MAR 24 1988

Docket Nos. 50-352
50-353

Philadelphia Electric Company
ATTN: Mr. J. S. Kemper
Senior Vice President, Nuclear
2301 Market Street
Philadelphia, Pennsylvania 19101

Gentlemen:

Subject: MEETING SUMMARY

A meeting was held with members of your staff on January 29, 1988 at the Region I office to discuss a proposal to license currently licensed operators at Limerick Unit 1 to operate Limerick Unit 2. The details of this discussion along with information provided by your staff are included in the Meeting Summary enclosed with this letter.

In accordance with Section 2.790 of the NRC's "Rules of Practice" Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed report will be placed in the NRC's Public Document Room.

No reply to this letter is required. Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

ROBERT M. GALLO

Robert M. Gallo, Chief
Operations Branch
Division of Reactor Safety

Enclosure: As stated

cc w/encl:
Graham M. Leitch, Vice President, Limerick Generating Station
Troy B. Conner, Jr., Esquire
Eugene J. Bradley, Esquire, Assistant General Counsel
W. M. Alden, Engineer in Charge, Licensing Section
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
John Hannon, Chief OLB, NRR
Commonwealth of Pennsylvania

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cc w/encl cont:
S. Joseph Kowalski, Vice President, Nuclear Engineering
W. T. Ullrich, Superintendent, Limerick 2 Project
J. M. Corcoran, Quality Assurance Manager
Graham M. Leitch, Vice President, Limerick Generating Station
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bcc w/encl:
Region I Docket Room (with concurrences)
Management Assistant, DRMA (w/o encl)
Section Chief, DRP
Robert J. Bores, DRSS

RI:DRS	RI:DRP	RI:DRS	RI:DRS
Howe/ja	Linville	Lange	Gallo
2/8 /88	2/8 /88	2/4 /88	2/12 /88

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket Nos. 50-352
50-353

License No. NPF-39

Licensee: Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Facility Name: Limerick Units 1 and 2

Purpose: Briefing on Limerick Unit 2 Operator Licensing Based on Differences Between Unit 1 and Unit 2

Introduction

A meeting was held at the NRC Region I Office on January 29, 1988 to discuss a proposal by the licensee to train its currently licensed operators at Limerick Unit 1 on differences between Limerick Units 1 and 2 in order for these operators to be licensed on Limerick Units 1 and 2. The meeting was requested by the licensee.

NRC Attendees

R. Fuhrmeister, Resident, Limerick, Unit 2
R. Gallo, Chief, Operations Branch, DRS
A. Howe, Senior Operations Engineer DRS
D. Lange, Chief, BWR Section, DRS
J. Linville, Chief Projects Section 2A, DRP
C. Sisco, Operations Engineer, DRS

Licensee Attendees

W. Barnshaw, Operations Department, Limerick 2
E. Firth, Training Coordinator, Limerick
J. Hutton, Startup Manager, Limerick 2
W. Ullrich, Superintendent, Limerick 2 Project

Summary

The licensee presented its program for achieving dual unit licenses for the currently licensed Limerick Unit 1 operators. The agenda discussed is included as Attachment 1 to this enclosure.

Specific Items Discussed

1. The licensee described its program for identifying differences, evaluating those which affect operations, and forwarding this information to the training department. When asked by the NRC how setpoint differences were treated, the licensee stated that these are handled the same way as design differences.

   The licensee also stated that where possible the plant differences would be minimized. The criteria for evaluating the effect of a design difference on the operator is given in Attachment 2 of this enclosure. Attachment 3 of this enclosure is a current summary of the differences which affect operator transparency. Attachment 4 of this enclosure lists all differences identified to this date.

2. The licensee stated that the Technical Specifications for Unit 2 would be a separate document. The licensee also stated that Technical Specifications for systems common to both units would be contained in the Unit 1 Technical Specifications. The licensee stated that a draft of Unit 2 Technical Specifications would be submitted to the NRC in April, 1988.

3. The licensee stated that all operating procedures for Unit 1 are being revised. All efforts to develop operating procedures which can be used by either unit are being made. The procedures for surveillance and testing will be unit specific.

4. The licensee described its proposed training program and training schedule. This plan is Attachment 5 to this enclosure.

5. The licensee described its proposed schedule for rotating personnel between units and into training. This schedule is Attachment 6 to this enclosure.

   The licensee also discussed its projected operator manpower status and is Attachment 7 to this enclosure.

Summary of Licensee Commitments

April 1988 — Submittal of letter to the NRC with a description of plant differences and the training plan for acquiring Unit 2 licenses for those Unit 1 personnel.

August 1, 1988 — Submittal to NRC Region I the training material used for instruction of the Unit 1 personnel and a draft copy of the Unit 2 Technical Specifications.

Summary of NRC Comments

The NRC advised the licensee of the applicable regulations (i.e. 10 CFR 55.47) and NUREG 1021 ES 106 (Examiner Standards). The NRC highlighted the requirement that these personnel will need extensive operating experience and advised the licensee that staff engineers may not meet this requirement.

The NRC notified the licensee that action on an individual's Unit 1 license would not be excluded if significant weaknesses were identified on the differences examinations.

Attachments:
1. Meeting Agenda
2. Criteria for evaluating effect of design difference on the operator
3. Summary of differences affecting operator transparency
4. List of differences identified to date
5. Proposed training program
6. Rotation schedule
7. Projected manpower needs

Attachment 1

NRC/LGS Unit 1 vs Unit 2 Differences Information Meeting

January 29, 1988

Agenda

- Background -

  NUREG 1021, major players, intent to discuss tentative dates for submittal, training, and exams. (E. G. Firth/D. B. Lange)

- Unit 1/2 Design, System, and Operational Characteristics Differences -

  S/U group plan to define and assimulate for training use. (J. A. Hutton/W. T. Ullrich)

- Tech Specs Differences -

  Expected differences between Unit 1, 2, and common expectations. (W. T. Ullrich/J. A. Hutton)

- Procedural Differences -

  Major expected changes between Unit 1 and 2. (J. A. Hutton/W. T. Ullrich)

- Control Room Design and Instrument Location -

  Plan on how training tours will be utilized to identify these to operators. (E. G. Firth/J. A. Hutton)

- Training Plan and Tentative Exam dates desired for Unit RO/SRO Licenses -

  (E. G. Firth)

- Expected method of rotating personnel between units and refamiliarization to be conducted before responsibility on new unit is assumed -

  (W. N. Barnshaw/W. T. Ullrich)

- NRC/PECo summary discussion of issues/Tentative exam dates scheduled or verified as previously submitted.

Attachment 2

PHILADELPHIA ELECTRIC COMPANY
MECHANICAL ENGINEERING DIVISION
2301 Market Street

PECo Engineering shall review proposed Unit #1 design changes and Bechtel Engineering shall review proposed Unit #2 design changes for potential impact the change will have with respect to the plant operators. The following criteria should be used to determine if the proposed design change involves an operator interface:

1) The design change requires a difference between Technical Specifications on Unit #1 and Unit #2.

2) The design change affects how a system or a piece of equipment responds to operator actions in the Control Room or at the Remote Shutdown Panel or at any local panel including response to emergency procedures, or safe or alternative shutdown procedures.

3) The design change affects how controls are configured including physical differences in layout, shape or feel,how information is displayed to the operators in the Control Room or at the Remote Shutdown Panel (i.e., switches, alarms, indicators) or at any local panel including response to emergency procedures, or safe or alternative shutdown procedures.

4) The design change affects the sequence in which an operator performs system operations in the Control Room or at the Remote Shutdown Panel or at any local panel or within the plant if improper performance of these actions can result in significant system upsets or spills or safety concerns.

5) The design change affects the way you test for operability of the system.

If a review of the proposed design change against the above criteria indicates that the change involves an operator interface, the following steps must be taken:

1) All mod requests should be reviewed by the station manager against these criteria prior to submittal to Engineering. If it is determined to be an operator transparency issue, the station manager should note on the mod request that it is an operator interface and is or is not needed prior to Unit #2 commercial operation. If it is not needed prior to Unit #2 commerical operation, it should be noted and still sent to Engineering where it will be put on a Unit #1 deferred mod request list.

2) If the proposed design change is for Unit #1 and is not needed for continued operations, Bechtel shall be requested by the responsible branch to process a Project Change Request for Unit #2. If the PCR is approved, the Responsible Engineer may proceed with the Unit #1 modification. If the PCR is disapproved or deferred, a letter will be sent to the station manager with justification or explanation as to why the Mod on Unit #1 will not go in due to operator transparency. This decision and the basis should be documented on the PCR and approved by the Division Chief Engineer.

3) If the proposed design change is for Unit #2, a PCR is generated and reviewed against the operator interface criteria. The PCR will document if an operator interface is involved. If the PCR is approved and identified as an operator interface, the Responsible Engineer should notify Electric Production in writing that the change is being made to Unit #2. A letter of concurrence from the Station Manager must be received to proceed with a similar design change on Unit #1.

/003

Attachment 3

SUMMARY OF DIFFERENCES AFFECTING OPERATOR TRANSPARENCY

01-1

1. In Unit 1 the steam supply for the RFP turbine and the gaseous radwaste recombiner preheater comes off main steam line "B" while Unit 2 comes off main steam line "C".

2. In Unit 1 the steam supply for the air ejectors comes off main steam line "C' while Unit 2 comes off main steam line "B".

The effect on operation is small since the motor operated valves in the lines retain their corresponding valve numbers. (i.e. HV-01-108 and HV-01-208 are in the supply line from main steam to gaseous radwaste recombiner preheater and RFP turbines on both Units; only the main steam line tapped off is different.

01-3

The Unit 2 turning gear employs two motors to minimize gear clash. The low speed torque motor engages the jack gear smoothly then stalls on high torque at which time the main motor starts and jacks the main turbine and generator. The Unit 1 turning gear has a main motor only which provides a less smooth transition to turning gear operation.

05-1

Installed restricting orifices in the condensate reject control valves by-pass line to allow manual throttling of the condensate reject by-pass valve 05-1033 for Unit 1. Before this mod, the 05-1033 could not be used since during Unit 1 Startup it was found unsuitable either throttled or full open.

On Unit 2, valve 05-2033 will not be able to be used until the restricting orifices are installed to reduce the pressure drop across the valve.

05-2

By-pass line with isolation valve and restricting orifices around the condensate minimum recirculation valve FV-C-05-103 for Unit 1 has been installed to allow maintenance of the condensate minimum recirculation valve without affecting plant operation by providing a manually operated bypass which can be used instead of the FV-C-05-103. This change has been deferred on Unit 2.

07-1

Installs a hotwire anemometer at mechanical vacuum pump discharge to provide main condenser in-leakage detection to be able to determine the SCFM in-leakage to the main condenser during mechanical vacuum pump operation prior to SJAE operation. Installed on Unit 2 to assist in condenser leak identification during Startup.

07-3

Deletes electrical wiring and instrument air supply to the radwaste decant pump discharge valve to Unit 2 condenser hotwell HV-67-232. This line was originally intended for use during Startup and will not be used on Unit 2 since the condensate phase seperators are contaminated from operation in support of Unit 1. The line is capped at the Unit 2 hotwell.

07-5

For Unit 2, an isolation valve will be added on the auxiliary steam supply piping between the condenser hotwell heating coil and the restricting orifice to prevent debris clogging the orifice and entering the condenser during flushing. Also, this will allow use of the hotwell heating coils without sending auxiliary steam condensate (which contains boiler water treatment chemicals) to the hotwell. The condensate can be dumped to the drain system if desired.

12-1

The present arrangement is;

Unit 1			Unit 2	
Equip. No.	Loc. of Control and indication		Equip. No.	Loc. of Control and indication
HV51-157A	1AC240	- same -	HV51-257A	2AC240
HV51-156B	1AC240		HV51-256B	2BC240
HV51-157B	1BC240	- same -	HV51-257B	2BC240
HV51-156A	1BC240		HV51-256A	2AC240

On Unit 2 design; the operator will be operating an equipment tagged "A" on a Control Panel tagged "A". Status lights will also be indicated on a Control Panel tagged "A". Likewise, equipment tagged "B" will be operated and status indicated on Control Panel tagged "B". Four Unit 2 RHR Heat Exh. Remote Lay-Up Valves will be operated as described above.

On Unit 1 design; two valves are operated and status indicated the same way as Unit 2 above. But the other two valves (HV51-156A & B) are operated & indicated on a control panel with different tag number, i.e. HV51-156A is operated & status indicated on 1BC240 and HV51-156B is operated & status indicated on 1AC240.

35-1 and 35-2

Unit 2 Main Unit Transformers are 500 KV, and a different design from Unit 1 (220 KV).

36-1 Alternate feed from TSC/UPS to RPS/UPS.

Unit 1 has installed an alternate feed to the RPS/UPS power supply from the TSC/UPS power supply for operational flexibility. This alternate feed is not yet provided on Unit 2.

38-2 Plant Monitoring System

The Unit 1 Process Computer and ERFDS are separate systems with the Process Computer's CPU located in the Auxiliary Equipment Room and the ERFDS CPM located in the TSC. The Process Computer CPU is a Honeywell system whereas the ERFDS CPU is a VAX supplied by Digital Equipment Corp (DEC).

Unit 2 uses a Plant Monitoring System (PMS) which combines the process computer and ERFDS functions. PMS utilizes VAX CPU's which are located in the TSC along with the Unit 1 ERFDS CPU.

Differences will exist between the process computer function display formats and keyboard layouts for the two units. A new Plasma display will show the current status of 3 chosen points, new printers and color copiers for the Toshiba displays.

The measured points ID's were retained from Unit 1, but the Unit 2 system allows greater database manipulation/changes and trend recording on the Toshiba screens (in addition to the Bailey recorders).

The Reactor Engineers will have their own office terminal and printer. They will see improvements in process function run times and expanded versatility in reactor status displays and user interaction. The Rod Worth Minimizer function is now functionally performed by a remote chassis which itself allows greater user interaction for information processing and display.

The SPDS displays are repeated for Unit 2 as are all of the basic functions of ERFDS. Upgrades include additional aids to the technicians for calibrating loops and spectrum analysis for pipe vibration testing.

41-5 Startup Sources

Unit 2 will utilize Californium-252 sources as opposed to the Antimony-124 sources used for the Unit 1 initial fuel load. Besides being more economical, the main advantage of using Cf-252 is that its half life is 2.65 years in comparison to the 60.2 day half life of Sb-124. This provides assurance that the source strength will still be adequate in the case of unexpected along delays in the initial startup test program. Cf-252 undergoes spontaneous fission as well as decays by alpha emission. There will be no neutron contribution from an alphaberyllium reaction due to Cf-252 encapsulation into a stainless steel pin. The Sb-124, on the other hand, decays only by alpha and gamma emission. The total activity of the seven Cf-252 pins used is expected to be approximately 1.7 Curies compared with about 16,000 Curies for the 14 Sb-124 pins used in Unit 1. The same source holder will be employed for the loading of the Californium sources. However, the Californium pins, having the same diameter as the Antimony pins, are only 3 inches in length compared to the 19.95 inch Antimony pins. Therefore, a Cf-252 pin will be loaded between two unirradiated Antimony pins in a source holder. To handle the shorter Cf-252 source pins, some special tools different from those used to handle the Antimony pins may be needed.

41-7 RPV NDT Temperature

The RPV flange and adjacent shell are required to be warmed to a minimum temperature of 80 degrees F for Unit 1 and 70 degrees F for Unit 2 before the RPV head studs are tensioned. The difference in the minimum temperature reflects a difference in the limiting component of each vessel. The limiting component in the Unit 1 vessel is the shell plate which connects to the closure flange. The limiting component for the Unit 2 vessel is the closure flange forgings.

41-10 Initial Fuel Loading

Initial fuel loading will be accomplished without the use of fuel loading chambers. This method is expected to save 4 to 5 days in the fuel loading process since the numerous movements of the fuel loading chambers will not be necessary. The startup sources will be loaded into their alternate locations which are closer to the SRM's. Fuel loading will start between a SRM and a source and continue in a spiral pattern until the core is fully loaded. A Special Test Exception will be proposed (supported by analysis) which requires no minimum SRM count rate for the first 16 fuel bundles loaded. After 16 bundles have been loaded, one SRM will have the required minimum count rate of at least 0.7 cps. The SRMs in the other quadrants will be verified to be operable at a frequency of at least once every 12 hours by using a portable neutron source (also part of the proposed Special Test Exception). Fuel loading will continue in this manner. As during the Unit 1 initial fuel load, a partial core shutdown margin demonstration will be performed after the first 144 bundles have been loaded.

44-1 Filling and Venting of the RWCU Pumps

Vents have been provided for the system piping high points. However, in the present system no vents were provided for the portion of the piping which is isolated during normal RWCU recirculation pump maintenance. Air entering this portion of pipe during maintenance could not be completely vented before placing the pump back in service. Vents have been installed on Unit 1 for air removal. Corresponding vents are not installed on Unit 2. This affects returning a RWCU pump to service after maintenance which could have drained the pump.

44-4 RWCU Regenerative Heat Exchanger Bypass

The connections for the Unit 2 RWCU regenerative heat exchanger bypass line are four inch as opposed to the two inch connections in Unit 1. When the bypass line is in use as a part of a shutdown alternative cooling method, the operator will experience a higher flow and more effective cooling with the Unit 2 system.

45-1 RWCU System - RECW Pressure at Main RWCU Pumps

In Unit 1 the low RECW cooling water trip to the RWCU pumps has been changed from an instantaneous trip to a time delayed trip. Unit 2's RWCU pump circuitry still reflects an instantaneous trip of the RWCU pumps.

51-3 Unit 2 RHR intertie Tees off Downstream of flow elements Unit 1 Tees off Upstream.

For Unit 1, when the intertie is used, FE 1N014C&D do not see pump total flow, causing control logic to open the associated min flow line valves. For Unit 2 this will not occur since the interties from the C loop to A loop and from D loop to B loop tee off downstream of the C and D loop flow elements. For example, flow from the C pump, through the intertie; to the A heat exchanger would be sensed by the C flow element on Unit 2.

51-5 Eliminate False RHR Out of Service Annunciation

During normal plant shutdown reactor pressure is reduced to below the RHR pump discharge piping pressure; the sensed differential pressure goes negative causing the transmitter output to go below the normal minimum of 4 MA. Eventually the sensed differential pressure will go far enough negative to drive the transmitter output to sense a low signal gross failure condition actuating a false RHR out-of-service annunciation.

The Unit 2 differential pressure instrument range was increased for PDT-51-2N058A,B,C, and D. Unit 1 has not been changed.

Because of the re-calibration of the instrument to a larger pressure range and resulting accuracy change, several TECH. SPEC. setpoints and allowable values related to RHR injection valve differential pressure are affected and must be changed for Unit 2. Also, the alarm will not come up on Unit 2 when the reactor is de-pressurized as it will on Unit 1.

51-8 RHR System RHRSW Ultimate Cooling Flowpath

a. Unit 1: The RHRSW connection for ultimate cooling taps into the B loop of RHR via the B RHR heat exchanger piping. (M-51 Sheet 4)

b. Unit 2: The RHRSW connection for ultimate cooling taps into the A loop of RHR via the A RHR heat exchanger piping. (M-51- Sheet 6)

51-12 RHR Head Spray Deletion

The RHR Head Spray from RHR to the Vessel was not installed on Unit 2. Difficulty in disassembling and reassembling for refueling activities is not justified by the limited use of the spray nozzle. The operator will not have this mode available for use on Unit 2. The containment penetration is capped and associated piping valves and controls removed. It is still installed on Unit 1, although a modification to delete Unit 1 Head Spray is being developed.

51-14 RHR System FPCC Flowpath

a. Unit 1: FPCC mode uses the B and D RHR pumps and discharges to the FPCC system via the B RHR loop. (M-51 Sheet 3)

b. Unit 2: FPCC mode uses the A and C RHR pumps and discharges to the FPCC system via the A RHR loop. (M-51 Sheet 5)

53-3 Spent Fuel Pool Underwater Work Table

The Fuel Pool Underwater Work table for Unit 1 was modified by attaching a permanent support/lift frame to allow for above water adjustment/removal of the table without divers or immersing the overhead crane hook. The Unit 2 change will not be done until prior to the 1st Unit 2 refueling.

53-4 Install Wire Mesh Screen Over Spent Fuel Pool Surge Tank Weir Opening.

For Unit 1 a wire mesh screen was installed over the Weirs between the spent fuel pool and the skimmer surge tank. This addition prevents foreign material from inadvertently entering the skimmer surge tank. Also, a gasket was installed between Weir plate and fuel pool wall to make fuel pool level control easier.

This change was deferred for Unit 2.

55-1 CRD Friction Test Station

The CRD friction test station consists of additional piping and manual valves installed downstream of the CRD system flow control valve. The station eliminates the need for repetitive instrumentation setups while friction testing the CRDs during startup testing and refueling outages. This station is provided on Unit 2 but not yet implemented on Unit 1.

56-1 Rod Worth Minimizer

The RWM used in Unit 2 is a hardware based device in comparison to the software base "Honeywell" RWM. The hardware concept allows significant performance improvements including speed, reliability and accuracy. The NUMAC design concept significantly reduces system maintenance, calibration, and surveillance time.

The following is a comparative description of the Unit 1 and Unit 2 RWMs:

Unit 1

The Unit 1 "Honeywell" rod worth minimizer is a passive display system which provides the operator in the main control room the decisions that the process computer has made relative to control rod positions.

a. Unit 1 RWM has the following displays that are back-lit by incandescant lamps;

   1. 2 insert error windows that display the address of the rod(s) that are past the insert limit,

   2. 1 withdraw error window that displays the address of the rod that is past the withdraw limit,

   3. 1 rod group window that displays the number of the currently latched group of control rods.

b. The Unit 1 Honeywell RWM has no rod bypass function.

c. The Unit 1 RWM will tolerate up to 2 insert errors and one withdraw error.

Unit 2

The Unit 2 NUMAC RWM is a stand alone active processor that receives rod position information directly from the rod position information system. The RWM compares this rod position information to pre-programmed rod sequences and displays the status of the comparison to the operator in the control room.

a. Unit II RWM has one electro-luminescent display that can display all parameters that the RWM is monitoring. The display, under control of "soft keys", can display pertinent messages, special rod tests, bypass lists, and substitute rod position information. The normal mode of display operation will include selected rod address and position, reactor power level, RWM mode (operate, bypass, rod test, inop) error status and block status.

b. The Unit 2 NUMAC RWM will allow bypassing of up to eight rods from RWM calculations.

c. The Unit 2 NUMAC RWM will enforce all limits that the Unit 1 RWM enforces, however, the NUMAC RWM will impose blocks before a limit is exceeded. Therefore, during a normal startup no insert or withdraw errors can occur. Errors will have to be corrected before rod pull can continue.

d. The reactor power setpoints for both RWMs are identical and the function of the RWMs within these levels is similar. However, the operator can activate the NUMAC RWM display at all times whereas the Unit 1 RWM display will be blank at power levels of greater than or equal to 30% power.

73-1 Manual flow control for containment H_2 recombiner.

Unit 2 Containment Hydrogen recombiners will have manual flow control instead of automatic as currently employed on Unit 1. The original automatic flow controller is no longer manufactured and no qualified substitute is available. Therefore, Unit 1 will also eventually be converted to manual flow control.

76-3 Replace Paul Monroes with Limitorques

MOD 682 (Unit 1) and PCN 5111N (Unit 2) were issued to replace the Paul-Munroe actuators with Limitorque actuators.

At present, both Unit 1 (HV-76-109 and 110) and Unit 2 (HV-76-209 and 210) have identical actuators. Other Unit 1 PAUL-MUNROE actuators have not been replaced. All Unit 2 PAUL-MUNROE actuators have been replaced by Limitorque operators.

76-5 RERS Filter Cooldown Mode

On Unit 2, the RERS filter cooldown mode has been deleted. This deleted ventilation valves HV-76-284A/B and HV-76-291A/B on Unit 2. A modification is being developed to delete the RERS cooldown mode on Unit 1.

77-2 Addition of a Pressure Indicator to TIP Purge Panel

MOD 341 added pressure gauge to the TIP purge panel 10S225 of the Containment Instrument Gas System to provide indication of nitrogen purge pressure when the flow meter is on zero.

The change only increases the system performance by providing visual assurance to the operator that the purge system is still on under zero flow condition (ball valve closed).

This difference is an operator transparency item since local panel operation is affected. This is a minor mod which Startup may be able to install before turnover.

UNIT 1/UNIT 2 DIFFERENCES

LEGEND

FUEL LOAD (FL) -
- "B" - TO BE DONE IN BOTH UNITS BEFORE UNIT 2 FUEL LOAD
- "A" - TO BE DONE IN BOTH UNITS AFTER UNIT 2 FUEL LOAD
- "N" - NOT TO BE DONE IN BOTH UNITS
- "D" - DIFFERENCE IDENTIFIED AND DISPOSITIONED TO LEAVE AS IS
- "C" - COMPLETE

UNIT STATUS (U#1, U#2 STAT) -
- "C" - CANCEL
- "D" - IN DESIGN
- "K" - DEFFERRED
- "MR" - DESIGN IN REQUEST STAGE
- "MI" - MRF'S ISSUED WITH SECTION 2
- "F" - FIELD COMPLETE
- "W" - WORKING

TRNS - TRANSPARENCY

Attachment 4

DIFF #	MOD	PCR	FL	U#1 STAT	U#2 STAT	RESP COOR O/I	FROM COORD DATE	F/A	ENGRG DATE	F/A	COORD CONCUR	TRS	PROC REVW	FA	TRAIN DATE	U#1/U#2 DIFFERENCE	EDIT #
00001-1			N			O	880120	A	880229	F		Y			880121	HV-01-108 COMES OFF MS LINE B HV-01-208 COMES OFF MS LINE C	1
00001-2	5531	20487	B	F	MR	O	880205	F				N				PARTIAL ARC TWO ADMISSION CONVERSION. UNIT 2 WILL BE CONVERTED BEFORE STARTUP.	2
00001-3			N			O	880122	A	880229	F		Y			880125	UNIT 2 MAIN TURBINE TURNING GEAR IS OF DIFFERENT DESIGN UTILIZING 2 MOTORS	215
00002-1			N			O	880120	A	880229	F		N			880121	DEVICES ON U1 P&ID NOT ON U2 P&ID. VENT/DRAIN VALVES	3
00002-2	D 452	20272	B	F	W	O	880205	F								MODIFY EXTRACTION STEAM CHECK VALVE LIMIT SWITCHES - SCOPE OF PCR IS GREATER THAN DCP	4
00003-1			N			O	880127	A				N				DEVICES ON U1 P&ID NOT ON U2 P&ID. VENT/DRAIN VALVES.	5
00003-2	5007	20439	B	MR	MR	O	880205	F								2ND CYCLE MOD FEEDWATER HTR LVL CNTRL INST RESPONSE TO TRANSIENT LVL CHANGES	6
00004-1			N			O	880120	A	880229	F		N			880121	DEVICES ON U1 P&ID NOT ON U2 P&ID. VENT/DRAIN VALVES.	7
00005-1	5198	20341	A	F	K	O	880120	A	880219	F		Y			880121	ADD RESTRICTION ORIFICES DOWN STREAM OF COND REJECT MANUAL BYPASS VALVE. UNIT 2 MANUAL VALVE CANNOT BE USED UNTIL ORIFICES INSTALLED.	8
00005-1	5198	891	A	F	K	O	880120	A	880219	F		Y			880121	ADD RESTRICTION ORIFICE DOWN STREAM OF COND REJECT MANUAL BYPASS VALVE. UNIT 2 MANUAL VALVE CANNOT BE USED UNTIL ORIFICES INSTALLED.	9
00005-2	5197	20340	A	F	K	O	880120	A	880219	F		Y			880121	CONDENSATE PUMP RECIRC MODIFICATION. MANUAL BYPASS LINE INSTALLED ON UNIT 2.	10
00005-2	5197	890	A	F	K	O	880120	A	880219	F		Y			880121	CONDENSATE PUMP RECIRC MODIFICATION. MANUAL BYPASS LINE INSTALLED ON UNIT 1.	11
00005-3	5732	20416	B	MR	MR	O	880127	A				N				TCA380 STRAINER ALARM NOT TRIP COND PUMPS	12
00005-4	653	20138	A	F	C	O	880120	A	880219	F		N			880121	ADD AIR/VAC VALVE AND ADDITIONAL PIPE SUPPORTS ON COND. TRANSFER. HYDRAULIC PROBLEM WAS RELATED TO PUMP START CONTROLS.	13

DIFF #	MOD	PCR	FL	U#1 STAT	U#2 STAT	RESP COOR O/I	FROM COORD DATE	F/A	ENGRG DATE	F/A	COORD CONCUR	TRS	PROC REVW	FA	TRAIN DATE	U#1/U#2 DIFFERENCE	EDIT #
00005-5	NONE	20155	N		W	O	880120	A	880229	F		N			880121	NO UNIT 1 MOD TO BE ISSUED. ADD O2 INJECTION POINTS AT THE COND PUMPS SUCTIONS SO THAT IMPLEMENTATION OF H2 WATER CHEM IS EASIER, IF DONE LATER.	14
00006-1	5205	BASE	B	MI	W	O	880127	A				N				PUMP BEARING OIL PRESSURE BELOW NORMAL SWITCH	15
00006-2	5751	20476	B	MR	MR	O	880205	F				N				TCA 90 - HT BUILDUP PANEL 10C668	16
00006-3	5142	20231	B	W	W	O	880205	F				N				TCA 528 - JUMPER SIGNAL CONTACT	17
00006-4	842	20085	B	D	W	O	880127	A				N				TCA 1021 FEEDWATER LEVEL CONTROL WIRING CHANGES	18
00007-1	NONE	20358	N		W	O	880120	A	880229	F		Y			880121	PROVIDES MAIN CONDENSER IN LEAKAGE DETECTION DURING MECH. VACUUM PUMP OPERATION.	19
00007-3	NONE	20419	N		W	O	880120	A	880229	F		Y			880121	ABANDON VALVE HV-67-232 IN PLACE NO UNIT 1 MOD WILL BE DONE	21
00007-4	5282	20397	B	MR	W	O	880205	F								VACUUM SENSOR RELOCATION	22
00007-5	NONE	20417	N		W	O	880120	A	880229	F		Y			880121	ADDS ISOLATION VALVE IN HOTWELL HEATING COIL UPSTREAM OF FLOW ORIFICE AND HOTWELL.	188
00008-1			N			O	880120	A	880229	F		N			880121	DEVICES ON U1 P&ID NOT ON U2 P&ID. VENT/DRAIN VALVES	23
00009-01			N			O	880120	A	880229	F		N			880121	DEVICES ON U1 P&ID NOT ON U2 P&ID. APPEARS TO BE COMMON EQUIPMENT.	24
00009-02	824	20357	B	D	W	O	880205	F				N				TCA 463 ADD DIFF PRESS ALARM ON INTAKE SCREENS	25
00009-04	5712	20343	B	MR	W	O	880205	F				N				TCA 891 TTA CHEMICAL INSTALLATION	27
00009-05	742	20422	B	MR	MR	O	880205	F				N				2ND CYCLE MOD. RELOCATE COOLING TWR MAKEUP AND BLOWDOWN SAMPLE LINES.	28
00009-06	5079	20421	B	MR	MR	O	880205	F								2ND CYCLE MOD ON LINE COND TUBE LEAK LOCATION	29
00009-07	822	20420	B	MR	MR	O	880205	F								2ND CYCLE MOD PROVIDE ALT DRAIN PATH FOR COND	30

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00009-10			N			O	880205	F								FVC-09-103 CLOSES [illegible] LEVEL, FVC-09-203 DOES NOT.	216
00009-11			N			O	880205	F								UNIT 2 ACID FEED TANKS HAVE DRAIN VALVES, UNIT 1 DOES NOT	217
00009-12			N			O	880205	F								09-1147 IS OPEN, 09-2147 IS CLOSED & 09-1146 IS CLOSED, 09-2146 IS OPEN.	218
00011-1			N			O	880120	A	880229	F		N			880121	VALVE 11-1067 HAS DIFFERENT # ON UNIT 2, 2079A (PRESSURE TEST VALVE)	31
00011-2			N			O	880120	A	880229	F		N			880121	VALVE 1066 FOR UNIT 1 IS NOT THE SAME FOR UNIT 2 (DRAIN VALVE)	32
00011-3			N			O	880120	A	880229	F		N			880121	TEST TAPS ON UNIT 1 DIFF # THAN ON UNIT 2	33
00011-4	NONE	20381	A		D	O	880120	A	880229	F		N			880121	ADD PITOT TUBE FLOW METERS TO SERVICE WATER SYSTEM FOR FLOW BALANCE ON UNIT 2.	34
00011-5	9045	20393	B	W	W	O	880205	F				N				ADD FLUSH CONNECTION TO ESW SUPPLY LINE TO U2 TURB ENCL COOLING WATER	35
00011-6	970	20448	B	F	MR	O	880205	F				Y				RHR OUTLET VALVE TIME DELAY RELAY	36
00011-7	5063	20103	B	MR	D	O	880205	F								2ND CYCLE MOD CHANGE PGIC COMP COOLING WATER SUPPLY FROM SW TO RECW	37
00011-8	5060	20102	B	D	W	O	880205	F								2ND CYCLE MOD RELOCATE ON/OFF SWITCH, SEPARATE FEEDS FOR DESSICANT DRYER PACKAGE	38
00011-9	5139	20150	A	F	K	O	880120	A	880210	F		N			880120	ADDITION OF PRESSURE TEST CONNECTIONS TO DG ESW PIPING. ALSO RELOCATES FLOW ORIFICE.	120
00012-1		5050	A		W	O	880120	A	880203	F		Y			880120	EXCHANGE PANEL LOCATION OF CONT SWITCHES AND INDICATION LIGHTS FOR HV-51-256B AND HV-51-256A	39
00012-2	5352	20438	B	MR	D	O	880205	F				N				2ND CYCLE MOD REPLACE EXISTING RHR SW RAD MONITORING CARBON STEEL PIPING WITH SS PIPING	40
00013-1	5470	6311N	B	MR	W	O	880205	F								2ND CYCLE MOD ISOLATION SIGNALS FOR DCW/RECW ISOLATION VALVES	41

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00013-2			N			O	880120	A	880229	F		N			880121	DEVICES ON U1 P&ID NOT ON U2 P&ID. TEST VALVES ON A LINE TO PRIMARY CONT. PENETRATION.	42
00014-2	106	BASE	B	W	W	O	880205	F				N				VALVE HV-13-206,207 RECEIVE CONT ISOLATION SIGNAL	43
00014-3			N			O	880120	A	880229	F		N			880121	DRAIN VALVE 14-1063 IN UNIT 1 BUT NOT IN UNIT 2	44
00015-2	5061	20099	B	MR	D	O	880205	F								2ND CYCLE MOD PROVIDE INST AIR FOR TIP DRIVE PURGE	45
00015-3	5710	20432	B	D	D	O	880205	F				N				TCA 841 - 2ND BACK UP SERVICE FOR REFUELING SEALS	46
00015-4	5503	20434	B	F	MR	O	880205	F				N				2ND CYCLE MOD OPEN EXISTING WALL PENE & ROUTE AIR/WATER/ELECT LINES THRU PENE	47
00015-5	365	20332	B	D	W	O	880205	F								LOW PRESS AIR BLOWER DRAIN ROUTING	48
00016-3	5575	20458	C	F	W	O	880205	F				N				INCREASE THE SIZE OF INLET/OUTLET TUBING TO SQ ROOT CONVERTERS	51
00016-4	5185	20294	B	W	F	O	880127	A				N				TCA 18 - REMOVE AUTO START FOR LOW PRESS AIR BLOWER	52
00019-1	0536		N			O	880120	A	880229	F		N			880121	MANUAL ISOLATION VALVES IN UNIT 1 RFPT LUBE OIL PURIFICATION SYSTEM.	53
00022-1		20177	N		W	O	880120	A	880229	F		N			880121	FIRE PROTECTION SYSTEM DELETION OF TEST DETECTORS ON UNIT 2.	54
00022-2	659	20088	B	F	W	O	880205	F				N				FIRE PROTECTION INSTALL A ROTATING RED BEACON INSIDE INVERTER ROOM.	55
00022-3	860	20425	B	MR	W	O	880205	F								2ND CYCLE MOD RACEWAY SHOULD BE PROVIDED WITH SPRINKLER PROT	56
00022-4	857	20424	B	MR	MR	O	880205	F								2ND CYCLE MOD SPRINKLER ISO BUS AND SUPPORT STEEL	57
00022-5	883	20426	B	MR	MR	O	880205	F								2ND CYCLE MOD PROVIDE SPRINKLERS FOR ALL AREAS UNDER THE TURB GEN FLOOR	58
00022-6	5457	20436	B	F	W	O	880205	F								DISABLE THE FIRE PROTECTION SYSTEM FLOW SWITCH INTERLOCK	59

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00023-1	5725	20450	B	MR	D	O	880205	F								TCA 838 DESIGN SAMPLE SINK DRN TO NORMAL WST	60
00023-2	5248	20285	B	MR	D	O	880205	F								TCA 506 - CLEAR TURB LO FLOW ON FEEDWATER	61
00027-1	9051	20301	B	D	D	O	880205	F				N				NORTH STACK SAMPLE BYPASS LINE. THIS MOD IS ON COMMON EQUIPMENT.	62
00027-2			N			I	880120	A	880229	F		N			880121	UNIT 1 ANNUNCIATOR READS SLIGHTLY DIFF THAN UNIT 2. (OFFGAS RAD. MON. DOWNSCALE).	63
00028-2	5336	20410	B	D	D	O	880205	F								TCA 623 FACILITATE CALIBRATION OF LI	65
00028-3	5028	20328	B	MR	W	O	880205	F				N				RELOCATION OF GENERATOR CORE MONITOR AND PYROLSATE CONDUCTOR	66
00031-1	996		A	D		O	880205	F								TCA 374,996 LIFT/TAPE LEAD FROM TERM PT12	67
00031-2	5008	20044	B	MR	W	O	880205	F								TCA 325 - COMPTR MONIT HOT SPOT RECORDER	68
00031-3	5373	20478	B	F	W	O	880205	F								TCA 54 - MAIN TURB SHAFT VOLT METER SCALE	69
00031-4	5108	20403	B	MR	MR	O	880205	F								TCA 496,557 - LOOP SEAL IS NOT LARGE ENOUGH	70
00031-5	5013	20309	B	MR	W	O	880205	F								TCA 468- TEMP INSTR FOR CROSS AROUND RELIEF	71
00032-1			N			O	880122	A	880229	F		N			880125	UNIT 2 MAIN GEN. HAS PYROLSATE TAGGING TO AID IN HOT SPOT LOCATION DETECTION ACTION	219
00033-1	5714	20408	B	MR	W	O	880205	F								TCA 1118 - ACC PRESS DIFF ON STATOR WTR SYST	72
00034-1			B			I	880205	F				N				UNIT 1 ANN WINDOW READS DIFF THAN UNIT 2 (ISO-PHASE BUS 'COOLER' VS. 'COMMON') SHOULD BE FIXED IN SFR.	73
00035-1	5441		N	MR		O	880120	A	880229	F		Y			880121	2ND CYCLE MOD RELOCATE MAIN TRANS N2 BOTTLES. THIS RESULTS FROM DIFFERENT TRANSFORMERS FOR UNIT 2.	74
00035-2			N			O	880127	A				Y				UNIT 2 MAIN TRANS ARE 500KV 7 DIFF DESIGN FROM UNIT 1. THIS DIFFERENCE CAUSES #35-1 DIFFERENCE.	189
00036-1	308	20013	A	F	K	O	880127	A				Y				ALTERNATE FEED FROM TSC/UPS TO RPS/UPS.	75

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00037-1	584	20253	B	F	W	O	880205	F								REWIRE LSH 07-156 AND LSH 07-157 TO NORMALLY CLOSED CONTACTS	76
00038-1	5241	20333	B	D	W	O	880205	F								ADDITION OF HPCI & RCIC LANYARD POT FOR PMS (ERFDS) INPUT	77
00038-2			N			O	880122	A	880229	F		Y			880122	PMS COMP DIFF FOR UNIT 2	190
00039-1	5142	20231	B	W	W	O	880205	F								REACTOR FEED PUMP MIN FLOW RECIRC CNTRL MOD	78
00041-01	801	20173	B	F	W	O	880205	F				N				ADD EXCESS FLOW CHECK VALVE TEST TAPS	79
00041-01	304	20173	B	F	W	O	880205	F				N				ADD EXCESS FLOW CHECK VALVE TEST TAPS	80
00041-03	4223	20153	B	F	K	O	880205	F				N				FAB OF RPV GUIDE ROD EXTENTION TOOLS	81
00041-04			N			O	880120	A	880229	F		N			880121	DEVICES ON U1 P&ID NOT ON U2 P&ID. TEST VALVES, VENT/DRAIN VALVES	82
00041-05			N			O	880122	A	880229	F		Y			880122	RX S/U SOURCE DIFF FOR U2	191
00041-06			N			O	880205	F								PSV HAVE BEEN DELETED FOR UNIT 2	192
00041-07			N			O	880122	A	880229	F		Y			880122	MIN TEMP FOR HEAD BOLT UP IS 80 FOR U1 AND 70 FOR U2	198
00041-08			D			O	880120	A	880229	F		N			880122	UNIT 2 CONTROL ROD PIN/ROLLER BALLS USE COBALT-FREE MATERIAL	206
00041-09			D			O	779120	A	880229	F		N			880122	UNIT 2 USES 80 MIL FUEL CHANNELS	207
00041-10			D			O	880220	A	880122	F		Y			880122	UNIT 2 INITIAL CORE LOADING WILL NOT UTILIZE FUEL LOADING NEUTRON DETECTORS.	208
00042-1			N			I	880205	F								UNIT 1 TRANS TAPS DIFF THAN UNIT 2	83
00043-1			N			O	880122	A	880229	F		N			880125	RECIRC PUMP 2A TEMP ELEMENT	84
00043-2	5076	20463	B	MR	MR	O	880205	F								2ND CYCLE MOD RECIRCULATION MG SET RETRACTABLE BRUSH HOLDERS	85
00043-3	5104	20312	B	MR	W	O	880205	F								TCA DUST AND DIRT IN MG SETS	86
00043-4	5295	[illegible]R	B	MR	W	O	880205	F								LOGIC AND ANN. DISCREPANCY	87
00044-1	5001	20206	A	MR	D	O	880120	A	880203	F		Y			880120	2ND CYCLE MOD FILLING AND VENTING OF RWCU PUMPS, ADDS FILL & VENT CONNECTIONS.	88

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00044-2	2088	20452	B	D	W	O	880205	F								2ND CYCLE MOD WIDEN THE RX WTR PH LO SET POINT	89
00044-3	5728	20415	B	D	W	O	880205	F								TCA 826,827,832, CONTR RM IND FOR RWCU PUMPS	90
00044-4			D			O	880120	A	880229	F		Y			880122	RWCU RNX BYPASS LINE CONNECTION SIZE	209
00045-1	526	20324	B	MR	D	O	880120	A	880229	F		Y			880122	ADDITION OF TIME DELAY TO RWCU RECIRCULATION	91
00046-1			N			O	880127	A				N				UNIT 1 P&ID NOT ON UNIT 2 P&ID DEVICES ON	92
00047-1	670	20212	A	MR	K	O	880120	A	880203	F		N			880120	INLET SCRAM VALVE SEAT RING REPLACEMENT	93
00047-2	555	20204	A	F	C	O	880120	A	880219	F		N			880120	INSTALL CONTROL ROD DRIVE REMOVAL TRACK	94
00047-3	87	20195	B	F	W	O	880205	F								INSTR AIR SUPPLY ISO VALVE FOR PVC-46-1F002 A/B	95
00047-4	5326	20331	B	D	W	O	880205	F								REPLACE CRD "O" RINGS AND ORIFICE PLUGS	96
00047-5			N			O	880205	F								UNIT 1 AND UNIT 2 P&ID DO NOT MATCH	97
00048-1			N			O	880205	F								UNIT 1 P&ID DIFF THAN UNIT 2 P&ID	98
00048-2	806	1567	B	F	W	O	880205	F								SLCS REPLACEMENT OF THE EXISTING SLCS ACTUATION RELAYS	99
00049-1			N			O	880215	F								49-1F036 & 49-1F037 LOCATED INSIDE CONTAINMENT, 49-2F036 & 49-2F037 LOCATED OUTSIDE CONTAINMENT	211
00050-1			N			I	880127	A				N				RCIC OUT OF SERVICE ALARM SWITCHES HAVE DIFFERENT POSITION LABELS. SHOULD BE FIXED BY SFR.	101
00050-2			N			O	880205	F								AUX STM HEADER DRN IS 21-1043D AND 21-2043C	102
00051-03	N/A	5006N	N		W	O	880120	A	880219	F		Y			880121	UNIT 2 RHR INTERTIE TEES OFF DOWN STREAM OF FE'S. UNIT 1 TEES OFF UP STREAM	105
00051-04	5716	20477	A	MR	W	O	880205	F								TCA 1022,1049,1130 PUMP TRIP ON RHR MOTOR	106
00051-05	522	1455	A	MR	W	O	880120	A	880203	F		Y			880120	ELIMINATE FALSE RHR OUT OF SERVICE ANNUNCIATION. RESULTS IN CHANGING RHR INJECTION VALVE D/P SETPOINTS.	107

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00051-06	5442	20423	B	MR	MR	O	880205	F								2ND CYCLE MOD ADD CHAIN WHEEL OPERATORS TO RHR HIGH POINT VENT VALVES	108
00051-07	5579	20405	B	D	D	O	880205	F				N				INSTALL ACCESSIBLE TEST POINTS FOR SURV TESTING	109
00051-08			N			O	880120	A	880229	F		Y			880122	RHR SERVICE WATER CROSS TIE LINE IS CONNECTED TO B LOOP FOR UNIT 1 A LOOP ON UNIT 2	110
00051-09			N			O	880205	F								UNIT 1 P&ID DOES NOT MATCH UNIT 2 P&ID	111
00051-10			N			I	880205	F								UNIT 1 DOES NOT MATCH UNIT 2 E625	194
00051-11			N			I	880205	F								UNIT 1 DOES NOT MATCH UNIT 2	195
00051-12	5658	20329	N	MR	W	O	880120	A	880219	F		Y			880120	RHR HEAD SPRAY DELETION. REMOVES PIPING AND VALVES AND CAPS CONTAINMENT PENETRATION.	100
00051-13			N			O	880120	A	880229	F		N			880121	UNIT 1 HAS MANUAL ISOLATION VALVES, UNIT 2 DOES NOTON DEMIN WATER TO RHRSW LA YUP SUPPLY LINE	49
00051-14			D			O	880120	A	880229	F		Y			880122	RHR SYSTEM TO FPCC SYSTEM FLOW PATH, UNIT 1-B RHR, UNIT 2 - A RHR	210
00051-15			N			I	880205	F								FT-51-2N007A, 7B HAVE A SQ ROOT ADDED TO U2	221
00052-1			N			I	880127	A				N				HPCI OUT OF SERVICE SWITCHES HAVE DIFF POSITION LABELS. ALARM SHOULD BE FIXED BY SFR.	112
00053-1			N			O	880120	A	880229	F		N			880121	DEVICES ON UNIT 1 P&ID NOT ON UNIT 2 P&ID. VENTS/DRAINS	113
00053-2	5077	20404	B	MR	W	O	880205	F								TCA 753,754,582,588 BACKWASH AIR INLET VALVE	114
00053-3	496	20192	A	F	K	O	880120	A	880219	F		Y			880120	SPENT FUEL POOL UNDERWATER WORK TABLE	115
00053-4	276	20162	A	F	C	O	880120	A	880129	F		Y			880120	INSTALL WIRE MESH SCREEN MTL OVER SPENT FUEL POOL SURGE TANK AND GASKET BETWEEN WEIR PLATE AND WALL TO ALLOW ACCURATE LEVEL CONTROL. U/1 MINOR MOD WHICH SHOULD BE INSTALLED BY S/U ON UNIT 2.	116

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00053-5	5021	20101	B	MR	D	O	880205	F								2ND CYCLE MOD ADD DRAIN TO FUEL POOL COOLING/RHR INTERTIE LINES	117
00053-6	5020	20097	B	D	D	O	880205	F								2ND CYCLE MOD INSTALL PRESS TRANS ON HBC-103 WITH IND ON PNL 10C221	118
00053-7	276	20475	B	F	W	O	880205	F								TCA 951 WATER LEAK ON EDGE REACT CAVITY	119
00055-01		20334	N		W	O	880120	A	880219	F		Y			880120	CRD FRICTION TEST STATION	121
00055-02			N			O	880127	A				N				FLOW ORIFICES NUMBERED DIFFERENTLY.	122
00055-03			N			O	880205	F								UNIT 1 P&ID DOES NOT MATCH UNIT 2 P&ID	123
00055-4			N			I	880205	F								ANNUN WINDOW LABLED DIFF. BETWEEN UNITS	213
00055-5			N			O	880205	F								55-1F014 & 55-1F015 ARE LOCATED INSIDE CONTAINMENT. UNIT 2 VALVES ARE OUTSIDE CONTAINMENT	214
00055-6			N			O	880205	F								TEST LINE ISOLATION VALVES LABELED DIFFERENTLY BETWEEN THE UNITS	223
00056-01			N			O	880120	A	880229	F		Y			880121	RWM FOR UNIT 2 DIFF THAN UNIT 1	193
00056-02			N			O	880205	F								DPAIN VALVE 56-1042 DOES NOT EXIST ON UNIT 2	222
00057-1		DCN	N			O	880126	A				N				UNIT 1 SCHEMATIC DIFF THAN UNIT 2 DCN TO BE WRITTEN TO FIX DRW ERROR	124
00057-2			N			O	880205	F								DEVICES ON UNIT 1 P&ID NOT ON UNIT 2 P&ID	125
00057-3	965	20282	B	D	W	O	880205	F								TCA 636 SUPPRESSION POOL INDICATOR	126
00057-4	5180	20336	B	D	MR	O	880205	F								2ND CYCLE MOD SEPARATE PWR SPPLY FOR TRICKLE HTR	127
00057-5	5121	20430	B	MR	MR	O	880205	F								2ND CYCLE MOD PROVIDE MEANS TO CLOSE HV-57-116 (N2 SUPPLY VALVE)	128
00058-1			N			I	880205	F								UNIT 1 TE WIRED DIFF THAN UNIT 2 TE	129
00059-1	5062	20099	B	MR	D	O	880205	F								2ND CYCLE MOD PROVIDE MEANS FOR BLOWING DOWN PCIG RECEIVERS	130
00059-2	5117	20427	B	D	MR	O	880205	F								2ND CYCLE MOD ADDITION OF DESICCANT BREATHERS ON ACID STORAGE TANKS	131

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0059-3			N			O	880121	A	880229	F		N			880121	UNIT 1 AND UNIT 2 P&IDS DO NOT MATCH. VENT/DRAINS RDC SHOULD BE ISSUED TO CORRECT U/1 P&ID FOR PDS-59-106A/B MOUNTING.	132
0059-4			N			O	880121	A	880229	F		N			880121	UNIT 1 AND UNIT 2 P&IDS DO NOT MATCH. DRAIN VALVE.	133
0060-1	5553	BASE	B	MR	D	O	880205	F								ALARM ANNUNCIATION FOR DRYWELL CHILLER	134
0060-2	5730	20433	B	MR	MR	O	880205	F								2ND CYCLE MOD - APP J MOD FOR LLRT	135
0060-3	5283	20462	B	MR	W	O	880205	F								2ND CYCLE MOD TERM SPARE WIRES FROM TE-37-125 AT DRYWELL PEN	136
0060-5	5175	20402	B	MR	D	O	880205	F								TCA 584 SET POINT ADJUST KNOB COVER	138
0061-2	258		A			O	880122	A	880229	F		N			880225	REWORK DRYWELL SUMP DISH PIPE	140
0061-3	778	20413	B	MR	D	O	880205	F								TCA 356,359 UNIT 1 CONDENSATE BWRT TO UNIT 2 COND	141
0061-4	955	20089	B	F	D	O	880205	F								INSTALLATION OF OIL REMOVING BELTS IN THE RW FLR DRN SUMPS	142
0061-5			N			O	880219	F								HV-61-202 DELETED - HV-61-201 STILL INSTALLED	199
0068-1	5703	20407	B	MR	D	O	880205	F								TCA 700 FLUSH SAMPLE CHAMBER DEMIN	143
0068-2	495	20471	B	D	MR	O	880205	F								TCA 218 AIR JUMPER NEEDED AROUND SUCT & DISCH	144
0068-3	144	6938	B	F	W	O	880205	F								TCA 3 SERVICE WTR THRU WINTER BY PASS LINE	145
0068-5	5493	20460	B	MR	MR	O	880205	F								2ND CYCLE MOD - PROVIDE FUSED PWR SUPPLY FOR REFUEL FOR VENT RAD MONITOR	146
0069-1	5053	20113	B	F	W	O	880205	F								TCA 427 CONDENSER AIR COOLER DRAIN	147
0069-2	610	20092	A	F	K	O	880120	A	880219	F		N			880120	OFFGAS AFTER COOLER COND TUBE CHANGE OUT	148
0069-3	5475	20451	B	MR	MR	O	880205	F								2ND CYCLE MOD - FLOW TOTALIZERS FOR SAMPLE PUMPS GASEOUS RELEASE PATH	149
0069-4			N			O	880205	F								DEVICES ON UNIT 1 P&ID NOT ON UNIT 2 P&ID	150
0071-1	604	20279	B	F	W	O	880205	F								TCA 294 DISCOLORED WIRE AT TPCC-F37-2	151

DIFF #	MOD	PCR	F L	U#1 STAT	U#2 STAT	RESP COOR O/I	FROM COORD DATE	F / A	ENGRG DATE	F / A	COORD CONCUR	T R S	PROC REVW	F A	TRAIN DATE	U#1/U#2 DIFFERENCE	EDIT #
00072-1			C			O	880126	A				N				SCALE CHANGE FI-70-250. SHOULD BE FIXED BY SFR #72B-2.	153
00072-2	5733	20454	B	D	D	O	880205	F								TCA 170 MSL BYPASS LEAKAGE BARRIER VENT VALVE	154
00072-3	746	20084	B	D	W	O	880205	F								TCA 716 TEMP ELEMENT RELOCATION RWCU SYSTEM	155
00072-4		20084	B		W	O	880205	F								TCA 927 RWCU REGEN HT EXCH RM TEMP CONTROL	156
00072-5	5257	20117	B	MI	W	O	880205	F								INSTALLATION OF TEST CONNECTION TO OUT BOARD MSIV PNEUMATIC SUPPLY	157
00072-6	5546	20431	B	MR	MR	O	880205	F								2ND CYCLE MOD MSRV STM CUTTING PROBLEM	158
00072-7	974	20214	B	MR	MR	O	880205	F								2ND CYCLE MOD MSRV PILOT DISC REPLACEMENT	159
00073-1	5278	20136	B	MR	W	O	880122	A	880229	F		Y			880125	MANUAL FLOW CONTROL FOR CONTAINMENT H2 RECOMBINER	160
00073-2	5173		A	MR		O	880127	A				N				TCA 705 FULL CORE DISPLAY FAN CONTROL CIRCU	161
00073-3	5326	20031	B	D	W	O	880205	F								TCA 501 CLEAR CRD HYD HI TEMP ALARM	162
00074-1		20271	A		W	I	880205	F				N				REACTOR RECIRC FLOW UNITS UPGRADING NEUTRON MONITORING FLOW UNITS	
00074-2			N			O	880219	F								FUEL CYCLES CAUSE DIFF TRIPS FOR APRM	
00075-1	5301	20043	B	F	W	O	880205	F								100% BYPASS OF THE TURB EXHAUST SYSTEM FILTERS	164
00076-1	5120	20401	B	MR	W	O	880205	F								TCA 578 DRN LINE COOLING COIL TO DRW/PLUGGED	165
00076-2	5726		B	D		O	880127	A				N				TCA 850 FANS TRIPPING LOW TEMP CUT OFF	166
00076-3	682	5111N	A	W	W	O	880205	F	880219	F		Y			880121	REPLACE PAUL MONROES WITH LIMITORQUES	167
00076-4	997	20429	B	D	D	O	880205	F								2ND CYCLE MOD - RX AIR ROLL FILTER BECOMES CLOGGED DURING SNOW STORMS	168
00076-5			N			O	880122	A	880219	F		Y			880125	RERS FILTER COOL DOWN MODE DELETED ON UNIT 2	201

DIFF #	MOD	PCR	F L	U#1 STAT	U#2 STAT	RESP COOR O/I	FROM COORD DATE	F / A	ENGRG DATE	F / A	COORD CONCUR	T R S	PROC REVW	F A	TRAIN DATE	U#1/U#2 DIFFERENCE	EDIT #
00077-1	5329	20409	B	MR	D	O	880205	F								TCA 597 LOSS OF LOCAL INDICATION OF PDI-42-IRD	169
00077-2	341	20163	A	F	K	O	880120	A	880219	F		Y			880121	ADDITION OF A PRESS IND TO TIP PURGE PNL. MINOR MOD SHOULD BE INSTALLED BY S/U.	170
00078-1	5667	20428	B	MR	MR	O	880205	F								2ND CYCLE MOD - PROVIDE ACCESS DOORS FOR CONTROL RM HVAC ISOLATION VALVES	171
00078-2	859		A			O	880127	A				N				2ND CYCLE MOD - PROVIDE FIRE STOP FOR THE CABLE PEN AT CONTROL STRUCTURE. MOD WILL COVER BOTH UNIT 1 & UNIT 2 CABLE PENETRATIONS.	172
00081-1	296	20391	B	W	W	O	880205	F								BLADE BEARING REPLACEMENT FOR CONTROLLABLE PITCH FAN BLADES	173
00085-1	794		A	D		O	880127	A				N				2ND CYCLE MOD - PROVIDE ADDITIONAL PA HANDSETS	174
00087-1	5553	DCN	N	D	W	O	880205	F								ANNUNCIATOR DIFFERENCE FOR DRY WELL CHILLERS	175
00092-1	5028	20328	B	MR	W	O	880205	F								GEN CORE MONITOR & PYROLYSATE COLLECTOR	176
00092-2			N			O	880127	A				N				FUSE #S DIFFERENT	177
00092-3			N			O	880127	A				N				FUSE #S DCFFERENT	178
00092-4	5599	8583N	B	MR	W	O	880205	F								2ND CYCLE MOD - DIESEL GEN CONTROL FUSES APPR	179
00092-5			N			O	880120	A	880219	F		N			880121	UNIT 1 AND UNIT 2 ALARM WINDOW WORDING SLIGHTLY DIFFERENT FOR SAFEGUARD BUS UNDERVOLTAGE.	180
00092-6			N			O	880219	F								UNIT 2 ELECT. LOADS ON UNIT 1 SYSTEMS.	202
00093-1			N			O	880127	A				N				UNIT 2 TURBINE SUPERVISORY RECORDER IS NEWER MODEL.	181
00097-1	5727	723	A	C	W	O	880205	F								TCA 1057 REFUEL PLAT-STRAIN RELIEF FOR HOIST	182
00097-2	480	6723	B	D	W	O	880205	F								2ND CYCLE MOD - RELIEVE STRAIN ON MAIN HOIST ELECT CABLE	183
00097-3	134	625	B	F	D	O	880205	F								PROVIDE BOUNDRY ZONE INTERLOCKS FOR REFUELING BRIDGE	184

DIFF #	MOD	PCR	FL	U#1 STAT	U#2 STAT	RESP COOR O/I	FROM COORD DATE	F/A	ENGRG DATE	F/A	COORD CONCUR	TRS	PROC REVW	FA	TRAIN DATE	U#1/U#2 DIFFERENCE	EDIT #
00100-1	5579	20405	B	MR	D	O	880205	F								TCA 825,886,892,893,958,959 INSTALL ACCESSIBLE TEST POINTS FOR SURV TEST	185
00100-2		20050	N		W	O	880120	A	880219	F		N			880121	REPLACE RCIC PUMP ACCELEROMETERS WITH VELOCITY PROBES	186
00100-3			N			O	880205	F								UNIT 2 SEISMIC INSTR. PROVIDED BY UNIT 1	196
00100-4			N			O	880219	F								VOLTAGE RELAYS DIFF.	203
00100-5			N			O	880122	A	880229	F		N			880125	HIGH ENERGY LINE BREAK DIFF.	204
00100-6			N			O	880122	A	880229	F		N			880125	SNUBBER REDUCTION PROGRAM FOR UNIT 2	205

Attachment 5

TRAINING PLAN FOR UNIT 1/UNIT 2 DIFFERENCES

Background:

NUREG 1021 requires that for an RO or SRO to be eligible to hold simultaneous valid licenses on more than one nuclear facility, the utility must justify to the commission that the differences between the units are not so significant that they impact the ability of the licensed personnel to operate safely and competently both facilities. Further, the utility must submit for NRC review the details of the training and certification program.

The analyses and summary of the differences that must be performed will include:

(1) Facility design and systems relevant to control room personnel

(2) Tech Specs

(3) Procedures (primarily ON/OT/TRIPs)

(4) Control room design and instrument location

(5) Operational Characteristics

The utility should also describe the expected method of rotating personnel between units and the refamiliarization to be conducted before responsibility on a new unit is assumed.

Plan:

Unit 2 Startup Manager staff presently assimilating those pertinent Unit 1 vs Unit 2 differences using Bechtel and PECo Engineering support. Jim Hutton will provide all pertinent information to LGS Nuclear Training no later than April 1, 1988. Superintendent-Training will assign lead instructors in Licensed Operator Requal (LOR) training to develop training material to cover these differences in LOR training during 1988. This training will consist of 2 weeks of systems, procedures, location, and Tech Spec instruction.

Schedule (tentative):

1) Receive all Unit 1 vs Unit 2 differences from Unit 2 Startup group no later than April 1, 1988.

2) Draft letter for submittal to NRC for their review of differences and LO/SLO training plan for acquiring Unit 2 license for those Unit 1 personnel.

3) Training to develop all training materials needed between April and August 1988.

4) Pending NRC review and approval, NTS will provide 2 weeks of instruction for all 6 crews of operators and all SRO licensed Engineers between August 29, 1988 and October 14, 1988. Differences training will consist of classroom instruction and plant tours with both a utility administered comprehensive written exam and plant-oral exam administered at end of the 2nd week of instruction.

5) NRC Region I to administer some type of exam (either written, plant-oral, or both) to all Unit 1 LO/SLO personnel the weeks of 10/10, 10/24, and 11/07/88 for about 23-24 people each week.

6) All LO/SLO personnel will have acquired Unit 1/2 dual licenses no later than December, 1988. This is approximately 6-7 months prior to fuel load and prior to start of Unit 1/Unit 2 tie-in outage.

7) Any failures of NRC exams will be re-trained and re-examined as required.

NOTE: A meeting to discuss this process with NRC Region I BWR Examination personnel has been scheduled for January 27, 1988. At this meeting, tentative approval/disapproval of this plan will take place and prospective exam dates will be addressed. Attending this meeting will be appropriate representatives of Unit 2 Startup group, Operations, and Training.

E. G. Firth
Superintendent-Training
Limerick Generating Station
01/29/88

28-Jan-88

PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION
OPERATIONS GROUP

6 CYCLE, 6 SHIFT ROTATION, 3 OPERATORS PER SHIFT- EXAMPLE OF OPERATORS ON SHIFT 01

OPERATOR/CYCLE	WEEK 1 S	M	T	W	T	F	S	WEEK 2 S	M	T	W	T	F	S	WEEK 3 S	M	T	W	T	F	S	WEEK 4 S	M	T	W	T	F	S	WEEK 5 S	M	T	W	T	F	S	WEEK 6 S	M	T	W	T	F	S	UNIT 1 & C CD	UNIT 1 & C UTIL RO	UNIT 1 & C UTIL DAY	UNIT 1 & C UTIL 110-7P	UNIT 1 & C S/T	UNIT 2 UTIL RO	UNIT 2 UTIL DAY	UNIT 2 S/T	TRAIN	SR/SB	GRAND TOTAL
SHIFT ROTATION	1A	1B	A	A	A	A	A	A	A	1A	1B	N	N	N	N	N	N	N	1A	1B	D	D	T	T	T	T	T	1A	1B	U	C	U	U	U	1B	1A	D	D	D	D	D	1B												
OPERATOR 1																																																					
CYCLES 1 & 4			RO U2					RO U2			CO							RO U1										U2 DAY							RO U1							7	7	0	8	14	7	5	12	4	12	42
CYCLES 2 & 5			RO U1					RO U1			RO U2					CO												U1 DAY							CO							7	7	5	8	19	7	8	7	4	12	42
CYCLES 3 & 6			CO					CO			RO U1					RO U2												U1 110-7P							RO U2							7	7	0	5	19	7	8	7	4	12	42
TOTALS																																											21	21	5	5	52	21	5	26	12	36	126
%																																													141%			121%	5%	29%	100%
OPERATOR 2																																																				
CYCLES 1 & 4			RO U1					RO U1			RO U2					CO												U1 DAY							CO							7	7	5	8	19	7	8	7	4	12	42
CYCLES 2 & 5			CO					CO			RO U1					RO U2												U1 110-7P							RO U2							7	7	0	5	19	7	8	7	4	12	42
CYCLES 3 & 6			RO U2					RO U2			CO					RO U1												U2 DAY							RO U1							7	7	0	8	14	7	5	12	4	12	42
TOTALS																																											21	21	5	5	52	21	5	26	12	36	126
%																																													141%			121%	5%	29%	100%
OPERATOR 3																																																			
CYCLES 1 & 4			CO					CO			RO U1					RO U2												U1 110-7P							RO U2							7	7	0	5	19	7	8	7	4	12	42
CYCLES 2 & 5			RO U2					RO U2			CO					RO U1												U2 DAY							RO U1							7	7	0	8	14	7	5	12	4	12	42
CYCLES 3 & 6			RO U1					RO U1			RO U2					CO												U1 DAY							CO							7	7	5	8	19	7	8	7	4	12	42
TOTALS																																											21	21	5	5	52	21	5	26	12	36	126
%																																													141%			121%	5%	29%	100%

Attachment 6

Attachment 7

PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION

OPERATIONS GROUP

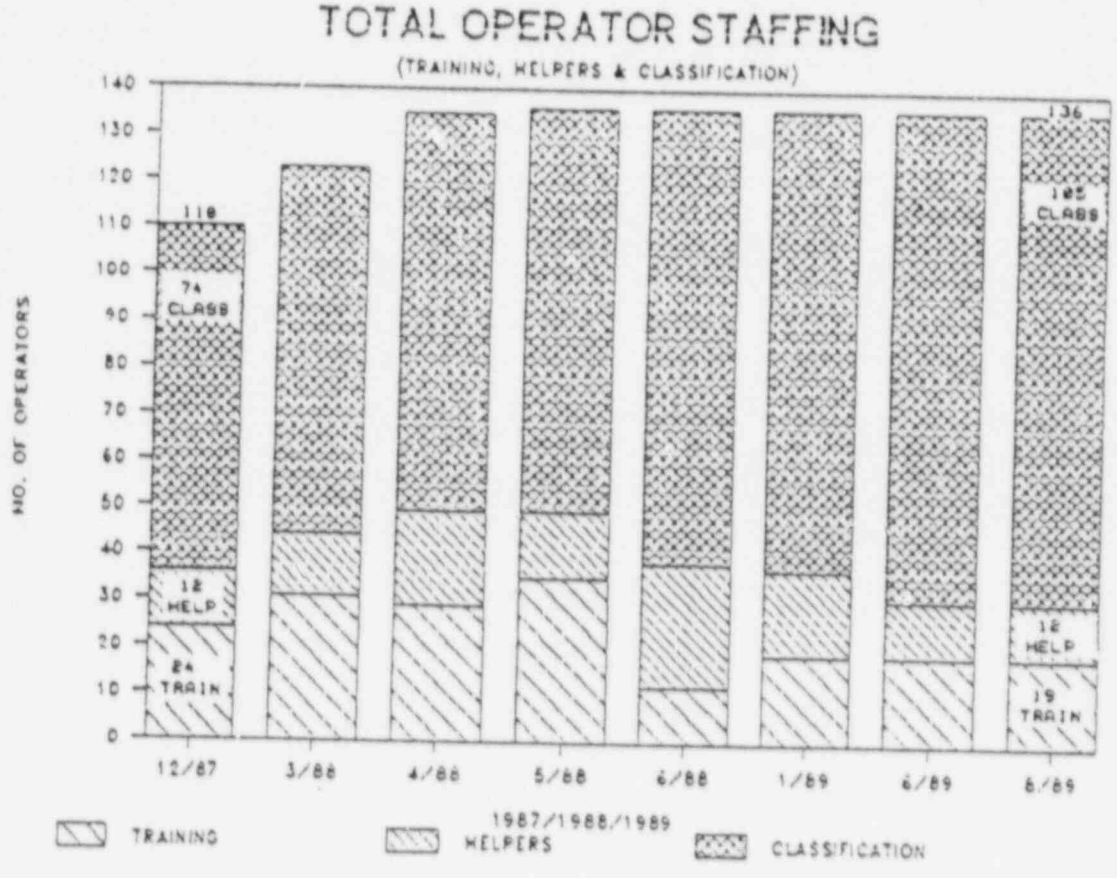
Operator Manpower

Operations Group Operator Manpower to Support Unit 2 Staffing and Budget Concerns (8 graphs):

1. Total Operator Staffing
2. Staffing by Classification (Operators on Shift Excluding Helpers)
3. Number of Helpers
4. Operators in Training
5. Staffing by Classification (Operators on Shift Including Helpers)
6. SRO Licenses
7. RO Licenses
8. Excess NLO Qualifications

Total Operator Staffing

This graph represents total operator staffing. It is broken down into three parts: (1) Staffing by Classification (operators on shift excluding Helpers) (2) Number of Helpers (3) Operators in Training. The series of graphs which follow further delineates these three parts. A graph representing all operators on shift including Helpers is also included. Three (3) additional graphs analyze license and non-license operator availability, staffing plans and requirements and excess qualifications. These additional graphs also depict the ability to handle attrition and training failures.

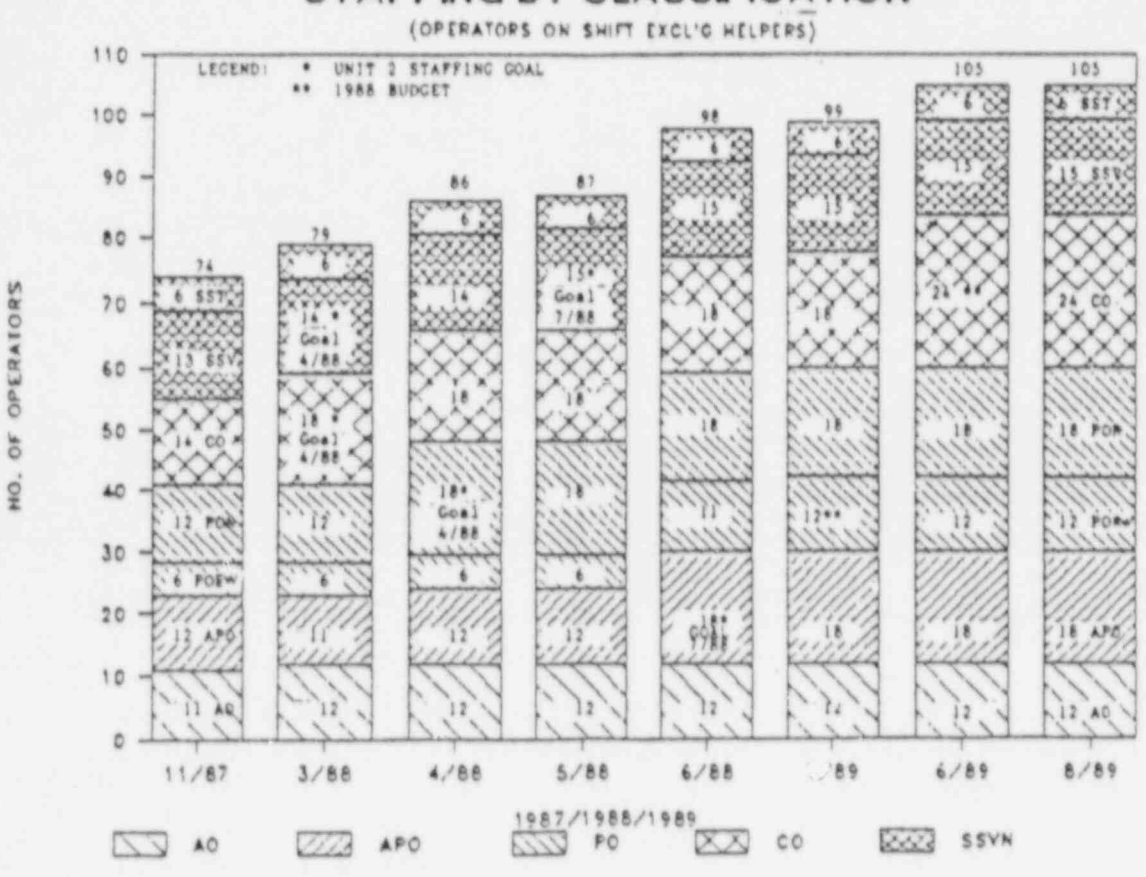


At the end of December, there were 110 total operators that were on shift, working as Helpers or in training with increases to 136 scheduled by early 1988. This includes recently added postings for 18 additional Helpers and reflects revised personnel plans. In late November 1987, 12 Helpers were added in response to an earlier posting and are presently in Auxiliary Operator training. Flexibility in the staffing and training program has been achieved by increasing both new hires and excess qualifications.

Staffing by Classification

(Operators on Shift Excluding Helpers)

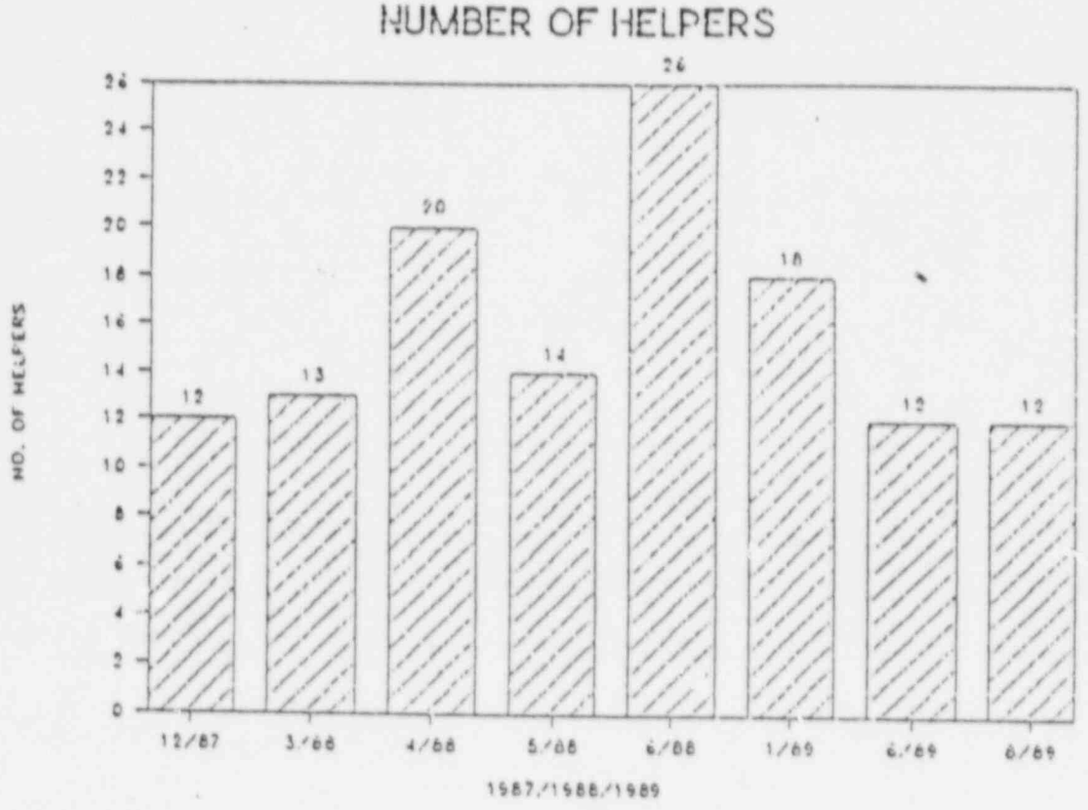
This graph represents present and long range plans for shift operator staffing by classifications worked, excluding Helpers on shift. The trend in overall staffing size is reflected by this bar chart as well as relative increases in classifications worked. Long range plans reflect increases to 105 operators on shift by 1989 to support Unit 2 and 1988 budget concerns.



Two (2) Chief Operators (CO's) remain dedicated to Unit 2. By 3/88, the Unit 2 staffing goals of 18 CO's and one (1) Supervisor will be met, one month ahead of schedule. The 18 CO's will work the Unit 2 CO position on a rotating basis. Unit 2 staffing goals are being achieved and, in most cases, are earlier than originally requested. This graph does reflect our plans to pursue schedule advanced training programs. This is necessary to provide excess qualifications which will allow a margin for attrition for various reasons.

Number of Helpers

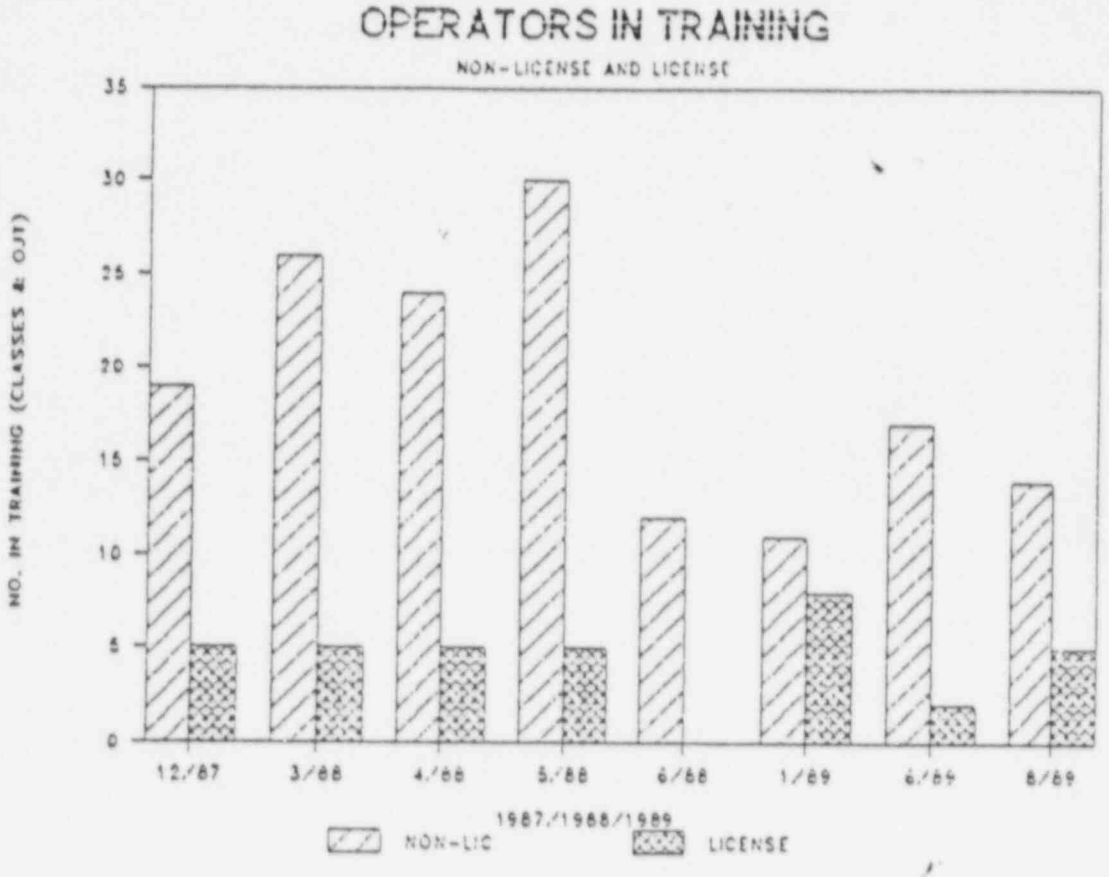
This graph represents the number of Helpers available on shift. This number, assuming timely training and qualification, reflects flexibility in responding to operator classification vacancies due to attrition and the need to fill vacancies as a result of training.



At the end of December, there were 12 Helpers available. The recently added 12 Helpers will be in training through January. Recently added postings for 18 Helpers, and their incorporation into the personnel plan, will maintain a minimum of 12 Helpers available on shift through 8/89.

Operators in Training

This graph represents the number of operators in non-license and license training and those in on-the-job training. These numbers do not include the training week which is a part of the normal operator shift rotation or any other incidental training. Non-license operator (NLO) progression classes are 11 weeks long. License operator training classes are 40 weeks long. The training schedule reflects efforts to upgrade operator qualifications in anticipation of shift vacancies (license and non-license), meet minimum requirements for accelerated progression training, staff Unit 2 and minimize temporary vacancies due to training.

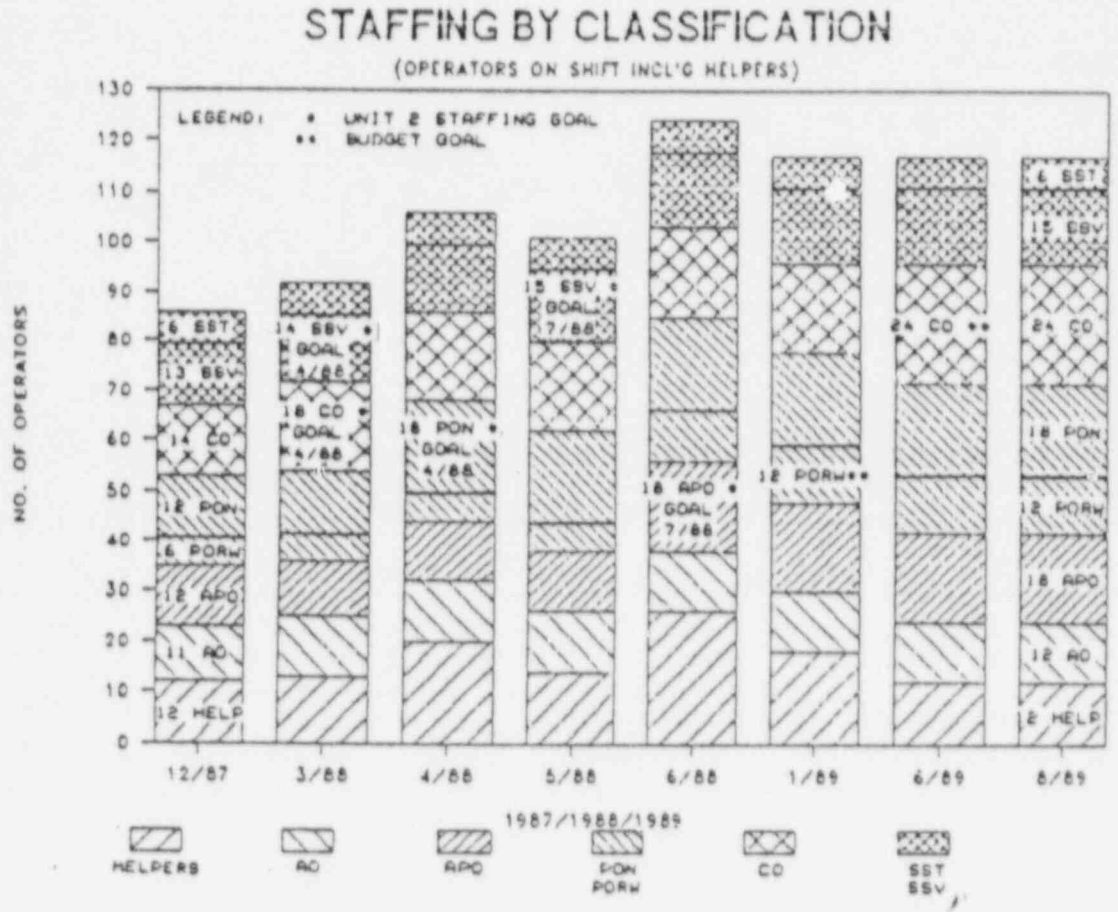


At the end of December, there were five (5) operators in licensed operator training (2 SRO's, 3 RO's) and 19 in NLO training. There will be eight (8) operators (2 SRO's, 6 RO's) in the license operator training class which is scheduled to start in 9/88.

Staffing by Classification

(Operators on Shift Including Helpers)

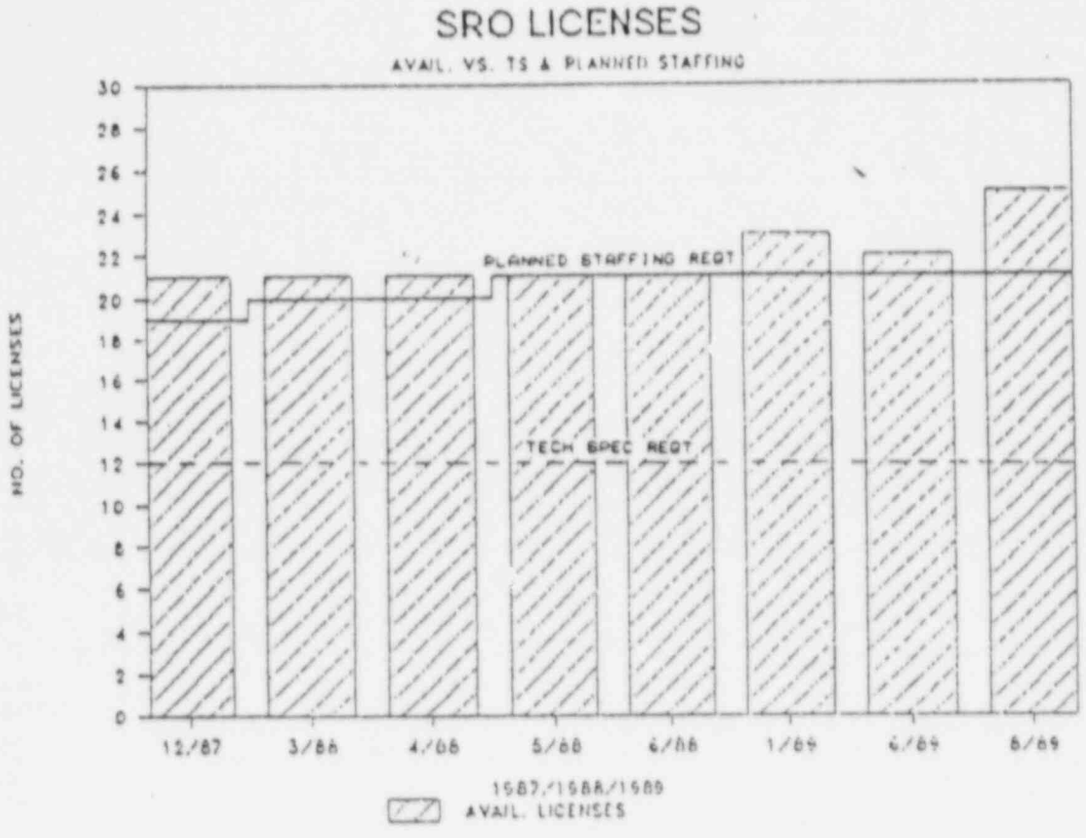
This graph represents present and long range plans for shift operator staffing by classification worked, including Helpers on shift. Those Helpers on shift and other operators qualified for higher classifications reflect the flexibility in responding to operator classification vacancies due to attrition and the need to fill vacancies as a result of training.



At the end of December, there were 86 operators on shift, 12 of which were Helpers.

SRO Licenses

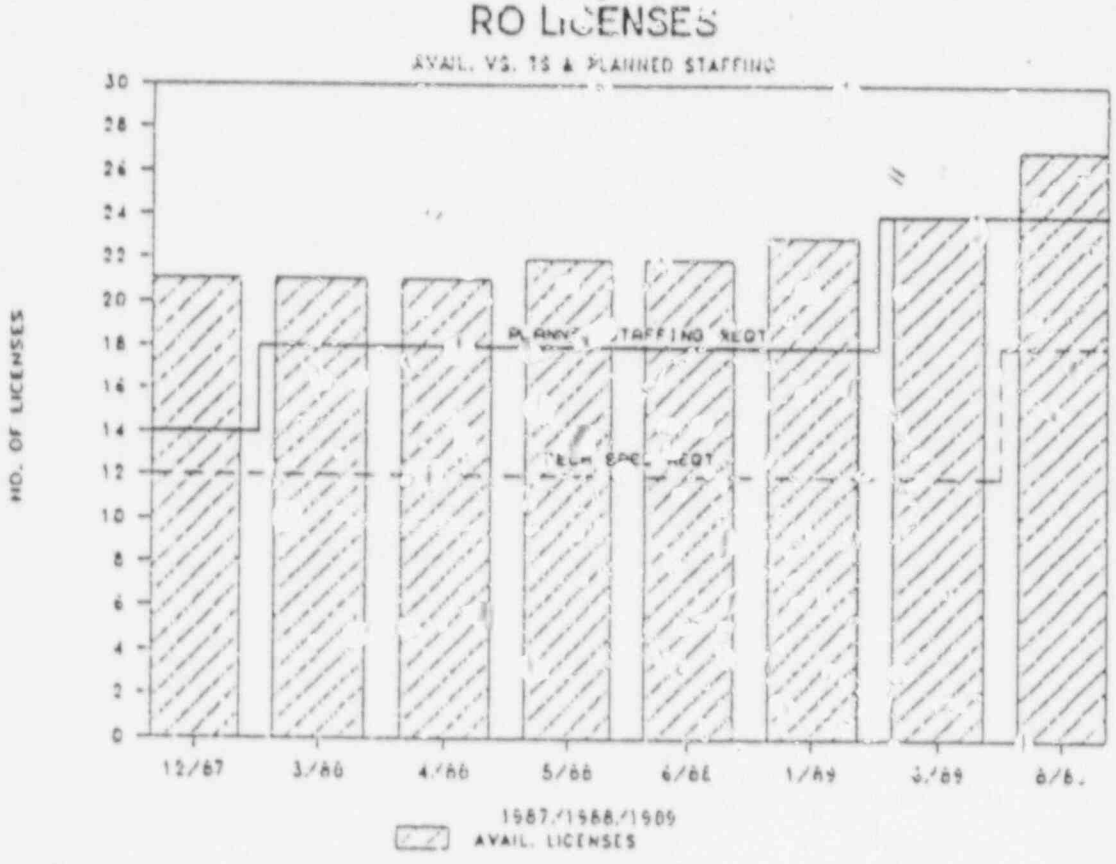
This graph represents the number of available Senior Reactor Operator (SRO) licenses with respect to planned staffing and Technical Specification (Tech Spec) requirements. Tech Spec requires two (2) SRO's per shift or 12 total, based upon a six (6) shift rotation for either one (1) or two (2) unit operation. The number of licenses available above the requirement lines represent excess licenses with respect to that requirement. Excess licenses reflect the flexibility needed to respond to vacancies in license positions (Chief Operator and Supervision). This graph also depicts the ability to handle attrition and training failures.



At the end of December, there were two (2) excess licenses with respect to planned staffing requirements and nine (9) excess licenses with respect to Technical Specifications. Revised training plans will increase excess licenses with respect to planned staffing to four (4) by 8/89.

RO Licenses

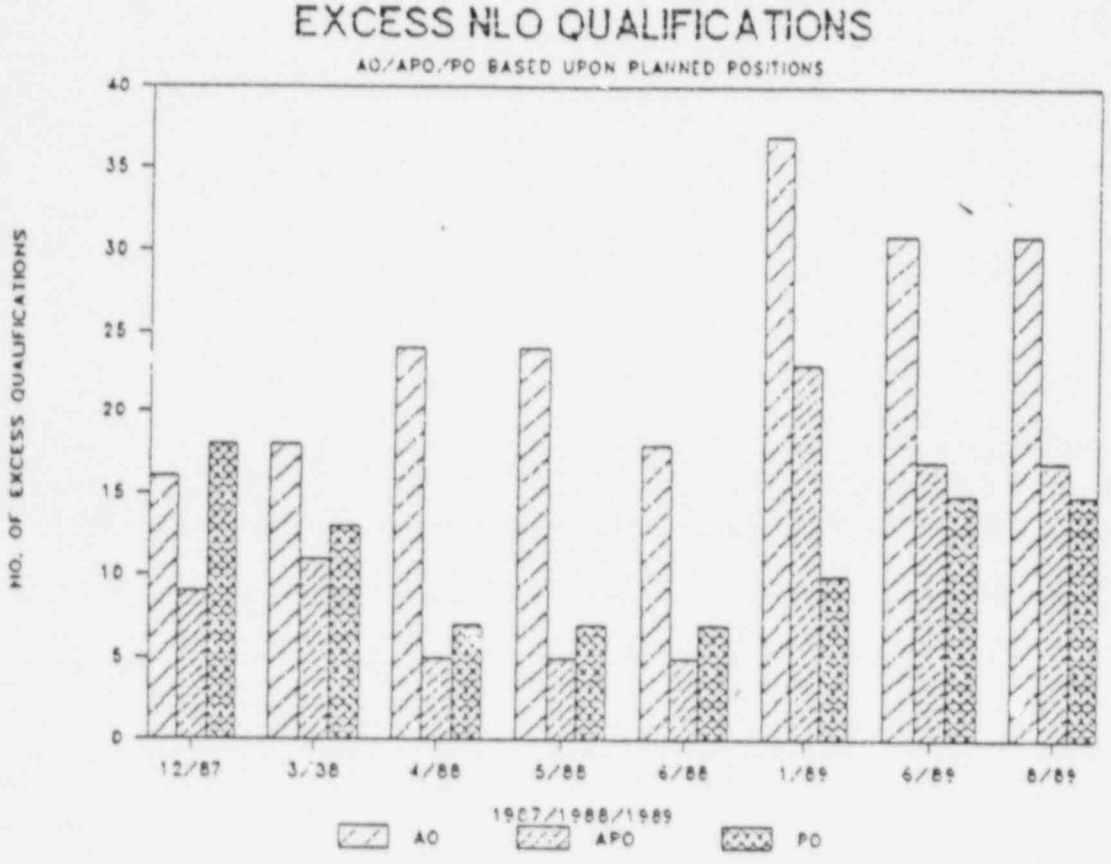
This graph represents the number of available Reactor Operator (RO) licenses with respect to planned staffing and Technical Specification (Tech Spec) requirements. Presently Tech Specs require two (2) RO's per shift for one (1) unit operation and three (3) for two (2) unit operation for a total of 12 and 18 respectively, based upon a six (6) shift rotation. The number of licenses available above the requirement lines represent excess licenses with respect to that requirement. Excess licenses reflect the flexibility needed to respond to vacancies in the Chief Operator license position. This graph also depicts the ability to handle attrition and training failures.



At the end of December, there were nine (9) excess licenses with respect to Technical Specifications. Increased training efforts will provide three (3) excess licenses available in 8/89 with respect to planned staffing. This is in response to the creation of ten (10) additional RO license positions by mid-1989.

Excess NLO Qualifications

This graph represents the number of excess non-licensed operator (NLO) qualifications for Auxiliary Operator (AO), Auxiliary Plant Operator (APO) and Plant Operator (PO). This excess number reflects the flexibility needed to respond to vacancies in non-license positions and is based upon presently planned position increases. This graph also depicts the ability to handle attrition and training failures.



At the end of December, there were 16 excess AO-qualified, nine (9) excess APO-qualified and 18 excess PO-qualified operators. During December 1987, five (5) additional operators were qualified AO, as planned. Excess qualifications will increase beyond mid-1988 based upon increased hiring efforts and accelerated training schedules.