ILLINOIS POWER COMPANY

PROGRAM FOR COMPLIANCE WITH
TMI ACTION PLAN ITEM I.G.1
TRAINING DURING LOW POWER TESTING

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Program for Compliance with TMI Action Plan Item I.G.1 Training During Low Power Testing

INTRODUCTION:

The Clinton Power Station (CPS) FSAR Appendix D, Item I.G.1 concerning Training During Low Power Testing makes the following commitment:

> "A Low-Power Test Training Program will be finalized six months prior to fuel load. The program will be developed using the guidelines in the report "BWR Owners Group Program for Compliance with NUREG-0737, Item I.G.1, Training During Low Power Testing" transmitted to the NRC via a letter to D. G. Eisenhut, Director of Licensing, from D. B. Waters, Chairman-BWR Owners' group, dated February 4, 1981. All licensed personnel and license candidates will participate in this training prior to full-power operation."

The BWR Owners' Group Program referenced above is divided into 5 sections as follows:

- I - Preoperational Testing
- II - Cold Functional Testing
- III - Hot Functional Testing
- IV - Startup Testing
- V - Additional Training and Testing

The first four sections briefly discuss the typical BWR test program and changes that can be made to improve the training benefit. The last section contains new testing proposed to provide meaningful technical information and enhance training.

The remainder of this paper consists of a comparison of the BWR Owners' Group Program to the Clinton Power Station Program. The following sections are taken verbatim from the BWR Owners' Program. After each quoted section the corresponding portion of the Illinois Power Company program will be discussed for comparison. The appendices of the BWROG Program are also included in the comparison format.

PROGRAM COMPARISONS:

I. PREOPERATIONAL TESTING

BWR OWNERS' GROUP PROGRAM:

> "Following completion of construction tests preoperational tests are performed. The purpose of the preoperational test program is to verify that the performance of plant systems meet design and operational requirements. System components are tested, logic checks are performed, and sensor setpoints are verified. The system is then tested as a whole. The preoperational test program serves a two-fold purpose. Primarily, it controls and documents the preoperational test effort. A secondary benefit of the program is that during the test phase, a detailed knowledge of the systems and their performance characteristics will be obtained by the plant operating group.

Preoperational tests are performed on, as a minimum, any system whose operation is safety related. Plant operating personnel will obtain hands on experience for testing of these systems thereby helping to satisfy the training concerns of NUREGs 0660 and 0694. Many system tests will be conducted as part of these preoperational tests which readily lend themselves to operator training. The Integrated ECCS with loss of AC and DC power test is one of the more significant tests performed during the preoperational test phase which significantly supports operator training. Appendix A describes this test.

To enhance the training benefit of this test future Integrated ECCS testing will be scheduled so that each shift will participate in at least one of these tests to obtain training. Operators obtain an appreciation and feel for control room and plant conditions/ limitations and will be required to resolve operational problems associated with the loss of emergency battery and diesel generators during a time when emergency equipment is required to operate."

ILLINOIS POWER COMPANY PROGRAM:

Preoperational tests are performed at Clinton Power Station and meet the intent of the description and objectives of the BWROG program discussed above. These tests are described in the CPS FSAR subsection 14.2.12.1. These descriptions include details on the preoperational test objectives, prerequisites, initial conditions, procedures and acceptance criteria for each system requiring testing. The preoperational tests at the Clinton Power Station are performed on systems or subsystems that are designed to perform nuclear safety functions. These tests are conducted by personnel from the Illinois Power Company startup organization, but the testing usually involves the participation of plant operations personnel. In this way, plant operating personnel can obtain hands on experience with these systems thereby helping to satisfy the training requirements of NUREGs 0660 and 0694.

One of the preoperational tests performed at CPS is a Loss of Off-Site Power/Integrated ECCS test. The details of this test can be found in FSAR subsection 14.2.12.1.40 and are compared to the BWROG program in Appendix A.

Because the Loss of Off-Site Power/Integrated ECCS test will be performed three times, each time allowing only one diesel generator to start, it can be scheduled so that each shift will participate in at least one of these tests to obtain training. Participation in this test by each licensed operations person will be documented per

Nuclear Training Department procedure number 2.7, "Initial Test Program Training." This procedure describes the specific training exercise and methods of documentation for all licensed operations personnel who participate in the initial test program at Clinton Power Station. This procedure will ensure that all licensed operations personnel will become familiar with CPS plant systems response and limitations. For those individuals unable to participate in the test, the training requirement for these individuals will be met by reviewing the test results.

II. COLD FUNCTIONAL TESTING

BWR OWNERS' GROUP PROGRAM:

"Cold Functional Tests are performed on a Plant for several reasons. Some of the more important reasons are as follows:

A. Assure that plant systems are available to support fuel loading.

B. Assure that shift personnel have operating experience with plant equipment.

C. Assure that certain plant operating procedures and surveillance procedures have been tried and are usable.

D. Assure that each shift has functioned together to operate the plant systems on an integrated basis.

E. Assure that specified plant equipment has been tested and the plant and personnel are ready for fuel loading.

The Cold Functional Tests are performed using plant procedures and are controlled and documented by use of checklists. The checklist provides a signoff sheet to assure that each shift has received training and experience on specified systems. Typically, a designated shift supervisory person will be responsible to ensure, by signing the checklist, that their shift has performed the operation specified. Typical systems to be included and an example of a typical checklist are found in Appendix B.

Present testing plans will be reviewed and upgraded, as necessary, to obtain documentation and testing scope for the operator training effort."

ILLINOIS POWER COMPANY PROGRAM:

Illinois Power Company does not perform a specific series of tests called cold functional tests; however, the scope of the CPS preoperational test program includes those items identified in the scope of the BWROG program for cold functional testing. The CPS preoperational tests assure that plant systems are available to support fuel loading and provide the shift personnel with plant equipment operating experience. The preoperational test procedures will provide indication that appropriate plant operating procedures are usable. Since the shift operating personnel participate in preoperational testing, it will be assured that each shift has functioned together to operate the plant systems on an integrated basis. The testing will also assure that specified plant equipment has been tested and the plant and personnel are ready for fuel loading.

The training requirements intended for the cold functional tests will be satisfied by Nuclear Training Department procedure number 2.7 "Initial Test Program Training" and CPS Administrative Procedure number 1402.02, "Nonlicensed Training". These procedures contain the checklists which will be used to control and document this training. Procedure 2.7 contains the details specifically related to training during preoperational testing, while administrative procedure 1402.02, required for licensed as well as nonlicensed operations personnel, involves reviews of system theory, system operating procedures and often involves the performance of practical factors such as system valve and electrical lineups. The typical systems and checklist found in the BWROG program Appendix B are compared with the Illinois Power Company program in Appendix B of this report.

III. HOT FUNCTIONAL TESTING

BWR OWNERS' GROUP PROGRAM:

"Hot Functional Tests are performed to assure that insofar as possible the system, procedures, and personnel are ready for operation at various power levels. This verification is done by operating systems in an integrated fashion at operating temperatures and pressures at the earliest opportunity for meaningful checks.

The Hot Functional Tests cover those areas of the Plant systems which are not tested by the Startup Test Procedures, but where it is felt that additional data over and above the Cold Functional Tests is beneficial.

Typically, the Hot Functional Tests will begin after fuel is loaded when nuclear heat is available. The Startup provides three phases which offer Hot Functional Test opportunities. These phases are listed below:

A. During heatup from ambient and 0 psig to rated temperature and pressure.

B. After increase from rated temperature and pressure to 30 percent power.

C. From 30 percent to 100 percent power.

The Hot Functional Tests are not intended to replace any of the startup test procedures, although there are portions which will be conducted simultaneously.

Those systems whose environment does not change during ascension to rated temperature and pressure will not receive additional testing.

Typical examples of tests, checks, and signoffs to be performed on systems are listed in Appendix C.

During the performance of this testing an Operations Supervisor shall cause a review to be performed of the Control Room copy of the procedures manual to ensure that changes are marked in the manual and with the required approvals as specified by the administrative procedures. He will additionally verify that personnel on each shift have been familiarized with the changes to procedures through the use of information acknowledgements.

Testing plans will be reviewed and upgraded, as necessary, to obtain sufficient documentation and testing scope for the operator training effort."

ILLINOIS POWER COMPANY PROGRAM:

Clinton Power Station does not have a specific group of tests that are called Hot Functional Tests. Clinton Power Station Preoperational, Startup and Acceptance Tests include tests that are similar to the tests identified in the BWROG Hot Functional Test program. These tests are described in CPS FSAR Section 14.2.12. Specific FSAR references are provided in the Illinois Power Company comparison contained in Appendix C.

If in the course of conducting Preoperational, Startup or Acceptance Tests inadequacies in the Plant Operating Procedures are discovered, changes to Plant Procedures will be initiated to correct the problem. This is usually done through issuance of a Temporary Change Form (TCF) to the Plant Procedure. The TCF is eventually incorporated in the Plant Procedure if the procedure requires a permanent change. CPS procedures are controlled documents. The controlled document system ensures that all copies of controlled documents are updated when revisions to the document occur. Changes to operations procedures are required to be reviewed by operations personnel.

IV. STARTUP TESTING

BWR OWNERS' GROUP PROGRAM:

"A typical startup test program is composed of phases characterized by differences in plant and test conditions. Startup tests are comprised of four phases which include fuel loading and subsequent tests.

1. Open Vessel Testing
2. Initial Heatup
3. Power Tests
4. Warranty Tests

Typical tests to be performed during open vessel, reactor heatup and power ascension are summarized in Figures 1 and 2 "(see Appendix D)".

The actual testing sequence will be determined at each site. The recommended normal testing sequence can be obtained from Figure 1: Start from the left side of the page and move to the right, completing each column of tests before proceeding to the next column (example - all open vessel tests should be completed before heatup tests are started). The notable exception is that testing at natural circulation on the 100% load line (Test Condition 4) will normally be done following pump trips from Test Condtion 6. The normal recommended sequence of tests in a column would be: 1) core performance analysis, 2) steady state testing, 3) control system tuning and 4) major trips. The actual testing sequence can vary from recommended test sequence due to equipment problems and other considerations.

Typical startup tests are described in the brief summaries of Appendix D. These tests were chosen from the tests listed in Figure 1 to provide insight into operator training obtained during this period.

The significant training related, startup tests will be balanced so that each operating shift will:

1. See at least one reactor scram transient.

2. See at least one pressure regulator transient.

3. See at least one turbine trip transient or load rejection.

4. Operate the RCIC (and if applicable HPCI) system.

5. See at least one water level setpoint transient.

The other testing will be balanced as much as practicable to ensure even exposure to testing for all operating shifts."

ILLINOIS POWER COMPANY PROGRAM:

Illinois Power Company Startup Tests are described in FSAR Section 14.2.12.2. FSAR references to typical Startup tests are included in the comparison to Appendix D. Each licensed operations person will be required to participate in tests that result in each of the following five events per Nuclear Training Department Procedure 2.7 "Initial Test Program Training":

1. Reactor Scram Transient

   Tests that result in this event are:

   a) Loss of Turbine Generator and off-site power at between 25% and 50% power.

   b) Remote Shutdown.

   c) Turbine Generator trip at 95% power.

   d) Full mainsteam line isolation at 75% power.

2. Turbine trip on Generator Load Reject

   Tests that result in this event are:

   a) Generator load reject at between 10% and 15% power.

   b) Turbine trip at between 50% and 75% power.

   c) Turbine or generator trip at 95% power.

3. Operation of the RCIC System

   Tests that result in this event are:

   a) Manual start with injection to the RCIC storage tank.

   b) Injection to the RCIC storage tank with step changes in flow.

   c) Injection to the RCIC storage tank for extended operation (2 hours) demonstration.

   d) Hot quick start with injection to the RCIC storage tank.

   e) Manual start with injection to the reactor vessel.

   f) Hot quick start with injection to the reactor vessel.

   g) Cold quick start with injection to the reactor vessel.

4. Pressure Regulator Transient

   This event occurs at numerous times during the startup test schedule.

5. Water Level Setpoint Transient

   This event occurs at numerous times during the startup test schedule.

Participation in these events will be documented per Nuclear Training Department procedure No. 2.7 "Initial Test Program Training." For those individuals unable to participate in a given event, the training requirement for the event can be met by reviewing test results.

The other testing will be balanced as much as practical to ensure even exposure to testing for all operating shifts.

V. ADDITIONAL TRAINING AND TESTING

BWR OWNERS' GROUP PROGRAM:

"Upgrading the training program for the presently defined test program will meet the training and testing intent of

the NUREG sections quoted in the INTRODUCTION section of this report. However, in response to information obtained at the 9/5/80 meeting held with the NRC and because of our efforts to provide as comprehensive a test program as possible several new tests will be added to the test program. These tests will provide additional technical information to aid in system and plant operational readiness evaluations. The tests will also provide some operator training. These tests will be performed once per plant and significant training information obtained will be transmitted to non-participating personnel via test critiques.

Appendix E contains test descriptions defining the scope of the tests to be added to the test programs. Each facility will write detailed procedures that will be prepared for individual plants within the scope of those descriptions."

ILLINOIS POWER COMPANY PROGRAM:

The tests from Appendix E of the BWROG program will be performed at CPS. Descriptions of these tests as they will be performed at CPS are provided in the comparison to Appendix E.

Reviews of test summaries of these tests by each licensed operations person will be added as a requirement of Nuclear Training Department Procedure No. 2.7, "Initial Test Program Training."

CONCLUSIONS

As illustrated in the above comparison, the testing program provides the necessary depth to ensure that the plant operating staff will obtain the maximum practical inplant training to assure that the licensed personnel will operate the station in a safe and competent manner and that all safety related systems are thoroughly tested. As identified in this report, the increased emphasis on operator training and the addition of new testing, when coupled with the present testing and training programs, adequately satisfies the requirements of I.G.1 and NUREGs 0660 and 0694.

APPENDIX A

COMPARISON OF BWR OWNERS' GROUP APPENDIX A TO THE ILLINOIS POWER COMPANY PROGRAM ON LOSS OF OFF-SITE POWER/INTEGRATED ECCS TESTING

BWR OWNERS' GROUP PROGRAM:

"Event: Integrated ECCS with Loss of AC & DC Power Test

The Integrated ECCS Test is performed to demonstrate the following:

A. If applicable, the capability of the startup transformer with interconnected buses and the station battery systems with interconnected buses to start all the core standby cooling systems.

B. The response of the diesel generators and interconnected equipment to a loss of off-site power (no loss of coolant).

C. The capability of the diesel generators with the load shedding logic to auto start and assume all their respective emergency core cooling loads under a loss of off site power, loss of coolant accident signal (LOCA).

D. The capability of the above systems to provide sufficient emergency core cooling equipment during LOCA conditions with "A" DC bus and associated emergency AC bus deenergized.

E. The capability of the above system to provide sufficient emergency core cooling equipment during LOCA conditions with "B" DC bus and associated AC bus deenergized.

F. The capability of the above systems to provide sufficient emergency core cooling equipment during LOCA conditions with each remaining individual emergency DC and associated emergency AC bus deenergized.

G. These tests are run for a sufficiently long period of time to verify proper separation between emergency power systems.

Typically, the following tests are performed:

1. Simulated LOCA (with offsite power available).

2. Loss of offsite power (LOSP) with simultaneous simulated LOCA.

3. LOSP with simultaneous simulated LOCA coincident with a loss of the "A" emergency DC battery system and associated emergency AC diesel generator.

4. LOSP with simultaneous simulated LOCA coincident with a loss of the "B" emergency DC battery system and associated emergency AC diesel generator.

5. Test 4 is repeated substituting each remaining emergency DC and associated emergency AC diesel generator for the "B" system until all systems are tested."

ILLINOIS POWER COMPANY PROGRAM:

CPS FSAR Subsection 14.2.12.1.40 describes the Loss of Off-Site Power/Integrated ECCS Test. The objectives of the test are as follows:

1. Demonstrate integrated AC system performance to simulated partial and full loss of off-site power.

2. Demonstrate independence among redundant on-site AC and DC power sources.

3. Verify voltage drop on system 1E buses down to the 120/208 level.

4. Demonstrate the ability of RHR/LPCI, LPCS and HPCS systems to realign, start and provide rated flow on integrated response to a simulated LOCA signal.

5. Demonstrate the ability of the diesel generators to maintain ECCS loads while they provide rated flow on integrated response to a simulated LOCA signal in conjunction with a loss of off-site power.

The test procedure is as follows:

1. Simulated partial and full loss of off-site power tests will be performed.

2. Independence between redundant class 1E power sources and load groups will be demonstrated by performing the loss of off-site power coincident with a LOCA signal three times, each time allowing only one diesel generator to start, and having only its associated DC system energized.

3. Load shedding will be demonstrated.

4. Re-energization sequencing and timing of ECCS loads will be verified.

5. Grid and Class 1E bus voltage down to the 120/208 volt level will be recorded at steady state, and during the starting of a large class 1E and non-class 1E load.

It can be seen that the CPS Loss of Off-Site Power/Integrated ECCS Test envelopes the Appendix A requirements of the BWROG program.

APPENDIX B

COMPARISON OF BWR OWNERS' GROUP APPENDIX B TO THE ILLINOIS POWER COMPANY PROGRAM ON PREOPERATIONAL TESTS AND DOCUMENTATION OF TRAINING RECEIVED DURING TESTING.

BWR OWNERS' GROUP PROGRAM:

"Typical Systems to be included as part of this program are:

Main Steam Systems

- Main Steam Isolation Valves
- Main Steam Relief Valves
- Turbine Seal and Steam Air Ejectors

Reactor Vessel & Auxiliary Systems

- Recirculation System
- Reactor Water Cleanup System
- Control Rod Drive System
- Reactor Vessel Level Instrumentation
- Standby Liquid Control
- Remote Shutdown System

ECCS System

- LPCS
- RHR (including LPCI, Shutdown Cooling, Suppression Pool Cooling and Suppression Pool Spray Modes)
- HPCI (if applicable)
- HPCS (if applicable)

Emergency Electrical System

- Diesel Generator, and Emergency Buses
- Emergency Batteries
- Vital AC System

Plant Support Systems

Service Water

Reactor Building Closed Cooling Water

Turbine Building Closed Cooling Water

Radwaste

Makeup Demineralizer

Fuel Pool Cooling

Demineralized Water Transfer and Storage

Condensate Transfer and Storage

Instrument and Service Air

Ventilation

Emergency Service Water

Circulating Water

System Training - Procedure and Experience Checks

System ______________________________

1) Shift foreman has conducted a review of the normal operating procedure with the shift personnel.
Procedure No. ______________________

2) The shift personnel have operated the system as specified below:

____

____

____

3) The shift foreman has conducted a review of the following emergency operating procedures:

Procedure No. ______________________

Procedure No. ______________________

Procedure No. ______________________

Procedure No. ______________________

4) The shift foreman has conducted oral examination of his shift personnel concerning the system and, in his judgement, the personnel have adequate knowledge of system operation.

5) Sign off of items 1, 2, 3, and 4.

Day shift____
SF Date

Evening shift____
SF Date

Midnight shift____"
SF Date

ILLINOIS POWER COMPANY PROGRAM:

Illinois Power Company does not perform a series of tests called cold functional tests. However, the systems tested under the CPS preoperational test program includes the systems listed under the BWROG cold functional tests.

The Illinois Power Company training for all licensed operating personnel includes extensive study of the plant normal and emergency operating procedures. The training program contained in CPS Procedure Number 1402.02 "Non-Licensed Training" is required for all licensed operating personnel and documents their training in the operating procedures. The emergency operating procedures are an integral part of the training for all licensed operations personnel. Training in the emergency operating procedures is documented through the Nuclear Training Department. This program accomplishes the intent of items 1, 3 and 4 in the BWROG program checklist.

Nuclear Training Department Procedure Number 2.7, "Initial Test Program Training", contains two forms to document the tests licensed operators participate in. The first form "Initial Test Program Qualification Card" is to be completed for each person participating in Preoperational and Startup testing as described in Sections I and IV. The tests that will be covered under this form are identified in Procedure Number 2.7. They include the integrated ECCS test and at least one reactor scram transient, one pressure regulator transient, one turbine trip transient or load rejection, one water level setpoint transient and operation of the RCIC system. The forms are signed at the completion of the testing by the Shift/Assistant Shift Supervisor. The second form will be used to document all other testing each shift participates in. The additional testing is intended to

be balanced as much as possible to ensure even exposure to testing by all operating shifts. All documentation shall include test procedure numbers to identify the procedure followed. By signing the Procedure Number 2.7 forms, the Shift/Assistant Shift Supervisor indicates the licensed individual has completed his system training during the testing program. These checklists meet the intent of items 2 and 5 of the BWROG program checklist.

APPENDIX C

COMPARISON OF BWR OWNERS' GROUP APPENDIX C TO THE ILLINOIS POWER COMPANY PROGRAM SYSTEMS, TESTS, CHECKS AND SIGNOFFS

BWR OWNERS' GROUP PROGRAM:

"DURING HEATUP FROM AMBIENT AND 0 PSIG TO RATED TEMPERATURE AND PRESSURE

SYSTEM	MODE OF OPERATION AND HOT FUNCTIONAL TESTS
CRD System	In continuous normal operation, check each fully withdrawn CRD for coupling as it is withdrawn. Observe temperatures are in limits. Observe for proper position indication. Record rod patterns.
Drywell Leakage Detection System	Monitor sump pump integrators which should be in continuous operation. Determine identified and unidentified leakage rates at 500 and 920 PSIG.
Drywell Temp. and Drywell Cooling	Both should be in continuous operation per procedure.
Process Radiation Monitors	In continuous operation. Check for response to increasing power levels.
Ventilation System	In continuous operation. Check that steam tunnel temperature is within temperature limits at rated temperature and pressure. Verify proper operation of leakage detection systems.
Turbine EHC Pressure Controls	Start heatup with controlling regulator set at 150 PSIG and by-pass opening jack at 0. When reactor pressure is greater than 150 PSIG check that regulator responds to setpoint changes.
Rod Worth Minimizer	In continuous operation. Verify proper operation as rods are withdrawn.

SYSTEM	MODE OF OPERATION AND HOT FUNCTIONAL TESTS
Main Steam Relief Valves	Record the discharge throat TC and pressure readings from recorder and determine that the valves do not have seat leakage.
Condensate Demineralizer System	Verify performance of system to adequately control water quality by observing that water quality stays within limits specified by plant chemist. Check (if applicable) demineralizer bypass valves not in auto.
TIP System	Make trail traces if flux level permits. Verify leak tightness and air/nitrogen purge.
Reactor Water Cleanup System	In continuous operation at approximately 50 percent to 100 percent flow. Place cleanup recirculation pumps in operation at pressure and operate in all modes. Check that valves operate properly. Reject reactor water back to condenser and radwaste to check reject valve for proper operation.
Reactor Recirculation System	In continuous operation per operating procedure. Check that seal cavity, oil reservoir, winding temperatures, and MG set temperatures are within limits. Check that cavity pressures follows heatup pressure. Check that recirc. loop temperature recorder indicates the proper temperature increase.
Condensate and Feedwater	In continuous operation to maintain reactor level. Start standby feed pump turbine per procedure, place in service and remove replaced turbine from service.
SRM and IRM	In continuous operation. Check for proper retract operation as they are withdrawn. Insert and check for proper operation/indication.

SYSTEM	MODE OF OPERATION AND HOT FUNCTIONAL TESTS
Turbine Seal	Place in continuous operation per operating procedure. Check that seal steam regulator controls seal pressure. Place backup regulator in service.
Vacuum Pump	Place in service per operating procedure.
Steam Jet Air Ejectors	Place in service per operating procedure. Place backup air ejectors in service.
Reactor Vessel Temps and Head Leak Detection	Should be in continuous service. Temperatures should be controlled such that vessel temperature differentials are within limits. Head seal leak detector should be valved per operating procedure and observed for seal leakage.
Circulating Water	Continuous operation to maintain adequate condenser vacuum. Shift modes of system operation.

AFTER INCREASE FROM RATED TEMPERATURE AND PRESSURE TO 30% POWER

A few significant system environmental changes occur between arrival at rated temperature and pressure and completion of 30 percent testing which requires the following additional hot functional checks.

SYSTEM	MODE OF OPERATION AND HOT FUNCTIONAL CHECKS
Turbine Generator	During this period the turbine generator will be placed in operation for the first time and the following checks should be performed which are not part of the formal test program. Verify procedure for turbine warmup and roll to 1,800 RPM. Perform the turbine generator no-load tests. Check turbine vibration at critical speed and 1,800 RPM okay. Verify proper operation of stator cooling and generator seal oil systems. Verify

SYSTEM	MODE OF OPERATION AND HOT FUNCTIONAL CHECKS
	operator familiarization with turbine generator instrumentation and controls both local and remote. Verify oil flow indication at each bearing inspection spout. Verify that expansion (stretchout) is satisfactory. Perform over-speed checks.
Feedwater Heater Controls	Put feedwater heaters in service, and establish level control. Feedwater temperature will rise. Inspect feedwater line and feedwater pump casings to assure thermal expansion has not opened flanges or affected mechanical seal operation.
RBCCW System	Check temperatures of cooled components. Readjust as necessary to maintain proper temperature in components as specified in the operating procedures.

DURING OPERATION FROM 30 PERCENT TO 100 PERCENT POWER

At this point, all safety-related equipment and procedures have been checked out by the combination of cold functional tests, surveillance tests, hot functional tests, and the startup tests, performed thus far. The startup test program adequately tests remaining plant performance and operating procedures associated with delivering greater than 30 percent power to network.

The following is an example of the format for a Hot Functional Test signoff:

Control Rod Drive System	Shift Foreman Operations Supervisor/Initials
1. Checks required are complete.	____________________/________
2. System performance adequate to proceed.	____________________/________
3. Operating procedures modified if necessary.	____________________/________

Control Rod Drive System	Shift Foreman Operations Supervisor/Initials
4. All shifts knowledgeable of system operation and procedure changes	____________________/______"

ILLINOIS POWER COMPANY PROGRAM:

Tests are conducted at Clinton Power Station that generally cover the same systems that the BWROG program lists for Hot Functional Tests. The following is a list of some of these tests:

Title	FSAR Section
Control Rod Drive System	14.2.12.2.5
Drain System	14.2.12.2.56
Leak Detection	14.2.12.1.63
Drywell Leakage	14.2.12.1.52
Drywell Atmospheric Cooling System	14.2.12.2.23
Process Radiation Monitors	14.2.12.1.19
Containment Building HVAC System	14.2.12.1.34
Turbine Electrohydraulic Control	14.2.12.3.1
Control Rod Drive System	14.2.12.1.10
Rod Control and Information System	14.2.12.1.8
Relief Valves	14.2.12.2.23
Condensate Polishing	14.2.12.3.10
Traversing Incore Probe System	14.2.12.1.18
Reactor Water Cleanup System	14.2.12.2.31
Recirculation System	14.2.12.2.27
Feedwater	14.2.12.2.20
SRM Performance and Control Rod Sequence	14.2.12.2.6
IRM Performance	14.2.12.2.9
Off-Gas System	14.2.12.2.35

Title	FSAR Section
Nuclear Boiler System	14.2.12.1.4
Condenser Circulating Water System	14.2.12.1.49
Feedwater System	14.2.12.1.1
Component Cooling Water System	14.2.12.1.25

Preoperational, Startup and Acceptance tests are performed and controlled with checklists. The checklists are used to document completion of each step of the test, and are used to document that each of the acceptance criteria for the tests have been met. The following are portions of a typical checklist:

2.0 ACCEPTANCE CRITERIA

2.1 MSIV operation and timing is within design tolerances for ambient conditions as listed below:

2.1.1 Each MSIV limit switch is set to operate per Data Sheet C (step 7.3).

Verified/Date______________/_________

2.1.2 Each MSIV slow closure time is set to operate between 45 and 60 sec. per Data Sheet D part A (step 7.4)

Verified/Date______________/_________

2.1.3 Each MSIV fast closure time is set up to operate at 4 ± 0.5 sec per Data Sheet D part B (step 7.5)

Verified/Date______________/_________

2.1.4 MSIV closure alarm is received for each MSIV closure test; alarm clears as valve reopens per Data Sheet D, Part C. (Step 7.6)

Verified/Date______________/_________

2.1.5 Each MSIV fails closed on loss of operating air (step 7.8)

Verified/Date______________/_________

7.0 PROCEDURE

7.1 MSIV Accumulator Capacity Check

_______/____ 7.1.1 From each MSIV air accumulator obtain the nameplate capacity rating and record this on Data Sheet A.

_______/____ 7.1.2 The nameplate capacities of the MSIV air accumulators shall be greater than or equal to 35 gallons.

_______/____ Step 7.1 completed.

If in the course of conducting Preoperational, Startup or Acceptance Tests, inadequacies in the Plant Operating Procedures are discovered, changes to Plant Procedures will be initiated to correct the problem.

Changes to plant operating procedures regardless of the source for the change are required to be reviewed by the plant operating staff.

APPENDIX D

COMPARISON OF BWR OWNERS' GROUP APPENDIX D TO THE ILLINOIS POWER COMPANY PROGRAM ON STARTUP TESTING

BWR OWNERS' GROUP PROGRAM:

"RCIC System

Purpose

The purpose of this test is to verify the proper operation of the Reactor Core Isolation Cooling (RCIC) system over its expected operating pressure range.

Description

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 pressures ranging from 150 psig (10.5 kg/cm^2) to rated, with corresponding pump discharge pressures throttled between 100 psig (17.6 kg/cm^2) and 250 psig above rated 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 two hours of continuous operation will be demonstrated. The cold quick start requires a minimum of three days with 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 25% power.

PRESSURE REGULATOR

Purpose

The purposes of this test are a) to determine the optimum settings for the pressure control loop by analysis of the transients induced in the reactor pressure control system by means of the pressure regulators, b) to demonstrate the takeover capability of the backup pressure regulator via simulated failure of the controlling pressure regulator and to set the regulating pressure difference between the two regulators to an appropriate value c) to demonstrate smooth pressure control transition between the turbine control valves and bypass valves when the reactor steam generation exceeds the steam flow used by the turbine.

Description

The pressure setpoint will be decreased and then increased rapidly by about 10 psi (0.7 kg/cm^2) and the response of the system will be measured in each case. It

is desirable to accomplish the setpoint change in less than 1 second. At specified test conditions the load limit setpoint will be set so that the transient is handled by control valves, bypass valves and both. The back-up regulator will be tested by simulating a failure of the operating pressure regulator so that the back-up regulator takes over control. The response of the system will be measured and evaluated and regulator settings will be optimized.

FEEDWATER SYSTEM

Purpose

The purposes of this test are a) to adjust the feedwater control system for acceptable reactor water level control, b) to demonstrate the capability of the automatic core flow runback feature to prevent low water level scram following the trip of one feedwater pump, c) to demonstrate adequate response to feedwater temperature loss, and d) to determine the maximum feedwater runout capability.

Description

Reactor water level setpoint changes of approximately 5 to 6 inches (12.5 to 15.3 cm) will be used to evaluate and adjust the feedwater control system settings for all power and feedwater pump modes. The level setpoint changes will also demonstrate core stability to subcooling changes. One of two operating feedwater pumps will then be tripped and the automatic flow runback circuit will act to drop power to within the capacity of the remaining pump. The worst single failure case of feedwater temperature loss will be performed and the resulting transients recorded between 80 and 90% power and near rated core flow rate. Data will be taken between 50 and 100% power to allow the determination of the maximum feedwater runout capability.

MAIN STEAM ISOLATION VALVES

Purpose

The purposes of this test are a) to functionally check the main steam line isolation valves (MSIVs) for proper operation at selected power levels, b) to determine isolation valve closure times c) to determine maximum power at which full closures of a single valve can be performed without a scram and d) to determine the reactor transient behavior resulting from the simultaneous full closure of all MSIVs.

Description

At 5% and greater reactor power levels, individual fast closure of each MSIV will be performed to verify their functional performance and to determine closure times. The MSIV closure times will be determined from the MSL isolation data.

To determine the maximum power level at which full individual closures can be performed without a scram actuation will be performed between 50 and 65% power and used to extrapolate to the next test point between 70 and 85% power, and ultimately to the maximum power test condition with ample margin to scram.

A test of the simultaneous full closure of all MSIVs will be performed at 75% of rated thermal power. Correct performance of the RCIC and relief valves will be shown. Reactor process variables will be monitored to determine the transient behavior of the system during and following the Main Steam Line (MSL) isolation.

TURBINE TRIP AND GENERATOR LOAD REJECTION

Purpose

The purpose of this test is to demonstrate the response of the reactor and its control systems to protective trips in the turbine and the generator.

Description

Turbine Trip (closure of the main turbine stop valves within approx. 0.1 second) and Generator Trip (closure of the main turbine control valves in about 0.1 to 0.2 seconds) will be performed at selected power levels during the Startup Test Program. At low power levels, reactor protection following the trip is provided by high neutron flux and vessel high pressure scrams. For the protective trips occurring at intermediate and higher power levels, reactor will scram by relays, actuated by stop/control valve motion.

A generator trip will be performed at low power level such that nuclear boiler steam generation is just within the bypass valve capacity to demonstrate scram avoidance.

For the trips performed at intermediate power range, reactor scram is most important in controlling the transient peaks.

Above about 40% power, the recirculation pump circuit breakers are both automatically tripped (RPT) and subsequent transient pressure rise will be limited by the opening of the bypass valves initially, and the safety relief valves, if necessary.

For the turbine trip, the main generator breakers remain closed for a time so there is no rise in turbine generator speed, whereas, in the generator trip, the main generator breaker opens and the residual turbine steam will cause a momentary rise in the generator speed.

SHUTDOWN FROM OUTSIDE THE CONTROL ROOM

Purpose

The purpose of this test is to demonstrate that the reactor can be brought from a normal initial steady-state power level to the point where cooldown is initiated and under control with reactor vessel pressure and water level controlled from outside the control room.

Description

The test will simulate the reactor shutdown following a control room evacuation. The reactor will be scrammed from a normal steady-state condition, the vessel water level and pressure will be controlled from outside the control room. All other operator actions not directly related to vessel water level and pressure will be performed in the main control room.

RECIRCULATION SYSTEM (for variable speed MG set plants)

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 2) to verify that no recirculation system cavitation will occur in the operable region of the power-flow map and 3) to verify that, during the trip of recirculation pumps, the feedwater control system can satisfactorily control water level without a resulting turbine trip/scram, and to record and verify acceptable performance of the recirculation pump circuit breaker trip system (RPT).

Description

Recirculation pump trips are performed to determine reactor water level transient characteristics. The reactor transient response during the trip and coastdown of one recirculation M-G set and its pump will be determined. All single-pump trips will be initiated by tripping either the M-G set drive motor breaker or field breaker. Single pump trips of one M-G set drive motor will be used to determine the Feedwater Control System Transient performance. These transients will be extrapolated to field breaker trip of one pump. 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. The two pump circuit breaker trip at test condition 3 provides the best opportunity to observe the drive flow and core flow coastdowns while not being greatly affected by other transients, as in the midst of a T/G trip.

LOSS OF TURBINE-GENERATOR AND OFFSITE POWER

Purpose

This test determines electrical equipment and reactor system transient performance during a loss of auxiliary power.

Description

The Loss of Auxiliary Power Test will be performed at 20% to 30% of rated power. The proper response of the reactor plant equipment, automatic switching equipment and the proper sequencing of the diesel generator loads will be checked. Appropriate reactor parameters will be recorded during the resultant transient."

ILLINOIS POWER COMPANY PROGRAM:

Tests similar to the ones described in the Owners Group Program will be conducted at CPS. Descriptions of these tests can be found in the following FSAR sections:

Test Name	FSAR Section
RCIC System	14.2.12.2.13
Pressure Regulator	14.2.12.2.9
Feedwater System	14.2.12.2.20
Main Steam Isolation Valves	14.2.12.2.22
Turbine Trip and Generator Load Rejection	14.2.12.2.24
Shutdown From Outside the Main Control Room	14.2.12.2.25
Recirculation System	14.2.12.2.27
Loss of Off-Site Power	14.2.12.2.28

CPS-FSAR Table 14.2-4 is similar to the BWROG Program Figure 1 and FSAR Figure 14.2-6 is similar to BWROG Program Figure 2. (See the attached figures.)

STARTUP TEST SPECIFICATIONS

FIGURE 1

STI NO.	TEST NAME	OPEN VESSEL	HEAT UP	TEST CONDITIONS 1	2	3	4	5	6		WARRANTY
1	Chemical & Radiochemical	X	X	X		X		X	X		
2	Radiation Measurements	X	X	X		X			X		
3	Fuel Loading	X									
4	Full Core Shutdown Margin	X									
5	CRD	X	X		X	X			X		
6	SRM Perf. & Control Rod Seq.	X	X		X						
8	Rod Sequence Exchange				X						
9	Water Level Measurements		X	X	X	X	X	X	X		
10	IRM Performance	X	X	X							
11	LPRM Calibration			X		X					
12	APRM Calibration		X	X	X	X			X		
13	Process Computer	X	X	X[3]				X	X		X
14	RCIC		X		X				X		
15	HPCI		X								
16	Selected Process Temperatures		X			X					
17	System Expansion		X	X	X	X			X		
18	Core Power Distribution					X					
19	Core Performance					X			X		
20	Steam Production			X	X	X	X	X	X		X
21	Core Power Void Mode Response						X	X			X
22	Pressure Regulators: Setpoint Changes			X,BP	X	X, No BP	X	X	X,A[13]		
	Backup Regulator			X,BP	X	X, No BP	X	X	X,A[13]		
23	FW System: FW Pump Trip								M[12]		
	Water Level Setpoint Change				X	X	X	X	X,A		
	Heater Loss								X[10]		
24	Turbine Valve Surveillance				X[4]			X[5],SP	X[5,6],SP		
25	MSIVs: Each Valve		X	X[3],SP							
	One Valve				X[4],SP			X[5,6],SP			
	Full Isolation								X[2,6,9],SP		
26	Relief Valves: Flow Demonstration				X[4,11]						
	Operational		X[11]		X[4]						
27	Turbine Stop Valve Trip and					X[2,11],SD			X[2,11]SD*		
	Generator Load Rejection				L,SP				*		
28	Shutdown From Outside C Room				X,SD						
29	Recirculation Flow Control System		X	X	M[4],A[4]	M,A[12]		M[5],A[5]	M,A		
30	Recirc. Sys: Trip One Pump					X[11]			X[11]		
	Trip Two Pumps					X[11]					
	System Performance				X	X	X		X		
	Non-Cavit. Verif.					X					
31	Loss of T-G, Offsite Power				X[2],SD						
33	Drywell Piping Vibration				X	X			X		
35	Recirc. System Flow Calibration	X				X			X		
70	Reactor Water Cleanup System		X								
71	Residual Heat Removal System		X[11]	X							

Figure 1. Startup Test Program

1 See Figure 2 for Test Conditions region map.
2 Perform Test 5, timing of 4 slowest control rods in conjunction with these scrams.
3 Between Test Conditions 1 and 3.
4 Between Test Conditions 2 and 3.
5 Between Test Conditions 5 and 6.
6 Before 100% Turbine Trip.
7 Not Applicable
8 Determine maximum power without scram.
9 Anywhere > 75% Power.
10 80-90% Power.
11 Do STI 33 in conjunction with this test.
12 Demonstrate Recirculation System's Runback Feature.
13 Down setpoint only.

L = Local Flow Control Mode
M = Master Manual Flow Control Mode
N = Local or Master Manual Flow Control Mode
A = Automatic Flow Control Mode
SP = Scram Possibility
SE = Scram Expected
SD = Scram Definite
BP = Bypass Valve Response
* = Do either Stop Valve or Control Valve Trip.

FIGURE 2

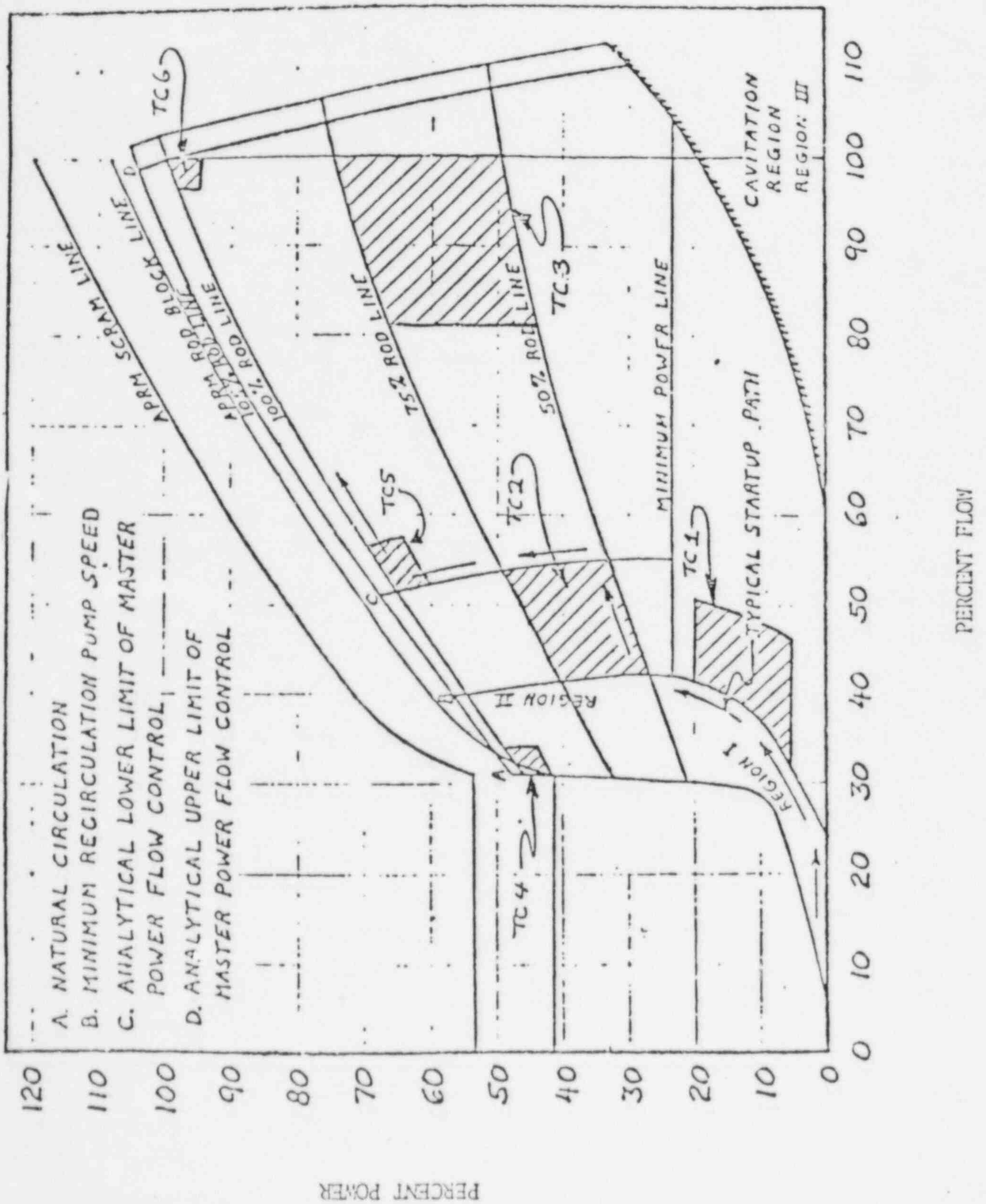
A. NATURAL CIRCULATION
B. MINIMUM RECIRCULATION PUMP SPEED
C. ANALYTICAL LOWER LIMIT OF MASTER POWER FLOW CONTROL
D. ANALYTICAL UPPER LIMIT OF MASTER POWER FLOW CONTROL
APRM SCRAM LINE
APRM ROD BLOCK LINE
107% ROD LINE
100% ROD LINE
75% ROD LINE
50% ROD LINE
MINIMUM POWER LINE
TYPICAL STARTUP PATH
CAVITATION REGION
REGION III
REGION II
REGION I
TC1
TC2
TC3
TC4
TC5
TC6
A
C
D
PERCENT POWER
PERCENT FLOW
0
10
20
30
40
50
60
70
80
90
100
110
120

FIGURE 2

DEFINITION OF TEST CONDITION REGIONS

Test Condition No.	Power-Flow Map Region and Notes
1	Before main generator synchronization-between 5% and 20% thermal power-within 10% of M-G Set minimum operating speed line in Local Manual mode.
2	After main generator synchronization-between the 50% and 75% power rod lines-between M-G Set minimum speeds for Local Manual and Master Manual modes the lower power corner must be less than Bypass Valve capacity.
3	Between the 50% and the 75% control rod lines, with core flow rated between 80% and 100% of its rated value.
4	On the natural circulation core flow line - within 5% of the intersection with the 100% power rod line.
5M	Within 5% of the 100% power rod line - within + 5% of the minimum M-G Set speed for Master Manual mode - Recirculation System engaged in Master Manual mode only.
5A	Within 5% of the 100% power rod line - within + 5% of the core flow rate at the lower end of the Auto Flow Control region - Recirculation System Engaged in Auto Flow Control mode only.
6	Between 95% and 100% of rated power and between 95% and 100% of rated core flow rate.

TABLE 14.2-4
STARTUP TEST PROGRAM

FSAR 14.2.12.2 SECTION	TEST NAME	COLD TEST OR OPEN RPV	HEAT UP	TEST CONDITIONS 1	2	3	4	5	6	WARRANTY
1	Chemical & Radiochemical	x	x	x		x		x	x	
2	Radiation Measurements	x	x	x	x	x		x	x	x
3	Fuel Loading	x								
4	Full Core Shutdown Margin	x								
5	CRD	x	x		x	x			x	
6	SRM Perf. & Control Rod Seq.	x	x	x						
8	Rod Sequence Exchange							x		
9	IRM Performance	x	x	x						
10	LPRM Calibration		x	x		x			x	
11	APRM Calibration		x	x	x	x		x	x	
12	Process Computer	x	x		x[3]	x			x	
13	RCIC		x	x[13]	x					
14	Selected Process Temperatures, Water Level		x	x	x	x	x		x	
15	System Expansion	x	x	x					x	
16	Core Power Distribution					x			x	
17	Core Performance			x	x	x	x	x	x	x
18	Core Power-Void Mode Response						x	x		
19	Pressure Controller: Set Point Changes			x,BP	x	x,no BP	x	x	x,A	
20	FW System: FW Pump Trip								M[14]	
	Water Level Set Point Change & Stability Verification		x	x	x	x	x	x	x,A	
	Heater Loss								x[12]	
	Maximum Runout Capability & Perf.		x	x	x	x		x	x[5]	
21	Turbine Valve Surveillance					x[4]		x[5,8,SP]	x[7,SP]	

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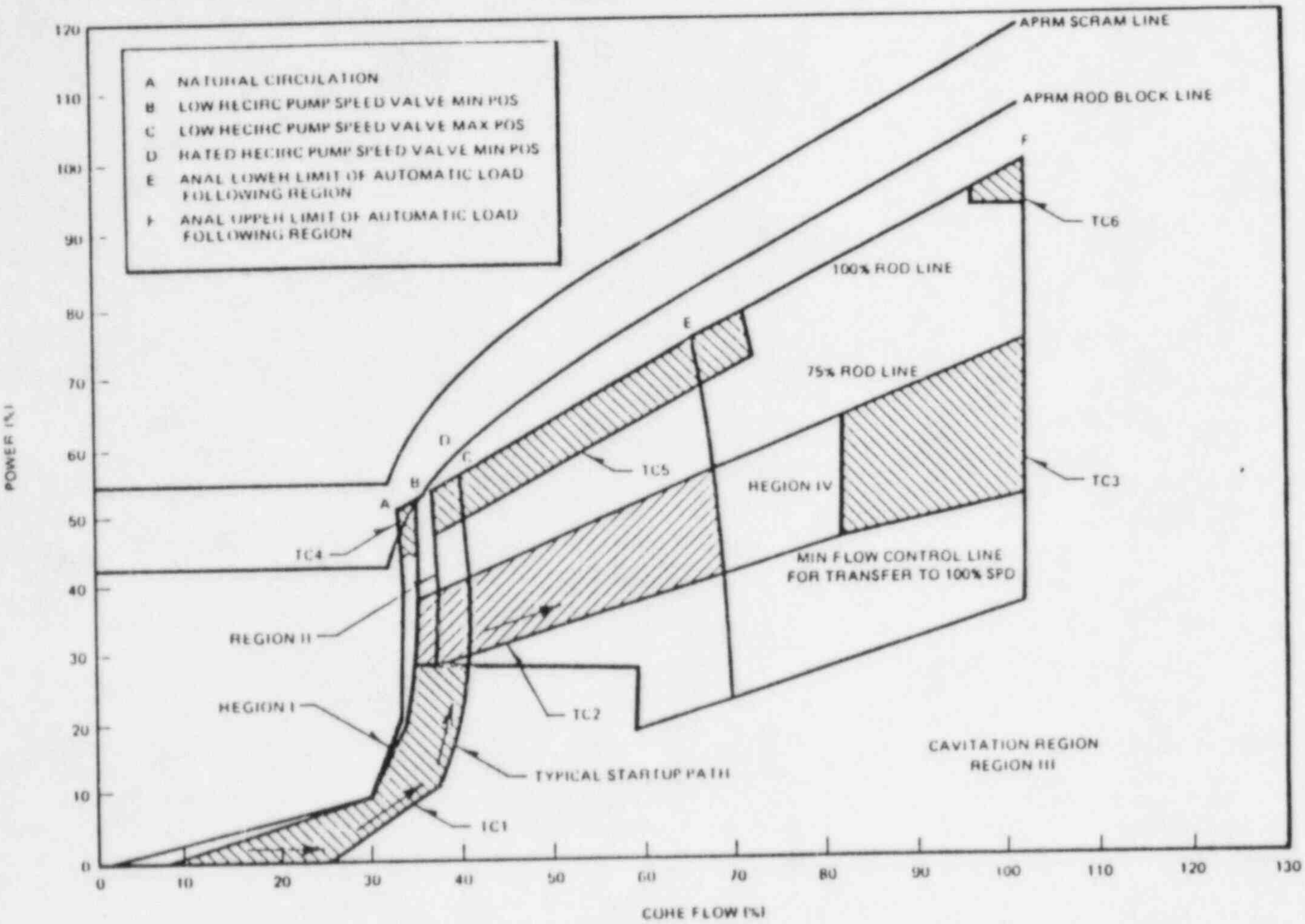
TABLE 14.2-4
STARTUP TEST PROGRAM

FSAR 14.2.12.2 SECTION	TEST NAME	COLD TEST OR OPEN RPV	HEAT UP	TEST CONDITIONS 1	2	3	4	5	6	WARRANTY
22	MSIVs: Each Valve		x	x,SP	x,SP			x,SP	x,SP	
	Flow Element Calibration					x			x	
	Full Isolation								$x^{2,6,13,SD}$	
23	Relief Valves: Flow Demonstration				x					
	Operational		x^{13}		x					
24	Turbine Stop Valve Trip and Generator Load Rejection				$x^{X,SP}$	$x^{16,2,13,SD}$			$x^{2,13,SD}$	
25	Shutdown From Outside C Room				x^{SD}					
26	Recirculation Flow Control System			x		$x^{M,A,L,14}$			$x^{M,A,L,5}$	
27	Recirc. System: Trip One Pump					x^{13}			x^{13}	
	Trip Two Pumps (RPT)					x^{13}				
	System Performance			x	x	x	x	x	x	
	Runback					x^{14}				
	Non-Cavit. Verif.				x	x				
28	Loss of Offsite Power			$x^{2,13,SP}$						
29	Drywell Piping Vibration		x	x	x	x		x	x	
30	Recirc. System Flow Calibration					x			x	
31	Reactor Water Cleanup System		x							
32	Residual Heat Removal System		x	x					x	
33	Drywell Atmosphere Cooling		x		x				x	
34	MSIV Leakage Control		x^{15}							
35	Offgas System		x	x		x			x	
36	Penetration Cooling		x	x	x	x			x	
37	Steam Production									x

TABLE 14.2-4 (Cont'd)
STARTUP TEST PROGRAM

1. See Figure 14.2-6 for Test Conditions region map.
2. Perform Test 5, timing of 4 slowest control rods in conjunction with these scrams.
3. Between Test Conditions 1 and 3.
4. Between Test Conditions 2 and 3.
5. Between Test Conditions 5 and 6.
6. Before 100% Load Rejection.
7. Future maximum power test point.
8. Determine maximum power without scram.
9. Perform at 100% Core Flow, 50% ±2.5% Power.
10. Deleted.
11. 70-80% Power.
12. 80-90% Power.
13. Do drywell piping vibration test in conjunction with this test.
14. Demonstrate Recirculation System Runback Feature.
15. In conjunction with shutdown from outside control room test, or any time a reactor isolation and depressurization are convenient.
16. 60 to 80 percent power, ≥95 percent core flow.

L = Local Flow Control Mode
M = Master Manual Flow Control Mode
X = Local or Master Flow Control Mode
A = Automatic Flow Control Mode
SP = Scram Possibility
SE = Scram Expected
SD = Scram Definite
BP = Bypass Valve Response
* = Do either Stop Valve or Control Valve Trip



TEST CONDITION (TC) REGION DEFINITIONS

Test Condition (TC)	Power Flow Map Region and Notes
1	Before or after main generator synchronization from 5 to 20% thermal power and operating on recirculation pump low frequency power supply.
2	After main generator synchronization from 50 to 75% control rod lines, at or below the analytical lower limit of Master Flow Control mode and with the lower power corner within bypass valve capacity.
3	From 50 to 75% control rod lines above 80% core flow, and within maximum allowed recirculation control valve position.
4	On the natural circulation core flow line within ±5% of the intersection with the 100% power rod line.
5	From the 100% rod line to 5% below the 100% rod line and between maximum flow at rated recirculation pump speed (minimum valve position) to 5% above the analytical lower limit of the automatic flow control range.
6	Within 0 to -5% of rated 100% thermal power, and within 5% of rated 100% core flow rate.

Figure 14.2-6. Startup Test Condition Power Flow Map

APPENDIX E

COMPARISON OF BWROG OWNERS' GROUP APPENDIX E TO THE ILLINOIS POWER COMPANY PROGRAM ON ADDITIONAL TRAINING AND TESTING

BWR OWNERS' GROUP PROGRAM:

"TEST: Startup of the RCIC System after Loss of AC Power to the System.

PURPOSE: Verify the design basis ability of the system to start without the aid of AC power with the exception of the RCIC DC/AC inverters.

INITIAL CONDITIONS:

- ° Preoperational Test has been performed on RCIC system.
- ° If test is performed prior to the availability of nuclear steam, sufficient auxiliary boiler capacity and piping to run the RCIC turbine/pump must be available.
- ° System valves in normal standby lineup (suction from CST)

  NOTE: 1) If the auxiliary boiler is used as the turbine steam supply, tag closed the drywell steam supply isolation valve.

  2) Flow can either be directed to the reactor pressure vessel or back to the condensate storage tank.

- ° Power to all RCIC components fed by site AC power shall be secured.
- ° Station batteries shall be fully charged.
- ° Instrument air shall be available for all operation and control of applicable valves.
- ° Instruments shall be calibrated and setpoints, where applicable, shall be verified.

TEST DESCRIPTION:

Perform a manual initiation of the RCIC System utilizing the manual initiation switch and verify the proper operation of all components required for the RCIC startup transient to rated flow.

NOTE: Manual manipulation of some valves will be required if flow is returned to the CST or auxiliary boiler steam is used.

ACCEPTANCE CRITERIA:

Proper operation of all components for the RCIC startup transient until rated flow is obtained.

TEST: Operation of the RCIC System with a Sustained Loss of AC Power to the System

PURPOSE: To verify the operation of RCIC beyond its design basis to evaluate the limits of system operation with extended loss of AC power to it and support systems with the exception of the RCIC DC/AC inverters.

INITIAL CONDITIONS:

- Preoperational test has been performed on RCIC system.
- If test is performed prior to the availability of nuclear steam, sufficient auxiliary/boiler capacity and piping to run the RCIC turbine/pump must be available.
- System valves in normal standby lineup (suction from CST).

  NOTE: 1) The auxiliary boiler is used as the turbine steam supply, tag closed the drywell steam supply isolation valve.

- Power to all RCIC components fed by site AC power shall be secured, including RCIC area coolers and battery chargers supplying the station battery from which RCIC DC loads are powered.
- RCIC batteries shall be fully charged.
- Instrument air shall be available for operation and control of applicable valves.
- Instruments shall be calibrated and setpoints, where applicable, shall be verified.

TEST DESCRIPTION:

Start and operate the RCIC system with return to the CST and run for 2 hours or until any system limiting parameter is approached (e.g., high RCIC area temp, low battery voltage, or high supp. pool temp) tripping and restarting the RCIC system two additional times during this operating period.

ACCEPTANCE CRITERIA:

None

TEST: RCIC Operation to Prove DC Separation.

PURPOSE: Verify proper operation of the RCIC DC components when non RCIC station batteries are disconnected.

INITIAL CONDITIONS:

- Preoperational test has been performed on RCIC system.
- Test to be performed prior to fuel load.
- This test is performed prior to the availability of nuclear steam, sufficient auxiliary boiler capacity and piping to run the RCIC turbine/pump must be available.
- System valves in normal standby lineup (suction from CST).
- Drywell steam supply isolation valve tagged shut.
- Station batteries shall be fully charged.
- Instrument air shall be available for operation and control of applicable valves.
- Instruments shall be calibrated and setpoints, where applicable, shall be verified.

TEST DESCRIPTION:

Start and operate the RCIC system with return to the CST. During system operation disconnect, each non-RCIC station battery from its BUS and verify proper operation of each RCIC DC component.

ACCEPTANCE CRITERIA:

Proper operation of RCIC DC components with non-RCIC station batteries disconnected.

TEST: Integrated Reactor Pressure Vessel Level Functional Test.

PURPOSE: Verify that instruments connected to the RPV are tubed properly, that the tubing is not blocked and that instrument tracking is proper.

INITIAL CONDITIONS:

- All instruments connected to the RPV have been calibrated and are operable.
- RPV has been flushed and is clean.
- All RPV instrument tubing has been filled, all instruments are vented, and proper valve lineup verified.
- A source of demineralized water is available to fill the RPV.
- Fuel has not been loaded into the RPV.
- RPV head removed or adequately vented to prevent pressurization.

TEST DESCRIPTION:

Raise and lower (or lower and raise, whichever is most convenient) the RPV water level through the range of RPV levels necessary to verify the proper operation and tracking of each RPV connected instrument.

NOTE: The temperature and pressure conditions at which this test will be performed are not the conditions for which the various instruments are calibrated. There will not be a one-to-one correspondence between actual reactor vessel level change and indicated level change.

ACCEPTANCE CRITERIA:

Each affected RPV instruments operation and tracking is satisfactory.

TEST: Integrated Containment Pressure Instrumentation Test (test to be performed in conjunction with containment integrated leak rate testing)

PURPOSE: Verify the proper connection, and tracking of containment pressure instruments and that the tubing supplying these instruments is not blocked.

INITIAL CONDITIONS:

- All initial conditions for containment integrated leak rate testing have been established.

- All containment pressure instruments have been calibrated and are valved into service.

TEST DESCRIPTION:

As containment pressure is increased, during the containment integrated leak rate test, verify proper tracking of all containment pressure instruments.

ACCEPTANCE CRITERIA:

All containment instruments track properly and all affected instrument lines are clear of obstructions."

ILLINOIS POWER COMPANY PROGRAM:

Illinois Power Company preoperational and startup tests will be revised to include the scope of the BWR Owners' Group program. The following test descriptions indicate the changes to be made to the CPS testing program.

1. TEST: Startup of the RCIC system after Loss of AC Power to the System. This test may be performed as part of PTP-RI-01 or STP-14 depending upon steam availability.

   PURPOSE: Verify the design basis ability of the system to start without the aid of AC power with the exception of the RCIC DC/AC inverters.

   INITIAL CONDITIONS:

   - Applicable Portions of preoperational test PTP-RI-01 have been performed on the RCIC system to support this test.

- Sufficient fission heat is available from the Nuclear Boiler to run RCIC. (If run during STP-14)

- System valves in normal standby lineup (suction from the RCIC storage tank)

  NOTE: Flow will be via the injection line to the RPV (Primary Flow Path) or to the RCIC Storage Tank (Secondary Flow Path).

- Power to all RCIC components fed by site AC power shall be secured.

- Station batteries shall be fully charged.

- Instrument air shall be available for operation and control of applicable valves.

- Instruments shall be calibrated and setpoints, where applicable, shall be verified.

TEST DESCRIPTION:

Perform a manual initiation of the RCIC system utilizing the manual initiation switch and verify the proper operation of all components required for the RCIC startup transient to rated flow.

NOTE: Temporary alterations of control logic for some valves will be required if flow is returned to the RCIC storage tank.

ACCEPTANCE CRITERIA:

Proper operation of all components for the RCIC startup transient until rated flow is obtained.

2. TEST: Operation of the RCIC System with a sustained loss of AC Power to the System. This test may be performed as part of the STP-14 or PTP-RI-01, depending upon steam availability.

PURPOSE: To verify the operation of RCIC beyond its design basis, to evaluate the limits of system operation with extended loss of AC power to it and support systems with the exception of the RCIC DC/AC inverters.

INITIAL CONDITIONS:

- Applicable portions of preoperational test PTP-RI-01 have been performed on RCIC system to support this test.
- Sufficient fission heat is available from the Nuclear Boiler. (If run during STP-14)
- System valves in normal standby lineup (suction from the RCIC storage tank).
- Power to all RCIC components fed by site AC power shall be secured, including RCIC area coolers and battery chargers supplying the station battery from which RCIC DC loads are powered.
- RCIC batteries shall be fully charged.
- Instrument air shall be available for operation and control of applicable valves.
- Instruments shall be calibrated and setpoints, where applicable, shall be verified.

TEST DESCRIPTION:

Start and operate the RCIC system with return to the RCIC tank and run for 2 hours or until any system limiting parameter is approached (e.g., high RCIC area temp, low battery voltage, or high supp. pool temp) tripping and restarting the RCIC system two additional times during this operating period.

ACCEPTANCE CRITERIA:

NONE

3. TEST: RCIC Operation to Prove DC Separation.

PURPOSE: Verify proper operation of the RCIC DC components when non RCIC station batteries are disconnected. This test may be performed as part of PTP-RI-01 or STP-14.

INITIAL CONDITIONS:

° Test to be performed prior to fuel load (if done during PTP-RI-01).

° If this test is performed prior to the availability of nuclear steam, sufficient auxiliary boiler capacity and piping to run the RCIC turbine/pump will be made available for this test.

° System valves in normal standby lineup (suction from the RCIC storage tank).

° Drywell steam supply isolation valve tagged shut.

° Station batteries shall be fully charged.

° Instrument air shall be available for operation and control of applicable valves.

° Instruments shall be calibrated and setpoints, where applicable, shall be verified.

TEST DESCRIPTION:

Start and operate the RCIC system with return to the RCIC tank. During system operation disconnect each non-RCIC station battery from its bus and verify proper operation of each RCIC DC component.

ACCEPTANCE CRITERIA:

Proper operation of RCIC DC components with non-RCIC station batteries disconnected.

4. TEST: Integrated reactor pressure vessel level functional test.

PURPOSE: Verify that instruments connected to the RPV are tubed properly, that the tubing is not blocked and that instrument tracking is proper. (This test will be performed as part of PTP-NB-03).

INITIAL CONDITIONS:

- All instruments connected to the RPV have been calibrated and are operable.
- RPV has been flushed and is clean.
- All RPV instrument tubing has been filled, all instruments are vented, and proper valve lineup verified.
- A source of demineralized water is available to fill the RPV.
- Fuel has not been loaded into the RPV.
- RPV head removed or adequately vented to prevent pressurization.

TEST DESCRIPTION:

Raise and lower (or lower and raise, whichever is most convenient) the RPV water level through the range of RPV levels necessary to verify the proper operation and tracking of each RPV connected instrument.

NOTE: The temperature and pressure conditions at which this test will be performed are not the conditions for which the various instruments are calibrated. There will not be a one-to-one correspondence between actual reactor vessel level change and indicated level change.

ACCEPTANCE CRITERIA:

Each affected RPV instrument's operation and tracking is satisfactory.

5. TEST: Integrated containment pressure instrumentation test. This test will be performed as part of PTP-IL/DW-01.

PURPOSE: Verify the proper connection, and tracking of containment pressure instruments and that the tubing supplying these instruments is not blocked.

INITIAL CONDITIONS:

- All initial conditions for containment integrated leak rate testing have been established.
- All containment pressure instruments have been calibrated and are valved into service.

TEST DESCRIPTION:

As containment pressure is increased, during the containment integrated leak rate test, verify proper tracking of all containment pressure instruments.

ACCEPTANCE CRITERIA:

All containment instruments track properly and all affected instrument lines are clear of obstructions.

It can be seen that Illinois Power Company's Testing Program will be revised to meet the intent of the BWROG Program on additional testing and training.