capability with added power-on relays, separated and enlarged scram-discharge headers and piping, the recirculation pump trip and a feedwater set-back feature. That ATWS fix decreased the ATWS probability by a factor of 10^{-2} from the present valve and still retained the SBLC system as a manually-operated mitigator. In March 1977 Edison requested NRC's response on this ARSS commitment for LSCS, but has received no response from the NRC, nor has any of the other eleven utilities who commited in 1976 to install ARSS for ATWS preclusion. To date, no cost-effective mitigator has been defined which can handle ATWS with failures as postulated during such transients.

Commonwealth Edison will perform appropriate testing for whatever system design is determined to be necessary as part of the ATWS solution.

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3. To clarify the information in Section 14.2 relating to "safety-related" startup tests, specifically identify each startup test listed in Table 14.2 that is not considered "essential" to demonstrate the operability of structures, systems, and components that meet any of the criteria listed below.

   a. Those that will be used for safe shutdown and cooldown of the reactor under normal plant conditions and for maintaining the reactor in a safe condition for an extended shutdown period; or

   b. Those that will be used for safe shutdown and cooldown of the reactor under transient (infrequent or moderately frequent events) conditions and postulated accident conditions and for maintaining the reactor in a safe condition for an extended shutdown period following such conditions; or

   c. Those that will be used for establishing conformance with safety limits or limiting conditions for operation that will be included in the facility technical specifications; or

   d. Those that are classified as engineered safety features or will be used to support or ensure the operations of engineered safety features within design limits; or

   e. Those that are assumed to function or for which credit is taken in the accident analysis for the facility, as described in the FSAR; or

   f. Those that will be used to process, store, control, or limit the release of radioactive materials.

Response:

All tests listed in Table 14.2-100 are essential to the above criteria with the following exceptions:

1. Control Rod Sequence Exchange.
2. Steam Production.
~~3. Reactor Water Cleanup System.~~

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27. Table 14.2-51, Reactor Protection System Test - Provide acceptance criteria for RPS channel response times that will assure that time lags associated with process-to-sensor input (e.g. sensing lines) are accounted for. Provide a description of the testing planned for RPS power supplies including devices that prevent over-and under-voltage and underfrequency conditions.

Response:

See revised Table 14.2-51. Time lags associated with process-to-sensor input are ~~[illegible]~~ analytically determined and are incorporated into RPS channel response times.

For Brent Clayton from R. D. Bishop

La Salle County Station.

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FSAR Revision
May 30, 1979

TABLE 14.2-51

REACTOR PROTECTION SYSTEM PREOPERATIONAL TEST

PT-RP101

TEST OBJECTIVES

1. The reactor protection system (RPS) preoperational test demonstrates the capability of the RPS to initiate a scram signal in conformance to system design. Additionally, a test is performed to demonstrate RPS response to motor-generator (MG) set coastdown. A scram response time test is performed for each RPS sensor.

SYSTEM INITIAL CONDITIONS AND PREREQUISITES

1. All construction tests are completed and approved.

2. Verify instruments within the RPS boundary have been calibrated.

3. Reactor manual control and CRD hydraulic systems are operational before scram testing.

4. A-c and d-c electrical power is available.

5. RPS MG sets are in service.

SAFETY PRECAUTIONS

1. Verify that all safety and constuction tags have been removed from all equipment to be operated or energized.

2. Ensure that adequate electrical safety precautions are observed while working on energized equipment.

TEST PROCEDURE

1. Verify proper operation of the modified RPS MG sets.

b. undervoltage, overvoltage,
c. Switching operations.

2. Verify all RPS sensor logic systems and scram relay operation.

3. All scram reset time delay operations are demonstrated.

4. Demonstrate the ability of the system to scram the reactor within a specific time.

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TABLE 14.2-51 (Cont'd)

5. Verify proper operation of the annunciators and alarms.

6. Verify proper system operation from normal and alternate power supplies and during switching transients.

ACCEPTANCE CRITERIA

1. RPS MG sets operate in accordance with design.

2. All system logic functions, interlocks, and time delay functions are within design tolerances.

3. RPS responds correctly to simulated scram condition input signals and annunciator and indicating systems function properly.

4. ~~RPS Response Times~~ are ~~will be verified within the limits prescribed by of Chapter 16, Table 3.3.1-2.~~ ~~Reactor scram times are within design limits.~~

5. Power supply switching and interlocks function properly.

4. ~~Reactor scram times~~ RPS channel response times are within design limits, with time lags associated with process-to-sensor input included.

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31. Table 14.2-88. Turbine Electrohydraulic Control System - Provide acceptance criteria for response times of turbine control and bypass valves.

Response:

~~The upper bound on the time from start if valve motion to close is 0.16 sec. for the control valves and 0.30 sec. for the bypass valves.~~

See revised Table 14.2-88.

TABLE 14.2-58

TURBINE ELECTROHYDRAULIC CONTROL SYSTEM DEMONSTRATION

SD-EH101

TEST OBJECTIVES

1. The objective of the turbine electrohydraulic control test is to demonstrate the reliable operation of the system to the extent possible without reactor steam.

SYSTEM INITIAL CONDITIONS AND PREREQUISITES

1. All construction tests are completed and approved.

2. Electrical power is available to motors, control circuits, and instrumentation.

3. Turbine building closed cooling water system is operational.

4. Reactor protection system functional.

5. Instrument calibration check sheets complete.

SAFETY PRECAUTIONS

1. All safety and construction tags are removed from equipment to be operated.

2. Ensure that adequate electrical precautions are followed when working on energized equipment.

3. Ensure that main steamlines are vented before opening main steam stop valves and control valves.

TEST PROCEDURE

1. All controls, alarms and interlocks are checked for proper operation.

2. The EHC fluid system is verified to operate properly.

3. Remote-operated valves are checked for proper operation.

4. EHC controlling function is verified using simulated input signals.

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TABLE 14.2-88 (Cont'd)

5. Sensor input signals to RPS ~~will be~~ are verified to function per design.
6. The turbine control, stop and bypass valves response times are verified to be consistent with accident analysis assumptions.

ACCEPTANCE CRITERIA

1. The turbine EHC system, including associated interlocks, trips and instrumentation, performs in accordance with design.

2. All RPS inputs function according to design.

3. All alarms and annunciators function in accordance with design.

35. Table 14.2-112, Reactor Core Isolation Cooling System Startup Test - The acceptance criteria in the test abstract should be modified to provide assurance of a reliable system. It is our position that an acceptance criterion of at least five consecutive successful cold starts be established for the test.

Response:

~~Did the NRC accept our response to Q-423.28? We do not intend to establish an acceptance criterion of 5 consecutive successful cold starts.~~

See revised Table 14.2-112.

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TABLE 14.2-112

REACTOR CORE ISOLATION COOLING SYSTEM STARTUP TEST

PURPOSE

To verify the proper operation of the Reactor Core Isolation Cooling (RCIC) system over its expected operating pressure range.

DESCRIPTION

see INSERT on following page

~~The RCIC system test consists of two parts: injection to the condensate storage tank; and injection to the reactor vessel. The CST injections consist of controlled and quick starts at reactor pressure ranging from 150 psig to rated, with corresponding pump discharge pressures throttled between 250 psig and 100 psi above rated reactor pressure. During this part of the testing, proper operation of the system will be verified and adjustments made as required to meet this criteria. A cold quick start and 2 hours of continuous operation will be demonstrated. A cold quick start requires a minimum of 3 days of no RCIC operation. The reactor vessel injection will consist of a cold quick start of the system with all flow routed to the reactor vessel at 20% to 25% power.~~

ACCEPTANCE CRITERIA

Level 1

a. The average pump discharge flow must be equal to or greater than the 100% rated value after 30 seconds have elapsed from initiation on auto starts at any reactor pressure between 150 psig and rated.

b. With pump discharge at any pressure between 250 psig and 100 psig above rated reactor pressure, the required flow is 600 gpm. (The 100 psig is a conservatively high value for line losses; the measured value may be used if available.)

c. The RCIC turbine shall not trip on overspeed during auto or manual starts.

If any Level 1 criteria are not met, the reactor will be allowed to operate only up to a restricted power level, until the problem is solved.

Level 2

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a. The turbine gland seal condenser system shall be capable of preventing steam leakage to the atmosphere.

To Grand [illegible] B.B. [illegible] Station

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Description

The RCIC system test consists of two manual starts, two hot quick starts, and five cold quick starts. The two manual starts and the two hot quick starts are condensate storage tank, CST, injections performed during the first reactor heatup.
One of the manual starts and one of the hot quick starts will be performed with the reactor dome pressure at 150 psi. The other manual and hot quick starts will be performed at rated reactor pressure. The pump discharge pressure during the above manual and hot starts will be throttled to 100 psi above the reactor pressure. This initial testing is performed to demonstrate operability and to make initial controller adjustments.

The two manual and two hot quick starts are followed by the first vessel injection beginning with cold RCIC hardware. ("Cold" being defined as a minimum of three days without any kind of RCIC operation.) Two additional vessel injections starting from cold RCIC conditions and with the same controller settings as determined during the first vessel injection will be performed. [illegible]

to exceeding 25 percent of rated thermal power. One of these injections will be done using the controllers at the remote shutdown panel. The vessel injections are performed to verify the adequacy of the startup transient and to make steady state controller adjustments.

After the final controller settings are determined two CST injections are done ~~with~~ from cold RCIC conditions. One CST injection is done with the ~~vess~~ reactor vessel dome pressure at 150 psi and the other with the vessel pressure at rated. These two cold starts provide a benchmark for future surveillance testing.

A demonstration of extended operation of up to two hours of continuous running is scheduled at a convenient time during the test program.

During vessel injections all reactor steam admission valves of the main and feedwater turbines are closed whenever the reactor power is above the moisture carryover threshold.

36. Table 14.2-120, Feedwater Control System Startup Test - The Level I acceptance criterion for MCPR is unrelated to the actual test case. The acceptance criterion should be modified such that the MCPR determined from actual test results will be compared to a predicted MCPR for the actual test case.

Response:

The loss of feedwater heating test has a heat flux criterion that is adjusted to the initial reactor power and the actual change in feedwater temperature. This criterion is a directly measurable quantity as are the parameters used to adjust it to actual reactor conditions.

The simulation input parameters along with the necessary parametric information will be included in the Transient Safety Analysis Design Report (MPL-A42-5010). ~~This report is docketed with the NRC. Any questions that they might have are therefore somewhat premature. The~~ is document provides peak heat flux ~~is given~~ as a function of initial power, initial dome pressure, and the feedwater temperature drop. The predicted heat flux rise is then determined by applying the initial power, initial dome pressure, and actual temperature drop correction factors to the base case calculation.

There would be no improvement in the understanding of the test results by adding a criterion that is based on a correlation of reactor parameters. Such an approach would just cloud the basis of the criterion and confuse its interpretation by inserting a correlation in place of test data. (It should also be noted that each core location would have a different beginning and end point). It scarcely needs to be stated that an evaluation of the thermal limits before and after the test would be adequate for monitoring MCPR. ~~If there are questions regarding MCPR behavior they should address either the correlation itself or its operational applicability.~~

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37. Table 14.2-122, Main Steam Isolation Valves Startup Test - The proposed power level (> 75 percent) for conducting the full MSIV closure test is not acceptable and should be changed to 100 percent. Also, the method for computing valve closure times by extrapolation needs to be justified and related to accident analysis assumptions. The acceptance criteria for the test should also be provided, as requested, along with the required degree of convergence between predicted results and actual results and the bases given for the degree of convergence.

Response:

The proposed power level has been changed to > 95%. See the modified Table 14.2-122.

The determination of the MSIV closure times will use an extrapolation from the position lights. The closure time is $1\frac{1}{9}$ times the time between the initiation signal and the time when the open light deenergizes.

$$T = T_{90} + \frac{1}{9}(T_{90}).$$

T = MSIV closure time.

T_{90} = Time to 90% closed.

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From: R. D. Bishop, LaSalle Cty. Station (4 pgs)
sent 7/18/79

39. Table 14.2-124, Turbine Stop Valve Trip and Generator Load Rejection Startup Test - The method of initiating the generator load rejection test is not clear. It is the staff's position that the method should be to initiate the trip in such a way that the maximum credible overspeed condition will occur. The requested information on the required degree of convergence of actual and predicted test results and their bases has not yet been provided. The acceptance criteria for the test should be expanded to address: 1) response times of turbine stop, control, bypass, reheat and intercept valves, 2) response time of recirc pump trips from turbine trip and generator load reject events, 3) the acceptance criterion referencing the flow coastdown curve specified in Figure 14.2-7 does not appear to be compatible with flow coast down assumptions (minimum pump inertia) used for LOCA analysis, 4) turbine overspeed for the generator trip and 5) response of the plant's electrical system for both turbine trip and generator load reject events. Also, the abstract should be modified to identify the hardware where worst case design or technical specification values will be used in predicting the outcome of the test and justification provided.

Response:

The generator load reject will be initiated by opening the generator output circuit breakers. This will result in the instantaneous disconnection of the generator from its load and will cause the worst possible overspeed condition.

~~The questions relating to response times will not be addressed in the abstracts to a greater degree than they already are. The following responses are provided to help clarify this position.~~

INSERT B

1. ~~Current criteria of Test 27 includes a requirement for bypass valve closure time. Although both turbine stop and control valve motion are normally monitored during the trip special arrangements would have to be made to insure that the resolution will be adequate for valve timing. An upper bound on the time from the start of valve motion to close is 0.21 sec. for the control valves and 0.19 sec. for the stop valves. Monitoring reheat and intercept valves would require additional cable pulls and signal conditioning equipment. The monitoring of TSV, TCV, IV, and reheat valves speeds has never been considered necessary to fulfill the purpose of those reactor startup tests involving the turbine generator. Such fine structure in the reactor response can be expanded indefinitely without any real gain in system understanding. If confirmation of specified turbine-generator performance is desired then this should be directly addressed as in time separate from the reactor startup testing.~~

2. ~~The response of the recirculation drive flow to an RPT event is provided as a criterion in~~ Table 14.2-127 ~~This test includes a simulation of a turbine trip initiated RPT to check out the coastdown prior to the first actual turbine trip.~~

The response time for the RPT recirc pump trips is illustrated by the horizontal portion of Figure 14.2-7 (≈ 0.141 sec). This response time is already included in the test acceptance criteria of Table 14.2-124.

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1. Responce times of the turbine stop and control valves was verified to be consistent with the accident analysis in the Turbine Electrohydraulic Control System Demonstration, SD-EH-101 (Table 14.2-88). Level 1 acceptance criteria for bypass valve response time are included in Table 14.2-124.

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See revised Table 14.2-124.

3. ~~The question regarding the min. pump inertia curve is still being researched.~~

   See revised Table 14.2-124.

4. ~~Turbine overspeed criteria are still being studied.~~

   See revised Table 14.2-124.

5. ~~There are preoperational tests to demonstrate successful electrical transfers. The startup test primarily focuses on demonstrating that a transient can be handled by the operator.~~

Both the generator load rejection and the turbine trip test predictions are parameterized in initial power, initial dome pressure, scram delays, and scram reactivity insertion rate. ~~This information is contained in the Transient Safety Analysis Design Report.~~

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TABLE 14.2-124

TURBINE STOP VALVE TRIP AND GENERATOR LOAD REJECTIONS

STARTUP TEST

PURPOSE

To demonstrate the response of the reactor and its control systems to protective trips in the turbine and generator.

DESCRIPTION

The turbine stop valves are tripped at selected reactor power levels. The main generator load rejection will be initiated in such a way that a load imbalance trip occurs. Several reactor and turbine operating parameters will be monitored to evaluate the response of the bypass valves, relief valves, RPS, and the reactor recirculation system during the subject transients. Additionally, reactor pressure, simulated heat flux, and reactor power will be monitored to determine the peak values of each of these parameters during both the turbine and generator trips. The ability to ride through a load rejection within the bypass capacity without a scram will be demonstrated.

ACCEPTANCE CRITERIA

Level 1

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R.D. Bishop
LaSalle Cty. Station

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TABLE 14.2-124 (Cont'd)

a. Feedwater system settings must prevent flooding of the steamline following these transients.

b. The two recirculation pump drive flow coastdown transient during the first 3 seconds must be equal to or faster than that specified in Figure 14.2-7.

INSERT-A

c. ~~d.~~ The positive change in vessel dome pressure occurring within 30 seconds after either generator or turbine trip must not exceed the Level 2 criteria by more than 25 psi.

The positive change in simulated heat flux shall not exceed the Level 2 criteria by more than 2% of rated value.

d. ~~e.~~ For turbine and generator trips there should be a delay of less than 0.1 second following the beginning of control or stop valve closure before the beginning of bypass valve opening. The bypass valves should be opened to a point corresponding to approximately 80% of their capacity within an additional 0.2 second (or an elasped total of 0.3 second from the beginning of turbine control valve or turbine stop valve closure motion).

f. Turbine speed does not reach the point where a mechanical overspeed turbine trip would occur.

Level 2

a. The MSIV's shall not be tripped closed at any time during the test transients.

b. The positive change in vessel dome pressure and in simulated heat flux which occurs within the first 30 seconds after the initiation of either generator or turbine trip must not exceed the predicted values.

Predicted values will be referenced to actual test conditions of initial power level and dome pressure and will use BOL (beginning of life) nuclear data. Worst case design or technical specification values of all hardware performance shall be used in the prediction, with the exception of control rod insertion time and the delay from beginning of turbine control valve or stop valve motion to the generation of the scram signal. The predicted pressure and heat flux will be corrected for the actual measured values of these two parameters.

INSERT A

c. Electrical load transfers occur as designed.

d.

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[illegible]

INSERT A

If the level 1 criteria for the two recirculation pump drive flow coastdown transient is passed, the data shall be analyzed within two weeks ~~to ensure~~ for compatibility with the safety analysis.

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40. Table 14.2-127, Recirculation System Startup Test - The test abstract should be modified to clarify how 1) "It will be verified that limits are sufficient to prevent operation where recirculation pump or jet pump cavitation occurs." 2) The Level 1 acceptance criteria should be modified to account for LOCA flow coastdown assumption. 3) Acceptance criteria should be established to preclude operation with cavitation of recirculation pumps, jet pumps and control valves. 4) Acceptance criteria for transfer from $60H_z$ to 15 Hz power supplies should be established in terms of allowable range of pump speed when the transfer occurs.

Response:

1. Plant instrumentation (jet pump and recirc. pump dP) will be closely monitored during the power reduction described in revised Table 14.2-127. ~~included in Am 44.~~ Flow control valve and jet pump cavitation will show up as a significant increase in the noise level of the jet pump dP instrumentation and recirc pump cavitation will result in similar observations on recirc pump dP instrumenation.

2. See revised Table 14.2-127. ~~The question regarding min. pump inertia is still being studied.~~

3. See revised Table 14.2-127. ~~included in Am. 44.~~

4. The purpose of the 60Hz to 15Hz power supply transfer is to reduce power and flow before the reactor enters the cavitation region of the power-flow map. The successful demonstration that cavitation does not occure prior to this transfer ensures the adequacy of the transfer setpoint. Further, the power supply transfer setpoints are verifed to be in accordance with design during the feedwater control preoperational test. No additional acceptance criteria are necessary.

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TABLE 14.2-127

RECIRCULATION SYSTEM STARTUP TEST

PURPOSE

The purposes of this test are (1) to obtain recirculation system performance data under different operational conditions, such as pump trip, flow coastdown, pump restart and flow induced vibration; (2) to verify that no recirculation system cavitation will occur in the operable region of the power-flow map; (3) to verify that, during the trip of one recirculation pump, the feedwater control system can satisfactorily control water level without a resulting turbine trip/scram; and (4) to record and verify acceptable performance of recirculation two pump circuit trip system.

DESCRIPTION

The reactor coolant recirculation system consists of the reactor vessel and two piping loops. Each loop contains a constant speed centrifugal recirculation pump, a flow control valve, and two isolation valves located in the drywell and ten jet pumps in parallel, situated in the reactor downcomer region. Each recirculation pump takes suction from the reactor downcomer and discharges through a manifold system to the nozzles of the ten jet pumps. Here the flow is agumented by suction flow from the downcomer and delivered to the reactor inlet plenum.

Recirculation pump trips have several different effects upon the reactor. In case of higher power turbine or generator trips, there is an automatic opening of circuit breakers in the pump power supply. The result is a fast core flow coastdown that helps reduce peak neutron and heat flux in such events. This two-pump-trip test, initiated by a simulated turbine-generator trip, verifies that this flow coastdown is satisfactory prior to the high power turbine/generator trip tests and subsequent operation.

A potential threat to plant availability is the high water level turbine trip scram caused by the level upswell that results after an unexpected recirculation one-pump trip. The change in core flow and the resultant power decrease causes void formation which the level sensing system senses as a rise in water level. The one-pump tests, initiated by opening the drive motor breaker from the control room, are to prove that the water level will not rise enough to threaten a high level trip of the main turbine or the feedwater pumps.

Both the jet pumps and the recirculation pumps will cavitate at conditions of high flow and low power where NPSH demands are high and little feedwater subcooling occurs. However, the recirculation flow will automatically run back upon sensing a

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TABLE 14.2-127 (Cont'd)

decrease in feedwater flow, to lower the reactor power. This runback is accomplished by a transfer of recirculation pump power supplies from 60 Hz to 15 Hz. The maximum recirculation flow is limited by appropriate stops which will run back the recirculation flow away from the possible cavitation region. It will be verified that these limits are sufficient to prevent operation where recirculation pump or jet pump cavitation occurs by reducing core power via control rod insertion on the rod control line expected to give 100% core flow at approximately 50% power until recirculation system runback occurs or cavitation is observed.

ACCEPTANCE CRITERIA

Level 1

The two pump drive flow coastdown transient during the first 3 seconds must be equal to or faster than that specified in Figure 14.2-7.

Level 2

a. The water level, APRM and transients of simulated heat flux, pressure drive and core flow shall not exceed those ~~significantly deviate from that~~ predicted in the Control System Design Report for the one pump trip. (The Control System Design Report provides transient responses based on a range of initial conditions).

b. The reactor water level margin to avoid a high level trip shall be ≥ 3.0 inches during the one pump trip.

c. The simulated heat flux margin to avoid a scram will be ≥ 5.0% during the one pump trip.

d. The recirculation system setback runback feature shall be adjusted such that a flow runback (transfer of recirculation pump power supplies from 60 Hz to 15 Hz) occurs prior to any observable cavitation in the recirculation system.

INSERT A

e.

INITIAL CONDITIONS

1. Construction tests and preoperational tests are complete and approved.

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INSERT A to Tables 14.2-124 and 14.2-127

If the level 1 criterion for the two recirculation pump drive flow coastdown transient is passed, the data shall be analyzed within two weeks ~~to determine~~ for compatibility with the safety analysis.

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TABLE 14.2-127 (Cont'd)

2. Verify that instruments within the primary pressure boundary have been calibrated.

3. The reactor protection system is operational.

4. All systems are operational to the extent required to conduct tests.

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41. Table 14.2-128, Loss of Turbine Generator and Offsite Power Startup Test - The abstract should be modified to address the following: 1) The duration of time that the entire non-class 1E a.c. power distribution system will remain deenergized following initiation of the test, 2) Acceptance criteria should be established for the onsite emergency power system and diesel generators, 3) Acceptance criteria for reactor scram (initiating cause and response time) should be established, and 4) Acceptance criteria should be established for control of process variables including reactor level and reactor pressure to assure that decay heat removal capacity is demonstrated.

Response:

1. During the loss of offsite power test the plant will remain isolated from the grid until control of vessel level and pressure have been demonstrated or for 30 minutes, whichever is greater (Control of vessel level and pressure is defined as vessel level maintained by operator action above the automatic initiation setpoint of the ECCS systems and pressure maintained by operator action below the lowest relief valve setpoint). During this time, non-class 1E loads may be supplied by the onsite emergency power system as required subject to the availability of diesel generator capacity.

   Data taking for this test will begin when the unit is isolated from the grid and will continue until the plant loads are returned to the grid.

2. The performance of the onsite emergency power system including bus transfers, diesel starts and load shedding and sequencing is checked in the Emergency Power Redundancy Preoperational Test (See Table 14.2-4) during simulated loss of offsite power and LOCA tests. The demonstration of compliance with the second Level 1 criterion of revised Table 14.2-128, included in Am. 44, provides additional assurance of satisfactory overall performance of the onsite emergency power system and diesel generators.

3. The most probable cause of the reactor scram is the loss of AC power to the leak detection system. This will cause a main steam line isolation which, in turn, will cause a scram on MSIV's $<$ 90% open. These events are expected to occur within the first several seconds following the initiation of the test. Since this test is basicly a verification of overall electrical distribution system performance and reactor transient performance with a minimum of supporting systems, the time in question has no significance in accomplishing the test objectives. Therefore, no acceptance criteria has been established for this parameter.

4. ~~Decay heat removal capability of the RHR system is demonstrated in startup test 21, RHR System startup test. At higher reactor pressure, decay heat removal is accomplished by a combination of relief valve actuation and RCIC system operation. Startup tests 20, Relief Valves and 14, RCIC system, demonstrate the abilities of these systems to function as designed. No additional criteria is required.~~

See revised Table 14.2-128.

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TABLE 14.2-118

CORE POWER-VOID MODE RESPONSE STARTUP TEST

PURPOSE

The purpose of this test is to measure the stability of the core power-void dynamic response and to demonstrate that its behavior is within specified limits.

DESCRIPTION

The core power-void mode that results from a combination of the neutron kinetics and core thermal-hydraulics is least stable near the natural circulation end of the 100% power rod line. Stability at this point will be investigated by making rapid reactivity changes using control rod notching and pressure regulator manipulation (simulated regulator failure to back up). Notching even a strong control rod is expected to produce only small effects while, the pressure regulator should produce more significant disturbances. The pressure regulator manipulation will be done as part of the pressure regulator startup test, but recording and analysis requirements of both this test and the pressure regulator startup test must be accomplished for satisfactory completion of this test.

ACCEPTANCE CRITERIA

Level 1

The decay ratio must be less than 1.0 for each process variable that exhibits oscillatory response. ~~to control rod movement.~~

Level 2

~~Not applicable.~~

The decay ratio must be less than or equal to 0.25 for each total core process variable that exhibits oscillatory response when the plant is operating above the lower limit setting of the Master Flow Controller.

595 079

46. Q 423.25 - Your response did not provide acceptance criteria for control rod buffer performance. Provide the requested information.

Response:

~~The control rod drives for BWR/5 such as utilized for buffer performance at LSCS do not have acceptance criteria. Control rod drive buffer times will be measured for information only. See revised Table 14.2-48.~~

Control rod drive buffer times are verified to be within design limits in the Control Rod Drive Hydraulic System Preoperational Test, PT-RD-102. See revised Table 14.2-48.

POOR ORIGINAL

595 080

TABLE 14.2-34

DIESEL-GENERATORS AND AUXILIARIES PREOPERATIONAL TEST

PT-DG101

TEST OBJECTIVES

1. Demonstrate the reliability of the standby diesels and HPCS diesel and a-c power source.

2. Provide assurance that the diesels are capable of providing emergency electrical power during normal and simulated accident conditions.

3. Diesel testing will demonstrate the proper startup operation by simulating all automatic start signals and demonstrate that the diesel-generator unit can start automatically and attain the design voltage and speed within the acceptable time and limitations.

4. The diesel generators will be tested to demonstrate the full load carrying capability for an interval of 24 hours of which 22 hours will be at full load (2600 kW) and 2 hours at the 2 hour rating (2860 kW).

5. The diesel shall be load-shed tested at full load as well as the largest single load to verify the diesel voltage and speed requirements are within acceptable limitations and overspeed limits are not exceeded.

6. The diesel generators will be tested to demonstrate their functional capability at full load temperature conditions by rerunning the tests in item ~~8~~ 3 above immediately following item ~~7~~ 4 above.

7. The diesel-generator testing will demonstrate the ability to (a) synchronize the diesel-generator unit with offsite power while the diesel generator is connected to the emergency load, (b) transfer the load to offsite power, (c) isolate the diesel-generator unit, and (d) restore the diesel generator to standby status.

8. The test will demonstrate the capability of the diesel-generator unit to supply emergency power within the required time and that this will not be impaired during periodic testing.

TABLE 14.2-34 (Cont'd)

9. The test will demonstrate that all diesel generators will function independently when started simultaneously. This test will be performed once during preoperational testing to help identify certain common failure modes undetected in a single diesel-generator unit test.

10. The start, stop, and protective circuit logic, the air receiver changing times, and system redundancy will be verified for the diesel-generator air starting system. The test procedure will also verify that the diesel-generator air starting system provides the proper number of starts on each system.

11. Load rejection tests shall be conducted to assure continuous diesel operation during accident or loss of normal power conditions.

12. Testing of droop settings shall be conducted on standby diesel generators. Droop settings are to be made during this test. Verification shall show the diesel generators operability to carry full load at the droop settings.

13. The required reliability of each diesel-generator unit* will be demonstrated with a minimum of 23 consecutive valid tests with no failures (valid tests and failures as defined by Regulatory Guide 1.108 Section C.2.e).

*Other than the Unit 1, HPCS diesel generator whose reliability was established at LSCS via the Vendor's Qualification Prototype Test.

SYSTEM INITIAL CONDITIONS AND PREREQUISITES

1. All construction tests are completed and approved.

2. All instrument calibration sheets are completed and approved.

3. The following systems and/or components are available:

   a. diesel fuel oil day tanks,

   b. diesel fuel transfer system,

   c. fire protection system in DG room,

   d. diesel ventilation system,

   e. CSCS Equipment Cooling Water,

   f. diesel air start system, and

595 032

TABLE 14.2-34 (Cont'd)

g. electrical power to motors, fans, etc.

SAFETY PRECAUTIONS

1. Verify that all mechanical systems are operational.

2. Verify that all safety and construction tags are removed from the equipment to be operated.

3. Prior to the operation of the diesel verify that all vendor precautions have been satisfied.

4. Established electrical safety procedures should be adhered to when working with energized equipment.

TEST PROCEDURE

1. The test procedure will assure that the system will operate according to design.

2. All diesel starting and trips will be tested to assure proper operation.

3. All diesel-generator auxiliary systems will be tested to demonstrate that they operate within design limits.

4. Demonstrate the manual and automatic operation of the diesel generator.

5. All interlocks, controls, and alarms operate in accordance with design.

ACCEPTANCE CRITERIA

1. Acceptance criteria will ensure that system construction and operation will meet design.

2. All auxiliary systems function in accordance with design.

Note: This preoperational test also applies to the HPCS diesel as an emergency power generator for the HPCS pump except where specifically excluded.

595 003