LILCO, August 3, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322-OL-3
	)	(Emergency Planning Proceeding)
(Shoreham Nuclear Power Station, Unit 1)	)	
	)	

STATEMENT OF MATERIAL FACTS IN SUPPORT
OF LILCO'S MOTION FOR SUMMARY RESOLUTION
OF JULY 24 BOARD ORDER

1. The Local Emergency Response Organization (LERO) for Shoreham Nuclear Power Station is composed largely though not entirely of LILCO employees. Approximately two-thirds of the LILCO employees in LERO belong to one or another of two unions. Absent the occurrence of events not being relied on as a basis for this license application, the composition of LERO will remain roughly in its present form for the foreseeable future. Cordaro Affidavit, ¶ 2.

2. In the current configuration of LERO it cannot be demonstrated that a strike against LILCO involving all of the union members of LERO would not, under any circumstances, impair the functioning of LERO in the event of a radiological event requiring offsite response. Cordaro Affidavit, ¶ 3.

3. The recently expired contracts with LILCO's unions contain no-strike clauses prohibiting strikes during their term.

Such clauses, or other clauses prohibiting strikes without notice, are typical of union contracts and are expected to be included in future contracts between LILCO and unions. Cordaro Affidavit, ¶ 4.

4. Strikes of any significant proportion generally do not begin without at least several days' notice established by either the contract expiration date, the subsequent failure of negotiations, or reports of unrest among union members. Further, the mechanics of strike commencement, including membership meetings and votes, build significant time, generally several days, into the process. The strike which began in July 1984 did not begin before the expiration date of the contract. Union leadership worked with LILCO management to provide ample notice of the actual start of the strike and to assure a smooth transition. Cordaro Affidavit, ¶ 5; Scalice Affidavit, ¶ 10.

5. Shoreham plant staff, with or without participation of operators who are union members, can take the Shoreham plant from full power operation to cold shutdown within 24 hours following normal procedures, and in a much shorter time if necessary. Scalice Affidavit, ¶ 10.

6. The Shoreham plant can be maintained indefinitely in cold shutdown condition by plant staff who are management employees, without the assistance of any union members. Scalice Affidavit, ¶ 11.

7. The Environmental Protection Agency has established Protective Action Guide (PAG) levels of 1 rem to the whole body and 5

rem to the thyroid for use in determining the need for response by the general population in the event of a radiological emergency. These values have been utilized in NRC proceedings to help determine the need for offsite radiological emergency response capability. Stergakos-Rigert Affidavit, ¶ 3.

8. Once the Shoreham plant has reached cold shutdown, there is no credible series of events which could lead to offsite consequences of exceeding 1 rem to the whole body or 5 rem to the thyroid. This remains true for the entire period the plant is maintained at cold shutdown. Stergakos-Rigert Affidavit, ¶¶ 3-7.

9. Fuel handling and other operations requiring access to the reactor core have associated with them a separate class of accidents not physically possible when the top of the reactor is in place. These accidents would not have offsite consequences equaling or exceeding 1 rem to the whole body or 5 rem to the thyroid provided sufficient time passes following attainment of cold shutdown. Stergakos-Rigert Affidavit, ¶ 9.

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AFFIDAVIT OF MATTHEW C. CORDARO

Matthew C. Cordaro, being duly sworn, deposes and says as follows:

1. My name is Matthew C. Cordaro. I am Vice President, Engineering, for LILCO. My business address is Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York 11801. I make this affidavit in support of LILCO's motion for summary resolution of issues involving the effect of a strike against LILCO under circumstances where, as now, a substantial proportion of LERO members are also unionized LILCO employees.

2. The Local Emergency Response Organization (LERO) for Shoreham Nuclear Power Station is composed largely though not entirely of LILCO employees. Approximately two-thirds of the LILCO employees in LERO belong to one or another of two unions. Absent the occurrence of events not being relied on as a basis for this license application, the composition of LERO will remain roughly in its present form for the foreseeable future.

3. In the current configuration of LERO it cannot be demonstrated that a strike against LILCO involving all of the union

members of LERO would not, under any circumstances, impair the functioning of LERO in the event of a radiological event requiring offsite response.

4. The recently expired contracts with LILCO's unions contain no-strike clauses prohibiting strikes during their term. Such clauses, or other clauses prohibiting strikes without notice, are typical of union contracts and are expected to be included in future contracts between LILCO and unions.

5. Strikes of any significant proportion generally do not begin without at least several days' notice established by either the contract expiration date, the subsequent failure of negotiations, or reports of unrest among union members. Further, the mechanics of strike commencement, including membership meetings and votes, build significant time, generally several days, into the process. The strike which began in July 1984 did not begin before the expiration date of the contract. Union leadership worked with LILCO management to provide ample notice of the actual start of the strike and to assure a smooth transition. I would expect, should a strike against LILCO ever occur in the future, that for the reasons outlined in this paragraph, LILCO management would have at least several days' advance notice of its imminence.

6. LILCO management understands, on the basis outlined in the accompanying affidavits of Dr. Stergakos and Messrs. Rigert and Scalice, that the Shoreham plant can be brought to cold shutdown in 24 hours or less, by management employees alone, and maintained in that status indefinitely thereafter by management

employees alone; and that from attainment of cold shutdown on, as long as the reactor is maintained in cold shutdown, no credible accident sequences can lead to offsite doses requiring the availability of an offsite emergency response capability, i.e., 1 rem or more to the whole body or 5 rems or more to the thyroid. LILCO management also understands, on the basis of these affidavits, that fuel handling and other operations requiring access to the reactor core would not result in accidents having offsite consequences requiring the availability of an offsite emergency response capability provided sufficient time has passed following the attainment of cold shutdown.

7. On the basis of the facts outlined in this affidavit and those set forth in the affidavits of Dr. Stergakos and Messrs. Rigert and Scalice, LILCO would be willing to accept the following condition on an operating license at Shoreham:

PROPOSED LICENSE CONDITION

> So long as LILCO shall rely on an offsite emergency response organization consisting entirely or primarily of LILCO employees, then in anticipation of the commencement of a strike by a union representing LILCO employees, LILCO shall bring the Shoreham Nuclear Power Station (SNPS) to cold shutdown condition using normal operating procedures. LILCO shall commence bringing SNPS to cold shutdown condition 24 hours prior to the commencement of such strike, or immediately upon receipt of less than 24 hours' notice of the impending commencement of a strike, with the goal of having the plant in cold shutdown condition by the time the strike commences. LILCO shall maintain SNPS in cold shutdown condition until the end of the strike except that, with the prior approval of the NRC Staff upon review of written application by LILCO, LILCO shall be permitted:

(1) to take the reactor to a refueling mode to conduct refueling or other operations requiring access to the reactor core if it is shown that such operations cannot result in the occurrence of any events requiring offsite emergency response capability; and

(2) to conduct such other operations as the Staff shall approve if it is shown that the strike does not, in fact, impair LILCO's ability to implement its offsite emergency preparedness plan.

This condition shall terminate at such time as any or any combination of agencies of the Federal, New York State, or Suffolk County governments shall provide to the NRC written notice of its or their agreement, under terms and conditions approved by FEMA, to assume legal responsibility for effectuation of offsite emergency response for Shoreham Nuclear Power Station.

____
Matthew C. Cordaro

COUNTY OF NASSAU)
STATE OF NEW YORK)

Subscribed and sworn to before me this ____ day of ____________, 1984

____
NOTARY PUBLIC

My Commission Expires on ________________________.

LILCO, August 3, 1984

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Before the Atomic Safety and Licensing Board

In the Matter of	)
	)
LONG ISLAND LIGHTING COMPANY	) Docket No. 50-322-OL-3
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(Shoreham Nuclear Power Station, Unit 1)	)

AFFIDAVIT OF ELIAS P. STERGAKOS AND JOHN A. RIGERT

ELIAS P. STERGAKOS and JOHN A. RIGERT, being duly sworn, depose and say as follows:

1. [Stergakos only] My name is Elias P. Stergakos. I am employed by the Long Island Lighting Company as Manager of the Radiation Protection Division; I report directly to the Manager of Nuclear Engineering Department. I have the overall responsibility for the Corporate overview and technical direction of all aspects of radiological protection and the design of radwaste systems. My business address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York, 11792.

2. [Rigert only] My name is John A. Rigert. I am employed by Long Island Lighting Company as Manager, Nuclear Systems Engineering Division of the Nuclear Engineering Department. My business address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York, 11792.

[Both affiants declare Paragraphs 3 through 9, as follows:]

3. We make this affidavit in response to the July 24, 1984 "Memorandum and Order Determining that a Serious Safety Matter Exists" of the NRC Licensing Board in the Shoreham emergency planning hearings. The purpose of this Affidavit is to provide support for the proposition that 24 or more hours after initiation of the descent to cold shutdown from full power following normal operating procedures -- a process which takes less than 24 hours -- there is no postulated abnormal event that could result in radiological consequences in excess of EPA's Protective Action Guidelines of 1 rem to the whole body and 5 rem to the thyroid. This conclusion is based upon a review of the events described in Chapter 15 of the Shoreham FSAR. The EPA PAGs have been utilized in NRC licensing proceedings to help determine the need for off-site radiological emergency response capability.

4. Chapter 15 of the Shoreham FSAR provides the results of analyses for the spectrum of accident and transient events that must be accommodated by the Shoreham plant to demonstrate compliance with the NRC's regulations. This portion of the safety analysis is performed to evaluate the ability of the plant to operate without undue risk to the health and safety of the public. The Shoreham FSAR was submitted to the NRC Staff for its review and was approved in the Staff's Safety Evaluation Report for Shoreham (NUREG-0420).

5. A number of the Chapter 15 events need no longer be postulated because of the different plant configuration and system lineup under cold shutdown versus operating conditions. In particular, the MSIVs would be closed; the reactor would be fully depressurized; and only low level decay heat would be produced. As a result of these plant conditions, even events which are theoretically possible are of little concern since they are unlikely to occur. Should they nonetheless occur, the available time for automatic or manual mitigation of the event would be greatly increased; the capacity requirements of the mitigation systems would be greatly reduced; and the radioactive inventory of the core and plant systems would be reduced thus reducing the potential radiological consequences.

6. The review of the Chapter 15 analysis revealed that of the 38 accident or transient events addressed in Chapter 15, 21 of the events could not occur physically during cold shutdown because of the operating conditions of the plant. An additional 14 events could physically occur, but the offsite radiological consequences would be inconsequential or non-existent. The remaining 3 events are possible at cold shutdown but have offsite radiological consequences below the PAG limits. One of the 21 events which could not occur during cold shutdown could, however, occur during the refueling mode. This event is the fuel handling accident that is discussed separately in Paragraph 9 below. Attachment 1 identifies the category into which each Chapter 15 event falls.

7. Of the four events which may produce an offsite radiological effect three produce doses which are at least an order of magnitude below the PAG limits even at full power operations. Event 29 represents occasional miscellaneous spills and leaks which may occur outside the primary containment. The offsite consequences are described in FSAR §§ 11.2 and 11.3 and are trivial (approximately 0.001 rem/year). Event 31 is postulated to occur due to the failure of one of the off-gas system charcoal absorber tanks during system operation. The offsite consequences are described in FSAR § 15.1.31 and the whole-body dose is approximately 0.02 rem. The consequences during cold shutdown would be significantly reduced since the off-gas system would be out of service. Event 32 entails the simultaneous failure of all liquid radwaste tanks as described in FSAR § 11.2.3.4.2 and results in a whole-body dose of less than 0.0004 rem and a thyroid dose of less than 0.5 rem.

8. Our review of Chapter 15, described above, confirms that no accident could occur during a cold shutdown condition which would result in any undue risk to the public health and safety.

9. If fuel handling operations or other operations requiring access to the core are conducted following cold shutdown, a fuel handling accident (Event 36), not possible during cold shutdown, may occur. The offsite consequences of this type of accident vary depending on fuel burnup and on the time that has passed since the attainment of cold shutdown. As time passes following cold

shutdown, all such consequences would diminish to levels below EPA PAG limits.

________________________ ________________________

Elias P. Stergakos John A. Rigert

COUNTY OF SUFFOLK)
STATE OF NEW YORK)

Subscribed and sworn to before me
this _____ day of _______________, 1984.

____
NOTARY PUBLIC

My Commission Expires on __________________________.

FSAR CHAPTER 15 ACCIDENT CONSEQUENCES

REACTOR AT COLD SHUTDOWN, 24 HOURS OR MORE AFTER INITIATION OF DESCENT FROM OPERATION AT 100% POWER

	Chapter 15 Event	Event Category
1.	Generator Load Rejection	*
2.	Turbine Trip	*
3.	Turbine Trip with Failure of Generator Breakers to Open	*
4.	MSIV Closure	*
5.	Pressure Regulator Failure - Open	*
6.	Pressure Regulator Failure - Closed	*
7.	Feedwater Controller Failure - Maximum Demand	**
8.	Loss of Feedwater Heating	*
9.	Shutdown Cooling (RHR) Malfunction - Decreasing Temperature	**
10.	Inadvertent HPCI Pump Start	*
11.	Continuous Control Rod Withdrawal During Power Range Operation	*
12.	Continuous Rod Withdrawal During Reactor Startup	*
13.	Control Rod Removal Error During Refueling	*
14.	Fuel Assembly Insertion Error During Refueling	*

* Event not possible.

** Event possible but offsite radiological consequences are inconsequentiaql or non-existent.

*** Event possible but consequence below PAG limits.

15. Off-Design Operational Transients Due to Inadvertent Loading of a Fuel Assembly into an Improper Location	**
16. Inadvertent Loading and Operation of a Fuel Assembly in Improper Location	*
17. Inadvertent Opening of a Safety/Relief Valve	*
18. Loss of Feedwater Flow	**
19. Loss of AC Power	**
20. Recirculation Pump Trip	**
21. Loss of Condenser Vacuum	*
22. Recirculation Pump Seizure	**
23. Recirculation Flow Control Failure - With Decreasing Flow	**
24. Recirculation Flow Control Failure - With Increasing Flow	**
25. Abnormal Startup of Idle Recirculation Pump	**
26. Core Coolant Temperature Increase	**
27. Anticipated Transients Without SCRAM (ATWS)	*
28. Cask Drop Accident	*
29. Miscellaneous Small Releases Outside Primary Containment	***
30. Off-Design Operational Transient as a Consequence of Instrument Line Failure	**
31. Main Condenser Gas Treatment System Failure	***
32. Liquid Radwaste Tank Rupture	***

33.	Control Rod Drop Accident	*
34.	Pipe Breaks Inside the Primary Containment (Loss of Coolant Accident)	**
35.	Pipe Breaks Outside Primary Containment (Steam Line Break Accident)	*
36.	Fuel Handling Accident	* 1/
37.	Feedwater System Piping Break	**
38.	Failure of Air Ejector Lines	*

1/ Event not possible during cold shutdown. If fuel handling operations were conducted following cold shutdown and an accident were to occur, the consequences at the Shoreham site boundary would be below PAG limits if sufficient time had passed following the attainment of cold shutdown.

LILCO, August 3, 1984

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In the Matter of)
)
LONG ISLAND LIGHTING COMPANY) Docket No. 50-322-OL-3
) (Emergency Planning Proceeding)
(Shoreham Nuclear Power Station,)
Unit 1))

AFFIDAVIT OF JOHN A. SCALICE

JOHN A. SCALICE, being duly sworn, deposes and says as follows:

1. My name is John A. Scalice. I am Operations Manager at the Long Island Lighting Company Shoreham Nuclear Power Station. My business address is North Country Road, Wading River, New York, 11792.

2. I make this affidavit in response to the July 24, 1984 "Memorandum and Order Determining that a Serious Safety Matter Exists" of the NRC Licensing Board in the Shoreham emergency planning hearings. This affidavit has two primary purposes. The first is to describe the actions that the Operations Division would typically take to bring the Shoreham plant to cold shutdown using normal station operating procedures, and the time required to complete those actions. The second is to discuss briefly the obligations of licensed reactor operators regarding operator relief and the turnover of reactor operations.

3. The initiation of a controlled plant shutdown is controlled by procedures SP22.004.01, "Operation Between 20 Percent and 100 Percent Power," and SP22.005.01, "Shutdown From 20 Percent Power." (Attachments 1 and 2). These procedures detail the steps and supplementary activities needed to bring the plant from "Power Operation" through "Hot Shutdown" to a "Cold Shutdown" condition.

4. The Shoreham Technical Specifications (§ 1, Table 1.2: Definitions) define the pertinent operational conditions as follows:

> Power Operation - Reactor Mode Switch in "Run" position with the average reactor coolant at any temperature.
>
> Hot Shutdown - Reactor Mode Switch in "Shutdown" position with the average reactor coolant temperature greater than 200°F.
>
> Cold Shutdown - Reactor Mode Switch in "Shutdown" position with the average reactor coolant temperature at less than or equal to 200°F.
>
> Refueling - Reactor Mode Switch in "Shutdown" or "Refuel" position, fuel in reactor vessel with the reactor head closure bolts less than fully tensioned or with the head removed; average reactor coolant temperature less than or equal to 140°F.

5. Briefly the operator actions required by procedures SP22.004.01 and SP22.005.01 to bring the plant to cold shutdown are as follows:

a. Reactor power is reduced by lowering recirculation flow utilizing Reactor Recirculation pumps.

b. The main steam is aligned to the Radwaste Steam Generator below 90% power.

c. Power is further reduced using the Reactor Recirculation pumps until the flow-biased rod blocks are reached.

d. Existing control rod movement sheets are then utilized to insert the control rods until both recirculations pumps can be removed from Master Manual Control.

e. Power reduction continues by the insertion of control rods and by the reduction of recirculation flow until both recirculation pumps reach minimum flow.

f. Plant auxiliaries are aligned in preparation for Turbine-Generator de-energization.

g. At approximately 15% to 20% power, the neutron level instrumentation is activated, tested and then utilized to monitor reactor power.

h. The control rods continue to be inserted and at approximately 5-10% power the reactor mode switch is placed in the next condition of operation: "Start/Hot Standby".

i. Generator load is reduced and the Turbine-Generator is removed from service by opening the main generator output breakers.

j. Control rod insertion continues until the reactor is subcritical and then an "all-rods-in" configuration is achieved.

k. The Reactor Mode Switch is then placed in the "Shutdown" position.

l. Reactor pressure is reduced by using the turbine bypass valves to maintain a cooldown rate below the allowable Technical Specification rate.

m. Reactor water level is maintained using the low flow feedwater controller, and the auxiliary boiler is used to transfer auxiliary loads tc auxiliary steam.

n. When reactor pressure has moved below 109 psig, the Residual Heat Removal System is

aligned in the "Shutdown Cooling Mode" of operation and one recirculation pump is removed from service.

o. This mode of cooling is continued until the reactor coolant temperature is below 200°F at which time the remaining recirculation pump is removed from service.

At this point, the reactor is in a "Cold Shutdown" condition.

6. The time needed to perform the entire sequence of activities described in Paragraph 5 is approximately 12 to 16 hours.

7. While not desirable, power reduction can be achieved more quickly by first reducing recirculation flow and then manually scramming the reactor. The scramming action inserts the control rods and takes the reactor to a subcritical condition in approximately 5 seconds. The time from full power to "all-rods-in" is therefore on the order of minutes. Subsequent pressure reduction and cooldown would follow the path described in items k to o of Paragraph 5. Using this method of power reduction, the total time to Cold Shutdown is approximately 8 hours, or one operations shift.

8. Based on the preceding discussions, if a postulated work stoppage provided twenty-four hours of advance notification, then ample time would exist for the planned operations complement to place the reactor in a Cold Shutdown condition.

9. My observations of those Shoreham licensed operators who are union members uniformly confirm a mature and dedicated

attitude on the part of these operators toward the performance of their duties, obligations and requirements of their licenses. They are fully trained in the proper procedures for operator relief and turnover, and are aware of the provisions of 10 CFR Part 55 which govern their licenses and outline possible causes for revocation including "any conduct determined by the Commission to be a hazard to safe operation of the facility."

10. This responsible attitude was abundantly apparent at the onset of the current work stoppage. The operating crew on shift provided an excellent shift turnover, which included the placement of new chart paper in all recorders, the preparation of operator log sheets, and even the cleaning of the control room facilities. Even though I am confident of the participation of licensed union-member reactor operators in bringing the plant to cold shutdown, their participation is not necessary to effectuate shutdown, following the procedures outlined in Paragraphs 5 through 7 of this Affidavit, in the times stated. Management-level plant staff employees alone can also perform these operations without further assistance, if necessary.

11. Once the reactor has been brought to cold shutdown, it can be maintained in that condition indefinitely, by management-level plant staff employees alone if necessary.

12. To conduct fuel handling activities the reactor must be brought to an operational level below cold shutdown: "Refueling Mode." Management-level plant staff employees alone could also take the reactor to this mode of operation and maintain it in that state.

____
JOHN A. SCALICE

COUNTY OF SUFFOLK)
STATE OF NEW YORK)

Subscribed and sworn to before
me this ___ day of _______________, 1984.

____
NOTARY PUBLIC

My Commission Expires on ____________________________.

Submitted: WR [signature]

Reviewed/OQA Engr.: J Thomas Rose [signature]

Approved/Plant Mgr.: W Ckuegy [signature]

MC-1

SP Number 22.ØØ4.Ø1
Revision 5
Date Eff. 6/20/84
TPC
TPC
TPC

OPERATION BETWEEN 2Ø PCT. AND 1ØØ PCT. POWER

1.0 PURPOSE

To provide instructions to the Station Operating Personnel for safe integrated plant operation between 2Ø% and 1ØØ% power.

2.0 RESPONSIBILITY

The Operating Engineer shall be responsible for ensuring the proper implementation of this procedure.

3.0 DISCUSSION

3.1 This procedure will outline the steps necessary to provide for safe, efficient operation of the plant between 2Ø% and 1ØØ% power.

3.2 The steps in this procedure are sequenced to provide a logical order of occurrence during power ascension and descension. The order may be altered at the discretion of the Watch Engineer based on plant conditions and equipment availability.

3.3 The following procedures are provided:

Appendix 12.1, Generator Capability Curve
Appendix 12.2, Power to Flow Map

3.4 All control switches and controllers for remotely operated valves, pumps and equipment are located in the Main Control Room, unless otherwise specified.

3.5 Since numerous systems are covered in this procedure, system designators will be provided, as needed, for clarity.

4.0 PRECAUTIONS

4.1 Rod movements shall be in accordance with the Control Movement Sheets provided by Reactor Engineering.

4.2 Maintain generator operation within the Reactivity Capability Curve of SPF 22.ØØ4.Ø1-1.

4.3 Maintain reactor operation within the Power/Flow Map limitations of SPF 22.ØØ4.Ø1-2.

4.4 All precautions associated with the operation of individual systems and components as presented in the individual system operating procedures shall be adhered to.

4.5 Primary containment O_2 concentration shall be less than 4% within 24 hours after achieving >15% rated thermal power and shall be verified <4% once per 7 days thereafter, unless within 24 hours prior to reducing thermal power to <15% rated thermal power preliminary to a scheduled reactor shutdown. (except during the performance of the Startup Test Program until either the required 100% of Rated Thermal Power trip tests have been completed or the Reactor has operated for 120 effective full power days).

4.6 Prior to all power ascensions, reactor engineering shall be notified so that they may monitor thermal limits and direct flux shaping and PCIOMR manuevers as appropriate.

4.7 Do not exceed the 80% rod line on the Power/Flow map unless total core flow is greater than 35 Mlbm/hr; otherwise, excessive neutron flux noise levels may occur. <5

5.0 PREREQUISITES

5.1 SP 22.001.01, Startup, Cold Shutdown to 20% Power Procedure completed.

6.0 LIMITATIONS AND ACTIONS

6.1 If any safety related equipment is or becomes inoperable follow the applicable Technical Specification requirements.

6.2 Notify Reactor Engineering upon completion of a thermal power increase of at least 15% of rated thermal power so that necessary Technical Specification Surveillances amy be performed.

6.3 The pressure drop across any one Condensate Demineralize Unit should not exceed 40 psid clean and 50 psid dirty when passing minimum flow (3430 gpm). Maintain flow rate through each demineralizer between 1600 and 3100 gpm during power ascension and descension.

6.4 Do not exceed 2436 MW_t power level.

6.5 The reheaters should be operated to maintain a reheat steam temperature differential of $<50°F$ and a ramp rate of $<125°F/hr$.

6.6 Follow PCIOMR as directed by Reactor Engineering.

6.7 Radiochemistry Section shall be notified to perform an Isotopic Analysis for Iodine (SP 74.010.02) if:

6.7.1 Thermal power changes >15% of rated thermal power in 1 hour or

6.7.2 Off-gas level at SJAE increased by more than 10,000 uci/sec or

6.7.3 Off-gas level at SJAE increased by more than 15% in one hour at release rates greater than 75,000 uci/sec.

7.0 MATERIAL OR TEST EQUIPMENT

N/A

8.0 PROCEDURE

8.1 Power Ascension

8.1.1 Ensure SP 22.001.01, Startup, Cold Shutdown to 20% power procedure completed.

8.1.2 Perform SP 24.12Ø.Ø1, Reactor Recirc and Jet Pump Operability Test.

8.1.3 Withdraw control rods in accordance with the Control Rod Movement Sheets provided by Reactor Engineering.

NOTE: Place additional Condensate Demineralizers in service as required by increased condensate flow, during the performance of this procedure.

8.1.4 Above 2Ø% power verify the following:

8.1.4.1 The RWM System is providing monitoring functions only and no rod blocks.

8.1.4.2 The RSCS is bypassed by verifying its above LPSP light is energized.

8.1.5 When power is >3Ø% perform the following:

8.1.5.1 Verify that the RWM System and RSCS monitoring functions is bypassed.

8.1.5.2 As power increases above 3Ø% determine the RBM setpoint by pushing each RBM pushbutton to record and read the setpoint from the associated RBM recorder.

1. If during power escalation, the green PUSH TO SET UP pushbutton illuminates, press the pushbutton to upscale the RBM setpoint.

NOTE: The RBM setpoint may be upscaled only twice before a rod block occurs.

8.1.5.3 Close the fifth point heaters extraction steam drain isolation valves, 1N23-AOV-Ø35A, B, C & D.

8.1.5.4 Ensure the steam lead drain valves 1N23-AOV-Ø55 A and B; close when their associated control valve opens.

8.1.5.5 Monitor the turbine supervisory instruments for abnormal trends.

8.1.6 At >4Ø% power perform the following:

8.1.6.1 Place the Steam Seal Evaporator on extraction steam.

1. Open the Extraction Steam to Steam Seal Evaporator Valve 1N11-MOV-Ø52 by momentarily depressing the OPEN pushbutton on panel *MCB-Ø1.

2. When Steam Seal Evaporator Shell Side pressure increases to >1Ø psig as indicated on PI-Ø11, and Steam Seal Evaporator Tube Side pressure increases to >4Ø psig as indicated on PI-Ø23, CLOSE the Main Steam to Steam Seal Evaporator Valve 1N11-MOV-Ø46 by placing its control switch to CLOSE on panel *MCB-Ø1.

3. When the Steam Seal Evaporator Shell Side pressure is stable at >1Ø psig, as indicated on PI-Ø11, place 1N11-MOV-Ø46 control switch to AUTO.

8.1.7.2 Place the second Reactor Feed Pump in AUTO control as follows:

1. Place the differential pressure selector switch for 1N21-PDI-Ø18 to the discharge valve (1N21-MOV-Ø35A or B) for the pump being placed in service.

2. Slowly increase the Feedwater Pump speed with its manual flow controller until the dP on PDI-Ø18 is slightly higher than the inservice pump differential pressure.

3. Slowly jog open the Feedwater Pump Discharge valve and observe the differential pressure and valve position indication to insure the valve is moving open.

   NOTE: As the speed of the second Feedwater Pump is increased, observe that the speed of the pump in Auto decreases proportionally and reactor vessel level remains constant.

4. Slowly increase the speed of the second Feedwater Pump with its manual flow controller until there is zero deviation on the manual flow controller.

5. Place the second Feedwater Pump control in automatic by depressing its AUTO pushbutton and observing that the AUTO indicating light is illuminated.

6. Observe Reactor Vessel Level and Feedwater Pump operation and insure feedwater control stability.

   NOTE: With both Reactor Feedwater Pumps in automatic, the pump flows should be approximately equal. If flows are not equal impose a bias signal on Reactor Feedwater Pump A with its bias adjust thumbwheel until flows are equal.

8.1.8 Continue withdrawing control rods until the 8Ø% power rod line is established in accordance with the Control Rod Movement sheets provided by Reactor Engineering. <5

CAUTION: During power ascension to the 8Ø% rod pattern line perform core thermal power calculations as necessary to ensure Reactor thermal limits are maintained.

8.1.9 Place the Recirculation Pumps on Master Manual Control as follows:

NOTE: Feedwater Flow must be $>3x1Ø^6$ lbs/hr and the low flow control interlock must be cleared.

CAUTION: When controlling recirc. flow with the individual M/A Transfer Stations, maintain Recirc Pump A & B speeds within 5% of each other.

8.1.9.1 Increase recirc flow in each recirc loop to 45% core flow by increasing each recirc pump speed with its associated speed controller on M/A Transfer Stations FIC-Ø88A & B.

1. Observe that neutron flux and reactor power increase as recirc flow increases.

2. Prior to power ascension on recirc flow, notify reactor engineering so that they may monitor thermal limits and direct PCIOMR manuevers as appropriate.

8.1.9.2 Transfer control of Recirculation Pump A to the Master Controller as follows:

1. Ensure the Master Controller FIC-Ø83 is in Manual by observing its MANUAL light is illuminated and its AUTO light is extinguished.

2. Adjust Master Controller FIC-Ø83 with its Increase/Decrease pushbuttons until M/A Transfer Station FIC-Ø88A input meter and output meter are matched.

<u>CAUTION:</u> While performing the next step observe Recirculation Flow on Flow Recorder FR-Ø11. If flow increases or decreases rapidly, place the M/A Transfer Station back to MANUAL by depressing the MANUAL pushbutton and re-establish flow to its original value.

3. Place M/A Transfer Station FIC-Ø88A in AUTO by depressing the AUTO pushbutton and observing the AUTO light illuminates and the MANUAL light extinguishes.

8.1.9.3 Transfer control of Recirculation Pump B to the Master Controller as follows:

1. On the M/A Transfer Station for Recirculation Pump B, FIC-Ø88B, adjust the pump speed with the Increase/Decrease pushbuttons until the M/A Transfer Station FIC-Ø88B input meter and output meter are matched.

   <u>CAUTION:</u> While performing the next step observe Recirculation Flow on Flow Recorder FR-Ø11. If flow increases or decreases rapidly place the M/A Transfer Station back to MANUAL by depressing the MANUAL pushbutton and re-establish flow to its original value.

2. Place M/A Transfer Station FIC-Ø88B in AUTO by depressing the AUTO pushbutton and observing the AUTO light illuminated and the MANUAL light extinguishes.

3. Verify that both M/A Transfer Stations, FIC-Ø88A & B, input and output meters read the same.

NOTE: Maximum Recirculation Pump speed is 88%. See Precautions.

8.1.10 Continue withdrawing control rods until the 1ØØ% power rod line is established in accordance with the Control Rod Movement Sheets provided by Reactor Engineering. <5

CAUTION: During power ascension to the 1ØØ% rod line perform core thermal power calculations as necessary to ensure reactor thermal limits are maintained.

8.1.11 Continue increasing reactor power by increasing Reactor Recirculation Flow with the Master Controller, FIC-Ø88 as directed by Reactor Engineering.

8.1.12 At >9Ø% power ensure Extraction Steam is aligned to supply the Radwaste Steam Generator as follows:

8.1.12.1 Open or verify Open Extraction Steam to Radwaste Steam Generator valve 1N11-MOV-Ø53.

8.1.12.2 When the Main Steam to Radwaste Steam Generator pressure control valve, 1N11-PCV-Ø26, is fully closed, close the Main Steam to Radwaste Steam Generator valve 1N11-MOV-Ø47.

8.1.13 Continue increasing reactor power to 1ØØ%. Perform a thermal calibration and adjust APRM indication to match the thermal calibration as required.

8.1.14 Ensure Primary Containment inerting is completed and O2 concentration is verified less than 4% within 24 hours of the time that reactor power first reached 15%.

8.1.15 Notify Reactor Engineering to perform SP 54.ØØ2.Ø1, Reactivity Anomalies Check, if the current startup is the first startup following Core Alterations. <5

8.2 Power Descension

8.2.1 Begin decreasing reactor power by decreasing Reactor Recirculation Flow with the Master Controller, FIC-Ø88 as directed by Reactor Engineering.

CAUTION: During power descension to the 1ØØ% rod pattern line perform core thermal power calculations as necessary to ensure Reactor thermal limits are maintained.

8.2.2 Below 9Ø% power, align Main Steam to the Radwaste Steam Generator by opening Main Steam to Radwaste Steam Generator valve 1N11-MOV-Ø47.

8.2.2.1 Verify that Main Steam to Radwaste Steam Generator pressure control valve, 1N11-PCV-Ø26, opens to maintain 85 psig supply to the Radwaste Steam Generator.

8.2.3 Continue reducing reactor power by reducing Recirculation Flow until the flow biased rod blocks are reached.

<u>CAUTION:</u> Do not reduce total core flow below 35 Mlbm/hr while above the 8Ø% power rod line on the Power/Flow map. <5

8.2.4 Obtain from Reactor Engineering the Control Rod Movement sheets necessary to establish the desired rod line.

8.2.4.1 Establish the desired rod line as directed by Reactor Engineering.

8.2.5 Begin insertion of control rods in the order specified by Reactor Engineering.

8.2.6 When Recirc. flow is equal to 45% in each loop remove Recirculation Pump A from Master Manual Control as follows:

8.2.6.1 Verify that M/A Transfer Station FIC-Ø88A input meter and output meter indication are matched.

8.2.6.2 Place M/A Transfer Station FIC-Ø88A in MANUAL by depressing the MANUAL pushbutton and observing the MANUAL light illuminates and the AUTO light extinguishes.

8.2.7 Remove Recirculation Pump B from Master Manual Control as follows:

8.2.7.1 Verify that M/A Transfer Station FIC-Ø88B input meter and output meter are matched.

8.2.7.2 Place M/A Transfer Station FIC-Ø88B in Manual by depressing the MANUAL pushbutton and observing the MANUAL light illuminates and the AUTO light extinguishes.

<u>CAUTION:</u> When controlling recirc. flow with the individual M/A Transfer Stations, maintain Recirculation Pumps A & B speeds within 5% of each other.

8.2.8 Continue reducing reactor power by reducing Recirculation Flow with M/A Transfer Stations A & B until both Recirculation Pumps are at minimum speed.

8.2.9 At approximately 45% power perform the following:

8.2.9.1 Establish Main Steam to the Steam Seal Evaporator as follows:

1. Open the Main Steam to Steam Seal Evaporator valve 1N11-MOV-Ø46.

2. Verify that Steam Seal Evaporator Tube Side Pressure Controller 1N11-PC-Ø22A opens to maintain tube side pressure at 4Ø psig as extraction steam flow decreases.

3. Close the Extraction Steam to Steam Seal Evaporator valve 1N11-MOV-Ø52 after 1N11-PC-Ø22A is controlling.

8.2.9.2 Place Reactor Feed Pump B in Manual Control and reduce the pump flow to minimum as follows:

1. Place the Feedwater Turbine Flow Controller HC-Ø12B to the Manual mode by depressing the MANUAL pushbutton. Observe that the MANUAL indicating light is illuminated.

2. Slowly decrease Feedwater Pump B speed to minimum with the Feedwater Turbine Flow Controller and observe that Feedwater Pump A speed increases to maintain reactor water level.

8.2.10 As power decreases toward 3Ø% perform the following:

8.2.10.1 Ensure the Steam Lead Drain valves 1N23-AOV-Ø55A & B open when their associated control valves go closed.

8.2.10.2 Open the fifth point heaters Extraction Steam Drain Isolation valves 1N23-AOV-Ø35A, B, C & D.

8.2.11 At $\leq$3Ø% power perform the following:

8.2.11.1 At the RBM recorders press the Push to Record switch.

8.2.11.2 Verify that RWM System monitoring function is automatically initiated.

1. At $\leq$30% power but $\geq$20% power, the RWM System will provide insert error alarms only. Ensure the rod pattern is correct as per Reactor Engineering in this transition zone and attempt to clear any insertion errors prior to reaching 20% power.

2. Verify the RSCS is in service.

8.2.12 Remove from service any condensate demineralizers not required as determined by condensate flow if not previously done.

8.2.13 Continue reducing power to 20% by rod insertion.

8.2.14 At 20% power perform the following:

8.2.14.1 Verify that the RSCS is automatically placed in service.

8.2.14.2 Verify that RWM System is active.

8.2.15 Stop Reactor Feed Pump B as follows:

8.2.15.1 At the Reactor Feed Pump Control panel, lower turbine B speed reference from the high speed stop by pressing the lower FAST pushbutton until the AUTO control light extinguishes.

8.2.15.2 Close the Feed Pump discharge valve 1N21-MOV-035B.

8.2.15.3 Trip Reactor Feed Pump B with its Manual Trip pushbutton.

8.2.15.4 Ensure that Reactor Feed Pump B goes on turning gear at approximately 2 rpm.

8.2.16 If shutdown is to continue, proceed to procedure SP 22.005.01 Shutdown - from 20% Power.

9.0 ACCEPTANCE CRITERIA

N/A

10.0 FINAL CONDITIONS

N/A

11.0 REFERENCES

11.1 Technical Specifications

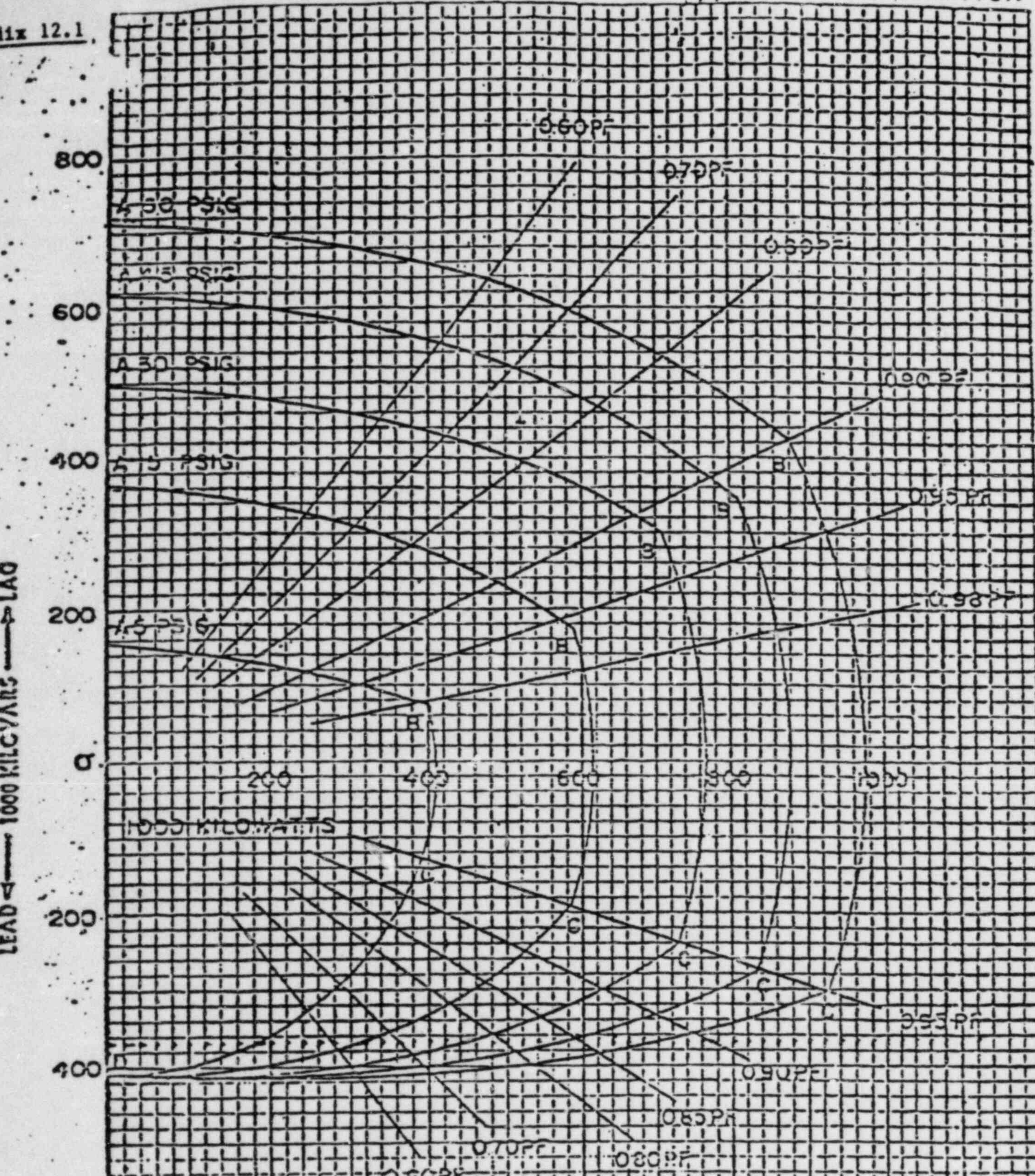
11.2 SP 22.ØØ1.Ø1 Startup, Cold Shutdown to 2Ø% Power

11.3 SP 22.ØØ5.Ø1 Shutdown - From 2Ø% Power

12.0 APPENDICES

12.1 SPF 22.ØØ4.Ø1-1, Generator Capability Curve

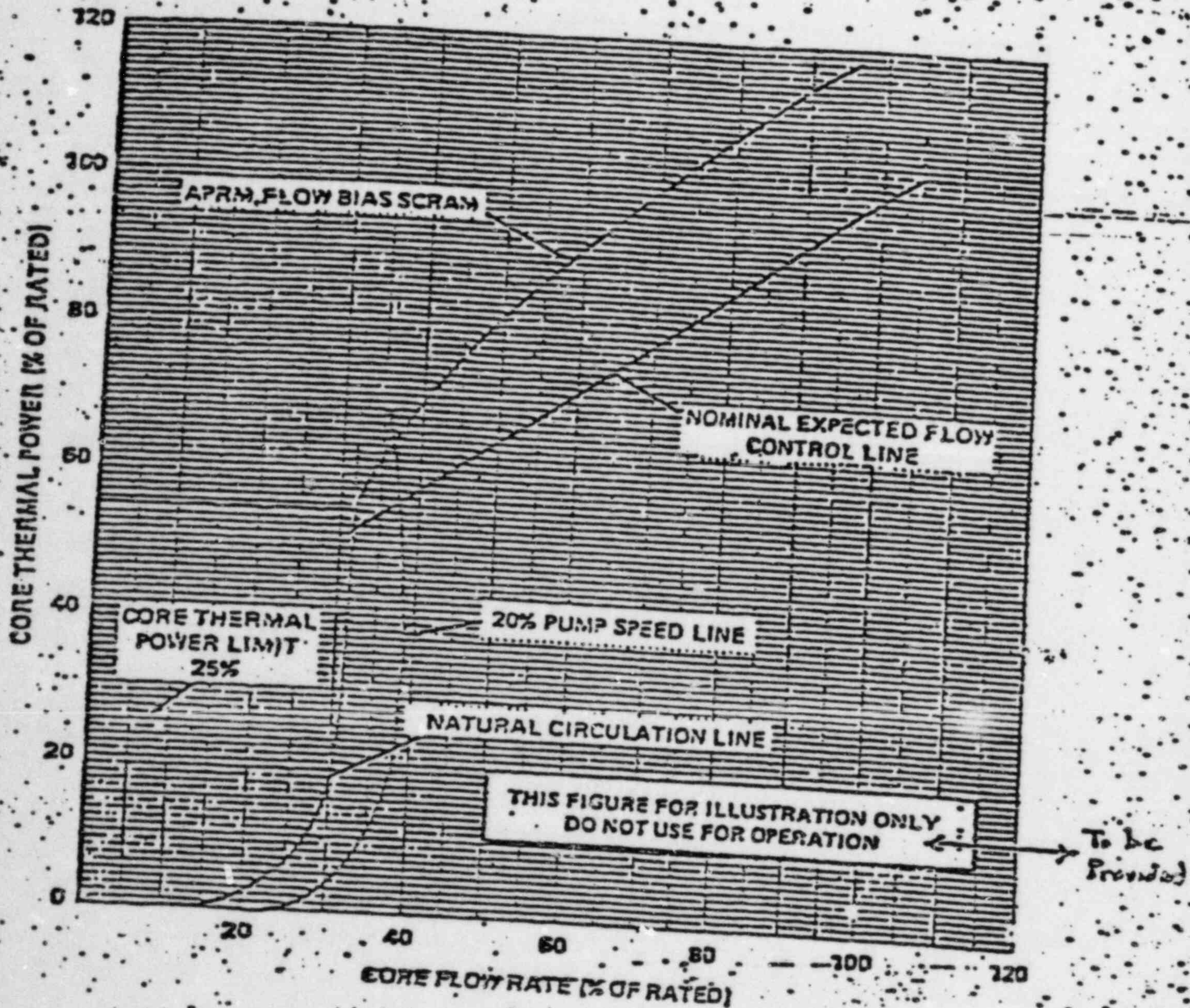
12.2 SPF 22.ØØ4.Ø1-2, Power to Flow Map



CURVE AB LIMITED BY FIELD HEATING

CURVE BC LIMITED BY ARMATURE HEATING

CURVE CD LIMITED BY ARMATURE CORE END HEATING



SPF 22.004.01-2, Rev. 5

ATTACHMENT 2

Submitted: [signature]

Reviewed/OQA Engr.: [signature]

Approved/Plant Mgr.: [signature]

MC-1

SP Number 22.005.01
Revision: 4
Date Eff.: 1/26/83
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SHUTDOWN - FROM 20% POWER

1.0 PURPOSE

To provide instructions to the station operating personnel for the shutdown of the Shoreham Nuclear Plant from 20% power generation to Hot Standby, Hot Shutdown or Cold Shutdown conditions.

2.0 RESPONSIBILITY

The Operating Engineer shall be responsible for ensuring the proper implementation of this procedure.

SR2-1021.200-6.421

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3.0 DISCUSSION

3.1 It is the intent of this procedure to outline the many steps required to achieve a safe Reactor shutdown.

3.2 This procedure addresses bringing the plant from 20% Reactor power with the generator on the line to a Cold Shutdown condition. If desired pressure reduction and cooldown using this procedure may be stopped and maintained at any pressure and temperature desired.

3.3 The following procedures are provided for Shutdown of the Reactor.

4.0 PRECAUTIONS

4.1 Reactor SCRAM will result if MSIV's are closed with the Mode Switch in RUN.

4.2 Reactor SCRAM will occur if the Mode Switch is placed in Startup above 15% Reactor power.

4.3 The decay of reactor power during the full insertion of control rods, which will performed concurrently with reactor cooldown, must be monitored continuously to avoid an inadvertant criticality.

4.4 Initiation of Shutdown Cooling must be done slowly to minimize the possibility of thermal shock on system components.

4.5 When operating the Shutdown Cooling System in conjunction with the Reactor Head Cooling System, adjust head cooling flow as required to avoid causing a pressure increase in the Reactor vessel.

4.6 Isolation of Shutdown Cooling will occur if reactor pressure rises above 1Ø9 psi.

4.7 Do not secure one method of decay heat removal prior to establishing another.

4.8 The use of auxiliary steam to support main turbine sealing system, radwaste off-gas and radwaste evaporators should be kept to the minimum consistent with good operations. The condensed aux. boiler steam adds to the radioactively contaminated water inventory of the station.

5.0 PREREQUISITES

5.1 Section 8.2 of SP22.ØØ4.Ø1 completed.

5.2 Aux boilers available to supply loads as needed.

5.3 System Operations has been notified of the impending shutdown and permission has been obtained from the Plant Manager or Chief Operating Engineer to perform a normal plant shutdown.

6.0 LIMITATIONS AND ACTIONS

6.1 Technical specifications; all sections of the Tech Specs listed in Section 11.0 are applicable.

6.2 Cooldown rate ≤ 1ØØ°F/hr.

6.3 Monitor Reactor vessel shell Temperature and Reactor vessel pressure once per 3Ø minutes during cooldown to ensure cooldown rate is within limits.

6.4 During Reactor Vessel heatup and cooldown the reactor coolant system temperature at the following locations shall be recorded until 3 successive readings at each location are within 5°F:

1. Reactor vessel bottom drain,
2. Recirculation Loops A and B, and
3. Reactor vessel bottom head.

6.5 Do not allow vessel temperature to decrease to <7Ø°F while head studs are tensioned.

6.6 Radiochemistry Section shall be notified to perform an Isotopic Analysis for iodine (SP 74.Ø1Ø.Ø2) if thermal power changes >15% of rated thermal power in 1 hr.

6.7 Do not place RHR system in the Shutdown Cooling mode until Reactor pressure is <1Ø9 psig.

6.8 The sequence listed in any one section of this procedure may be altered with the approval of the Watch Engineer to suit existing plant conditions and time requirements, however, all steps within a given section shall be completed before starting the next section. Each step shall be initialed by the Watch Engineer or Nuclear Station Operator. If steps are repeated, due to problems encountered during the cooldown, the repeated steps should be indicated and initialed.

7.0 MATERIALS OR TEST EQUIPMENT

N/A

8.0 PROCEDURE | Initials

8.1 Normal Shutdown

8.1.1 Prior to reducing power below 20% perform the following:

8.1.1.1 Ensure the prerequisites of Section 5.0 are complete. ________

8.1.1.2 If required, perform Rod Worth Minimizer Functional Test, SP24.6Ø7.Ø1. ________

8.1.1.3 If required perform Rod Sequence Control System Functional Test, SP24.6Ø9.Ø1. ________

8.1.2 Continue inserting control rods as directed by Reactor Engineering. ________

8.1.3 Between 20% and 15% power perform the following:

8.1.3.1 Stop one condensate booster pump. (SP23.1Ø9.Ø1) ________

8.1.3.2 Stop one condensate pump. (SP23.1Ø3.Ø1) ________

8.1.3.3 Place the Reactor Vessel Level Control System to the single element mode of operation. (SP23.656.Ø1) ________

8.1.3.4 As necessary, remove condensate demineralizers from service as Condensate Flow decreases. (SP23.1Ø4.Ø1) ________

8.1.3.5 Place all 8 IRM range selector switches to Range 10 (SP23.6Ø2.Ø1). ________

8.1.3.6 Fully insert all operable IRM detectors. (SP23.6Ø2.Ø1) ________

8.1.4 At 15% power perform the following:

8.1.4.1 IRM/APRM overlap calibration in accordance with SP24.6Ø2.Ø2. ________

8.1.4.2 OPEN the following main Turbine drain valves (SP23.127.Ø1):

a. Crossunder Pipe (1N23-MOV-38A, B, C, & D) ________

b. Crossover Pipe (1N23-MOV-74A, B) ________

c. MSR 1st Stage Reheat Steam Supply Pipe (1N23-MOV-44A, B) ________

d. MSR Shell Pocket (1N23-MOV-61A, B, C & D) ________

e. Extraction Line Drains on 1st thru 4th Point Heaters (1N23-AOV-31A, B; 32A, B; 33A, B; 34A, B). ________

8.1.5 Continue inserting control rods as directed by Reactor Engineering. ________

8.1.6 When Reactor power is between 5 - 1Ø%, transfer the Reactor Mode Switch to START/HOT STANDBY as follows:

CAUTION: (1) If Reactor power >15% and the mode switch is place in START/HOT STANDBY a scram will result.

(2) An APRM downscale combined with a companion IRM Hi Hi will cause a scram if the Mode switch is in RUN.

8.1.6.1 Momentarily switch each IRM/APRM and IRM/RBM recorder to IRM and verify all eight IRM indications are on range. ________

8.1.6.2 Turn the IRM/APRM recorders back to indicate APRM output, but leave the IRM/RBM recorders switched to IRM. ________

8.1.6.3 When the first APRM DNSC alarm light illuminates, switch the IRM/APRM recorders to IRM. ________

8.1.6.4 Select the IRM ranges for each of the eight channels so that the indication is between 25/125 and 75/125 on the black (125) scale or between 8/4Ø and 25/4Ø on the red scale. ________

8.1.6.5 Place the Reactor Mode Switch in START/HOT STANDBY and record the time in the operator's log. ________

8.1.7 When the Reactor Feed Pump Turbine speed decreases to 2000 rpm, transfer the feedwater flow path to the Startup Level Control Valves, 1N21-LCV-007X/Y. (SP23.656.01) ________

8.1.8 Continue decreasing load until Main Generator output is at 50 MWe, then perform the following:

8.1.8.1 Test the AUTO start of the Emergency Bearing Oil Pump then, return to AUTO. ________

8.1.8.2 START the Main Turbine High Pressure Lift Pumps, Motor Suction Pump, and the Turning Gear Oil Pump. ________

8.1.8.3 Request permission from the System Operator to separate the Generator from the Grid. ________

8.1.8.4 Place the Main Turbine Generator Bearing Vibration and Temperature Recorders in HI speed. ________

8.1.9 Decrease the Main Generator output to 20 MWe with the Load Selector and then perform the following:

8.1.9.1 Adjust the Generator MVAR's to 0 with the AC Auto Adjust regulator. ________

8.1.9.2 Verify that the Turbine Bypass Valves are open maintaining Reactor pressure at approximately 920 psig. ________

8.1.9.3 Adjust the Main Generator DC Manual Adjust for Zero indication on the Main Transfer Voltage Indicator and then place the Main Generator Auto Voltage Reg. Transfer switch to MANUAL. ________

8.1.9.4 OPEN both GENERATOR OUTPUT BREAKERS 91310 and 1330). Record the time in the operator's log. ________

8.1.9.5 Run the Main Generator DC Manual Adjust down to its low limit stop, GREEN light illuminated. ________

8.1.9.6 OPEN the Exciter Field Breaker and verify that generator voltage decreases to zero. ________

8.1.9.7 Inform the System Operator that the unit is off the line. ________

CAUTION: The Vacuum Breakers should be used only when an emergency condition requires that the unit be decelerated as fast as possible.

Opening Vacuum Breakers imposes excessive loads on the Turbine last stage buckets. Vacuum shall not be broken until the unit shaft rotation has decreased to <1200 RPM.

8.1.10 TRIP the turbine in accordance with SP 23.127.01. ________

8.1.11 Open the drain valves associated with the turbine, reheater and Main Steam lines as required. (SP 23.127.01) ________

8.1.12 As the Turbine slows down, observe bearing metal temperatures for a sudden spike which may be indicative of a wiped bearing. ________

8.1.13 Secure cooling water to the Generator Bus Duct cooler if, TBCLCW drops below ambient temperature. ________

8.1.14 Reduce Main Turbine Generator bearing oil inlet temperature as the Turbine slows down so that it is 95°F when ready for Turning Gear operation. ________

8.1.15 Start the Turning Gear oil pump. As soon as the Turbine Shaft is $\leq$ 1/2 rpm, verify that the Turning Gear Motor starts and the Turning Gear engages. Verify locally that the turbine shaft is turning. ________

8.1.15.1 If the Turning Gear does not engage automatically, engage it manually. ________

8.1.16 After the Main Turbine is on turning gear Stop the Motor Suction Pump and place its control switch in Pull-To-Lock. ________

8.1.17 CLOSE the Main Steam to the 2nd Stage Reheaters (1N11-MOV-031A & B) and open the steam line drains (1N23-MOV-043A & B). ________

8.1.18 CLOSE the 2nd Stage Extraction steam to the 1st Stage Reheaters (1N23-MOV-033A & B) and open the Extraction Steam Line Drains (1N23-MOV-044A & B) and apply blanket steam to the Reheaters (SP 23.110.01). ________

8.1.19 Press the Vent Pushbutton on the Main Generator Hydrogen panel to vent the hydrogen sample system to atmosphere. OPEN Analyzer vent to atmosphere (1N45-02V-0012) & CLOSE Analyzer return to generator (1N45-01V-0016). ________

8.1.20 Insert the SRM detectors, prior to reaching range 4 on the IRM's, and move them in as necessary to maintain the SRM count rate between 10^2 & 10^5 counts per second. ________

NOTE: If the Reactor is to be maintained in the Hot Standby condition go to Section 8.2 of this procedure at this time.

8.1.21 Open the Main Steam Line drains 1B21*MOV-Ø33 & 38 to the condenser. ________

8.1.22 Monitor Reactor cooldown, record temperatures on SPF22.ØØ5.Ø1-2 every 5 minutes and plot the cooldown on SPF22.ØØ5.Ø1-1 every 3Ø minutes. ________

8.1.23 Continue inserting control rods in the selected rod sequence until all rods are fully inserted. ________

8.1.24 Change the range switches on the IRM recorders as necessary to keep all recorders operating in the desired range. ________

8.1.25 Place the Reactor Mode Switch to SHUTDOWN. ________

NOTE (1) The Reactor Mode Switch may be placed in REFUEL to allow trouble shooting or surveillance testing.

(2) If the Reactor is to remain in Hot Shutdown perform Step 8.1.26.

(3) If the reactor is to be cooled down to Cold Shutdown proceed to Step 8.1.27.

8.1.26 If the Reactor is to remain in Hot Shutdown, transfer the following loads to the Aux Boiler as required to minimize plant cooldown:

8.1.26.1 Main Turbine Steam Seal System (SP23.124.Ø1). ________

8.1.26.2 Steam Jet Air Ejector and Radwaste Off Gas (SP23.7Ø1.Ø1). ________

8.1.26.3 Radwaste Regen and Waste Evaps (SP23.124.Ø2). ________

8.1.26.4 Station heating system (SP23.422.Ø1). ________

NOTE: Maintain Hot Shutdown by dumping steam to the condenser as required to maintain Reactor pressure and temperature.

CAUTION: Reactor cooldown is limited to $\leq$ 1ØØ°F per hour.

8.1.27 Start Reactor pressure reduction and cooldown by adjusting the BYPASS JACK as necessary to maintain a cooldown rate less than the Technical Specification rate. ______

8.1.28 As feedwater flow to the Reactor decreases, verify the condensate pump pressure control valve opens to maintain dP across the pump at approximately 2Ø5 psid. ______

8.1.29 Decrease Pressure Set 50 - 75 psig above reactor pressure until 150 psig is reached. ______

8.1.30 When Reactor pressure decreases to 35Ø psig perform the following:

8.1.30.1 Place the Low Flow Feedwater Level Control Valves 1C32-LCV-ØØ7X/Y in Manual and maintain Reactor water level at 35" ± 2". ______

8.1.30.2 Remove the remaining Reactor Feed Pump from service (SP23.656.Ø1). ______

8.1.31 When Reactor pressure decreases to 15Ø psig place the following loads on Aux Boiler Steam:

8.1.31.1 Main Turbine Steam Seal System (SP23.124.Ø1). ______

8.1.31.2 Radwaste Regen and Waste Evaps. (SP23.124.Ø2). ______

8.1.31.3 Station Heating System if required (SP23.422.Ø1). ______

8.1.32 When Reactor pressure decreases to 12Ø psig place the SJAE and Radwaste Off-Gas on Aux Boiler Steam. (SP23.7Ø1Ø1). ______

8.1.33 When Reactor pressure decreases to <1Ø9 psig perform the following:

NOTE: When aligning the RHR System for shutdown cooling it is preferred to use the "B" RHR System for Reactor cooling.

8.1.33.1 Stop Reactor Recirculation Pump B (SP23.12Ø.Ø1). ______

8.1.33.2 Place the "B" loop of RHR in service in the Shutdown Cooling Mode of operation as per SP23.121.Ø1. ______

8.1.34 Continue cooldown using RHR Shutdown cooling and steam dump to the condenser. ______

8.1.35 When Reactor coolant temperature is <212°F and Reactor

pressure is atmospheric perform the following:

8.1.35.1 Open the Reactor head vent valves to the drywell equipment drain tank, 1B21*MOV-Ø83 & Ø84. ________

8.1.35.2 Close the Reactor head vent valve to "A" Main Steam line, 1B21*MOV-Ø85. ________

8.1.35.3 Secure the Feedwater alignment to the Reactor vessel. ________

8.1.35.4 Stop the running condensate booster pump. ________

8.1.36 Continue cooldown to ≤ 2ØØ°F. ________

NOTE: The Reactor is now in COLD SHUTDOWN with the Reactor mode switch in SHUTDOWN, moderator temperature is ≤ 2ØØ°F and all rods are inserted.

8.1.37 If desired, break condenser vacuum as follows:

8.1.37.1 Announce TWICE over the plant PA System.

"CAUTION, all personnel stand clear of the Main Condenser vacuum breakers." ________

8.1.37.2 Secure the SJAE and the Condenser Off-Gas Removal System (SP23.7Ø1.Ø1). ________

8.1.37.3 Fully open the Main Condenser vacuum breaker valves. ________

8.1.37.4 When the Main Condenser vacuum reaches Ø psig, secure the steam seals on the Main Turbine and Reactor Feed Pump Turbines and remove the Gland Steam packing exhauster from service SP23.124.Ø1. ________

8.1.37.5 Stop the running condensate pump if desired. ________

8.1.38 Continue cooldown using shutdown cooling until the final desired shutdown temperature is achieved. ________

8.1.39 Remove the running Reactor Recirculation Pump from service and any remaining equipment from service as desired using the applicable operating procedures. ________

8.1.40 The final conditions of this section are as follows:

8.1.40.1 Reactor temperature <2ØØ°F. ________

8.1.40.2 Reactor Mode Switch in SHUTDOWN or REFUEL. ________

8.2 Shutdown, Hot Standby

NOTE: (1) This section is to be used when it is necessary to isolate the Reactor from the condenser while maintaining the Reactor critical. It is designed to eliminate the time consuming plant cooldown and shutdown with subsequent approach to criticality and heatup.

(2) When lowering RHR heat exchanger level, in Steam Condensing Mode, it must be done slowly to minimize thermal shock to the heat exchanger.

(3) While regulating Reactor pressure with the Bypass Valves, and if inadvertently a Group I isolation occurs, actuate RCIC/HPCI in the Heat Sink Mode, to control Reactor pressure.

(4) If, while regulating reactor pressure with the RHR in the Steam Condensing Mode, and RHR inadvertently isolates, actuate RCIC/HPCI or Safety Relief Valves to control reactor pressure.

8.2.1 Place the RCIC System in operation in the Full Flow Test Mode (SP23.119.Ø1). ________

8.2.2 Place 1 RHR heat exchanger (B" loop is preferred) in the Steam Condensing Mode of operation with its condensate returning to the suppression pool (SP23.121.Ø1). ________

8.2.3 If Suppression Pool heatup is anticipated, place 1 RHR loop (A" loop is preferred) in the Suppression Pool Cooling mode of operation. ________

8.2.4 Transfer the following loads to the Aux Boiler:

8.2.4.1 SJAE and Condenser Off-Gas System (SP23.7Ø1.Ø1). ________

8.2.4.2 Steam Seal System (SP23.124.Ø1). ________

8.2.4.3 The Waste Evaporator (SP23.711.Ø1). ________

8.2.4.4 The Regen Evaporator (SP23.712.Ø1). ________

NOTE: Excessive rod insertion, will result in an undesirably large shutdown margin and increased rod motion.

8.2.5 Insert control rods to achieve a slightly negative period. ________

8.2.6 Insert SRM detectors as necessary to maintain the count level between 1,ØØØ and 1ØØ CPS. ________

8.2.7 When a desired power level is achieved for "HOT STANDBY", adjust rods in accordance with the rod sequence checklist to obtain the target power level desired by Reactor Engineering. ________

NOTE: (1) It is recommended that the "HOT STANDBY" power level should be in the IRM range 4-6.

(2) It is desirable to maintain reactor pressure as close to 92Ø psig as is practicable during the hot standby condition. This will minimize the thermal cyclic stresses on the primary boundary and expedite the subsequent recovery.

CAUTION: 1) The operator should not attempt to control reactor pressure with control rod movement.

2) If inadvertant safety relief actuation should occur while in Hot Standby manually scram the Reactor.

3) Reactor Cooldown limit is $\leq$ 1ØØ°F/hr.

8.2.8 Ensure the PRESSURE SET setpoint is 92Ø psig and the bypass valves are modulating to maintain this pressure. ________

CAUTION: The injection of RCIC water to the reactor must be introduced slowly as not to add a significant amount of positive reactivity due to cold water. Control rods may have to be inserted to control power within the desired range.

8.2.9 When the conductivity of the condensate being rejected from the RHR heat exchanger to the suppression pool is suitable for reactor makeup, commence feeding the reactor with the RCIC pump as follows:

8.2.9.1 Adjust the speed of the RCIC turbine and the position of full flow test valve 1E51-MOV-Ø37 to match its discharge pressure with reactor pressure. ________

NOTE: At this point, it may be necessary to divert some flow to the CST in order to maintain RCIC speed above 2ØØØ RPM.

8.2.9.2 With RCIC pump discharge pressure equal to or greater than reactor pressure, open the RCIC pump discharge valve 1E51-MOV-Ø35. ________

8.2.9.3 Slowly increase RCIC pump speed. Observe that the Low flow feed control valves 1N21-LCV-ØØ7X/Y move in the close direcion as the RCIC pump provides reactor makeup water. ________

8.2.9.4 Divert RHR heat exchanger condensate flow to the RCIC pump suction by opening RHR HX to RCIC 1E11-MOV-Ø43A(B) and closing RHR supp pool drain 1E11-MOV-Ø44A(B). ________

NOTE: Do not exceed 14Ø°F or 75 psig at the suction of the RCIC pump or let turbine speed fall below 2,ØØØ rpm.

8.2.10 Adjust the RHR heat exchanger level and RCIC pump speed such that they are removing all of the reactor heat as indicated by the turbine bypass valve(s) automatically closing. ________

NOTE: RCIC pump speed is being maintained manually or automatically with its controller and being supplied condensate from the RHR heat exchanger supplying all of the reactor makeup water (excluding CRD hydraulic flow). RHR heat exchanger level is being adjusted manually to remove all the excess heat from the reactor.

8.2.11 Ensure that the following conditions have been met:

8.2.11.1 Vessel level is stable. ________

8.2.11.2 RHR heat exchanger level is stable. ________

8.2.11.3 Reactor makeup is being provided entirely by RCIC and CRD flow. ________

8.2.11.4 Reactor pressure is stable. ________

8.2.12 Isolate the reactor vessel as follows:

8.2.12.1 If a reactor feedpump is operating, remove it from service (SP23.1Ø9.Ø1). ________

8.2.12.2 Shut main steam isolation valves 1B21-AOV-Ø81A, AOV-Ø81B, and AOV-Ø81C. ________

8.2.12.3 Note that the above listed conditions of 8.2.11 are still stable, then shut main steam isolation valves 1B21-AOV-Ø81D, AOV-Ø82A, AOV-Ø82B, AOV-Ø82C, AOV-Ø82D. ________

8.2.12.4 CLOSE Main Steam Line Drain Valves, 1B21-MOV-Ø33 and 1B21-AOV-Ø89. ________

8.2.13 Continue to make the proper adjustments to maintain Hot Standby condition:

8.2.13.1 Maintain reactor power with control rod movement. ________

8.2.13.2 Maintain reactor pressure by varying RHR heat exchanger level. ________

8.2.13.3 Reactor level is maintained by the RCIC system injecting a constant flow. Reactor Water Cleanup will have to be lined up to reject the extra water inventory added by CRD flow. ________

8.2.13.4 If reactor decay heat is decreased to a small amount, RHR steam condensing may be secured. The RCIC turbine can be run periodically in the full flow test mode to control temperature and pressure. ________

CAUTION: If RHRS inadvertently isolates, use Safety Relief Valves as necessary to maintain Reactor pressure.

8.2.14 If it is desired to break Condenser vacuum, perform the following steps:

CAUTION: Announce twice on the PA system "CAUTION all personnel stand clear of the turbine condenser vacuum breakers." ________

8.2.14.1 Insure all MSL drains are SHUT to prevent blowing steam to Condenser. ________

8.2.14.2 Remove SJAE and Radwaste Off-Gas system from service (SP23.7Ø1.Ø1). ________

8.2.14.3 OPEN the Vacuum Breaker by placing its Control Switch to OPEN. ________

8.2.14.4 When Condenser vacuum reaches zero, SHUTDOWN the Steam Seal system (SP23.124.Ø1). ________

8.2.15 The final conditions of this Section are as follows:

8.2.15.1 Reactor is critical with Mode Switch in Startup. ________

8.2.15.2 Reactor temperature $\geq$ 212°F. ________

8.2.15.3 MSIV's are closed. ________

8.2.15.4 The Main Condenser may or may not be available. ________

9.0 ACCEPTANCE CRITERIA

N/A

10.0 FINAL CONDITIONS

10.1 The final conditions are listed at the end of Sections 8.1 and 8.2.

11.0 REFERENCES

11.1 Technical Specifications, Section 3.1.4.1 RWM OPERABLE <2Ø% Power.

11.2 Technical Specifications, Section 3.1.4.2 RSCS OPERABLE <2Ø% Power.

11.3 Technical Specifications, Section 3.4.4 Reactor Coolant Conductivity and Chloride Limits.

11.4 Technical Specifications, Section 3.4.6.1 Reactor Coolant Heatup and Cooldown Limits.

11.5 Technical Specifications, Section 3.6.2.2 Suppression Pool Water Temperature and Level Limits.

11.6 Technical Specification, Section 3.5.1 HPCI OPERABLE >15Ø psig.

11.7 Technical Specification, Section 3.7.4 RCIC OPERABLE >13Ø psig.

11.8 SP22.ØØ2.Ø1 Hot Standby

11.9 SP22.ØØ4.Ø1 Operation Between 2Ø PCT and 1ØØ PCT Power

11.10 SP23.1Ø1.Ø1 Aux Blr & Aux Blr Stm & Fuel Oil Supply

11.11 SP23.1Ø3.Ø1 Condensate

11.12 SP23.1Ø4.Ø1 Condensate Filter Demineralizer

11.13 SP23.1Ø9.Ø1 Feedwater System

11.14 SP23.11Ø.Ø1 Feedwater Heaters, Extract Stm, Htr Drains and Moisture Separator Reheaters

11.15 SP23.111.Ø1 Generator Hydrogen and Carbon Dioxide Gas

11.16 SP23.115.Ø1 Generator Exciter

11.17 SP23.116.Ø1 Main and Auxiliary Steam

11.18 SP23.119.Ø1 Reactor Core Isolation Cooling (RCIC) System

11.19 SP23.121.Ø1 Residual Heat Removal (RHR) System

11.20 SP23.124.Ø1 Steam Sealing

11.21 SP23.127.Ø1 Turbine Generator

11.22 SP23.13Ø.Ø1 Turbine Lube Oil and Turning Gear

11.23 SP23.1Ø2.Ø1 High Pressure Coolant Injection (HPCI)

11.24 SP23.6Ø1.Ø1 Source Range Monitoring System (SRM)

11.25 SP23.6Ø2.Ø1 Intermediate Range Monitoring System (IRM)

11.26 SP23.6Ø4.Ø1 Average Power Range Monitoring System (APRM)

11.27 SP23.6Ø7.Ø1 Rod Worth Minimizer (RWM)

11.28 SP23.6Ø9.Ø1 Rod Sequence Control System (RSCS)

11.29 SP23.621.Ø1 Reactor Vessel Water Level

11.30 SP23.623.Ø1 Reactor Vessel Temperature System

11.31 SP23.656.Ø1 Feedwater Control

11.32 SP23.7Ø1.Ø1 Condenser Off-Gas Removal

11.33 SP23.7Ø9.Ø1 Reactor Water Cleanup

11.34 SP23.714.Ø1 Gaseous Radwaste (Holdup)

12.0 APPENDICES

12.1 SPF 22.ØØ5.Ø1-1, Reactor Cooldown Rate Data Sheet.

12.2 SPF 22.ØØ5.Ø1-2, Reactor Vessel Temperature Data Sheet.

Appendix 12.1

REACTOR COOLDOWN RATE DATA SHEET (Limit < 100°F/Hr)

Date______________ Start Time___________

LATER

REACTOR VESSEL TEMPERATURE DATA SHEET

NORMAL SHUTDOWN

Date________________ Start Time________________

START TIME PLUS HOURS	MINUTES	ACTUAL TIME	REACTOR VESSEL WALL TEMPERATURE	B21-R007 REACTOR VESSEL FLANGE TEMPERATURE	REACTOR VESSEL BOTTOM HEAD TEMPERATURE	G33-R607 REACTOR VESSEL BOTTOM DRAIN TEMPERATURE	B31-R650 RECIRCULATION PUMP SUCTION TEMPERATURE A	B	1C32-PI-003 REACTOR VESSEL PRESSURE
	00								
	05								
	10								
	15								
	20								
	25								
0	30								
	35								
	40								
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	40								
	45								
	50								
	55								
	60								

SPF 22.005.01-2 Rev. 4 Completed by________________

LILCO, August 3, 1984

CERTIFICATE OF SERVICE

In the Matter of
LONG ISLAND LIGHTING COMPANY
(Shoreham Nuclear Power Station, Unit 1)
(Emergency Planning Proceeding) Docket No. 50-322-OL-3

I hereby certify that copies of LILCO'S MOTION FOR SUMMARY RESOLUTION OF BOARD DETERMINATION INVOLVING EFFECT OF STRIKE ON LERO AND PROPOSAL OF LICENSE CONDITION and STATEMENT OF MATERIAL FACTS IN SUPPORT OF LILCO'S MOTION FOR SUMMARY RESOLUTION OF JULY 24 BOARD ORDER were served this date upon the following by first-class mail, postage prepaid, or by hand (one asterisk), or by Federal Express (two asterisks).

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DATED: August 3, 1984