POWER AUTHORITY OF THE STATE OF
NEW YORK
AND
CONSOLIDATED EDISON
DOCKET NO. 50-286

EXHIBITS TO APPLICATION FOR
AMENDMENT TO OPERATING LICENSE
MARCH, 1977

50-286

Date 3/16/77

770310337

EXHIBIT A

LIST OF TRUSTEES AND PRINCIPAL STAFF

POWER AUTHORITY OF THE STATE OF NEW YORK

EXHIBIT A

TRUSTEES

Name	Business Address
JAMES A. FITZPATRICK Chairman	48 Court Street Plattsburgh, New York 12901
GEORGE L. INGALLS Vice Chairman	One Marine Midland Plaza Eighth Floor Binghamton, New York 13902
WILLIAM J. RONAN	Room 5600 30 Rockefeller Plaza New York, New York 10020
RICHARD M. FLYNN	410 Park Avenue New York, New York 10022

PRINCIPAL STAFF

Name	Business Address
GEORGE T. BERRY General Manager and Chief Engineer	10 Columbus Circle New York, New York 10019
LEWIS R. BENNETT Assistant General Manager - General Counsel	10 Columbus Circle New York, New York 10019
WILBUR L. GRONBERG Assistant General Manager - Engineering	10 Columbus Circle New York, New York 10019
JOHN W. BOSTON Director of Power Operations	10 Columbus Circle New York, New York 10019
THOMAS F. McCRANN, JR. Controller	10 Columbus Circle New York, New York 10019

EXHIBIT B

PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS

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5.0 ADMINISTRATIVE CONTROLS

Administrative and management controls have been established to provide continuing protection to the environment through implementation of the Environmental Technical Specifications. This section describes the assignment of responsibilities, organizational structure, operations, procedures, review and audit functions and reporting specifications.

5.1 RESPONSIBILITY

5.1.1 The Resident Manager, the Plant Operating Review Committee and headquarters' engineering and operations personnel have responsibility for review of the Environmental Technical Specifications.

5.1.2 The Resident Manager shall have direct responsibility for assuring the operation of the Indian Point No. 3 Plant is conducted in such a manner as to provide continuing protection to the environment. During periods when the Resident Manager is unavailable, he shall delegate his responsibilities to the Superintendent of Power, or in his absence, to other qualified supervisory personnel.

5.1.3 The implementation of the Environmental Technical Specifications is the responsibility of the Superintendent of Power, with the assistance of the plant staff organization. The plant staff organization is shown in Figure 6.2-1 of Appendix A.

5.1.4 Monitoring of environmental programs will be performed by site technical personnel, and when necessary, by environmental consultant personnel. Engineers from the headquarters' staff will be available for assistance when required.

5.2 ORGANIZATION

Organization relative to environmental matters at the plant and headquarters' levels are presented in Figures 5.2-1 and 5.2-2 respectively.

5.3 REVIEW AND AUDIT BY PLANT OPERATING REVIEW COMMITTEE (PORC)

5.3.1 Review and audit of environmental matters by PORC shall be performed as described below and in Section 6.5 of Appendix A.

5.3.2 The responsibilities of the Plant Operating Review Committee as related to the Environmental Technical Specifications are as follows:

a. Review results of environmental monitoring programs prior to submittal in each annual environmental monitoring report.

b. Review proposed changes to the Environmental Technical Specifications and the evaluated impact of the change.

c. Review proposed changes or modifications to the plant systems or equipment and the evaluated impact which would adversely affect the evaluation of the plant's environmental impact.

d. Review the Environmental Technical Specification development with the Safety Technical Specifications to avoid conflicts and for consistency.

e. Review all proposed procedures or changes thereto which adversely affect the plant's environmental impact.

f. Review all reported violations of Environmental Technical Specifications. Where review warrants, prepare and forward a report covering their evaluation and recommendation to prevent recurrence to the Resident Manager and the Chairman of the Safety Review Committee.

5.3.3 The Plant Operating Review Committee will make tentative determination as to whether or not proposals submitted to the committee involve a change in the plant's environmental impact. This determination is subject to review by the Safety Review Committee.

5.4 REVIEW AND AUDIT BY SAFETY REVIEW COMMITTEE (SRC)

5.4.1 Review and audit of environmental matters by the SRC shall be as described below and in Section 6.5.2 of Appendix A.

5.4.2 The responsibilities of the Safety Review Committee as related to the Environmental Technical Specifications are as follows:

a. Review proposed changes and/or modifications to procedures, equipment or systems which adversely affect the plant's environmental impact.

b. Review proposed tests and experiments which adversely affect the plant's environmental impact.

c. Review proposed changes in the Operating License and Technical Specifications relating to environmental concerns.

d. Make or cause to be made periodic audits of plant operation to verify conformance with the Environmental Technical Specification.

e. Review violations of the Environmental Technical Specifications.

5.5 PROCEDURES

5.5.1 Detailed written procedures, including applicable checklists and instructions, have been prepared and are followed for all activities involved in carrying out the environmental monitoring program. Procedures include sampling, data recording and storage, instrument calibration, measurements and analyses, and actions to be taken when limits are approached or exceeded. Testing frequency of alarms, as determined from experience with similar instruments in similar environments and from manufacturers'technical manuals, have also been included.

5.5.2 Plant Operating Procedures include provisions, in addition to the procedures specified in Section 5.5.1, to ensure that all plant systems and components are operated in compliance with the limiting conditions for operations established as part of the Environmental Technical Specifications.

5.6 PLANT REPORTING REQUIREMENTS

5.6.1 Routine Reports

a. Annual Environmental Operating Report

Part A: Nonradiological Report. A report on the environmental surveillance programs for the previous 12 months of operation shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) as a separate document within 120 days after January 1 of each year. The report shall include summaries, interpretations, and statistical evaluation of the results of the nonradiological environmental serveillance activities (Section 3) and the environmental monitoring programs required by limiting conditions for operation (Section 2) for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance

reports and an assessment of the observed impacts of the plant operation on the environment. If harmful effect or evidence of irreversible damage are detected by the monitoring, the licensee shall provide an analysis of the problem and a proposed course of action to alleviate the problem. Specifically the following information shall be provided in this report:

(1) Thermal Discharges and Hydraulics

- Data on daily maximum, minimum, and average temperature measurements of the water in the intake and discharge canal water, and the ΔTc across the Circulating Water System during full and reduced flows and during pump maintenance and deicing operations.

- Any rate of temperature change across the condenser pursuant to Sections 2.1.4 and 3.1.4.

- Nominal Unit No. 3 Condenser flow rates, and changes in flow rates including date and time of day when reduced flow takes place.

- Calculated total thermal energy in Btu released from Unit No. 3 through the discharge outfall during the month.

- Calculated Unit No. 3 maximum and average release rate of energy through the discharge outfall in Btu per hour.

- Calculated intake velocity and flow rate per Unit No. 3 intake screen.

- Calculated discharge velocity and head differential across the discharge canal (24 hrs. average).

(2) Chlorination of Cooling Water

- The dates on which Unit No. 3 chlorination was performed.

- Amount of sodium hypochlorite consumed during each Unit No. 3 chlorination.

- Concentration of sodium hypochlorite used.

- Analytical results of chlorine tests.

- Unit No. 3 cooling water flow rate during Unit No. 3 chlorination.

(3) Chemical Discharges and Water Quality

- Dates at which samples were taken and analyzed in accordance with Table 2.3.-1.
- Analytical results of tests performed in accordance with Table 2.3.-1.
- Inventory of chemicals discharged from Unit No. 3 in accordance with Table 2.3.-2.
- Unit No. 3 water flow rate in the discharge canal at times of releases.
- Amount of non-radioactive Unit No. 3 solid waste material collected (in cubic feet) at the intake screens and disposed of as solid waste in accordance with local regulations.
- Dissolved oxygen concentration measurements.
- pH measurements.

NOTE: As Indian Point Unit No. 3 shares a common discharge canal with Indian Point Units No. 1 and 2, the figures reported under 5.6.1 a (1)-(3) will be site figures unless specifically noted as Unit No. 3 figures.

Part B: Radiological Report. A report on the radiological environmental surveillance programs for the previous 12 months of operation shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) as a separate document within 120 days after January 1 of each year. The reports shall include summaries, interpretations, and statistical evaluation of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by the Technical Specifications. If harmful effect or evidence of irreversible damage are detected by the monitoring, the licensee shall provide an analysis of the problem and a proposed course of action to alleviate the problem.

Results of all radiological environmental samples taken shall be summarized and tabulated on an annual basis. In the event that some results are not available within the 120 day period, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

5.6.1

b. Semiannual, and/or Special Environmental Operating Reports

(1) Non-Radiological

A Progress report and/or Annual Report shall be submitted by the licensee to the Director of Office of Nuclear Reactor Regulations by the end of July and the end of January, or as otherwise specified below, describing activities of the Thermal Plume Mapping and Ecological Survey Program, Entrainment Studies, Impingement Studies, and Special studies for the prior six-month interval. Information to be presented will include the following:

NOTE: These programs and studies will be performed in conjunction with Consolidated Edison, operators of Indian Point Units No. 1 and 2, and a joint report issued.

(a) Effects of chlorine and other chemical discharges on the ecosystem of the Hudson River in accordance with Sections 2.3 and 3.3 and 4.1.2a(2).

(b) Reduction in frequency of chlorination and reduction in concentration of free and combined residual chlorine in the discharge canal.

(c) Thermal plume model verification and mapping (near and far field) in accordance with Section 4.1.1.a.

(d) Ecological effects of thermal discharges in accordance with Section 4.1.2a(2).

(e) Potential reduction in dissolved oxygen in the cooling water through the plant.

(f) Results of the general ecological survey in accordance with Section 4.1.2a(1).

(g) Ecological effects of entrainment of organisms in accordance with Section 4.1.2a(2)V.

(h) Ecological effects of fish impingement in accordance with Section 4.1.2a(2)VI.

(i) Other ecological effects as indicated in Section 4.0.

(j) Evaluation of data in accordance with Section 4.1.2a(2) (I through IV).

Upon completion of the environmental surveillance studies described in Section 4.0, a final summary report shall be submitted within six (6) months of completion of each study to the Director of Office of Nuclear Reactor Regulation.

Monthly report on the number of each species of fish collected per day on the intake screens shall be submitted to the Region I Office of Inspection and Enforcement and copies to the Director of Office of Nuclear Reactor Regulation and the New York Department of Environmental Conservation, in accordance with items (b) and (c) under Reporting Requirements in Section 4.1.2a(2)VI.

All reports submitted to other Federal agencies or to the New York State Department of Environmental Conservation as a requirement of a permit or certificate involving environmental matters containing information not already covered in the ETSR, shall also be submitted to the NRC at the same time.

5.6.1

c. Radioactive Effluent Release Report

A report on the radioactive discharges released from the plant during the previous 6 months of operation shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) within 60 days after January 1 and July 1 of each year. The period of the first report shall begin with the date of initial criticality. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents released and solid waste shipped from the plant as outlined in Regulatory Guide 1.21, Rev.1,"Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," with data summarized on a quarterly basis following the format of Appendix B. thereof.

The report shall include a summary of the meteorological conditions concurrent with the release of gaseous effluents during each quarter as outlined in Regulatory Guide 1.21, Rev.1, with data summarized on a quarterly basis following the format of Appendix B thereof.

5.6.2 Nonroutine Reports

a. Nonroutine Environmental Operating Reports

A report shall be submitted in the event that (a) a limiting condition for operation is exceeded (as specified in Section 2, "Limiting Conditions for Operation"), (b) a report level is reached (as specified in Section 3, "Environmental Surveillance"), or (c) an unusual or important event occurs that causes a significant environmental impact.

(1) Prompt Report. Those events requiring prompt reports shall be reported within 24 hours by telephone, telegraph, or facsimile transmission to the Director of the NRC Regional Office and within 14 days by a written report to the Director of the Regional NRC Office (with a copy to the Director, Office of Nuclear Reactor Regulation).

(2) 30-Day Report. Those events not requiring prompt reports shall be reported within 30 days by a written report to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation).

(Written 14-day and 30-day reports and, to the extent possible, the preliminary telephone, telegraph, or facsimile reports shall (a) describe, analyze, and evaluate the occurrence including extent and magnitude of the impact, (b) describe the cause of the occurrence, and (c) indicate the corrective action (including any significant changes made in procedures) taken to preclude repetition of the occurrence and to prevent similar occurrences involving similar components or systems.

5.6.2

b. Nonroutine Radiological Environmental Operating Reports

(1) Anomalous Measurement Report. If a confirmed measured level of radioactivity in any environmental medium exceeds ten times the control station value, a written report shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) within 14 days after confirmation if said radioactivity is caused by operation of Unit No. 3.* This report shall include an evaluation of any release conditions, environ-

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* A confirmatory reanalysis of the original, a duplicate, or a sample may be desirable, as appropriate. The results of the confirmatory analysis shall be completed at the earliest time consistent with the analysis, but in any case within 30 days.

mental factors, or other aspects necessary to explain the anomalous result.

(2) Milk Pathway Measurements

(a) If cow or goat milk samples collected over a calendar quarter show average concentrations of 4.8 picocuries per liter or greater, and if said radioactivity is caused by operation of Unit No. 3, a plan shall be submitted within 30 days advising the Director of Office of Inspection and Enforcement of the proposed action to ensure the plant-related annual doses will be within the design objective of 15 mrem/yr to the thyroid of any individual.

(b) When pasture grass is sampled rather than goat milk, if individual pasture grass samples show I-131 concentrations of 0.022 picocuries per gram (wet weight) or greater, and if said radioactivity is caused by operation of Unit No. 3, a plan shall be submitted within 30 days advising the Director of Office of Inspection and Enforcement of the proposed action to ensure that plant-related annual doses will be within the design objective of 15 mrem/yr to the thyroid of any individual.

(3) Nonroutine Radioactive Effluent Report

The reporting requirements for nonroutine radioactive discharges are specified in Section 2.4 and 3.4 of these specifications.

5.6.3 Changes in Environmental Technical Specifications

a. A report shall be made to the NRC prior to implementation of a change in plant design, in plant operation, or in procedures described in Section 5.5 if the change would have a significant adverse effect on the environment. The report shall include a description and evaluation of the change and supporting information.

b. Request for changes in Environmental Technical Specifications shall be submitted to the Director, Division of Reactor Licensing, for review and authorization. The request shall include an evaluation of the environmental impact of the proposed change and supporting information.

5.7 RECORDS RETENTION

5.7.1 Records and logs relative to the following areas shall be made and retained for the life of the plant:

a. Records and drawings detailing plant design changes and modifications made to systems and equipment as described in Section 5.6.3.

b. Records of all data from environmental monitoring, surveillance, and special surveillance and study activities required by these Environmental Technical Specifications.

5.7.2 All other records and logs relating to the Environmental Technical Specifications shall be retained for five years following logging or recording.

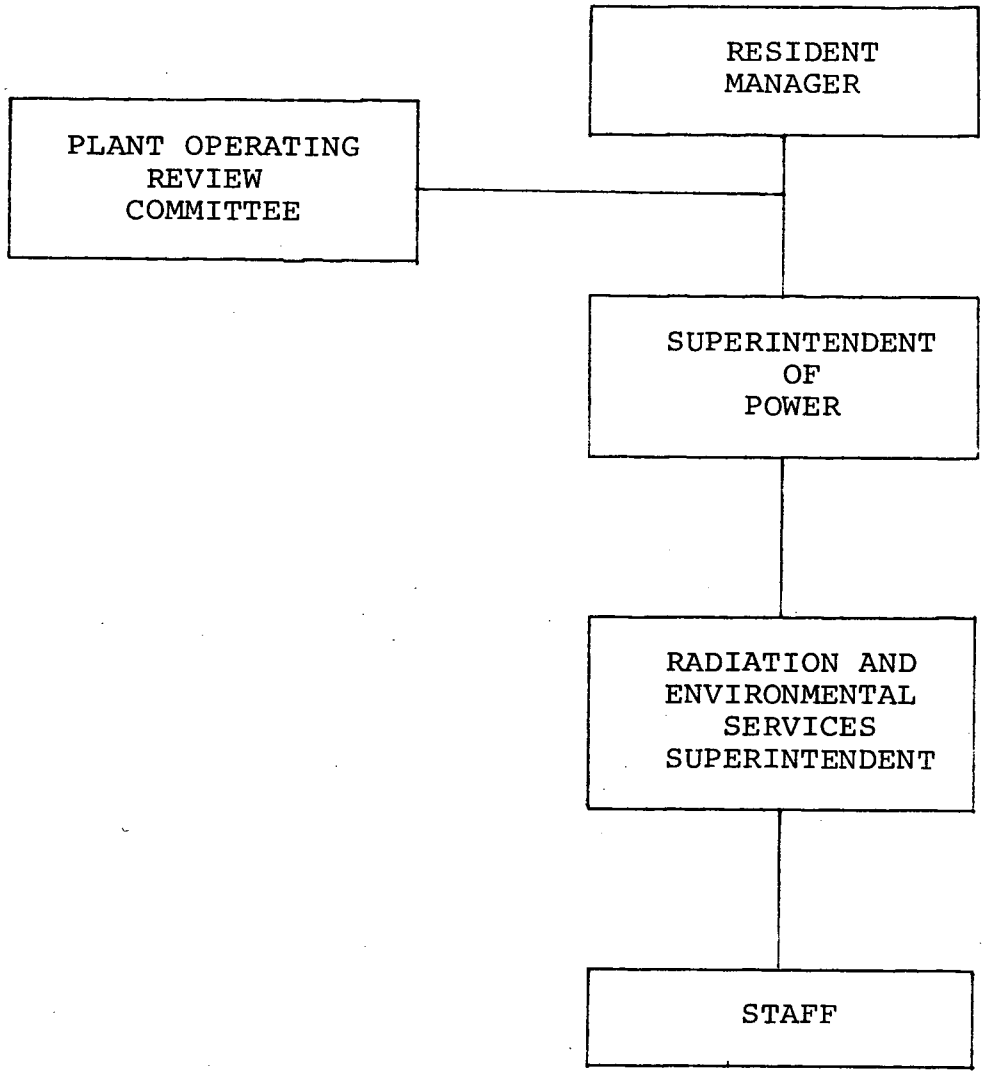

FIGURE 5.2-1
PLANT ORGANIZATION - ENVIRONMENTAL
INDIAN POINT 3 NUCLEAR POWER PLANT

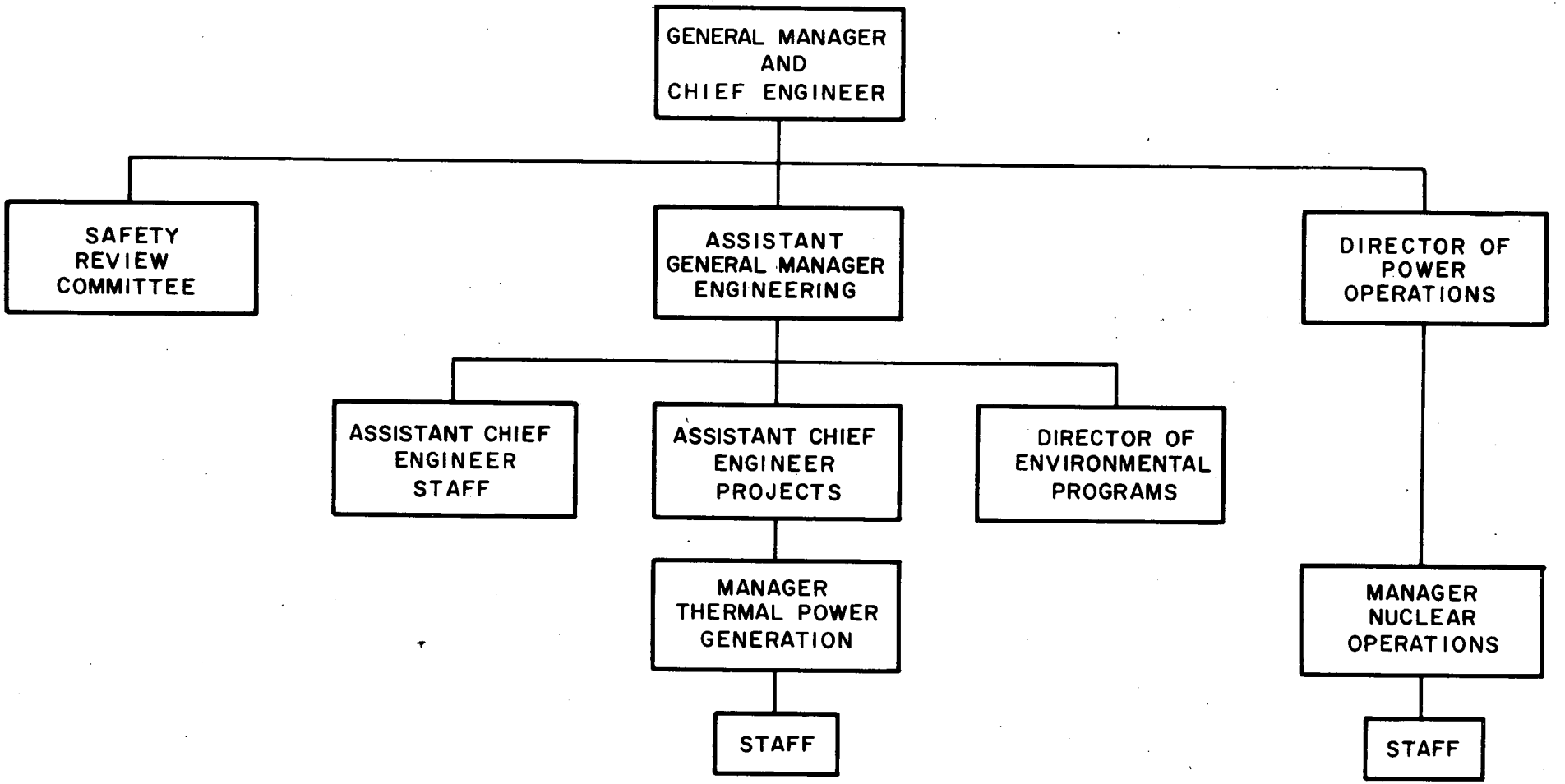

FIGURE 5.2 – 2
MANAGEMENT ORGANIZATION
ENVIRONMENTAL
INDIAN POINT 3 NUCLEAR POWER PLANT

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6.0 ADMINISTRATIVE CONTROLS

Administrative Controls are the means by which plant operations are subject to management control. Measures specified in this section provide for the assignment of responsibilities, plant organization, staffing qualifications and related requirements, review and audit mechanisms, procedural controls and reporting requirements. Each of these measures are necessary to ensure safe and efficient facility operation.

6.1 RESPONSIBILITY

The Resident Manager is responsible for safe operation of the plant. During periods when the Resident Manager is unavailable, the Superintendent of Power will assume his responsibilities. In the event both are unavailable, the Resident Manager may delegate this responsibility to other qualified supervisory personnel. The Resident Manager reports directly to the General Manager and Chief Engineer for administrative matters and functionally to the Manager-Nuclear Operations for operational related matters, as shown in Fig. 6. 1-1.

6.2 PLANT STAFF ORGANIZATION

The plant staff organization is shown graphically in Fig. 6.2-1 and functions as follows:

1. Each on-duty shift shall be composed of at least the minimum shift crew composition shown in Table 6.2-1.

2. At least one licensed Operator shall be in the control room when fuel is in the reactor.

3. At least two licensed Operators shall be present in the control room during reactor startup, scheduled reactor shutdown and during recovery from reactor trips.

4. An individual qualified in radiation protection procedures shall be on site when fuel is in the reactor.

5. ALL CORE ALTERATIONS after the initial fuel loading shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling. This individual shall have no other concurrent responsibilities during this operation.

6. In the event of illness or absenteeism, up to two (2) hours is allowed to restore the shift crew to normal complement.

6.3 PLANT STAFF QUALIFICATIONS

The minimum qualifications with regard to educational background and experience for plant staff positions shown in Fig. 6. 2-1 shall meet or exceed the minimum qualifications of ANSI N18. 1-1971 for comparable positions, except for the Radiation and Environmental Services Superintendent who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975. Any deviations will be justified to the NRC upon individual's filling of one of these positions.

6.4 RETRAINING AND REPLACEMENT TRAINING

A training program shall be maintained under the direction of the Training Coordinator to assure overall proficiency of the plant staff organization. It shall consist of both re-training and replacement training and shall meet or exceed the minimum requirements of Section 5.5 of ANSI N18.1-1971.

The retraining program shall not exceed periods two years in length with a curriculum designed to meet or exceed the requalification requirements of 10 CFR 55, Appendix A.

6.5 REVIEW AND AUDIT

Two separate review groups for the review and audit of plant operations have been constituted. One of these, the Plant Operating Review Committee (PORC), is an onsite group. The other is an independent review and audit group, the offsite Safety Review Committee (SRC).

6.5.1 PLANT OPERATING REVIEW COMMITTEE (PORC)

(A) Membership

The PORC is comprised of:

Resident Manager (Chairman)
Superintendent of Power (Vice Chairman)
Operations Superintendent
Maintenance Superintendent
Technical Services Superintendent
Instrument and Control Superintendent
Radiological and Environmental Services Superintendent

Other individuals, as required to provide expert advice, may be utilized when the nature of a particular subject dictates.

(B) Alternates

Alternate members shall be appointed in writing by the PORC Chairman to serve on a temporary basis; however, no more than two alternates shall participate in PORC activities at any one time.

(C) Meeting Frequency

Meetings will be called by the Chairman as the occasions for review or investigation arise. Meetings will be no less frequent than once a month.

(D) Quorum

The Chairman or Vice Chairman and three members, including designated alternates, shall constitute a quorum.

(E) Responsibilities

1. Review plant procedures, and changes thereto, required by Specification 6.8.

2. Review proposed tests and experiments that affect nuclear safety.

3. Review proposed changes to the Operating License and Technical Specifications.

4. Review proposed changes or modifications to plant systems or equipment that affect nuclear safety.

5. Investigate violations of the Technical Specifications and prepare and forward a report covering evaluation and recommendations to prevent recurrence to the Resident Manager, who will forward the report to the Chairman of the Safety Review Committee and Manager-Nuclear Operations.

6. Review plant operations to detect potential safety hazards.

7. Review the Security Plan and implementing procedures annually.

8. Review the Emergency Plan and implementing procedures annually.

9. Perform special reviews and/or investigations at the request of the Resident Manager.

(F) Authority

The PORC shall:

1) Function to advise the Resident Manager on all matters related to nuclear safety and environmental operations.

2) Recommend approval or disapproval to the Resident Manager of those items considered in 6.5 1E (1) through (4).

3) Determine if items considered in 6.5 1E (1) through (5) constitute unreviewed safety questions, as defined in 10 CFR 50.59.

In the event of a disagreement between the PORC and the Resident Manager, the Chairman of the SRC or his designated alternate shall be notified within 24 hours and written notification provided on the next business day; however, the course of action determined by the Resident Manager pursuant to 6.1 above shall be followed.

(G) Records

Minutes of all meetings of the PORC shall be recorded. Copies will be retained in file. Copies will be forwarded to the Chairman of the SRC and Manager-Nuclear Operations.

(H) Procedures

Conduct of the PORC and the mechanism for implementation of its responsibilities and authority are defined in the pertinent Administrative Procedures.

6.5.2 SAFETY REVIEW COMMITTEE (SRC)

(A) Membership

The SRC shall consist of not less than five members (including the Chairman) the majority of which will be offsite personnel who do not have direct line responsibility for operation of the plant. The qualifications and expertise of the SRC members shall be consistent with the requirements of ANSI N18.7-1972, "Administrative Controls for Nuclear Power Plants". Any deviations will be justified to the NRC prior to an individual being appointed to the SRC.

It is recognized that expertise of the SRC members collectively may not encompass all of the areas listed in ANSI 18.7-1972. Therefore, special consultants to provide expert advice may be utilized when the nature of a particular problem dictates. The Chairman shall be appointed by the General Manager and Chief Engineer. The Vice Chairman shall be appointed by the Chairman.

(B) Alternates

Alternates shall be appointed in writing by the Chairman. No more than two alternates shall participate in SRC activities at any one time.

(C) Meeting Frequency

Meetings of the SRC will be called as the occasions for review arise. Meetings will be held at least once per six months.

(D) Quorum

Chairman or Vice Chairman and two members, including designated alternates, shall constitute a quorum.

(E) Responsibilities

1. Review proposed changes and/or modifications to procedures, equipment or systems which may involve an unreviewed safety question as defined in 10 CFR 50.59 as identified to SRC by the Resident Manager or the headquarters' Technical Staff.

2. Review proposed tests and experiemnts which may involve an unreviewed safety question as defined in 10 CFR 50.59 as identified to SRC by the Resident Manager or the headquarters' Technical Staff.

3. Review the safety evaluations for changes and/or modifications to procedures, equipment or systems completed under the provisions of 10 CFR 50.59 to verify that such actions did not constitute an unreviewed safety question.

4. Review the safety evaluations for test and/or experiments conducted under the provisions of 10 CFR 50.59 to verify that such actions did not constitute an unreviewed safety question.

5. Review proposed changes in the Operating License and Technical Specifications.

6. Make or cause to be made periodic audits of plant operation to verify conformance with the facility Operating License and other regulatory requirements.

7. Review reports and minutes of PORC

8. Review violations of Technical Specifications.

9. Review NRC inspection reports, reportable occurrence submittals, and related correspondence.

10. Review aspects of plant design and operation which may result in an unacceptable environmental effect.

(F) Audits

The SRC shall provide an independent review and audit function of safety-related aspects of plant activities in the areas of:

1. Nuclear power plant operations

2. Surveillance Program

3. Radiation Protection and Environmental

4. Training

5. Security Plan

6. Records

7. Quality assurance and maintenance

8. Emergency Plan

(G) Authority

The Safety Review Committee shall be advisory to the General Manager and Chief Engineer.

(H) Records

Records will be maintained in accordance with ANSI 18.7-1972 and in accordance with the SRC Charter.

(I) Charter

Conduct of the committee will be in accordance with a charter, approved by the General Manager and Chief Engineer setting forth the mechanism for implementation of the committee's responsibilities and authority.

6.6 REPORTABLE OCCURRENCE ACTION

(A) In the event of a Reportable Occurrence, the NRC shall be notified and/or a report submitted pursuant to the requirements of Specification 6.9.

(B) Each Reportable Occurrence requiring 24 hours' notification to the NRC shall be reviewed timely by the PORC and a report submitted by the Resident Manager to the Chairman of the SRC and Manager-Nuclear Operations.

6.7 SAFETY LIMIT VIOLATION

(A) If a safety limit is exceeded, the reactor shall be shut down and reactor operation shall only be resumed in accordance with the provisions of 10 CFR 50.36 (c) (1) (i).

(B) An immediate report of each safety limit violation shall be made to the NRC by the Resident Manager. The Chairman of the SRC and Manager-Nuclear Operations will be notified within 24 hours.

(C) The PORC shall prepare a complete investigative report of each safety limit violation and include appropriate analysis and evaluations of: (1) applicable circumstances preceding the occurrence, (2) effects of the occurrence upon facility components, systems or structures and (3) corrective action required to prevent recurrence. The Resident Manager shall forward this report to the Chairman of the SRC, the NRC and the Manager-Nuclear Operations.

6.8 PROCEDURES

(A) Written procedures and administrative policies shall be established, implemented and maintained that meet or exceed the requirements and recommendations of Sections 5.1 and 5.3 "Facility Administrative Policies and Procedures" of ANSI 18.7-1972 and Appendix A of Regulatory Guide 1.33, November 1972.

(B) Those procedures affecting nuclear safety shall be reviewed by PORC and approved by the Resident Manager or his designee prior to implementation.

(C) A mechanism shall exist for making temporary changes to procedures. Temporary changes shall only be made by approved personnel in accordance with the requirements of ANSI 18.7-1972. These changes shall be documented and reviewed by PORC on a timely basis.

6.9 REPORTING REQUIREMENTS

(A) Routine and Reportable Occurrence Reports

Information to be reported to the Commission, in addition to the reports required by Title 10, Code of Federal Regulations, shall be in accordance with the Regulatory Position in Revision 4 of Regulatory guide 1.16, "Reporting of Operating Information - Appendix A Technical Specifications".

(B) Special Reports

Special reports shall be submitted to the Director of Region 1, Office of Inspection and Enforcement, within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

1. Sealed source leakage on excess of limits (Specification 3.9)

2. Inoperable seismic monitoring instrumentation (Specification 4.10)

3. Seismic event analysis (Specification 4.10)

4. Primary coolant activity in excess of limits (Specification 3.1D)

6.10 RECORD RETENTION

(A) The following records shall be retained for at least five years:

1. Records and logs of facility operation covering time interval at each power level.

2. Records and logs of principal maintenance activities, inspections, repair and replacement of principal items of equipment related to nuclear safety.

3. Reportable Occurrence Reports.

4. Records of surveillance activities, inspections and calibrations required by these Technical Specifications.

5. Records of reactor tests and experiements

6. Records of changes made to Operating Procedures

7. Records of radioactive shipments.

8. Records of sealed source leak tests and results.

9. Records of annual physical inventory of all source material of record.

(B) The following records shall be retained for the duration of the Facility Operating License:

1. Records of any drawing changes reflecting facility design modifications made to systems and equipment described in the Final Safety Analysis Report.

2. Records of new and irradiated fuel inventory, fuel transfers and assembly burnup histories.

3. Records of facility radiation and contamination surveys.

4. Records of radiation exposure for all individuals entering radiation control areas.

5. Records of gaseous and liquid radioactive material released to the environs.

6. Records of transient or operational cycles for those facility components designed for a limited number of transients or cycles.

7. Records of training and qualification for current members of the plant staff.

8. Records of in-service inspections performed pursuant to these Technical Specifications.

9. Records of Quality Assurance activities required by the Quality Assurance Manual.

10. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59.

11. Records of meetings of the PORC and the SRC.

6.11 RADIATION AND RESPIRATORY PROTECTION PROGRAM

(A) Radiation Protection Program

Procedures for personnel radiation protection shall be prepared and adhered to for all plant operations. These procedures shall be formulated to maintain radiation exposures received during operation and maintenance as far below limits specified in 10 CFR 20 as reasonably achievable.

(B) Respiratory Protection Program

1. Pursuant to 10 CFR 20.103, allowance shall be made for the use of respiratory protective equipment in conjunction with activities authorized by the operating license for this plant in determining whether individuals in restricted areas are exposed to concentrations in excess of the limits specified in Appendix B, Table I, Column 1, of 10 CFR 20.

6.12 HIGH RADIATION AREA

As an acceptable alternate to the "control device" or alarm signal required by paragraph 20.203 (c) (2) of 10 CFR 20:

1. Each High Radiation Area in which the intensity of radiation is greater than 100 mrem/hr but less than 1000 mrem/hr shall be barricaded and conspicously posted as a High Radiation Area and entrance thereto shall be controlled by issuance of a Radiation Work Permit and any individual or group of individuals permitted to enter such areas shall be provided with a radiation monitoring device which continuously indicates the radiation dose rate in the area.

2. Each High Radiation Area in which the intensity of radiation is greater than 1000 mrem/hr shall be subject to the provisions of 6.12, above, and in addition locked doors shall be provided to prevent unauthorized entry into such areas and the keys shall be maintained under the administrative control of the Shift Supervisor on duty.

6.13 INDUSTRIAL SECURITY PROGRAM

(A) An industrial security program shall be maintained throughout the life of the plant in accordance with the provisions of the Plant Security Plan. Annual review of the Plant Security Plan shall be performed by the Plant Operating Review Committee and the Safety Review Committee.

6.14 EMERGENCY PLAN

(A) A Site Emergency Plan shall be maintained throughout the life of the plant in accordance with the provisions of 10 CFR 50, Appendix E.

(B) Site Evacuation exercises will be conducted annually utilizing applicable provisions contained within the Emergency Plan. The exercise shall involve coordination with offsite support groups and include communication checks.

(C) The Emergency Plan shall be reviewed on an annual basis by the PORC and SRC.

Table 6.2-1

Minimum Shift Crew Composition

License Category	During Operations Involving Core Alterations	During Cold Shutdown or Refueling Periods	At All Other Times
Senior Operator License	2*	1	1
Operator License	1	1	2
Non-Licensed	(As Required)	1	2

*Includes individual with SRO license supervising fuel movement as per Section 6.2 Item 5.

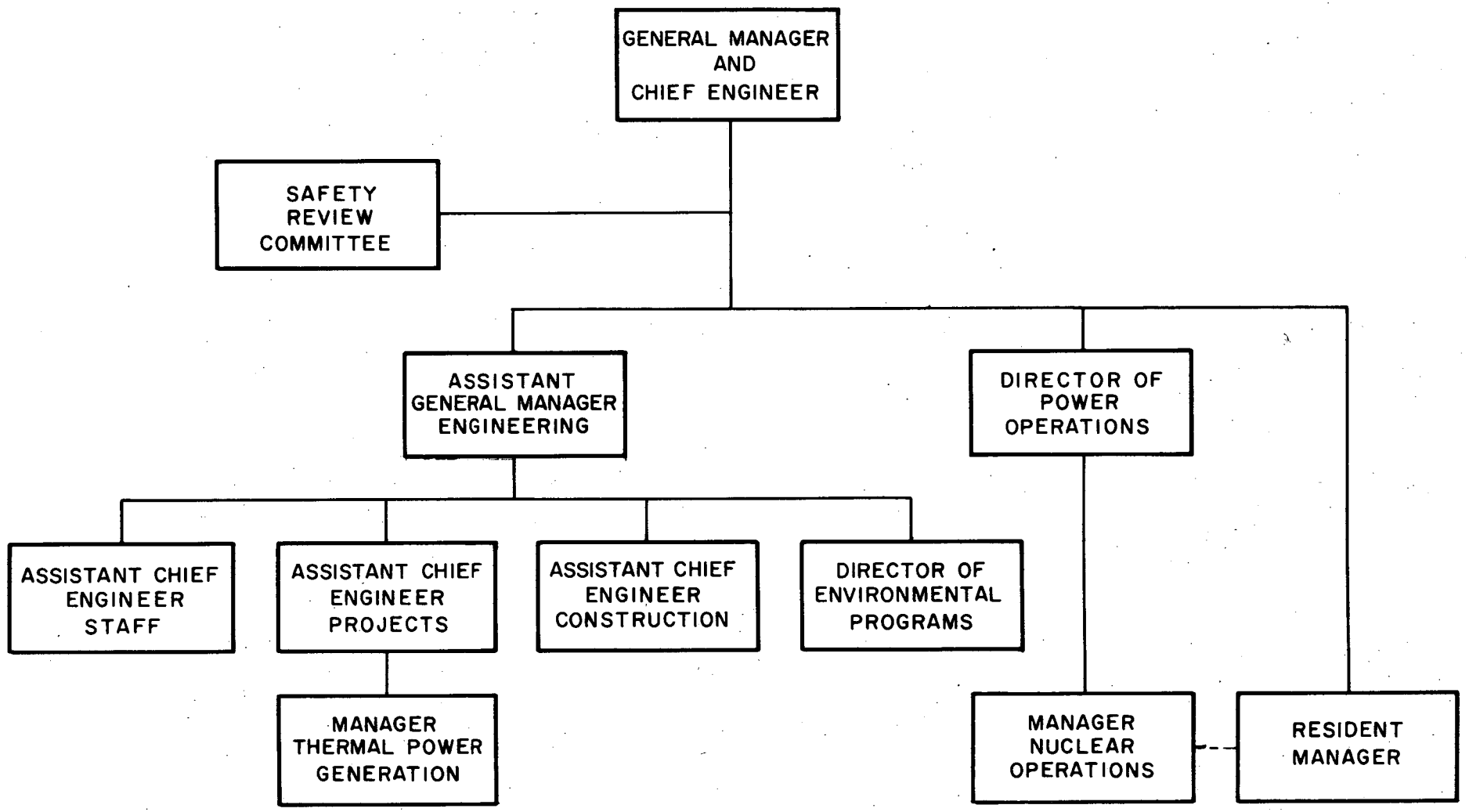
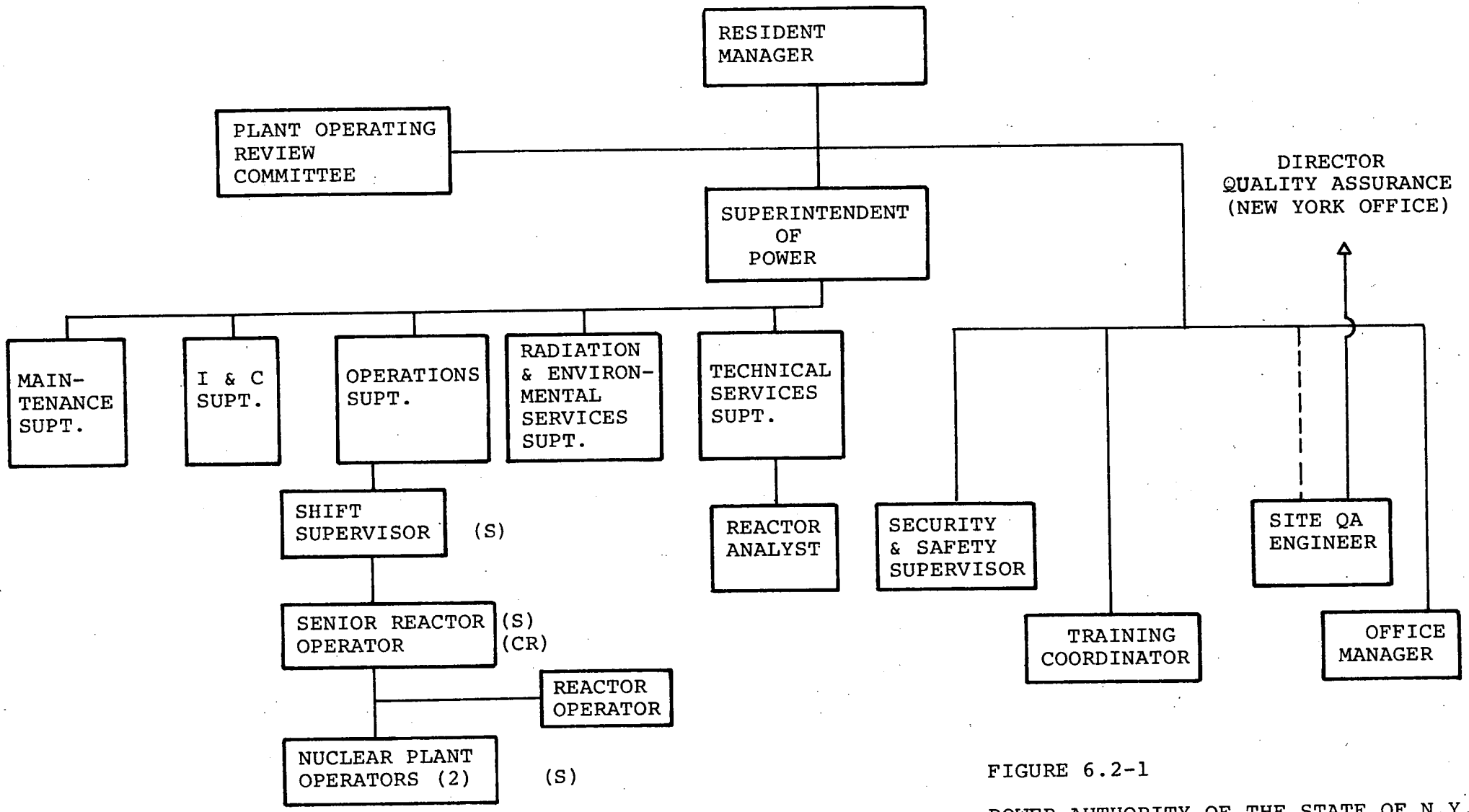


FIGURE 6.1-1
MANAGEMENT ORGANIZATION CHART
INDIAN POINT 3 NUCLEAR POWER PLANT



(S) Continuous Coverage
(CR) Control Room

FIGURE 6.2-1

POWER AUTHORITY OF THE STATE OF N.Y.
INDIAN POINT NUCLEAR POWER PLANT
PLANT STAFF ORGANIZATION

EXHIBIT C

TECHNICAL SUPPORT INFORMATION

POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT 3 NUCLEAR POWER PLANT

Application to Amend the Operating License -
Technical Support Information

INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

This technical support information is submitted in support of the application by the Power Authority of the State of New York (the Authority) for an amendment to a license to allow the Authority to operate the Indian Point 3 Nuclear Power Plant (IP3NPP, AEC docket 50-286 Permits #CPPR-62 and DPR-64). It provides the following pertinent technical information in accordance with Section 50.34 and Section 50.90 of 10 CFR 50 requirements to obtain a nuclear power plant operating license.

(1) Introduction and Summary - Describes the present and proposed plant operating, engineering and licensing responsibilities, Authority/Con Edison agreements, identification of other principal contractors and environmental and safety-related commitments.

(2) Site Description - Describes the present and proposed site ownership and control, property boundary, access, and exclusion and restricted area and security fence.

(3) Conduct of Operation - Includes personnel resumes, and contains the information specified in Chapter 13 of Revision No. 2 of the NRC Standard Format and Content Guide (September 1975). Reference to the Proprietary Security Program is made herein.

(4) Emergency Plan - Describes the Authority's emergency plan including coordination of activities with Con Edison.

(5) Quality Assurance Program - Describes the Authority's QA Program for the plant operations phase and organizational capabilities for performing Quality Assurance/ Quality Control functions during plant operation.

In addition, this application to Amend DPR-64 includes proposed Technical Specification changes reflecting the Authority's operational responsibilities in both the Operating Technical Specifications (Appendix A) and the Environmental Technical Specifications (Appendix B).

1.2 POWER AUTHORITY OF THE STATE OF NEW YORK

Power Authority of the State of New York is engaged in the generation, transmission and sale of electricity. It has constructed, owns and operates hydroelectric plants at Massena, New York and Niagara Falls, New York with a combined net dependable generating capacity of #3,200,000 kWe. It has approximately 530 circuit miles of high voltage (345 kV) transmission lines. It also has approximately 250 circuit miles of 230 kV lines and 30 circuit miles of 115 kV lines.

The Authority is authorized by Article 5, Title 1 of the New York Public Authorities Law to construct pumped storage hydroelectric and base-load nuclear generating facilities, to make possible optimum use of the generating capacity of the Authority's St. Lawrence and Niagara hydoelectric projects, to supply low cost power to high load factor manufacturers, and to supply the future needs of the Authority's

existing municipal electric and rural electric cooperative customers. Pursuant to that authorization, the Authority has constructed and is operating a pumped storage project at Gilboa, New York with a generating capacity of 1,000,000 kWe.

The Authority has also constructed the James A. FitzPatrick Nuclear Power Plant at a site on the shore of Lake Ontario. The FitzPatrick Plant, which has a net capacity of 821,000 kWe was declared commercial on July 7, 1975. In December 1976, the Authority submitted an application to the NRC in support for an amendment to Facility Operating License No. DPR-59 CJAFNPP-NRC Docket No. 50. 333 to permit the Authority to operate the James A. FitzPatrick Nuclear Power Plant.

The Authority has filed an application with the Federal Power Commission for a license to construct and operate a second pumped storage power project in New York State, to be located on Schoharie Creek and to have a capacity of 1,000,000 kWe. It has received authorization from the New York Public Service Commission to construct 134 miles of 765,000 volt transmission lines and 71 miles of 230,000 volt transmission lines in northern New York State.

The Authority is authorized by State law to construct generation and transmission facilities to supply electricity for the Metropolitan Transportation Authority, its subsidiaries, and other public corporations and electric corporations in the New York metropolitan area. The Authority has applied to the New York State Board on Electric Generation, Siting and the Environment to con-

struct a nominal 700,000 kWe fossil fuel plant with a primary proposed site on Staten Island in New York City and a nominal 1,200,000 kWe nuclear plant with a primary proposed site in Greene County, New York. Application has also been made with the United States Nuclear Regulatory Commission for authorization to construct the nuclear facility.

The Authority was further authorized, by legislation enacted in 1974 by the State of New York, to purchase from Con Edison a partially completed power plant in New York City. Pursuant to such authorization the Authority has acquired the Astoria Unit No. 6 power plant which is designed to have a net generating capacity of approximately 800,000 kWe when completed, and which will be operated and maintained by the Authority.

The Authority sells power at wholesale to 47 municipalities and cooperatives in New York and Pennsylvania, seven utility companies, twelve industrial concerns, the United States Air Force and the State of Vermont. It has no low voltage distribution system.

The Authority is a member of the New York Power Pool, established in 1966 to formalize and extend state-wide coordination of planning and operation among electric utilities serving New York State. The Authority's facilities are connected into an intergrated operating network and are interconnected with other systems in the Northeast.

The Authority is also an active participant in the Northeast Power Coordinating Council, an organization which provides for

coordination of the planning and operating procedures of the member systems. The members comprise all major utilities in New York and New England and The Hydro-Electric Power Commission of Ontario and New Brunswick, which supplies almost all the electricity in those provinces.

1.3 OPERATING RESPONSIBILITIES

On December 24, 1975, the NRC issued Amendment No. 1 to Operating License DPR-64 which authorized the Authority to purchase and acquire title, but not operate, Indian Point 3 Nuclear Power Plant. Under this authorization, Consolidated Edison retained responsibility for operation of Indian Point 3 Nuclear Power Plant with the same operating license restrictions on subcritical operation.

On December 30, 1975 the Authority purchased and acquired title to the Indian Point 3 Nuclear Power Plant, including a portion of the Indian Point site, buildings, facilities and equipment required to support operation of the Unit. Certain systems and facilities, the use of which have been provided for by contract between the Authority and Consolidated Edison, are shared between Indian Point 3 and the other Units at the site. With respect to facilities which were not acquired by the Authority, but which are shared by Unit 3, the Authority acquired temporary easements for these facilities. Mutual use of the combined site as the restricted area and exclusion area for all Units has also been provided for by contract and is presently in effect.

On April 5, 1976 the NRC issued Amendment No. 2 to DPR-64 permitting full term continuous power operation of the IP3NPP. This Amendment included a number of Operating License conditions for power level, environmental, geophysical and safety areas and, by reference wholly incorporated the Technical Specifications (dated April 5, 1976).

Under the terms of its contract with the Authority,and upon completion of construction, preoperational tests and initial start-up, Consolidated Edison assumed and presently retains responsibility for plant operation. Services contracted include operation, quality assurance, engineering, maintenance, training services, health physics, water chemistry, environmental monitoring, plant and site security, testing modification, repair, and refueling. However, irrespective of the contractual arrangements described above, the Authority is the sole present applicant for license amendment and as owner and applicant, will be responsible for all further design and construction at the Indian Point 3 Nuclear Power Plant, although the Authority may request Con Ed (under Authority direction) to complete programs already in progress.

The Authority's present application requests authorization to perform all of the activities presently performed by Con Edison. However, with respect to shared facilities within Consolidated Edison's property boundary, Consolidated Edison will retain responsibility for operational services under contract with the Authority. Facilities used by Units 1 and 2 that are within the Authority's property boundary, will be operated by the Authority under similar contracts with Con Edison.

The design of Indian Point 3 Nuclear Power Plant is essentially the same as Indian Point 2 which has also been licensed for operation by the NRC at the Indian Point site. Presently certain facilities in Units #1 and #2 are utilized for Unit 3 in accordance with the procedures to ensure that the safety of the Indian Point Units are not compromised. These facilities include portions of the radwaste systems, service steam, demineralized water, electrical distribution, service air, condensate and steam generator blowdown systems; and medical decontamination units personnel, health physics, security and outfall structures.

Certain facilities will be made independent of the other units. It is the Authority's intent to submit a future application for Amendement to the Operating License which would describe the safety-related facilities for IP3NPP and request authorization to construct and operate such facilities.

1.4 OTHER PRINCIPAL CONTRACTORS

The IP3NPP was designed and built by the Westinghouse Electric Corporation who acted as prime contractor for Consolidated Edison. Under the contract, Westinghouse undertook to provide a complete, safe, and operable nuclear power plant ready for commercial service. The project was originally directed by Westinghouse Corporation; and subsequently, through its wholly-owned subsidiary, WEDCO. Westinghouse engaged United Engineers and Contructors of Philadelphia, Pennsylvania to provide the engineering and architectural design of certain portions of the plant.

Prior to the advent of WEDCO, the Westinghouse management organization was responsible for the Westinghouse effort at Indian Point Units No. 2 and 3. However, as Indian Point Units No. 2 and 3 are now in operation, the services of Westinghouse will be revised to reflect the operating plant status. Presently, Consolidated Edison retains complete project management control of the IP3NPP. Subsequent to its formation, WEDCO was responsible for the management of some site construction activities and either performed or subcontracted the work of construction and equipment erection. Preoperational testing of equipment and systems at the site and initial plant operation was performed by Consolidated Edison personnel under the technical direction of WEDCO and assisted by Westinghouse and United Engineers and Constructors expertise as required.

The Authority is in the process of developing plans for construction of additional facilities at the IP3NPP site. Burns & Roe Engineering Corporation has been retained by the Authority as the architect-engineer for the engineering, design, and construction of these facilities.

2. SITE DESCRIPTION

2.1 GENERAL

The Indian Point site comprises approximately 239 acres of land on the east bank of the Hudson River at Indian Point, Village of

Buchanan in upper Westchester County, New York. IP3NPP is located adjacent to and south of Unit No. 1. Indian Point Unit No. 2 is adjacent to and north of Unit No. 1. The IP3NPP site comprises 102. acres, which is owned by the Power Authority. The site is about 24 miles north of the New York City boundary line. The nearest city is Peekskill, 2.5 miles northeast of Indian Point. An aerial photograph, FSAR Figure 2.2-1, shows the site and about 58 square miles of the surrounding area.

2.2 SITE OWNERSHIP AND CONTROL

The Power Authority of the State of New York is the sole owner of Indian Point 3 Nuclear Power Plant. Figure 2-1 shows the land owned by the Authority and the land owned by Consolidated Edison at the Indian Point site. There is no mutual Authority/Con Edison ownership of any land at the Indian Point 3 site. Figure 2-2 shows a plot plan of IP3NPP and the boundary of the Authority's property line adjacent to Unit No. 1 and the Hudson River. Figure 2-3 shows the Indian Point site ownership boundaries, the location of surrounding communities, and the Low Population Zone for Unit 3.

As shown in Figure 2-1, the Algonquin Gas Transmission Company has a 26 inch gas main on a right-of-way (approximately 1350 feet long and 65 feet wide) running east to west through the Authority's property. The Georgia-Pacific Corporation has an easement, (approximately 1610 feet long and 30 feet wide), along the Authority's southerly property line. The Georgia-Pacific easement is used for

overhead electrical power and telephone lines, and underground gas, water and sewer lines. These easements permit the Authority to determine all activities within the right-of-way in order to ensure safe operation of the unit.

Unit No. 3 will be surrounded by a chain link type fence surmounted by three-strand barbed wire as indicated in the Security Plan. Appropriate Power Authority control will be maintained at all access points into the Unit No. 3 fenced area.

Regarding the security of shared facilities, Power Authority employees desiring access to that portion of the shared facilities on Consolidated Edison's property would be subject to Consolidated Edison's security program. Conversely, Consolidated Edison employees, who would need access to or through any portions of the Power Authority property, would be required to adhere to the security provisions and check points operated and controlled by the Power Authority's security force. Details of the Power Authority's security program are given in the Power Authority's Security Plan, which will be transmitted to the NRC under rules for submittal of proprietary information.

2.3 ACCESS

The site is accessible by several roads in the Village of Buchanan. A paved road links the eastern boundary of the site to the existing plant. The site is not served by rail. Indian Point 3 Nuclear Power Plant protected area is bounded by chain link type

fencing, or the equivalent, and contains an interior roadway system, access to which is under the control of the Authority Guard Force. Access to the protected area of Units 1 and 2 will be controlled by Con Edison.

2.4 CONTROL OF EXCLUSION AND RESTRICTED AREA

Agreements have been reached between Con Ed and the Authority for joint control of the overlapping areas which fall into the "Exclusion Area" for the site. These mutual agreements provide that, in the event of an emergency situation at any of the Indian Point Units, the person-in-charge at that Unit shall immediately inform the person in charge at the other units of the situation and request that the emergency plan at the other units be immediately put into effect. Further action, evaluation or institution of the offsite emergency plans will then depend on the seriousness of the emergency situation. Further details are provided in the Indian Point Unit 3 Emergency Plan.

Control of the Indian Point Site Restricted Area to exclude unauthorized personnel at all times will also be by joint Authority/Con Edison Agreement. Each organization shall have responsibility for maintaining direct and continuous control over the persons on its property, and in addition, shall abide by reasonable requests of the other organization to exclude non-plant personnel.

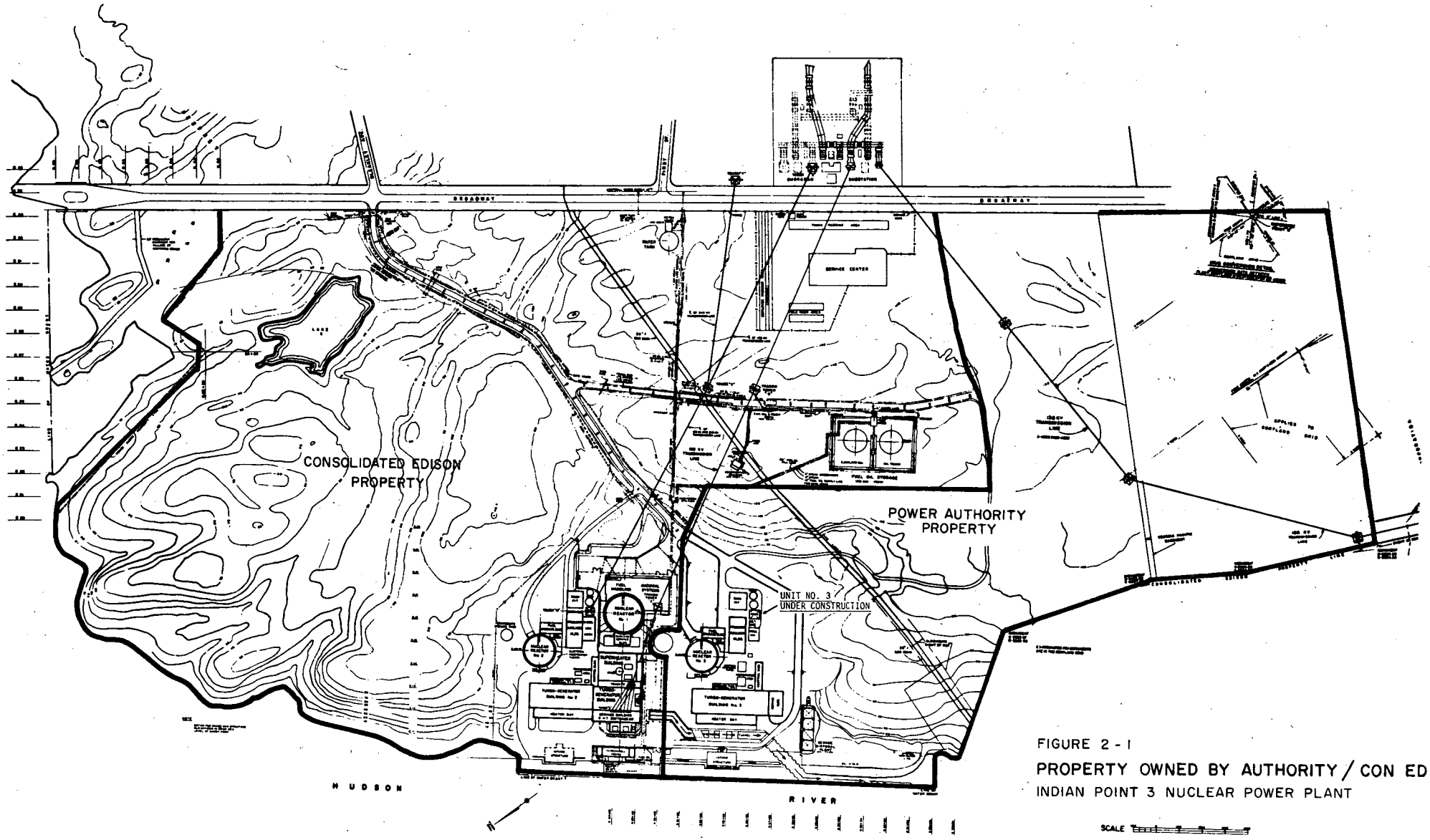
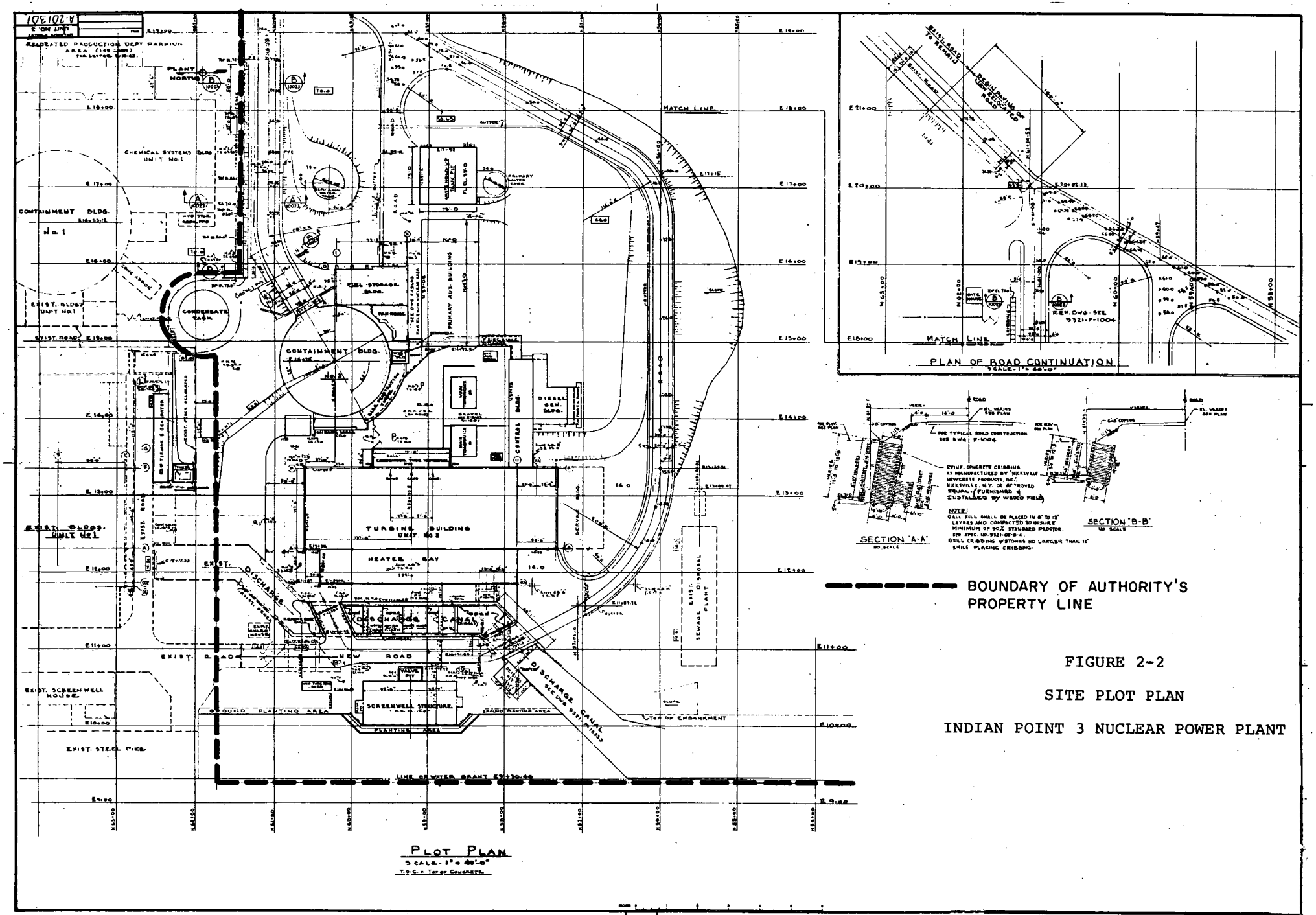


FIGURE 2 - 1

PROPERTY OWNED BY AUTHORITY / CON ED

INDIAN POINT 3 NUCLEAR POWER PLANT

SCALE



PLOT PLAN

SCALE - 1" = 40'-0"

T.O.C. = Top of Concrete

FIGURE 2-2

SITE PLOT PLAN

INDIAN POINT 3 NUCLEAR POWER PLANT

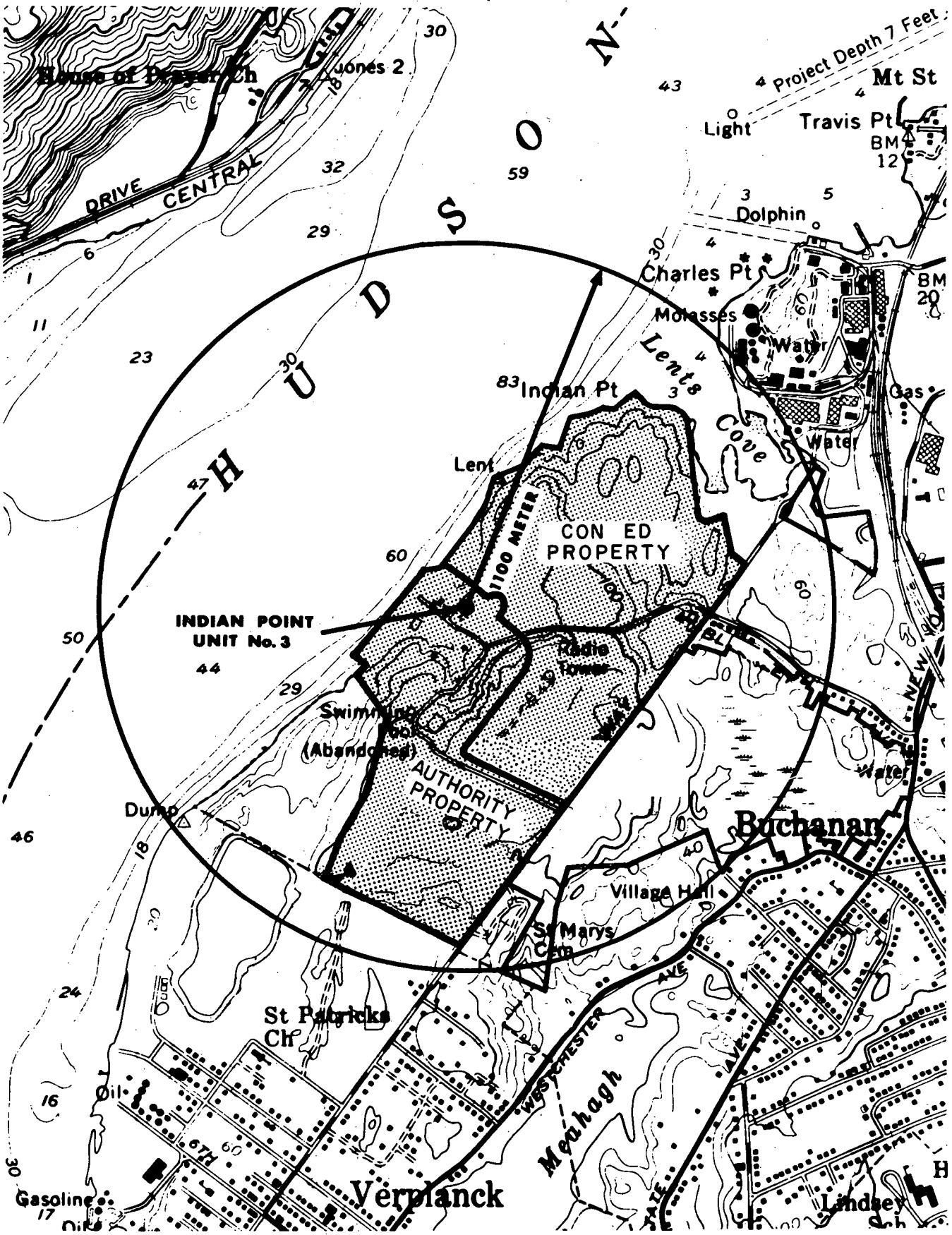


FIGURE 2-3

PROPERTY BOUNDARY

INDIAN POINT 3 NUCLEAR POWER PLANT

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13. CONDUCT OF OPERATIONS

13.1 ORGANIZATIONAL STRUCTURE

13.1.1 MANAGEMENT AND TECHNICAL SUPPORT ORGANIZATION

The Power Authority of the State of New York (the Authority) as the sole owner of the Indian Point 3 Nuclear Power Plant (IP3NPP) will assume full responsibility for its operation and engineering technical support. Previously this responsibility was contracted to the Consolidated Edison Company (Con Ed) by the Authority. Although not directing the operation and maintenance during this period, the Authority has maintained cognizance by residence at the plant, attendance of the Station Nuclear Safety Committee meetings, membership on the Nuclear Facilities Safety Committee, providing engineering support and design review, selection of equipment, and involvement in licensing efforts related to IP3NPP in order to provide self-assurance of safe and efficient operation in conformance with regulatory requirements.

13.1.1.1 DESIGN AND OPERATING RESPONSIBILITIES

The plant has been operated and maintained by Con Ed according to contract with the Authority and in accordance with operating license No. DPR 64.

With the assumption of responsibility for operation and maintenance of the plant, the Authority will assume full responsibility for the safe conduct of operations and for any required improvements and modifications to the plant. The Authority, assisted by the NSSS vendor, the plant original designer or other suitably qualified design organizations, when required, will perform design, engineering, construction and testing.

13.1.1.1.1 MAINTENANCE PROGRAM

The plant will be maintained in accordance with approved written procedures as described in the plant's Administrative Procedures. Anticipated work procedures to maintain the plant in a safe and operable condition are prepared and approved in accordance with the Administrative Procedures prior to the time they are required. Non-routine or emergency maintenance will be accomplished in accordance with procedures which shall be written not later than concurrent with the work and approved as expeditiously as possible. Maintenance requests will be in writing using properly approved forms provided for that purpose. Work shall not commence until the equipment is placed in such condition as to safely protect personnel, equipment and other plant components from harm or damage. Administrative Procedures will define the mechanics of the protective controls.

A preventative maintenance program will be conducted on equipment which experience has demonstrated to require periodic servicing. Testing will be regularly scheduled on equipment and systems in order to detect degradation from original operating parameters. Historical records of maintenance activities on all significant equipment will be preserved.

13.1.1.1.2 TECHNICAL SUPPORT

The Authority will maintain a high degree of technical expertise in the Plant Staff. Technical expertise in the various activities associated with overall plant operation will be provided by the Authority's headquarters Engineering and Power Operations personnel.

The Project Engineering Section will have the prime responsibility for engineering, design and licensing activities. It will have expertise in nuclear, mechanical, electrical and structural engineering and licensing. It will have recourse to the Staff Engineering Department and Power Operations Department for additional information or greater specialization. It will also utilize the original plant designer, NSSS vendor or other suitably qualified design organizations as required.

The Staff Engineering Department will provide technical expertise in review of thermo-hydraulic and transient analysis, metallurgy, materials, chemistry, health physics and environmental matters.

The Power Operations Department will monitor overall plant activities and provide technical expertise in core management.

In addition to the technical support provided by headquarters staff, consultants will be engaged whenever the degree of specialization is determined to be necessary or desirable.

13.1.1.2 ORGANIZATIONAL ARRANGEMENT

Figure 13.1.1.2-1 depicts the corporate structure for the technical support of the operation of IP 3 Nuclear Power Plant.

The General Manager and Chief Engineer has overall responsibility for the entire administration of the Power Authority, including operations, engineering, construction, quality assurance, security, financial, public relations and legal.

13.1.1.2.1 ENGINEERING

The Assistant General Manager - Engineering, reporting directly to the General Manager and Chief Engineer, has responsibility for the design of all Authority projects.

The Assistant Chief Engineer - Projects, reporting to the Assistant General Manager - Engineering, is responsible for the supervision and coordination of the project organizations.

The Manager - Thermal Power Generation, reporting to the Assistant Chief Engineer - Projects, is responsible for the design and licensing of all thermal plant projects and is the primary source of technical back-up. The Thermal Power Generation Section is shown in Fig. 13.1.1.2-2. He performs the duties of the "engineer-in-charge" as defined in ANSI N18.1, section 4.6.

The Principal Nuclear Engineer - Projects, reports to the Manager - Thermal Power Generation and supervises the design and licensing of all nuclear projects including IP 3 Plant. Each project is in turn supervised by a Project Engineer and staff.

The Project Engineer - IP3NPP reports to the Principal Nuclear Engineer - Projects and is responsible to him for all engineering activities at the plant. He and his staff produce conceptual designs, review designs of contractors and provide the primary technical back-up for the plant Staff Organization. The staff is composed of Electrical, Mechanical, Nuclear and Civil Engineers well versed in nuclear power plant engineering technology.

The Licensing Engineer reports to the Principal Nuclear Engineer - Projects and is responsible for all licensing activities including the coordination of the preparation of all documents submitted to the NRC or other regulatory bodies in support of the licensing efforts for the Authority's Nuclear plants. Licensing experience acquired from licensing of other Authority nuclear plants will be utilized in the preparation of licensing submittals for the IP3NPP.

The Assistant Chief Engineer - Staff reports to the Assistant General Manager - Engineering. He is responsible on a purely technical basis for detailed studies of problem areas, special design reviews, equipment anomaly analysis, providing assistance to the project groups and technical back-up for plant operation. He is assisted in this activity by Principal Electrical, Nuclear, Mechanical, Civil and Environmental Engineers, who will have a staff of competent engineers.

13.1.1.2.2 RESIDENT MANAGER

The Resident Manager of IP3NPP reports directly to the General Manager and Chief Engineer for administrative matters and functionally to the Manager - Nuclear Operations for operational related matters.

13.1.1.2.3 POWER OPERATIONS

The Director of Power Operations reports directly to the General Manager and Chief Engineer and is responsible for the operation of all Authority generating facilities including fuels management and transmission capabilities. The Power Operations Department is shown on Fig. 13.1.1.2-3.

The Manager - Nuclear Operations reports to the Director of Power Operations and is responsible for the operation of the Authority's nuclear plants. He and his staff monitor plant operations, provide certain technical support to the plant staff and provide the necessary interface with the Authority's Engineering, Construction and Quality Assurance Department.

The Principal Fuels Engineer reports to the Director of Power Operations and is responsible for nuclear fuel management. The Principal Fuels Engineer has a staff of competent engineers.

13.1.1.2.4 CONSTRUCTION

The Assistant Chief Engineer - Construction Supervision reports to the Assistant General Manager - Engineering. He is responsible for the construction, contracts evaluation, scheduling, expediting and construction inspection during construction of all plants. Although not in the direct line of technical back-up for operation, the experience of his staff is available to the project and staff groups.

The Contract Administrator reports to the Assistant Chief Engineer - Construction Supervision with responsibility for the administration of the procurement cycle for items purchased by the Authority at Headquarters. He is additionally responsible for monitoring other delegated organizations in their administration of contracts and the evaluation of bids (as related to design changes) in conjunction with other departments of the Authority as appropriate.

13.1.1.3 QUALIFICATIONS

In general, the minimum qualifications with respect to education and experience for those headquarters personnel directly involved with providing technical support for IP3NPP are indicated below. With the approval of the General Manager and Chief Engineer, exceptions may be made on a case-by-case basis if education and experience are equivalent:

Manager-Thermal Power Generation (Engineer-in-Charge)

Education: Baccalaureate degree in an engineering discipline related to thermal power.

Experience: Ten years in engineering and/or operations of thermal power plants, at least five of which shall be nuclear and five of the total shall have been in engineering design supervisory positions.

Assistant Chief Engineer - Staff
Assistant Chief Engineer - Projects

Education: Baccalaurate degree in an engineering or scientific discipline related to thermal power.

Experience: Ten years in engineering design or research design of thermal power plants, five of which shall be nuclear and five of the total shall have been in engineering design supervision.

Manager - Nuclear Operations

Education: Baccalaurate degree in an engineering discipline related to production of thermal power.

Experience: Ten years experience of responsible power plant supervision of which five shall be nuclear.

Principal Nuclear Engineer (Projects)

Education: Baccalaurate degree in an engineering discipline related to thermal power.

Experience: Eight years in engineering design of thermal power plants of which four shall be nuclear and four shall have been in supervision.

Principal Nuclear Engineer (Staff)
Principal Mechanical Engineer (Staff)
Principal Electrical Engineer (Staff)
Principal Structural Engineer (Staff)
Principal Nuclear Performance Engineer
Principal Nuclear Operations Engineer
Principal Fuels Engineer
Project Engineer
Licensing Engineer
Radiological Engineer

Education: Baccalaurate degree in the engineering discipline related to their assignment in thermal - nuclear design and performance.

Experience: Five years in design, operation or other related activities of thermal power plants of which three shall be nuclear and three of the total shall be in supervision of engineering, design or analysis.

Director of Environmental Programs

Education: Bacculaureate degree in environmental science.

Experience: Ten years in environmental sciences of which five years must have been in industrial/power utility area, including experience with nuclear and fossil generating station planning and operations and five years minimum in a management position.

Nuclear Training Supervisor
Director of Security and Safety

Education: Formal training in a field related to the area of their responsibility.

Experience: Five years in activities related to their specific responsibilities, two years of which shall be directly related to nuclear facilities.

Project Electrical Engineer
Project Mechanical Engineer
Project Nuclear Engineer
Project Civil Engineer
Staff Electrical Engineer
Staff Radiation Protection Engineer
Staff Nuclear Engineer
Staff Instrument Engineer
Staff Civil Engineer
Staff Mechanical Engineer
Staff Aquatic Environmental Engineer
Staff Terrestrial Engineer
Staff Aquatic Biologist

Education: Baccalaureate degree in engineering or scientific discipline related to their assignment in thermal nuclear power.

Experience: Three years at a working level commensurate to the assignment.

Following is a list of those whose resumes are included and who provide the primary or specialized headquarters support:

Capability	Job Title	Person
Engineer-in-Charge	Manager-Thermal Power Generation	Z.E. Chilazi
Operations	Manager-Nuclear Operations	M.W. Hultgren
"	Principal Nuclear Operations Engineer	P.W. Lyon
"	Project Operations Engineer	P.F. Ahern
Project Engineering	Project Engineer	K.S. Sunder Raj
Structural Engineering	Principal Civil Eng. (Staff)	O. Mallon
Electrical Engineering	Principal Electrical Engineer (Staff)	L.E. Burnett
Nuclear Engineering	Project Nuclear Engineer	J.M. Vargas
Civil Engineering	Project Civil Engineer	I.C. Huang
Mechanical Engineering	Project Mechanical Engineer	P.S. Lu
Electrical Engineering	Project Electrical Engineer	W.I. Sayed
Licensing	Licensing Engineer	
Chemistry and Health Physics	Radiological Operations Engineer	R. Shropshire

Capability	Job Title	Person
Fueling	Principal Fuels Engineer	J.M. Clabby
Transient Analysis	Principal Nuclear Engineer (Staff)	J.F. Davis
Maintenance	Principal Nuclear Performance Engineer	J.M. Griffin
	Principal Operations Engineer	J.H. Phillips
Environmental	Director of Environmental Programs	J.W. Blake
Radiological Environmental	Radiological Engineer	R. Shropshire
Meteorological	Radiological Engineer	R. Shropshire
Training	Training Supervisor	B.W. Deist

13.1.2 OPERATING ORGANIZATION

13.1.2.1 PLANT STAFF ORGANIZATION

The Authority has staffed and will operate the plant in conformance to Fig. 13.1.2.1-1. The Resident Manager reporting to the General Manager and Chief Engineer administratively and the Manager-Nuclear Operations functionally (Fig. 13.1.1.2-1) will have complete responsibility for the safe and efficient operation of the plant. The Resident Manager will administer an organization of Authority supervisory employees skilled in the various disciplines of nuclear plant operation. Supervisory employees in turn will direct the actions and supervise the performance of physical forces at the plant, some of which may be contract personnel. All plant personnel shown in Fig. 13.1.2.1-1 will meet or exceed the minimum qualifications of ANSI N18.1 1971 for comparable positions or justifications will be provided to the NRC prior to an individual's filling of one of these positions.

13.1.2.2 PLANT PERSONNEL RESPONSIBILITY AND AUTHORITIES

Resident Manager

The Resident Manager is responsible for the safe, efficient and dependable operation of the plant. He is empowered to implement all Authority policies in conformance with applicable regulatory requirements with regard to the facility and has responsibility for the coordination of all plant functions through the Superintendent of Power and Department Superintendents. He is also responsible for the selection and training of personnel and implementation of plant security.

Superintendent of Power

The Superintendent of Power is responsible to the Resident Manager for the functional operation of the plant with the assistance of the Operations, Maintenance, Instrument and Control, Radiation and Environmental Services and Technical Services Superintendents. The Superintendent of Power is responsible for assuring that the plant operates in an efficient, safe manner within the bounds of the Technical Specifications and other regulatory requirements. He acts for the Resident Manager in his absence.

Operations Superintendent

The Operations Superintendent directs the functional conduct of shift operations. He is responsible to the Superintendent of Power to assure that the plant is operated in accordance with approved procedures by qualified personnel and that maintenance requests are properly transmitted to assure that plant equipment is in a state of high reliability and readiness. He provides the liaison between the shift and plant staff organizations. He shall assure that operation is conducted in full compliance with Technical Specifications and all other regulatory requirements.

Maintenance Superintendent

The Maintenance Superintendent is responsible for the maintenance of all mechanical and electrical equipment (exclusive of instrument and control) and reports directly to the Superintendent of Power. He will coordinate maintenance activities during extensive overhauls and inservice inspection. He will direct contract maintenance personnel and Authority maintenance personnel. He will develop lists of spare parts needed to assure safe and reliable operation of the plant.

Superintendent of Technical Services

The Superintendent of Technical Services is responsible to the Superintendent of Power for technical support related to plant operations. This includes monitoring plant performance, making recommendations for plant improvements, performing field engineering with respect to plant maintenance and modification, maintaining an overview of the plant surveillance test program and maintenance of plant records.

Instrument and Control Superintendent

The Instrument and Control Superintendnent is responsible to the Superintendent of Power for the repair, calibration, analysis of system control malfunctions and test work associated with fixed and portable instruments and controls. He shall support and work with other plant Superintendents in the areas of instrumentation, controls and testing so as to enhance all departmental efforts in the interest of integrated plant reliability.

Radiation and Environmental Services Superintendent

The Radiation and Environmental Services Superintendent is responsible to the Superintendent of Power for compliance with approved procedures for the radiological control and protection of personnel and the general public from radiological hazards. In this capacity he has overall responsibility for the radiochemistry and chemistry, and radiation protection areas. He monitors the environmental program and all other functions having to do with the radiological and ecological effects of the plant. He has the responsibility for custodianship of source material used for equipment and responsibility for radiological aspects of nuclear shipments leaving the plant. If in his opinion radiological conditions threaten a radiation hazard to plant personnel or the general public, he may recommend cessation of work or that the plant be shut down. If necessary, he has recourse to the Resident Manager on site or the General Manager and Chief Engineer.

Reactor Analyst

The Reactor Analyst is responsible to the Superintendent of Technical Services for the operational management of the reactor core. This includes physics testing, thermohydraulics, economics of fuel management, reactor core safety analysis, analysis of anomalies and special nuclear material accountability. He maintains fuel records in conformity to NRC requirements.

Security and Safety Supervisor

The Security and Safety Supervisor reports to the Resident Manager. He is responsible for implementing the security plan by insuring that the security implementing procedures are carried out by exercising control over the plant's guard force. He will receive direction from the headquarter's Director of Security and Safety for policy matters with regard to the security of the plant. The Security and Safety Supervisor will assure that intrusion alarms are tested and are in good working order and initiate work requests as necessary to correct deficiencies. He will also maintain liaison with local law enforcement agencies. He will be responsible for the functioning of the plant fire brigade and act as liaison with the municipal fire companies. He will insure that safety equipment is provided and personnel performance is in keeping with good industrial safety practices.

Training Coordinator

The Training Coordinator reports directly to the Resident Manager. He is responsible for the formulation and implementation of training programs for all classifications of personnel within the plant. To accomplish this, he may schedule other supervisors for training in their specialty or accomplish it himself. He receives technical direction and advice from the headquarters nuclear Training Supervisor on the formulation of training policies and programs.

Job performance evaluations conducted by immediate supervisors will be maintained by him.

Replacement training and retraining of NRC licensed operators are his responsibility and records will be maintained supporting these activities pursuant to NRC requirements.

Shift Supervisor

The Shift Supervisor is responsible to the Operations Superintendent for the operation of the plant on his shift. On offshifts, weekends, and holidays, the Shift Supervisor represents plant management unless the Operations Superintendent, Superintendent of Power or Resident Manager is on site. The Shift Supervisor is responsible for the operation of the plant in accordance with the requirements of the NRC and other regulatory agencies. He will assure that all operations on his shift are performed in accordance with approved procedures and in compliance with the limits of the Technical Specifications. He will originate maintenance requests As problems may arise. In case of radiation or any other hazards which, in his opinion, requires plant shutdown, he can order the plant shut down. On offshifts he is in charge of administrative implementation of plant security. He will hold an NRC Senior Reactor's Operator's License.

Senior Reactor Operator

The Senior Reactor Operator is responsible to the Shift Supervisor for the starting, stopping, operational adjustment, testing and recording of such events either personally or by the direction of others. The major portion of his time will be spent in the control room. He will direct the Reactor Operator and Nuclear Plant Operators from this point. The Senior Reactor Operator on duty has direct authority to shut down, if, in his opinion, it is required because of radiation or any other hazard. He will hold an NRC Reactor Operator's License.

Reactor Operator

The Reactor Operator is directed in his activities, which are mainly in the control room, by the Senior Reactor Operator and Shift Supervisor. He will assist the Senior Reactor Operator in the direction of Nuclear Plant Operators. He will hold an NRC Reactor Operator's License and may assume the duties of the Senior Reactor Operator, should the need arise.

Nuclear Plant Operators

The Nuclear Plant Operators take direction from the Senior Reactor Operator, Reactor Operator and Shift Supervisor and are responsible for the operation of all auxiliary equipment throughout the plant. They provide clearance operations prior to maintenance and restore equipment to service upon its completion. They will be knowledgable in radiation control and protection requirements.

13.1.2.2.1 LINES OF COMMUNICATION

Major communications on plant operation, availability, scheduling and maintenance generally will be between the Resident Manager and Manager-Nuclear Operations. However, should consultation on performance, anomalies or modifications be required, the Resident Manager has at his disposal, for direct communcations, the entire headquarters staff. Likewise, any of the supervisors at the plant having specific responsibilities may have direct communication with the engineer at headquarters assigned to that discipline or who is most cognizant with the problem.

Should the Resident Manager be absent from the site, his responsibilities will be assumed by the Superintendent of Power. In the event both are unavailable, the Resident Manager shall designate in writing other qualified supervisory personnel who shall assume the responsibilities of the Resident Manager.

Superintendents of major departments within the plant organization are responsible to the Superintendent of Power on an overall performance basis. The Superintendent of Power in turn is responsible to the Resident Manager for the functional performance of the plant. A Shift Supervisor, competent to supervise all shift operations, is on duty at all times. He has the authority to control all operating, maintenance and testing on his shift. At all times, each Shift Supervisor on duty has direct authority to shut down the plant if, in his opinion, it is required because of radiation or any other hazard.

Administrative Procedures will originate from the Resident Manager or his authorized representative. Safety related procedures are reviewed by the Plant Operations Review Committee (PORC) prior to approval and issuance.

13.1.2.3 OPERATING SHIFT CREWS

Each shift will be supervised by a Shift Supervisor holding an NRC Senior Reactor Operator's License. He is responsible for the operation of the plant on his shift. A Senior Reactor Operator and a Reactor Operator are normally stationed in the control room. Both will hold NRC Reactor Operator Licenses. One will be in the control room anytime there is nuclear fuel in the reactor. Nuclear Plant Operators perform equipment operations and monitor system functions throughout the plant. All shift personnel will receive radiation protection training so that they may perform self-monitoring to the extent of allowing access into high radiation areas. They will also be trained in the techniques and necessity of keeping personal dosages as low as is reasonably achievable and actions to be taken in the event of a radiation emergency. The Shift Supervisor will be responsible to keep the total exposure of his group as low as is reasonably achievable.

There will normally be six shifts of licensed operating personnel and five of non-licensed. In this way, one shift of licensed operators may be solely involved in training or retraining programs. Inasmuch as it only requires the time of four and one-third shifts for continuous operation, there is sufficient manpower available for refueling activities, as well as normal operating functions. The Shift Supervisor, of which there will be one on site whenever fuel is in the reactor, will be responsible for and exercise overall supervision of all aspects of plant operation.

All core alterations after the initial fuel loading shall be directly supervised by either a Licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling. This individual shall have no other concurrent responsibilities during this operation.

The minimum shift personnel, if there is fuel in the vessel, will be as follows:

a. Other than "cold shutdown", "start-up" or scheduled shutdown:

1 NRC Licensed Senior Reactor Operator on site
1 NRC Licensed Reactor Operator in Control Room
1 NRC Licensed Reactor Operator on site and readily available
2 Non-Licensed Operators

5

b. During "startup" and scheduled shutdowns:

1 NRC Licensed Senior Reactor Operator on site.
2 NRC Licensed Reactor Operators in Control Room
2 Non-Licensed Operators

5

c. During cold shutdown:

1 NRC Licensed Senior Reactor Operator on site
1 NRC Licensed Reactor Operator in Control Room
1 Non-Licensed Operator

3

13.1.3 QUALIFICATION OF NUCLEAR PLANT PERSONNEL

13.1.3.1 QUALIFICATION REQUIREMENTS

The minimum qualifications with regard to educational background and experience for plant staff positions shown in Fig. 13.1.2.1-1 will meet or exceed the minimum qualifications of ANSI 18.1-1971 for comparable positions except for the Radiation and Environmental Service Superintendent who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975. Any deviations will be justified to the NRC prior to an individual's filling of one of these positions.

13.2 TRAINING

13.2.1 REPLACEMENT AND RETRAINING

13.2.1 Licensed Operators - Requalification Training

Licensed Operating and Supervisory personnel have been trained under Con Ed training programs. The replacement and retraining programs were established in compliance with 10CFR50.54 (i-1) and were designed to meet the requirements of Appendix A, 10CFR55. The Authority will continue to meet said requirements.

1. SCHEDULE

The requalification program shall not exceed periods of two years in length. Successive requalification programs using the same format shall follow the first in a continuous cycle not exceeding two years in length.

2. LECTURES

Preplanned lectures on a regular and continuing basis spanning the requalification program will be provided by the plant staff or others suitably qualified on the following subjects:

(a) Theory and principles of operation
(b) General specific plant operating characteristics
(c) Plant instrumentation and control system
(d) Plant protection systems
(e) Engineered safety systems
(f) Normal, abnormal, emergency and special operating procedures.
(g) Radiation control, safety and radiation protection procedures
(h) Technical specifications
(i) Applicable portions of Title 10 CFR
(j) Quality assurance for operations
(k) Changes in equipment and operating procedures
(l) Facility design and license changes
(m) Emergency Plan and procedures
(n) Fuel handling equipment and techniques

Films, video tapes and other effective training aids may be used to supplement lectures. The use of these devices shall not exceed approximately 50% of the lecture series.

3. ON-THE-JOB TRAINING

Each licensed Reactor Operator will manipulate and each licensed Senior Reactor Operator will either manipulate or supervise the manipulation of the controls of the reactor or a simulator that reproduces the general operating characteristics of the reactor during 10 reactivity changes during the term of their license. These manipulations shall involve a variety of the evolutions listed below:

(a) Reactor Start-up to the point of adding heat
(b) Orderly reactor shut down
(c) Reactor heatup of 50° F or greater
(d) Power changes of 10% or greater using control rods
(e) Power changes of 10% or greater caused by manual initiation of boron concentration changes
(f) Manual rod control prior to and during main generator synchronization
(g) Adjustments of control rods or boron concentration to compensate for transient conditions
(h) Shutdown margin testing
(i) Startup or shutdown of a reactor coolant pump with the reactor critical
(j) Reactor Operations involving emergency or special procedures with reactivity changes
(k) Manual control of steam generator level during startup or shut down
(l) Control Rod Scram Insertion Time Tests
(m) Turbine Stop Valve Testing
(n) Core Alterations involving fuel handling

A simulator having the general operating characteristics of the facility may be used to demonstrate that the operator understands the operation of the equipment and systems under normal, abnormal and emergency conditions.

4. EVALUATION

An annual written examination for the unit will be given to determine the effectiveness of the retraining program, individual knowledge level, and to identify areas that require emphasis in future lectures. The examination will normally be given in four parts of about two hours each (total eight hours). Each part will be given at appropriate times throughout the year and will include two or three sections. These sections will correspond to the lecture topics. The scope of the annual examination will be broad and not limited to just the material presented in the retraining lectures.

Operators scoring above 80% in all sections of the annual examination shall not be required to attend further requalification lectures. Operators attaining 80% or above on some topics but below 80% on others shall be required to attend review lectures only on those below 80%.

An overall grade of 70% is considered passing. Should an individual fail to attain 70%, he will be given an oral examination within two weeks by the Operations Superintendent and Training Coordinator to determine his competency with respect to continuing to operate. Regardless of their decision, he will be given additional training in the indicated areas of weakness and a follow-up examination will be administered within five weeks of his failure to attain a passing grade on the annual examination.

Operators who score less than 70% on the follow-up examination will be placed in an accelerated requalification program. Individual programs will be tailored to place emphasis where required.

Exact scope and duration will be determined by a review team consisting of the Superintendent of Power, Operation Superintendent, and Training Coordinator. Individuals participating in the accelerated requalification program will be removed from regular shift duties.

Emergency and abnormal conditions response may be demonstrated by the use of a simulator or in the control room. When the control room is used the actions and control device to be operated during Emergency and abnormal conditions will be discussed. Manipulation of the panel will not be required. Evaluation will be accomplished by the Training Coordinator, his assistant, or other designated qualified supervisors, and recorded.

The Training Coordinator will periodically review each Licensed Operators and Senior Reactor Operators file and schedule evolutions, lectures and other training functions so as to keep each individuals retraining current.

13.2.2 REFRESHER TRAINING FOR UNLICENSED PERSONNEL

Retraining will be provided for personnel not requiring NRC licenses such as supervisors, professionals, non-licensed operators, technicians and maintenance personnel.

1. GENERAL RETRAINING

(a) At least once a year all personnel will review applicable portions of the administrative controls and procedures affecting organization, responsibilities, security, access control, rules for visitors, contractors and temporary personnel and other related subjects.

(b) Review sessions on Radiation Protection and Radiation Safety will be conducted at least annually. These shall include methods of keeping exposure to a minimum, and use of protective equipment including breathing apparatus and clothing.

(c) The Security Plan and Implementing Procedures shall be reviewed with those personnel responsible for its implementation on an annual basis.

(d) Review sessions on the Emergency Plan and Procedures shall be held on an annual basis. This shall include but not be limited to the various orders of radiation emergencies including evacuation and fire.

2. NON-LICENSED OPERATORS

Nuclear Plant Operators do not require an NRC Operators License. However, these operators must maintain a high degree of proficiency for safe plant operation. They shall have and maintain the basic qualifications and training such that when required they may readily enter the operators training course and obtain a license.

(a) They may be scheduled for selected lectures in the licensed operator requalification program. They will not be required to maintain the same certification standards.

Periodic "Walk through" simulating normal and abnormal operating conditions will be given by the Shift Supervisor and/or the Training Coordinator. Operators will be evaluated on their responses and results will be recorded in their training files.

3. TECHNICIANS

In addition to the General Retraining Program, all technicians will receive refresher training in their particular area of expertise. Supervisors of each applicable department, along with the Training Coordinator will design the retraining program according to the needs indicated by observation, performance or increased scope of work. Retraining may be provided by lectures, demonstrations, or "one-on-one" application. Training records will reflect the extent of retraining.

4. MAINTENANCE PERSONNEL

In addition to the General Retraining Program, maintenance personnel will be provided with refresher seminars as the Maintenance Superintendent deems necessary through observation, performance or increased work scope. This may be provided by informal group discussion, lectures or observation of individuals performance with follow-up critique on specific assignments. Training records will reflect the individuals' extent of retraining.

5. PROFESSIONAL AND SUPERVISORY

The Training Coordinator will maintain an up-to-date resume of all educational and retraining activities engaged in by each non-licensed Technical, Professional or Supervisory employee. The Resident Manager with the assistance of the Training Coordinator shall from time to time schedule retraining activities for this group as necessary to maintain their technical competence. These may include lectures, seminar type discussion sessions, formal outside academic courses, participation on professional committees or assignment to other reactors, simulators or manufacturer facilities. This group will also participate in the General Retraining Program.

13.2.2.3 REPLACEMENT TRAINING

The general philosophy for Replacement Personnel Training involves upgrading from within the ranks to fill vacancies in the station staff and to ensure a sufficient reserve of qualified individuals.

All new employees will receive indoctrination in radiation safety, emergency plan, security, quality assurance, industrial safety, and job functions.

Most new employees will be assigned to a starting job in a specific department of the plant. The method of training will be determined according to the type of work to be performed. They will be conducted on walk-throughs in their work area, simulating normal and abnormal conditions, and given hands-on training on a one-on-one basis during regular shift operations. Tutoring type explanations of the systems they work on will be provided for a single individual entering employment while class instruction will be available should individuals enter at nearly identical times. When it is necessary or desirable to license additional operators they shall be provided with training closely paralleling the curriculum in the original program, adjusted for their current training, qualifications and experience.

Technicians and maintenance personnel in addition to receiving new employees' general training will receive personal attention in explanation of job evolutions either by the supervisor of the group or designated experienced lead person with hands-on, on-the-job type participation.

Persons entering employment in professional or supervisory categories will be provided with indoctrination training commensurate with their experience and academic background at the discretion of the Resident Manager.

In general the training and evaluation of replacement personnel will closely follow that of the original programs adjusted for personal experience, background and availability and accessability of equipment in an operating plant. The scope and training that an individual with prior experience will be required to take will be determined on a case by case basis depending upon the Resident Manager's evaluation of the individual's qualifications.

13.3 EMERGENCY PLANNING

The IP3NPP Site Emergency Plan is submitted as a physically separate document and describes the Authority's plans for coping with emergencies pursuant to 10CFR50.34 (a) (10) and (b) (6) (v) of 10CFR50, Appendix E. The Emergency Plan describes appropriate portions of 10CFR50, Appendix E. Con Ed presently has an Emergency Plan for the site.

13.4.1 ON-SITE REVIEW

Each major department supervisor reviews, by timely examination of logs and charts, the performance of personnel and equipment for which he is responsible. Engineers and Technicians periodically conduct tests on equipment and systems and evaluate present conditions with respect to previous operating parameters.

In addition to these normal review functions, the Plant Operations Review Committee (PORC) meets to review all aspects of plant operation and modifications of safety significance.

13.4.1.1 PLANT OPERATING REVIEW COMMITTEE

The membership, meeting frequency, responsibilities, authority, records and procedures of the Plant Operating Review Committee are detailed in Section 6.5.1 of the Plant's Technical Specifications, Appendix A.

13.4.2 INDEPENDENT REVIEW

The safety related activities at the plant will be reviewed by a separate knowledgeable group, the Safety Review Committee, the majority of which will be off-site personnel who do not have direct line responsibility for operation of the plant.

13.4.2.1 SAFETY REVIEW COMMITTEE

The membership, meeting frequency, responsibilities, authority records and charter of the Safety Review Committee are detailed in Section 6.5.2 of the Plant's Technical Specifications, Appendix A.

13.4.3 AUDIT PROGRAM

The Safety Review Committee will have the responsibility to perform or supervise the performance of formal audits in order to assure top management that the plant is being operated in a safe manner and in conformity to the facility license and approved procedures. Auditable items will be grouped into similar categories and assigned to an auditor knowledgeable in that discipline but not having line responsibility for its implementation. Each audit may be carried out as frequently as is deemed necessary by the Chairman of the Safety Review Committee but shall be completed at least once in every consecutive two year period. The audits during the two year period will be made in approximately equal time increments thereby assuring that prolonged periods of operation without outside audit will not occur. Each auditor, in addition to his special assignment will check on general plant conditions and performance. An auditor may cover more than one audit group if properly qualified. Audit groups shall be approximately, but not necessarily confined to the following:

AUDIT I OPERATION

Adherence to approved procedures
Approval of changes to procedures
Determination of currency of procedures in use
Observation of operating evolutions
Qualification of operating personnel
Documentation of events by operating personnel
Operational core management and refueling operations

AUDIT II QUALITY ASSURANCE AND MAINTENANCE

Adherence to approved procedures for equipment repair
Performance of plant Quality Assurance group in inspections and audits of day to day operation and maintenance
Performance of group receiving, inspection, storage and retrieving spare parts and material.
Inservice inspections of primary system
Adequacy of welding, N.D.E. and equipment overhaul procedures
Performance of headquarters Engineering, Power Operations and Quality Assurance Staffs.

AUDIT III SURVEILLANCE PROGRAM

Conformance to procedure and frequency of equipment and systems tests as per Technical Specifications.
Conformance to procedure and frequency of instrument and control checks as per Technical Specifications.

AUDIT IV RADIATION PROTECTION AND ENVIRONMENTAL

Exposure of personnel
Whole body counts
Contamination control
Work planning to minimize exposure
Release to the environment
Records related to radiation protection and the environment

AUDIT V TRAINING

Adherence to retraining program for NRC licensed operation
Training and retraining of regular personnel in radiation protection
Training of temporary personnel in radiation protection
Training and qualification of new operators
Training and retraining of radiation protection technicians
Verification of training programs commensurate with work requirements in other groups
Individual records of training

AUDIT VI SECURITY AND EMERGENCY PLAN

Adequacy of procedure
Review of drills and drill critiques
Implementation of procedures
Performance of security

AUDIT VII RECORDS

Continuity of historical records
Documentation of occurrences
Log Keeping
Proper retention and ease of retrieval of all records
Protection of quality assurance documents
Fuel and isotopic accountability
Records of review and audit groups

13.5 PLANT PROCEDURES

Con Ed as the initial operator of the plant, has produced Administrative Procedures which met the requirements of the Authority's Quality Assurance Program for Operations. The Authority has reviewed these procedures, concurred with their general guidance and used them as a basis for establishing the Authority's IP3NPP Plant Administrative Procedures Manual. The Authority intends to continuously review, revise add to and delete as necessary, these procedures.

The physical procedures, in use during the Con Ed tenure will be retained "as is" and utilized by the Authority. These procedures will be periodically reviewed during the Authority's tenure and where desirable amended as necessary. After approval in accordance with Administrative Procedures, they will be reissued.

13.5.1 ADMINISTRATIVE PROCEDURES

13.5.1.1 CONFORMANCE TO REGULATORY GUIDE 1.33

Administrative procedures have been prepared in accordance with Regulatory Guide 1.33 - Nov. 1972 "Quality Assurance Program Requirements (Operation)" and ANSI 18.7 - 1972 "Administrative Controls for Nuclear Power Plants."

13.5.1.2 PREPARATION OF PROCEDURES

Administrative Procedures currently in use at IP3NPP will have been edited to reflect the Authority's operating organization and approved in accordance with the Authority's IP3NPP Plant Administrative Procedures Manual. Administrative Procedures may be written by either personnel of the Authority cognizant in the area to be covered by the procedure or by consultants retained by the Authority in a particular area or expertise. In either event, knowledgeable individuals other than the author, shall make a detailed review of the document.

These procedures are reviewed by the Quality Assurance Department and approved by the Resident Manager or his designated alternate prior to issuance and implementation.

13.5.1.3 PROCEDURES

The Administrative Procedures state limits, restrictions and procedures which must be followed by plant personnel. They cover methods to be employed in all plant evolutions and define the limits of authority and the responsibility of those charged with their implementation. They meet the requirements of ANSI N 18.7 - 1972.

The Administrative Procedures set forth responsibilities of plant personnel such as the Shift Supervisor, Senior Reactor Operator and Reactor Operator. They will include:

a. Their authority and responsibility to start, stop and maneuver the reactor plant according to approved written procedures within the limits of technical specifications and other regulatory requirements.

b. Their responsibility to become fully appraised of all pertinent facets of operation occurring since their last duty before relieving the shift.

c. The Senior Reactor Operator and/or Reactor Operator's responsibility to notify the Shift Supervisor in the event of radiation hazard, limiting conditions for operation or other problems involving the safety of the plant. Should the Shift Supervisor not be immediately available and in the opinion of the Senior Reactor Operator or in his absence, the Reactor Operator, prompt action is required, he has the authority to shut the plant down.

d. The Shift Supervisor, as the highest supervisory authority on shift, is responsible for the entire plant and all personnel during his shift. He is authorized to function within the limits of approved Administrative, Operating and Radiation Protection Procedures. However, should discrepancies in procedures become apparent or additions to them become necessary, he may institute such changes in accordance with the appropriate Administrative Procedure. He may order equipment out of service, change load, perform routine tests or order the reactor shut down, if, in his opinion, a radiation hazard would exist or system conditions are such as to threaten the safety of the plant, its personnel or the public. He shall assure that the plant is operated during his shift within the limits of Technical Specifications, Environmental Tech. Specs. and other regulatory requirements. After a reactor trip, or unscheduled power change, it is his responsibility to conduct an investigation, with the assistance of other cognizant personnel into the cause.

Administrative Procedures delineate responsibilities required in the following paragraphs of 10CFR50.54:

(i) Only Reactor Operator or Senior Reactor Operator licensed personnel may manipulate or direct the manipulations of the controls of the reactor.

(j) Mechanisms which could affect reactivity or power level of the reactor will not be operated without the knowledge and consent of a licensed individual.

(k) A licensed individual shall be present at the controls at all times during operation of the facility as described in the Administrative Procedures.

(l) Persons directing the activities of licensed operators shall be licensed as Senior Reactor Operators.

(m) A Senior Reactor Operator licensed individual shall be on site at the facility at all times during operation, start up, approach to power, trip recovery, power reduction and refueling.

Administrative Procedures provide the mechanism for issuing directives from management having short term applicability, including: special operations of a temporary nature, housekeeping, data taking, publications, plotting process parameters, personnel actions and other similar matters.

Administrative procedures provide for the control of equipment as necessary for maintenance, and personnel and equipment safety. The equipment status is under the jurisdiction of the Shift Supervisor. He, or other duly authorized operations personnel, authorize the removal of equipment from service. Equipment removed from service will be tagged to prevent inadvertent operation.

Equipment and associated controls not requiring immediate maintenance, but for special reason should be operated only at the direction of the Shift Supervisor, are identified by tags specifically designed for this purpose.

All equipment not tagged will be considered operable. The Shift Supervisor and Operator logs are maintained such that a continuous and current record of the status of the plant is available at all times. At the beinning of each shift it is the duty of the oncoming operators to ascertain any changes in status since their last duty.

Methods for control of maintenance are described in the Administrative Procedures. These procedures describe the program for preventive and corrective maintenance and repair of mechanical, instrument and electrical equipment. They include the initiation, planning,scheduling and documenting of maintenance of all safety related equipment. Mechanical, electrical and instrument maintenance are performed either upon the basis of a preventative maintenance program or as the result of unsatisfactory equipment performance or failure. Maintenance or modifications that may affect functioning of safety related structures, systems, or components shall be performed in a manner to assure quality at least equivalent to that specified in applicable codes, bases, standards, design requirements, material specifications and inspection requirements. Special processes shall be performed in accordance with the requirements of appropriately approved procedures. Requests for maintenance will be done only on forms provided for that purpose. They provide the basis for a quality control surveillance and become a part of the historical record.

Initiation and control of additions or modifications of plant systems or equipment is controlled by Administrative Procedures. They cover all deviations in design as described in the FSAR for nuclear safety related systems . This includes a substitution of components by a component of different specification, the elimination of electrical, mechanical, pneumatics or hydraulics connections and the insertions of additional components and connections.

Changes may originate from many sources such as NRC reports, manufacturers experience letters and recommendations, malfunction of equipment and systems or desire for improvement. Proposed modifications must have proper approval. The procedures provide for complete record retention in the plant files of drawings, specifications, quality assurance records, code inspections, tests and other pertinent information.

Surveillance testing is controlled by Administrative Procedure. It describes the general methods by which the master surveillance program required by Technical Specifications will be implemented and monitored. Included are: Functional tests, instrument channel calibration, instrumentation check, instrument channel functional tests, logic system functional tests and sensor checks.

Temporary procedures will be produced, reviewed and approved in a manner similar to that followed with respect to permanent procedures.

13.5.2 OPERATING AND MAINTENANCE PROCEDURES

13.5.2.1 CONTROL ROOM OPERATING PROCEDURES

Con Ed has been operating the IP3NPP with approved control room operating procedures. These procedures will be retained "as is" and utilized by the Authority. These procedures will be periodically reviewed and revised as necessary. These procedures may be categorized into groups having similar characteristics such as:

1. System Operating Procedures

   Instructions for the performance of operating evolutions on the various systems of the plant and the equipment contained within them. Their format is in accordance with ANSI 18.7 - 1972.

2. Plant Operating Procedures

   Instructions for the integrated operation of the plant. Their format is in accordance with ANSI 18.7 - 1972.

3. Plant Emergency Procedures

   Instructions to the control room operators providing information for identification of specific emergencies and manipulation of controls to mitigate the effects. Their format is in accordance with ANSI 18.7 - 1972.

4. Alarm Response Procedures

   Instructions to apprise the Operator of the required response to a given safety related alarm. Any alarm received is assumed to be true. The Operator's first action is verification of the alarm by either scanning the controls and instruments available in the control room or by contacting the roving Operator for a local observation. Corrective action is taken upon verification, as outlined in the procedure.

5. Temporary Operating Instructions

Temporary operating instructions will be written for special operating evolutions not covered by the regular operating procedures. They will be subject to the same approvals as permanent procedures.

Sufficient procedures have been prepared, and will be maintained to, as a minimum, meet the reuirements of Appendix A of Regulatory Guide 1.33, November 1972. The maintenance of these procedures will be the responsibility of the Operations Superintendent.

13.5.2.2 OTHER PROCEDURES

1. Plant radiation protection procedures, which describe the basic philosophy and methods used in the plant to minimize personnel radiation exposure, are reviewed and approved in accordance with Administrative Procedure. They form the Radiation Protection Manual and all personnel are required to follow them. Procedures which are used by radiation protection technical personnel for use in their duties, such as radiation surveys, radiological analysis and record keeping, are also reviewed and approved in accordance with Administrative Procedures.

   Preparation, review, revision and implementation of these procedures is the responsibility of the Radiation and Environmental Services Superintendent.

2. Emergency Plan and Procedures are those directives that implement the Emergency Plan. The Resident Manager is responsible for the maintenance of the plan with on-site activities provided by the staff of the Radiation and Environmental Services Superintendent. These procedures are intended, with the plan, to provide a manual combining all necessary instructions for required action in event of radiation emergency, fire fighting, rescue, contamination, injury, natural disaster and accidental (radioactive) liquid release. They are reviewed and approved in accordance with the Administrative Procedures.

3. Instrument calibration and test procedures excluding chemistry, radiochemistry and radiation protection equipment and test procedures, are the responsibility of the Instrument and Control Superintendent. He, and those designated by him, will prepare, review, revise and implement this series of procedures. Instrument and control module maintenance and calibration procedures are reviewed and approved in accordance with Administrative Procedures. These procedures may be in the form of manufacturers' instructions that have been likewise approved. Complete instrument-control-channel surveillance tests, as required by Technical Specifications, are conducted in accordance with approved procedures.

Calibration and test procedures for chemistry, radiochemistry, health physics and meteorological equipment are the responsibility of the Radiation and Environmental Services Superintendent.

4. Chemical-radiochemical control procedures are the responsibility of the Radiation and Environmental Services Superintendent who, through his staff and other designated personnel, will prepare, review, revise and implement the series of instructions required to perform analysis and maintain plant water quality. Other analysis required in the operating process both chemical and radiochemical are included in these procedures. They are reviewed and approved in accordance with Administrative Procedures.

5. Radioactive waste management procedures are those instructing personnel in the operation of equipment pertinent to the liquid, gaseous and solid radioactive waste handling systems. They are reviewed and approved in accordance with Administrative Procedures.

   Procedures that pertain to monitoring, shipping and receiving radioactive materials and which are performed fundamentally by radiation protection technicians are the responsibility of the Radiation and Environmental Services Superintendent.

6. Maintenance procedures are either preventative or corrective. The Maintenance Superintendent has the responsibility for both classes of procedures. He assures that approved procedures are in order and directs the preparation of new procedures and reviews and revises, as required, previously prepared procedures. Some preventative procedures are in the form of tests and may be prepared by others. Modifications to equipment will be controlled by Administrative Procedures and will utilize Maintenance Procedures where applicable. All procedures for maintaining or modifying the plant will be reviewed and approved in accordance with Administrative Procedures.

7. Material control procedures are reviewed and approved in accordance with Administrative Procedures. They direct the manner of ordering, receiving, identifying, storing and issuing material. The procedure is designed to assure that only properly documented material and parts are used for replacement and modification in order to at least maintain the design standards.

   The Resident Manager is responsible for the material control program, its origin, review and implementation by coordination of the efforts of the entire staff. The Quality Assurance group is available to the staff for consultation.

8. Security implementing procedures are the direct responsibility of the Resident Manager through the Security and Safety Supervisor. They are reviewed by the Plant Operating Review Committee and the Director of Security and Safety. They are written to delineate the duties of the security guard force as outlined in the security plan, which is submitted as Proprietary Information under Part 2.790(d), Title 10, Code of Federal Regulations.

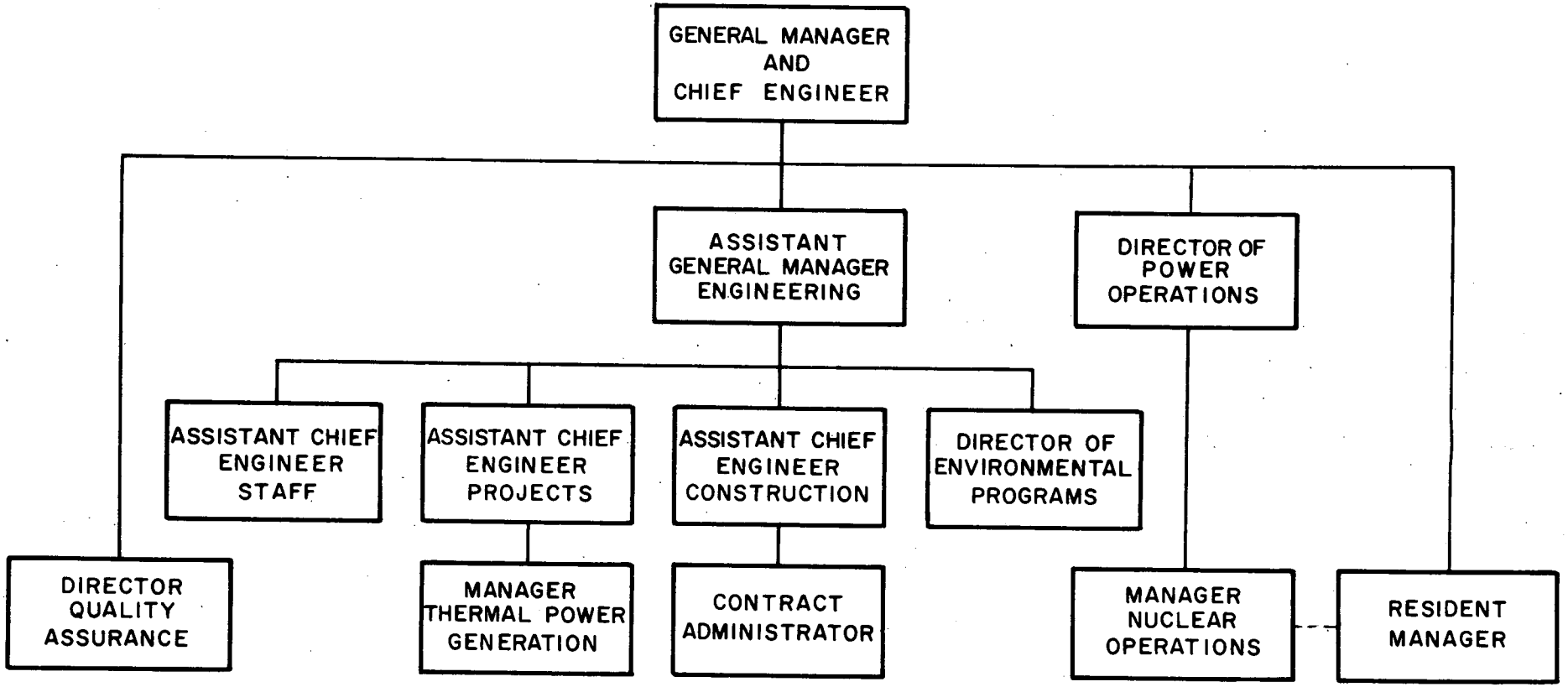

FIGURE 13.1.1.2-1
CORPORATE STRUCTURE
INDIAN POINT 3 NUCLEAR POWER PLANT

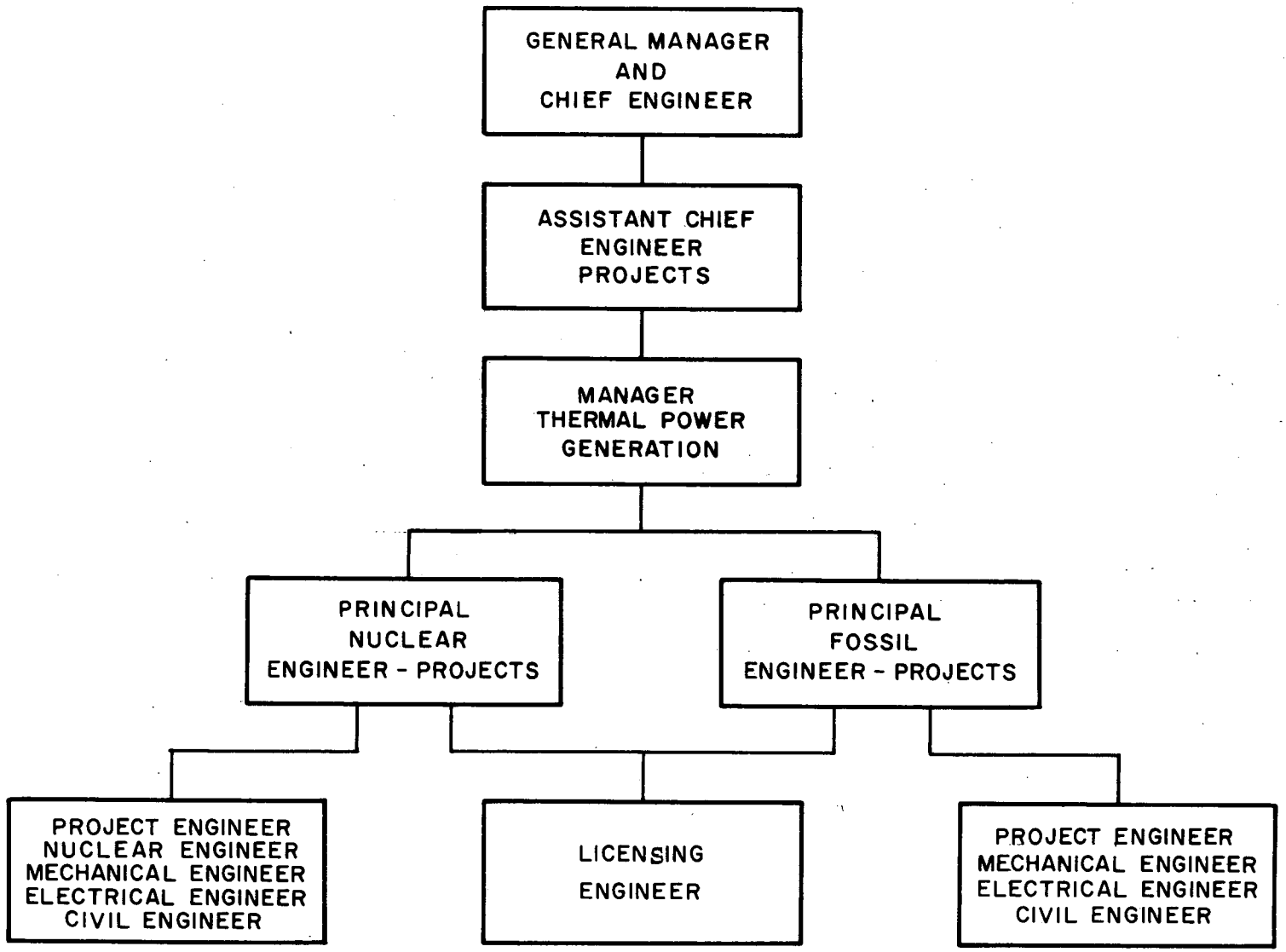

FIGURE 13.1.1.2-2
PROJECTS ORGANIZATION
INDIAN POINT 3 NUCLEAR POWER PLANT

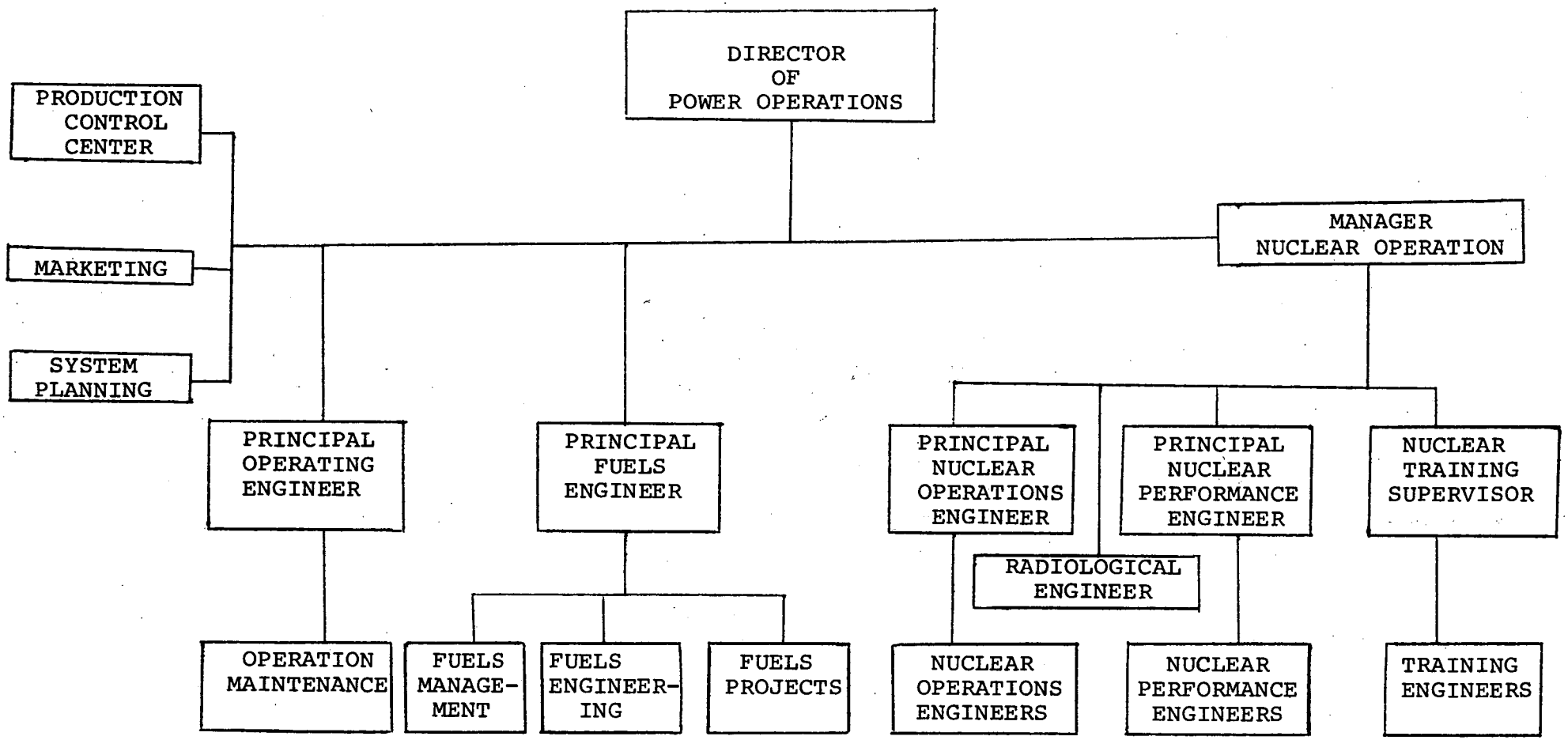

FIGURE 13.1.1.2-3
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER OPERATIONS DEPARTMENT

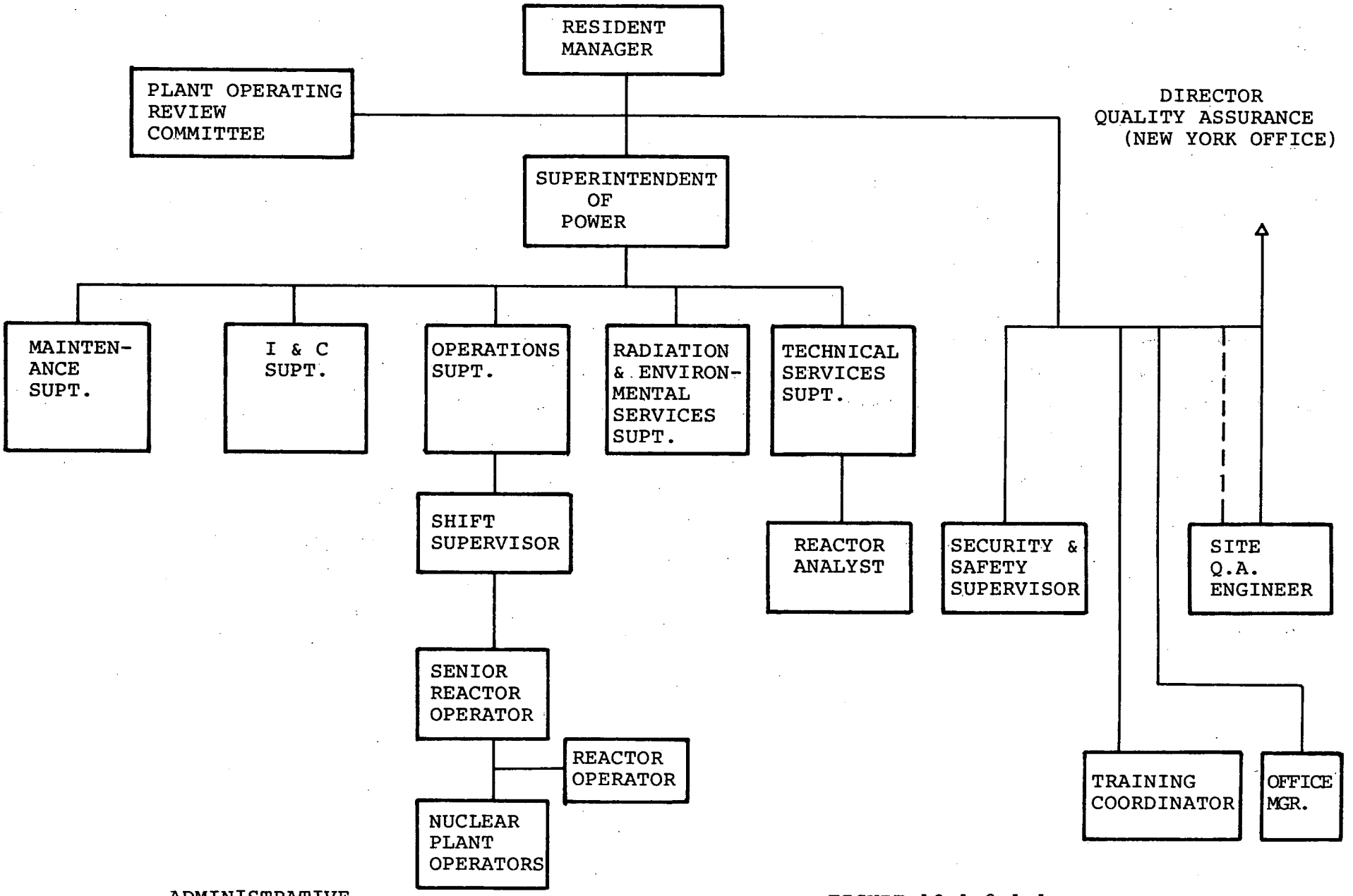

FIGURE 13.1.2.1-1

PLANT STAFF ORGANIZATION

INDIAN POINT UNIT 3 NUCLEAR POWER PLANT

PAUL J. EARLY
ASSISTANT CHIEF ENGINEER-PROJECTS
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Graduated U.S. Navy Academy - 1947
Completed Nuclear Propulsion Training as an Engineer - 1953
Completed three month refresher course - 1961

EXPERIENCE:

1976 - Present

POWER AUTHORITY OF THE STATE OF NEW YORK
Assigned as the Assistant Chief Engineer-Projects, reporting directly to the Assistant General Manager-Engineering. Responsible for the total supervision and coordination of the project organizations, through the Manager-Thermal Power Generation.

1974 - 1976

U.S. NAVY
As the Director, Ocean Surveillance Division and frequent acting number two executive in the Anti-Submarine Warfare and Ocean Surveillance Programs Office, supervised all planning, programming, and budgeting activities. Acted as the principal advisor in the allocation of resources for all procurement, maintenance, training, intelligence and research in these areas. Primarily involved in Navy undersea, surface, and air/space surveillance, as well as over-the-horizon targeting efforts.

Acted as project officer in negotiating for, establishing, and maintaining bilateral projects with five foreign navies.

Inspected numerous field activities to insure and improve the quality of training, operations, maintenance, and personnel retention.

1972 - 1974

First job as Rear Admiral. Supervised and improved operating and maintenance standards, and training levels of 25 nuclear attack submarines, a submarine base, a submarine tender, and 20 nuclear ballistic missile submarine crews. Was instrumental in establishing a submarine support facility to improve maintenance. 16,000 military personnel involved. Personally improved local civil-military community relationships.

Ballistic missile submarine squadron commander overseas. Senior American representative in local area. Dealt extensively with local governments, host military commands, and local populace. Maintained and improved the professional standards and material readiness of 10 nuclear submarines, their 20 crews, a submarine tender, and a floating drydock. Supervised the repair and replenishment of the submarines and the on board training of the crews so that a fully ready submarine departed on time every 10 days for over a year. Each refit involved 50,000 manhours of maintenance. 2200 military personnel involved at sites. Directed procedures for security and readiness of all embarked nuclear missiles, and for the maintenance of reactor security in the area.

1967 - 1970

Senior Member Nuclear Propulsion Examining Board. Established standards of training, operational capability, and maintenance for nuclear propulsion crews to improve reactor security. Examined crews to these standards and exercised authority to shut down operating plants. Directly influenced marked improvements in maintenance and cleanliness levels, and in operational proficiency by rigorous examination of theory and practice.

1953 - 1967

Commanding Officer of 2 nuclear submarines for 6 years. Second in command of a guided missile nuclear submarine. Directed 1 reactor refueling and initial testing of 2 new reactor plants. Trained and supervised operating crews. Trained personnel in nuclear weapons safety. Established procedures for the security and readiness of the embarked nuclear missiles.

Engineering Officer of first nuclear submarine for 2 years. Directed and supervised all reactor plant operations and testing, first ship reactor refueling, and all engineering matters, including maintenance, operations and training. Personally responsible for reactor security.

Watch officer for 2 years during the initial operation, testing, and refueling of the first prototype reactor plant.

ZAKARIA E. CHILAZI
MANAGER, THERMAL POWER GENERATION NUCLEAR & FOSSIL PLANTS
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Rensselaer Polytechnic Institute, Troy, New York
Bachelor of Mechanical Engineer (1950)
Westinghouse Nuclear Power Seminar - Pittsburgh, Pennsylvania (1960)
Science and Technology Lectures, State University of New York at Buffalo, New York - 1964-1965

EXPERIENCE:

1974 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Manager, Thermal Power Generation Nuclear & Fossil Plants Overall Technical Direction and Administration of the Project Engineering Department for five electric power generating plants. One nuclear power plant rated at 850 MWe Gross, one nuclear power plant rated at 965 MWe Gross, one nuclear power plant rated at a nominal 1300 MWe in preliminary engineering, design and licensing stages scheduled for operation in 1984, one fossil fueled power plant rated at 825 MWe under construction and one fossil fueled power plant rated at a nominal 700 MWe in preliminary engineering, design and licensing stage scheduled for operation in 1980. The activities which were and are being performed on these plants include site selection and associated load demand, plant concept and environmental studies, licensing, engineering and design review and approval, scheduling, procurement and associated activities such as specifications review, bids evaluation, contracts negotiations, quality assurance, review of construction, pre-operational testing, power ascension and operation, cost control, supervision and auditing of architect-engineers, consultants and certain contractors. The manager has been involved in each phase and step mentioned above.

1969 - 1974 — Principal Nuclear Engineer - Design & Constructing
Project engineering and management for the 850 MWe gross J.A. FitzPatrick Nuclear Power Plant. These responsibilities involved overall technical direction and management of the project which consisted of total review and coordination of the work performed by the Nuclear Steam Supply Steam Vendor, Main Turbine Generator Vendor and Primary Containment Vendor, the Architect-Engineer, Manager of Construction and other major suppliers and contractors.

1957 - 1969 — NIAGARA MOHAWK POWER CORPORATION

1968 - 1969 — Manager of Engineering Review & Compliance & Project Coordination Department for all Niagara Mohawk Power Corporation Systems
Engineering assurance review, quality assurance review, and overall planning, coordination and field implementation for all projects.

1967 - 1968 Project Engineer, Easton Nuclear Station
Responsible for the technical direction of all the activities of the System Project Engineering Department with respect to Easton Nuclear Station and coordination of the activities of all major contractors, including NSSS vendor, primary containment vendor, turbine generator vendor, architect engineer and other consultants.

1959 - 1967 Senior Nuclear Engineer - Supervisor of Nuclear Systems Engineering Group
Perform economic and technical evaluations of various concepts of nuclear plants, review Vallecitos Nuclear Superheat Reactor design for nuclear and safety items, running shielding calculations, supervising the design of reactor safeguards, auxiliary systems, station systems and components for safety and other nuclear aspects of the design of Nine Mile Point Unit 1 Nuclear Station. Review the nuclear and basic design aspects of the material presented to the AEC for Nine Mile Point Unit 1 Nuclear Station.

1957 - 1959 Mechanical Engineer
Develop complete design of equipment and systems, perform engineering computations, perform economic analysis, prepare specifications and evaluate proposals, run acceptance tests in accordance with applicable codes, including ASME Turbine Test Code for general performance and heat rate determination in conjunction with boiler plant acceptance tests.

1951 - 1957 ALEPPO POWER COMPANY, Aleppo, Syria
Head of New Projects Departments
Perform system demand study, prepare functional and purchase specifications for a complete steam turbine electric power plant, review manufacturers' proposals, supervise systems layout and construction.

1951 - 1953 Engineer-Design & Operation
Supervising engineer for the operation of multiple diesel engine electric power generating plant and two unit oil fired power plant. This involved evaluation and resolution of problems associated with both plants. Conducted performance tests. Acted as an engineer on call for all Aleppo Power Company plants and distribution system on rotating basis. The latter function was performed during the period 1951-1957.

1950 - 1951 Training at different firms in England and West Germany. The training covered engineering, design, manufacturing, testing, installation and debugging of components.

ROBERT T. SCHOMER

PRINCIPAL NUCLEAR ENGINEER - PROJECTS

POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION

Stevens Inst. of Tech., New Jersey - B.M.E. (1940)
Stevens Inst. of Tech., New Jersey - M.S.M.E. (1949)
Oak Ridge School of Reactor Tech. - Nuc. Engr. (1951)

EXPERIENCE

1976 - Present

Power Authority of the State of New York
Principal Nuclear Engineer - Projects
Supervises the design, engineering and licensing of all nuclear projects.

1975-1976

International Business Manager - Projects Development
Assisted the Manager of the International Development and Business Planning Department in the evaluation of the advisability and justification for overseas nuclear power plant sales. Specific effort was developing plans for overseas project offices and evaluating design and fabrication capabilities of local concerns. Countries involved were Israel, Italy and Spain.

1971-1975

Senior Project Manager
Head of a project manager team consisting of Project Managers and Associate Project Managers. Responsible for contracts for commercial nuclear power plants for Sacramento Municipal Utility District, Virginia Electric & Power Company, and Power Authority of the State of New York consisting of a total of six units of three different sizes totaling over 5700 MWe.

1967-1971

Project Manager
Overall responsibility for company's supply of a nuclear steam supply system and nuclear fuel for a nominal 900 MWe PWR commercial nuclear power plant for Sacramento Municipal Utility District.

1962-1966

Development Programs Manager
Responsible for product planning, market research, fiscal control and implementation of the Division's research and development activities with an annual budget of approximately $4,000,000.

1959-1963

In charge of the N.S. Savannah Upgrading Program.
This program produced the CNSG (Consolidated Nuclear Steam Generator), the design basis for the German Nuclear Ship project, the Japan Nuclear Oceanographic Survey Ship proposal and for other offers made in the nuclear marine propulsion field. Was Project Manager for the GNS Project, the CNSG-J proposal and actively participated in the Company's nuclear marine marketing effort.

1955-1959	Technical Project Manager for the USAEC Liquid Metal Fuel Reactor Experiment Contract Responsible for technical direction of the LMFRE. Also responsible for administration of related divisions of technical effort and coordination with government requirements. Provided technical supervision and direction of over 100 employees.
1953-1955	Project Manager - Atomic Energy Division Participated extensively in the design of boilers, heat exchangers, heaters, test loops, pressure vessels, and associated nuclear power facilities for such projects as Shippingport and Sea Wolf. Was resident Project Manager of feasibility study of Liquid Metal Fuel Reactor Experiment at Brookhaven National Laboratory involving personnel from 17 companies and agencies.
1946-1953	At Gibbs & Cox, Inc., New York, N.Y. Engaged in the design and development of atomic submarines. Was on loan to Oak Ridge and Brookhaven National Laboratories for work on the liquid metal loop design, fabrication and operation.
	At Musicraft Manufacturing Co., New York, N.Y. Plant Manager responsible for reactivating a closed plant, recruiting personnel, solving technical problems and dealing with production and labor relations problems. Put the plant on a profit-making basis and supervised approximately 160 employees.
	At Signature Recording Corporation, New York, N.Y. Plant Engineer responsible for designing, constructing and putting into operation a new plant.
1943-1946	Lieutenant, U.S. Navy, Aviation Maintenance.
1940-1943	Federal Shipbuilding and Dry Dock Company, Kearny, N.J. Engaged in design of power plants for tankers, cargo ships and destroyers.

PAPERS:

"Extracting Heat From Liquid Metal Fuel"; Co-author; Nuclear Engineering and Science Congress, Cleveland, Ohio, December 1955.

"The Liquid Metal Fuel Reactor"; ASME, October 1956.

"Preliminary Design of an "LMFR" Power Plant"; Co-author; ANS, Washington, D.C., December 1956.

"The Liquid Metal Fuel Reactor Experiment"; ANS, New York, New York, October 1957.

"LMFR Evaluation"; Co-author; Second Int. Conf. - Peaceful Uses of Atomic Energy, Geneva, Switzerland, September 1958.

"Consolidated Nuclear Steam Generator for Marine Propulsion"; Co-author; Int. Symposium for Nuclear Ship Propulsion, Turin, Italy, October 1962.

"Review of CNSG Marine Reactor Program and Recent Advances"; Co-author; Third Nuclear Propulsion for Merchant Ships Conference, Kiel, Germany, May 1964.

"N.S. Savannah Containment Tests"; Co-author; Third Nuclear Propulsion for Merchant Ships Conference, Kiel, Germany, May, 1964.

PATENT:

Liquid Metal Purifier: No. 2, 959,970.

MERLOW WAYNE HULTGREN
MANAGER NUCLEAR OPERATIONS
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: B.S.M.E. from San Jose State College, (1962)
Registered Professional Engineer - California
License No. NU 252

EXPERIENCE:

1975 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Manager Nuclear Operations
In charge of operations at all Power Authority Nuclear Plants. With staff audits operation and identifies methods for plant improvement. Provides consultation in operation and maintenance to plant personnel.

1962 - 1972 — GENERAL ELECTRIC COMPANY

James A. FitzPatrick Nuclear Power Plant
Operations Site Manager
In charge of nuclear steam supply system start-up crew for vendor. Coordinated efforts with customers operating organization.

1969 - 1972 — DRESDEN NUCLEAR POWER STATION
Site/Project Manager
In charge of turnkey operations and construction site staff for vendor on Dresden #2 & #3. Held Senior Reactor Operators License on these units.

1967 - 1969 — TARAPUR ATOMIC POWER PROJECT
Shift Superintendent
Supervised and in charge of shift in start-up crew on two boiling water reactors.

1966 - 1967 — KRB ATOMIC POWER STATION
Assistant Shift Supervisor during pre-operational and start-up testing of BWR unit. Held IAEA Senior License.

1964 - 1966 — Warranty Engineer - Provided field service

1962 - 1964 — Engineering Training Program
Advanced work on thermal-hydraulics and high density fuels programs.

PETER W. LYON
PRINCIPAL NUCLEAR OPERATIONS ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: Graduated from U. S. Naval Academy, 1953

Completed one year of nuclear power training July 1960. Designated as qualified for duty in connection with supervision, operation and maintenance of naval nuclear propulsion plants.

Completed three months Pre-Commanding Officer course in advanced nuclear engineering in 1966. Course administered by Naval Reactors Branch/AEC.

EXPERIENCE:

1976 to date: POWER AUTHORITY OF THE STATE OF NEW YORK

Principal Nuclear Operations Engineer

Responsible for supervision and direction of headquarters personnel in maintaining current knowledge of the status of nuclear plant. Coordinates engineering, training and other work performed in headquarters in support of plants. Acts as primary communications contact between headquarters and plants. Responsible for providing up-to-date industry operating experience and trends to plant staffs. Provides management with operations review and advice on new designs, plant modifications and performance programs. Responsible for plant operations personnel development and performance relative to predicted manpower requirements.

1975 - 1976 UNITED STATES NAVY
Deputy Director of the Attack Submarine Division of the Office of the Chief of Naval Operations.

Responsible for current readiness, warfare tactics of all operational nuclear attack submarines in both fleets. Responsible for long range nuclear attack submarine force level requirements and objectives and the preparation of plans and programs to support those goals. Coordinated acquisition of new construction submarines and development of new equipment and systems.

1973 - 1975 UNITED STATES NAVY
Commanding Officer of Naval Submarines Training Center Pacific (400 instructors, 18,000 graduate annually).

Responsible for all ashore training of 55 nuclear submarine crews. Training provided ranged from basic submarine officer and enlisted indoctrination to advanced

courses in submarine operation, tactics, weapons and nuclear engineering operations and maintenance. In addition, instructed all future Submarine Force Pacific, Engineer Officers in advance nuclear engineering subjects to ensure their readiness to pass the stringent Naval Reactors/AEC engineer oral and written examinations.

1970 - 1973 UNITED STATES NAVY
Submarine Division Commander and Deputy Submarine Squadron Commander.

Responsible for overseeing in detail the training and material readiness programs of 12 nuclear attack submarines in squadron (S-3W, S-4W, 5-5-W). Majority of effort (95 per cent) involved ascertaining and correcting the state of training and safety of operations of engineering personnel in nuclear propulsion plants. Certified their subsequent readiness to pass stringent annual Operational Reactor Safeguards Examination by Naval Reactors Branch/AEC.

1966 - 1970 UNITED STATES NAVY

Commanding Officer of modern nuclear attack submarines. Responsible for the management, administration, planning, training and budgeting for this submarine. Managed multi-million dollar, eighteen-month nuclear refueling and concurrent overhaul of all associated reactor plant, steam generating and auxiliary systems. This submarine was consistently considered the best of twelve contemporary submarines in squadron.

1964 - 1966 UNITED STATES NAVY

Executive Officer of modern nuclear powered Polaris Missile Submarine. Responsible to the Commanding Officer for the management, administration, planning, training and budgeting for this submarine.

1962 - 1964 UNITED STATES NAVY

Submarine Squadron Engineer. Directed, planned and budgeted for all repair efforts of a nuclear submarine tender in the repairs and modifications required by all assigned nuclear and conventional submarines.

1949 - 1962 Graduated from U. S. Naval Academy and commissioned as Ensign in 1953. Served in many positions gaining the training and maturity necessary to become a Commanding Officer.

Komandur Srinivas Sunder Raj
Project Engineer - IP 3 Nuclear Power Plant
Power Authority of the State of New York

EDUCATION:

Bachelor of Science Degree in Mechanical Engineering, Osmania University, India, 1965
Master's Degree in Engineering Management, Northeastern University, 1970

EXPERIENCE:

1975 to Date: Power Authority of the State of New York
Project Engineer - Indian Point 3 Nuclear Power Plant. Responsible for the overall direction and coordination of the Authority's headquarter office for IP3NPP.

1973-1975: Manager and Supervising Mechanical Engineer, United Engineers and Constructors, Inc., Philadelphia, Pa. Responsible for supervision of nuclear steam supply and turbine plant evaluations, as well as development of computer programs required.

1972-1973: Mechanical Engineer, Burns & Roe, Oradell, N.J. Assigned to the Three Mile Island Nuclear Project, Unit No. 2, Middletown, Pa., with responsibilities for preparation of sections of the Final Safety Analysis Report, including containment isolation, fire protection, and reactor coolant systems supports. Also responsible for various systems design review and calculations.

1967-1972: Mechanical Engineer, Stone & Webster Engineering Corporation, Boston Mass.
Assigned to the Beaver Valley Nuclear Project, Unit No. 2, a pressurized water reactor nuclear plant in Shippingport, Pa. Responsible for diagrams and specifications for heat exchanges, pumps and major equipment. Also responsible for economic studies, safety analyses, and computer programs.

PROFESSIONAL SOCIETIES: Registered Professional Engineer, State of Pennsylvania Member, American Society of Mechanical Engineers.

OWEN MALLON
PRINCIPAL CIVIL STRUCTURAL ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: Manhattan College, New York - B.C.E. (1960)
City College of New York
Graduate Courses - Structural Engineering
New York Professional Engineer
New Jersey Professional Engineer

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Principal Civil-Structural Engineer
Perform review function re AE work on the Authority's various projects in the area of Civil-Structural related items, as required by those projects.

1972 - 1976 — BURNS AND ROE, INC. - Oradell, N. J.
Supervising Civil Engineer
Responsible for the engineering and design of steel and reinforced concrete structures for nuclear and fossil fueled power plants. Supervised the Lead Civil Engineers on the following projects:

960 MW Three Mile Island Unit #2 (Nuclear - Pwr)
1190 MW Forked River Nuclear Power Plant (Nuclear - Pwr)

2-550 MW Muskogee, Okla. Generating Station Units 4 & 5 (Coal Fired)

600 MW Wm. F. Wyman Station Unit #4 (Oil Fired)

1967 - 1972 — EBASCO SERVICES INC. - New York
Principal Engineer, Concrete - Hydraulic Engineering Dept.
Responsible for engineering and design foundations, reinforced concrete structures (including reactor building, radwaste building, containment structure and other Class I structures), hydraulics and site development for the following projects and proposals:

1100 MW Fukushima Unit #6 (Bwr), 870 MW Seabrook (Pwr) Unit #1, 650 MW Millstone (Bwr) Unit #1; Rio Blanco-Langunitas Transmission Line and proposal engineering for Martins Creek, 1100 MW(e) N.E.P.P., Unit #1; Millstone Unit #2 N.E.P.P. (Pwr-Bwr and containment studies).

1963 - 1967 — CUSHING AND NEVELL TECHNICAL DESIGN INC. - New York
Assigned to Ebasco Services (3-65 to 3-67) - Senior Designer. Supervised analysis, design and preparation of plans of foundations and reinforced concrete structures (including containment structure, reactor auxiliary building, fuel handling building and other Class I structures) for the following projects:

700 MW H. B. Robinson N.E.P.P.; Unit #2; 22 MW Las Minas SES Unit #1.

Assigned to Chemical Construction Company (12-63 to 3-65) - Senior Design Engineer. Responsible for the structural analysis and design of steel and reinforced concrete structures to support and house industrial and chemical equipment.

1963 — ALLIED CHEMICAL CORPORATION - New York
Senior Design Engineer
Analyzed and designed steel and reinforced concrete structures for petrochemical plants.

1962 - 1963 — CHEMPLANT DESIGNS CORPORATION - New York
Design Engineer
Analyzed and designed steel and reinforced concrete structures for chemical plants

1961 - 1962 — BLAUVELT ENGINEERING - New York
Design Engineer
Analyzed and designed steel and reinforced concrete highway and railway bridges.

1961 — SLATTERY CONSTRUCTION COMPANY - New York
Assistant Superintendent
Elevated highway construction.

1960 - 1961 — PRAEGER-KAVANAUGH - Waterbury, New York
Design Engineer
Analyzed and designed steel and reinforced concrete highway bridges.

Assistant Resident Engineer on a pier construction project.

1959 — BRONX BOROUGH PRESIDENT'S OFFICE - New York
Jr. Civil Engineer
Street and sewer construction.

1957 - 1958 — NEW YORK STATE DEPARTMENT OF PUBLIC WORKS - Albany, N.Y.
Surveyor - Highway construction projects.
Inspector at concrete and asphalt plants.

LEWIS E. BURNETT
STAFF ELECTRICAL ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

City College of New York - B.E.E. (1959)
General Electric Co. Power System Engineering Course (1966-67)
New York Professional Engineering License No. 046613
Harrison College, Barbados, West Indies - Oxford and Cambridge Higher Certificate (Mathematics) 1948.

EXPERIENCE:

1972 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Principal Electrical Engineer
Duties involve the Supervision of the Staff Electrical Engineering Section and providing technical consultation to upper management.

1964 - 1972 — CONSOLIDATED EDISON CO. OF NEW YORK
Engineer, Electrical Engineering Department
Duties involved the conduct of analytical studies on power system, including switching transients, fault calculations, equipment evaluation and selection, specification and application of protective and control systems for large steam turbine generators.

1959 - 1964 — INTERNATIONAL TELEPHONE & TELEGRAPH LABORATORIES, Nutley, N. J.
Senior Engineer
Research and development of control, communication and digital computers systems. Primary responsibility for the development and design of advanced solid state circuitry.

1949 - 1952 — GRAMMAR SCHOOLS - St. Vincent and Dominica, West Indies
Mathematics Master
Teaching of Mathematics at the Junior College level.

PROFESSIONAL ACTIVITIES:

Member of IEEE, Eta Kappa Nu and CIGRE; Member of the NPCC Task Force on System Protection and lecturer in P.E. Review Course sponsored by IEEE.

MILITARY:

Sgt. U.S. Army Medical Service Corp., Clinical Psychology Technician; Administration, Scoring and Evaluation of objective psychological tests.

JOE M. VARGAS
NUCLEAR ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Columbia University
M.S. in Nuclear Engineering.

New York University
B.S. in Nuclear Engineering.
Recipient of the American Nuclear Society "Nuclear Engineering Award".

Bronx Community College
A.A.S. in Engineering Science.
Recipient of the "Physics Medal", the "Engineering Science Award", and the Morris Meister Medallion (highest index of the graduating class).

Westinghouse Zion Simulator
Attended one week operator training.

Georgia Tech
Attended one week Radioactive Waste Seminar.

EXPERIENCE:

June 1976 - present

POWER AUTHORITY OF THE STATE OF NEW YORK
Indian Point 3 Nuclear Power Plant
Engineering and Procurement:
Assigned as the Nuclear Engineer for the Indian Point 3 Nuclear Power Plant. Responsible for the engineering design of all nuclear systems, nuclear facilities and nuclear related activities. Responsible to assure that the IP 3 plant implements the latest requirements of the NRC, code of Federal Regulations, ASME codes and other industry standards.

June 1973 - June 1976

STONE & WEBSTER ENGINEERING CORP.
Greene County Nuclear Power Station (PASNY)
Engineering and Design:

1. Nuclear Systems
   Responsible for the engineering and design of the Nuclear Systems (including the Emergency Core Cooling Systems). Responsible for the sizing and selection of all the safety-related pumps, heat exchangers, valves, filters and associated piping for these systems. Responsible for the preparation and issuance of the Systems Flow Diagrams, Logic Diagrams and System Description. Prepared the PSAR sections, PSAR amendments, responses to NRC review questions and Project Regulatory Guide Positions.

2. Inservice Inspection

Assigned to assure that the Greene County Project was designed to meet all the requirements of Inservice Inspection (ISI per ASME XI). Reviewed all piping and equipment drawings for ISI. Prepared all PSAR sections (tables and figures), responses to NRC questions and prepared project position in accordance with 10CFR50, ASME III and ASME XI.

Nuclear Procurement:

Responsible for the specification preparation, technical bid evaluation and award for the following Major Nuclear Equipment:

a) Reactor Building Polar Crane, Fuel Building Crane, QA Cat. 1.
b) Inservice Inspection (including Baseline).
c) Heat Exchangers (all ASME VIII).
d) Pumps (all QA Cat. III).

Surry Nuclear Power Station 3 & 4

1. Licensing

Assigned to Stone & Webster's main licensing headquarters in Boston to assure the construction permit for Surry 3 & 4. This effort required a detailed knowledge of the NRC's Regulatory Guides, Codes of Federal Regulation (10CFR50) and PSAR requirements.

2. Mechanical Section

Promoted to perform liaison with Stone & Webster's Boston Mechanical Section. Responsible for the engineering, purchasing and scheduling of all the mechanical design specifications (including the design of the containment and refueling cavity liners, the purchasing of all tanks and vessels, and the analysis and design of all supports and restraints). Responsible for all the mechanical analyses that were performed for the projects (i.e. all static, dynamic and seismic analysis). Prepared PSAR sections, responses to NRC questions and prepared project positions in accordance with the latest code requirements.

I-CHEN HUANG

CIVIL STRUCTURAL ENGINEER

POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION

Worcester Polytechnic Institute, Mass. - M.S. (1970)
Taiwan Cheng-Kung University - B.S. (1966)
Registered Professional Engineer - New York (#51419)

EXPERIENCE

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Project Civil-Structural Engineer
Review of civil-structural related work on the additional facilities for Indian Point 3 Nuclear Power Plant.

1973-1976 — EBASCO SERVICES, INC. - New York, N.Y.
Structural Engineer - Washington Public Power Supply System Nuclear Project No.3 and No. 5, 1200 MW each (PWR)

Responsible for Static Analysis and Dynamic Analysis (max. ground acceleration 0.32g) of the Auxiliary Building, Reactor Building, Fuel Handling Building, the common Mat, and design of reinforcement in Mat and sheer walls.

1970-1973 — WOLCHUK AND MAYRBAURL CONSULTING ENGINEERS, NEW YORK, N.Y.
Structural Engineer - Donald C. Cook Nuclear Power Plant

Analysis and design of steel restraint bracket for 30" main steam pipes.
Design of prestressed steel lifting truss for lifting 115 ton steel liner cap.

Philip S. Lu
Project Mechanical Engineer
Power Authority of the State of New York

Education: North Carolina State University, M. Mechanical Engineering
Taipei Institute of Technology, B.S. Mechanical Engineering

Licenses: Registered Professional Engineer, New York

Experience:

1976 - Present POWER AUTHORITY OF THE STATE OF NEW YORK
As mechanical engineer in the Engineering Department, I am assigned to work on the 1000 MW, PWR, Indian Point 3 Nuclear Power Plant. Main responsibilities include: to resolve operation problems requiring engineering assistance, to coordinate with Legal and Environmental Departments for legal proceedings concerning Indian Point Station Site Environmental Impacts study and NRC hearings, and to evaluate the budget, scheduling and planning of major retrofitting works to be done during unit outage time.

1973 - 1976 EBASCO SERVICES, INC.
Senior Mechanical-Nuclear Engineer
As acting project engineer and mechanical job engineer, I participated in the engineering, design, bids evaluation, technical and general coordination, project man-days and cost control for the following projects:

- Fuel Oil Conversion, 750 MW, P.H. Robinson Station, Unit No. 4, Houston Lighting and Power Company.
- Fuel Conversion, 2x750 MW, Cedar Bayou Station, Units No. 1&2, Houston Lighting and Power Company.
- Fuel Conversion, Sam Bertron Station, Units No. 1,2,3, &4, Houston Lighting and Power Company.
- Combined Cycle Installation, 300 MW, T.H. Wharton Station, Units No. 3 & 4, Houston Lighting and Power Company.
- Oil fired installation, 425 MW, Greens Bayou Station, Unit No. 5, Houston Lighting and Power Company.

- Fuel Oil Storage and Transfer Projects, Cedar Bayou Station, Greens Bayou Station, T.H. Wharton Station and P.H. Robinson Station, Houston Lighting and Power Company.

Also, participated as lead mechanical engineer in the engineering and design of the following projects:

- 2x1100 MW, BWR, Allens Creek Station Units No. 1 & 2, Houston Lighting and Power Company.

Also, participated as lead nuclear engineer, in the engineering, design, bids evaluation, coordination of the following project:

- 2x865 MW, PWR, St. Lucie Station, Units No. 1 & 2, Florida Power and Light Co.

1969 - 1973 BURNS & ROE, INC.
Mechanical Engineer
Participated in the engineering, design, equipment selection, bids evaluation of the following projects:

- 425 MW Lignite-Fired plant, LeLand Olds Station, Unit No. 2 Basin Electric Power Cooperative.
- 1100 MW,BWR, WPPSS Nuclear Project No. 2, Unit No. 1, Washington Public Power Supply System.
- 835 MW, BWR, Cooper Station Unit No. 1, Nebraska Public Power District.

1968 - 1969 AMERICAN HEAT RECLAIMING CORP.
Mechanical Engineer
Worked on the engineering, design, fabrication, installation and operation of heat transfer equipment and pressure vessels for process industry.

WAHEED SAYED

ELECTRICAL ENGINEER

POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION

Degrees in Electrical and Mechanical Engineering.
Completed the AMA Supervisory Course.
Completed the in-house Bechtel Nuclear Power Course.
Member of IEEE.

EXPERIENCE

1975-Present

Power Authority of the State of New York
Responsibilities: Review of architect-engineer work associated with Indian Point (PWR) Nuclear Power Plant. Modification of security system. Resolution of licensing and environmental problems. Design modifications for improving plant availability, including fire protection.

1970-1975

Bechtel Power Corporation, Gaithersburg, Maryland
Architect-Engineer for Power Plants

(1973-1975)

Engineering Supervisor
Responsibilities: General management of the electrical group comprised of 50 engineering personnel for manpower, budgeting, activity planning and scheduling in accordance with project construction schedules and providing technical direction and support to the group. Responsible for licensing work including client representation at meetings.

(1970-1973)

Senior Engineer - Head of Control Group
Responsibilities: Management of 20 engineers, designers and draftsmen. Planning and motivation of the group for increased productivity. Resolution of problems with client and vendors through on-the-spot meetings and discussions.

Developed the Safety Analysis Report (Electrical) for the Farley Nuclear Power Plant (PWR). Actively involved in mechanical and civil design aspects related to safety evaluation and licensing viz. pre-operational testing of the Emergency Core Cooling System.

Control engineering work covering the development of control circuits for safety and interlocking systems and including relay setting and coordination. Engineering calculations viz. fast transfer, voltage drop and short circuit studies. Design of the auxiliary power system for the Farley Nuclear Plant.

Procurement (preparing specifications, evaluating bids and recommending purchase) of electrical equipment viz. 4 kv switch-gear, load centers, motor control centers.

1966-1970 Tata Consulting Engineers, Bombay, India (formerly in collaboration with Ebasco of New York)

(1966-1970) Senior Assistant Engineer
Responsibilities: Procurement of electrical equipment for nuclear power plants. Developed the CPM network and designs for indoor and outdoor 230 kv switchyards. Designed the auxiliary power systems for the Madras Atomic Power Plant.

1960-1966 Tata Electric Companies, Bombay, India

(1962-1966) Assistant Engineer
Responsibilities: Preparation of project feasibility reports, receiving station designs, equipment procurement and assistance to erection staff at site. Deputed to work with the U.S. AID Mission in Nepal on the aerial cable car system project. Completed advanced training in Sweden with ASEA in design, manufacture and installation of power plant equipment.

(1960-1962) Trainee Engineer
Training in all departments of the Company including testing, load despatch, construction, transmission and distribution departments.

ROBERT SHROPSHIRE
RADIOLOGICAL ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

B.S. Nuclear Engineering, Columbia University
M.S. Nuclear Engineering, Columbia University (in progress)
Health Physics Certification Course; American Health Physics Society -
Senior Reactor Operator Training Course; Cornell University -
Nuclear Power Reactor Safety Course at M.I.T., Boston, Mass. 1973 -
Environmental Surveillance Course, Harvard School of Public Health, Boston, Mass. 1974 -
Professional Engineer's Review Course; Cooper Union, New York, N. Y.

LICENSES:

Nuclear Reactor Senior Operating Licenses

1. U.S.N. AIW; Arco, Idaho 1962
2. U.S.N. S5W; U.S.S. Sam Houston SSBN609; 1963
3. Brookhaven National Laboratory Graphite Research Reactor (BGRR); Upton, L.I., New York 1965
4. U.S.A.E.C. Cornell University 1966

EXPERIENCE:

April 1976 to date

POWER AUTHORITY OF THE STATE OF NEW YORK
Radiological Engineer, reporting to the Manager-Nuclear Operations; responsible for disciplines of Radiochemistry and Radiation Protection. He assures that the operation of the nuclear facilities under the jurisdiction of the Power Authority of the State of New York conform to the criteria established by applicable regulatory bodies.

His duties include interfacing with government agencies both Federal and State, contractors, site radiological personnel, and interdepartmental personnel.

1973 - 1976

STONE & WEBSTER ENGINEERING CORPORATION
Engineer in the Power Division
Division Licensing Representative
Radiation Protection Engineer
Provided guidelines and methods for Radiation Protection. Provided expert testimony at both Advisory Committee on Reactor Safeguards and Atomic Safety and Licensing Board Hearings.

1969 - 1973	Employed by ATCOR, Inc. in the capacity of Project Supervisor and Health Physicist. Involved primarily with the decommissioning of nuclear facilities. Projects geared towards mechanical engineering with a strong emphasis on health physics.
1966 - 1969	Reactor supervisor at the Columbia University TRIGA Mark II reactor. Responsibility included assisting in the installation of the facility and writing: the PSAR, technical specifications, and operating procedures.
1964 - 1966	His research reactor experience began with the BGRR at Brookhaven; there he attained an "A" (Senior Operator) status and performed startup, shutdown, normal operation and routine maintenance of the reactor.
1959 - 1964	U.S. Navy

SOCIETIES:

Technical: Health Physics Society
American Nuclear Society (Member)

Academic: MENSA

MILITARY: The U.S. Navy provided basic reactor and electronics background. Served in the Navy for five years, first in electronics and then in the nuclear navy aboard the Polaris submarine U.S.S. Sam Houston SSBN609, as Reactor Operator/Reactor Technician.

JAMES M. CLABBY
PRINCIPAL FUELS ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

B.A. and B.S. in Civil Engineering, Oregon State, 1951
M.E. in Nuclear Engineering, NYU, 1968
Professional Engineer, New York #39344

EXPERIENCE:

1959 to date — POWER AUTHORITY OF THE STATE OF NEW YORK

Principal Fuels Engineer
Manage and direct all engineering and procurement work performed in regard to the utilization and purchasing of oil, coal, natural gas and nuclear fuels for the Power Authority.

Nuclear Engineer, Fuel Management
In charge of nuclear fuel engineering and procurement. Developed the Authority's program for nuclear fuel management.

Planning Engineer
Studied electrical load projections and made generalized forecasts of electrical load growth. Performed site selection studies for nuclear and pumped storage power plants. Assisted in a study of peaking power resources in the Northeastern U.S.

Assistant Contract Engineer
Reviewed engineering work performed by outside consultants and assisted in the engineering of appurtenances to large hydroelectric power plants. Assisted in the administration of contracts for hydroelectric power plant construction work.

1955 - 1959 — PARSONS, BRINCKERHOFF, HALL & MAC DONALD

Civil Engineer
Highway planning, route selection and design; bridge design, highway and bridge construction.

1954 — U.S. ARMY CORPS OF ENGINEERS (Atlantic District)

Construction Engineer
Reviewed and commented on plans prepared by architect-engineers for the construction of airfields and appurtenant works.

1952 - 1953 — U.S. ARMY CORPS OF ENGINEERS (Portland District)

Civil and structural engineer in the design and construction of large dams, river bank protection works and docks.

1951 - 1952 — J.H. CLABBY, CONSULTING ENGINEER

Land subdivision, construction surveys, design and drafting work for streets and city water and sewerage systems.

JAMES F. DAVIS
PRINCIPAL NUCLEAR ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Polytechnic Institute of New York - BEE, 1957
Pennsylvania State University - Master of Engineering (Nuclear), 1963
Reactor Supervisors Training Program (Penn State) 1963

EXPERIENCE:

1976 to date

POWER AUTHORITY OF THE STATE OF NEW YORK
Principal Nuclear Engineer - Review of the adequacy of nuclear related designs and transient analyses and assistance on nuclear projects as required; specification and conceptual design improvements for future nuclear projects.

1975 - 1976

Fuel Engineer, Power Operations Division - Responsible for specification, procurement, and contracting for nuclear and fossil fuel supplies that operate in accordance with design intent and meet applicable regulatory and licensing requirements. Coordinate nuclear plant transient analysis efforts with nuclear steam supplier. Coordinate nuclear plant transient analysis efforts with consulting engineer as independent check on nuclear steam supplier.

1957 - 1975

AMERICAN ELECTRIC POWER SERVICE CORPORATION
Section Head of Nuclear Materials & Fuel Management, Nuclear Division - Responsible for supervision and direction of in-core fuel management capabilities utilizing existing industry computer programs such as PDQ; independent verification of core performance predictions by the Nuclear Steam Supplier; correlating the results of startup calculations to predictive results using in-house codes; out-of-core fuel management activities including procurement of uranium, nuclear - fuel fabrication, conversion, and enrichment, spent-fuel transportation and recovery, and the handling of radioactive waste and its transportation off-site. Additional responsibilities included: Review of pre-operational and startup test procedures for core analysis and independent evaluation of the test results, supervision of cognizant duties related to the reactor and fuel handling; quality assurance audits of nuclear fuel supplier, fuel handling and core loading procedures; review of technical specifications as they relate to core performance; preparation of bid specification of NSSS and fuel supply on generic basis. Other duties included Secretary of Quality Assurance Advisory Panel which was independent check of QA Manager's activities; development of the special nuclear material accountability program; and participation in standardizing procedures that reflect company's engineering practice.

969 - 1972	Senior Engineer, Nuclear Division - Organized and coordinated the pre-operational test program for Unit No. 1 of D.C. Cook, Nuclear Plant. Worked with outside consulting organization on a schedule and cost control management program for the erection labor required to install, hang, weld, and restrain piping. Worked with Nuclear Fuel Vendor on a plutonium recycle fuel design and fuel management concept. Engineer in charge of development program with our reload nuclear fuel supplier on a 15 x 15 fuel assembly - pressurized water reactor - design. Participation in contract negotiations on fuel supply. Member of the Performance Test Code Committee for Nuclear Steam Supply Systems of the ASME. Member of the working group of the Reactor Assessment Panel of the Edison Electric Institute.
1965 - 1968	Engineer, Nuclear Division - Evaluation of bid proposals and awards for NSSS and nuclear fuel. Contract negotiation on nuclear fuel supply. Established economic parameters for nuclear fuel costs. Participated in an 800 MWe conceptual study on Boiling Water Reactor with General Electric Company which eventually became the BWR/4 series.
1962 - 1965	Associate Engineer, Nuclear Division - Assigned from July 1964 to July 1965 to Babcock & Wilcox Company, Atomic Energy Division in Lynchburg, Virginia to work on the physics calculations and analyses for a steam - cooled breeder reactor concept. Assigned from September 1963 to July 1964 to Argonne National Laboratory to the Reactor Engineering Division for engineering duties on the Fast Reactor Test (FARET) facility in the area of fuel handling and the Hot Cell Containment approach to fuel handling. Received Master's Degree from Penn State in 1963 and also completed the Reactor Supervisors Training Program. Was a Licensed Reactor Operator in 1963 for the Penn State Research Reactor.
1960 - 1962	Assistant Engineer, Electrical Engineering Division - Worked in electrical relay section on the specification and application of relays for transmission line protection. Performed short circuit calculations, specified relay settings, approved installation drawings.
1958 - 1960	On Leave of Absence as 1st Lieutenant U.S. Army as Engineer Unit Combat Commander.
1957 - 1958	Engineering Trainee, Electrical Engineering Division - Spent nine months on company training program as Electrical, Mechanical, and System Planning Divisions. Spent three months in Transformer Engineering Section.

JOHN M. GRIFFIN
PRINCIPAL NUCLEAR PLANT PERFORMANCE ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

B.S. Degree in Naval Science (1967), U.S. Naval Academy
Attended U.S. Navy Nuclear Power Training Schools:
Nuclear Power School - Bainbridge, Maryland
Phototype Training School - West Milton, New York
Submarine School - New London, Connecticut

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Principal Nuclear Plant Performance Engineer
Supervises and provides direction of headquarters personnel to determine the state of the art, and makes recommendations to management with regard to nuclear plant, systems, and equipment performance and reliability monitoring, analysis, and improvement programs and techniques. Provides technical guidance and advice to site performance personnel to implement approved programs. Reviews and monitors plant data and provides operating data to NRC.

1973 - 1976 — CAROLINA POWER AND LIGHT COMPANY
Engineering Supervisor - at the Brunswick Steam Electric Plant
Responsible for the direction and supervision of all engineers assigned to the plant. This includes the development of a plant efficiency program, power range testing program and correspondence between the plant and the Nuclear Regulatory Commission. Responsible for the coordination and performance of all unit outages.

Startup Supervisor
Responsible for the direction and supervision of the startup and test engineers in the plant startup group. Included the coordination and completion of all testing required for initial operation of the nuclear unit, the writing, reviewing, executing and evaluating of all tests in the plant, recommending and implementing corrective action or modifications as required to ensure proper operation of the plant, maintaining all documentation and records required by the test program and providing planning and sequencing information to construction management to ensure an efficient unit startup. During this time approximately 70 preoperational tests were completed and the unit attained initial criticality and power operation. Also during this time the initial startup effort was begun on the second unit including electrical distribution systems and several plant safety systems. Developed a detailed construction schedule for the second unit through fuel loading and initial operation based on errors and problems encountered on the first unit.

Startup and Test Section Leader
Responsible for the direction and supervision of 20 engineers and technicians working on the startup of the unit. This included processing documentation and procedures, providing test coordination and reviewing test results. During this time the vessel hydrostatic test, structural integrity test and several preoperational tests were performed resulting in the licensing and fuel loading of the first unit.

Startup Engineer
Responsible for the writing and performing of procedures for the flushing, hydrostatic testing, preoperational testing and startup testing of assigned plant systems. Served as test director and system coordinator to assure proper and expeditious system testing and to provide engineering support for the plant test program.

1971 - 1973 U.S. NAVAL ACADEMY, Annapolis, Maryland
Company Officer
During this time was responsible for the training, education, and conduct of 120 midshipmen.

1969 - 1971 U.S.S. GEORGE C. MARSHALL SSBN-654
While on board MARSHALL qualified on all watch stations in Nuclear Propulsion plant including Engineering Officer of the Watch. Qualified as Diving Officer and Officer of the Watch. Qualified in Submarines and as Chief Engineer. Primary assignments included Main Propulsion Officer, Chemistry and Radiological Controls Officer, Communications Officer and Qualification Officer.

J.H. PHILLIPS
PRINCIPAL OPERATING ENGINEER
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Clarkson College of Technology (1966) BSEE
Niagara Mohawk Power Corp. - Auxiliary Supervisory Development Course - 1966 (Syracuse)
Public Utility Systems & Practice Course (1971)
Electrical Utility Systems & Practice Course (1971)
Digital Computer Maintenance (Leeds & Northrup 16 weeks)

EXPERIENCE:

1974 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Principal Operating Engineer (1974)
Supervising an section whose responsibilities are to optimize plant availability through the use of good operations and maintenance practices. Direct responsibility for the implementation of an Energy Control Center (dispatch) and associated with major power plant implementation and assist in delineation of staff requirements.

1973-1974 — NIAGARA MOHAWK POWER CORPORATION
Test Engineer
Supervised engineers and technicians in the designs, installation and maintenance of state-of-the art instrumentation, protection, power, and communication equipment associated with a 25 unit, 2500 Mw hydroelectric generating project and associated substation and transmission line network.

1969-1973 — NIAGARA MOHAWK POWER CORPORATION
Assistant Test Engineer
Performed work to that of Test Engineer in a lesser administrative capacity.

1966-1969 — NIAGARA MOHAWK POWER CORPORATION
Operating Supervisor
Assigned special projects in engineering operations and maintenance including a security study, design of building renovations, inspection of dam and turbine repairs, distribution engineering, structural engineering, penstock repairs, etc.

1966-1968 — Supervisory Trainee
Participated in a training program which involved work experience in all phases of gas and electric engineering, operations, maintenance sales, accounting, financing, etc.

DR. JOHN W. BLAKE
DIRECTOR OF ENVIRONMENTAL PROGRAMS
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Massachusetts Institute of Technology - S.B. (1955)
University of North Carolina - M.A. (1958)
- Ph. D. (1961)

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Director of Environmental Programs
Responsibilities include supervision, administration and monitoring of environmental studies for compliance with applicable standards and regulations, public presentations, liaison with government agencies, and detailed involvement with environmental impact reports and statements.

1972-1976 — UNITED ENGINEERS AND CONSTRUCTORS, INC. - Philadelphia, Pa.
Manager, Environmental Sciences - Responsible for providing and supervising staff expertise (Ecology, Biology, Hydrology, Meteorology/Air Quality, and Acoustics) for all projects. (Nuclear, Fossil and Hydro Power, and various industrial facilities).

1969-1972 — RAYTHEON CO., SUBMARINE SIGNAL DIVISION - New London, Conn. and Portsmouth, R.I. - Technical Director, Ecology - Participated in and supervised pollution ecology consulting services provided to industries, A/E firms, power utilities and government agencies.

1965-1969 — BATTELLE MEMORIAL INSTITUTE - Columbus, Ohio and Duxbury, Mass.
Senior Aquatic Ecologist - Supervised and participated in research and development services provided to government and industries, including fields of pollution ecology, aquaculture, corrosion and anti-fouling.

1960-1965 — ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA
Assistant Curator, Research Associate - Department of Limnology
Member of pollution ecology field team, responsible for commercial shellfish and aquatic invertebrate studies.

1959-1965 — AQUACULTURAL RESEARCH CORPORATION - Cape Cod, Mass.
Biologist, Director of Research - Directed and participated in application of basic research to practical farming of commercial shellfish.

1955-1961 — MARINE BIOLOGICAL LABORATORY - Woods Hole, Mass.
Investigator, Marine Biology

LIGGETT & MYERS TOBACCO CO. - Durham, N.C.
Organic Chemist

UNIV. OF NORTH CAROLINA - Chapel Hill, N.C.
Research Assistant, Graduate Student

BRUCE W. DEIST
NUCLEAR TRAINING SUPERVISOR
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

Navy: Interior Communications (Class A) School
Instructor Training School
Interior Communications (Advanced)
Nuclear Power School
General Electric: BWR Technology and BWR Senior Operator Training
Pennsylvania State University: Continuing Education Program

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK

Nuclear Training Supervisor. Formulates and directs the training programs for site and New York Office personnel per NRC requirements and additional requirements pursuant to the desires of Authority management.

1970 - 1976 — GENERAL ELECTRIC COMPANY

Manager, BWR Training Center.
Have overall on-site personnel administration and functional responsibility for the operation of the BWR Simulator and its related equipment. Includes the discharge of proprietary responsibility for the effective and efficient use, occupancy, and upkeep of the Center to carry out the BWR operator training required by the Department and Overseas Contracts on schedules and programs of training provided by BWR Training, San Jose. Exercise overall supervision of the BWR Training Center as a business operation as well as investigate new training program concepts to maintain the Department's leadership in the field.

Training Supervisor
Responsible for the development, preparation and supervision of training courses and support material for customer and General Electric personnel in the technology and operation of BWR nuclear power plants. Supervise and deliver marketing and sales presentation for BWR training products. Coordinate and schedule training courses, BWR simulator control room and personnel utilization. Supervised up to 15 Training Engineers. Interface with customer and NRC personnel for the establishment of a good working relationship for the conduct of training.

Training Engineer
Classroom and control room instructor for Company and customer students. Instructed students in nuclear reactor operation, radiological controls, health physics, radioactive waste controls and related systems.

Startup Test Engineer (Dresden Unit 2)
Provided on shift coordination for maintenance, reactor operations and reactor refueling. Directed plant startup and operation as Shift Superintendent.

Training Engineer
Duties and responsibilities as described above.

Startup Test Engineer (Dresden Unit 3)
Wrote and directed pre-operational tests. Coordinated the conduct and completion of the pre-operational test program. Assisted the General Electric Company Shift Superintendent in the conduct of the routine shift operations and startup training.

1968 - 1970 SAXTON NUCLEAR EXPERIMENTAL CORPORATION
Qualified as a reactor operator and received AEC license on September 11, 1968. Assigned to an operating shift section for reactor operations and tests. Performed fuel handling for inspection and loading of the Saxton Core III.

Assisted in the training of Westinghouse Corporation trainees during their Saxton training phase. This included oral checkouts on plant systems, heading seminars on reactor theory, health physics and other topics, and personal instruction on plant operations (including actual reactor startups, shutdowns and maneuvering).

Supervised operation of the power plant as relief Shift Supervisor. Directed normal and test operations, coordinated on shift training.

1958 - 1967 U.S. NAVY

Engineering Officer of the Watch
Supervised the operation of the U.S. Naval Prototype DIG reactor for training cycles and engineering tests. Had leadership and administrative responsibilities for over forty enlisted students and twenty staff operators. Also instructed officer students and guided them in their academic progress.

Leading Reactor Technician
Supervised technicians on the operation and maintenance of all the U.S. Naval Prototype DIG reactor plant control, instrumentation and protective systems.

U.S. Naval Training Center; Bainbridge, Maryland
U.S. Naval Nuclear Power Training Unit; West Milton, New York (Trainee).
USS Enterprise (CVA(N) 65.
Entered the U.S. Navy nuclear power program at Bainbridge, Maryland. Received education in the following subjects related to nuclear engineering (on a junior college level): mathematics, classical and nuclear physics, reactor principles, heat transfer and fluid flow, engineering materials, radiological controls and reactor plant technology. This training was followed by qualification as a reactor operator at the DIG prototype and later aboard the USS Enterprise.

Duty at various stations as an Interior Communications Electrician.
These duties were comprised of maintenance and repair of interior communications systems, gyro compass systems, amplified and unamplified voice systems, instrumentation and control systems and related equipment.

Successfully completed the Naval Instructors School at Norfolk, Virginia in preparation for future assignments as an instructor.

JOHN PHILLIP BAYNE
RESIDENT MANAGER
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: Graduated with distinction U. S. Naval Academy, 1954.

Completed one year of nuclear power training April 1960. Designated as qualified for duty in connection with supervision, operation and maintenance of naval nuclear propulsion plants.

Graduated with distinction, U. S. Naval War College, 1966.

Master's Degree, International Affairs, George Washington University, 1966.

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Resident Manager, Indian Point 3 Nuclear Power Plant

Complete responsibility for the assumption of plant operation and administration from Consolidated Edison Company. Directed and developed policies for staffing, training, security, regulatory affairs, and spare parts. Responsible for takeover planning, budget management and implementation of the Quality Assurance Program. Represented the Power Authority of the State of New York as a member of the Consolidated Edison Company's offsite review committee.

1975 - 1976 — UNITED STATES NAVY
Head of the Plans and Requirements Branch of the Attack Submarine Division of the Office of the Chief of Naval Operations.

Served as a principal advisor to the Director of the Division on matters of long range planning and future requirements. Served as Project Officer of a study to delineate the critical operational characteristics of a submarine to meet the threat of the 1995 time frame, a study which will have a far reaching impact on the future of the Navy.

1973 - 1975 — UNITED STATES NAVY

Commanding Officer of a nuclear submarine tender. Responsible for the management, administration, training and budgeting for an activity which conducted maintenance and logistic support for ten modern nuclear submarines and one submarine rescue vessel. During this two years the

repair productivity was doubled, the supply effectiveness was increased by 30 per cent and the tender itself was significantly improved at a minimum cost by utilizing $500,000 dollars of parts cannabalized from inactive Navy ships. The improvements noted resulted in this tender being considered the leading intermediate maintenance activity in the submarine force of the U. S. Atlantic Fleet in May of 1975.

1972 - 1973 UNITED STATES NAVY

Submarine Division Commander - Responsible for the operational planning and training of three modern nuclear attack submarines and one rescue vessel.

1969 - 1972 UNITED STATES NAVY

Commanding Officer - Responsible for the management, administration, planning, training and budgeting for a modern nuclear attack submarine, this submarine was consistently considered one of the best of ten contemporary submarines and performed a mission never before done by a submarine.

1966 - 1969 UNITED STATES NAVY

Commanding Officer of one of Admiral Rickover's nuclear power schools, was responsible for the administration and training of 250 officers and 1200 enlisted personnel in basic and advanced science, reactor plant engineering and associated subjects. Directly responsible for a reduction in student disenrollment rate from 26 to 12 per cent.

1948 - 1966 Enlisted in the Navy. Won a fleet appointment to the U. S. Naval Academy and was graduated and commissioned an ensign. Served in many positions gaining the training and maturity necessary to become a commanding officer.

STEVEN H. CANTONE
SUPERINTENDENT OF POWER
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: B.E. Stevens Institute of Technology - Hoboken, N.J. 1963
Alexander Hamilton Institute Correspondence Course
1969 - 1971 Certificate of Completion

Special Training:

April 1969 - Attended a six week program, sponsored by Westinghouse Electric Corporation on large pressurized water reactor plant design.

January 1973 - Attended an intensified one week operator training program at Westinghouse's Zion Simulator

EXPERIENCE: POWER AUTHORITY OF THE STATE OF NEW YORK
Superintendent of Power
Indian Point 3 Nuclear Power Plant

Responsible for the proper staffing and organization of the Power Authority at the Indian Point Unit No. 3 site for the eventual take-over of the operations and maintenance activities from Consolidated Edison. Responsible for the coordination and direction of the activities performed by the Operations, Maintenance, Instrumentation and Controls, Radiological and Environmental Services, and Technical Services Superintendents so as to assure safe and dependable plant operation in accordance with the applicable regulatory requirements. Act for the Resident Manager in his absence.

1974 - 1976 CONSOLIDATED EDISON COMPNAY OF NEW YORK
Chief Operations Engineer - Indian Point Station

Responsible for overall operation of all three nuclear units at Indian Point.

1972 - 1974 Operations Engineer - Indian Point Unit No. 3

Responsible for development and administration of Indian Point Unit No. 3 startup program, including: training, development of administrative controls, writing of system descriptions and operating procedures and organization of the pre-operational test program.

During this period of time, temporarily served as Shift Supervisor for Indian Point Unit No. 2 during its startup program for a period of five months.

1969 - 1972 Superintendent, Performance

Retained previous Unit No. 2 responsibilities and assumed responsibility for direction of the Performance and Chemical Departments.

1966 - 1969 Production Engineer - Indian Point Station

Instructed operators for licensing purposes on Indian Point Unit No.1; served as Refueling Supervisor on Indian Point Unit No. 1; wrote Indian Point Unit No. 2 System Descriptions and Operating Procedures; and trained operators, foremen and startup staff for licensing on Indian Point Unit No. 2.

1965 - 1966 Production Engineer - Ravenswood Generating Station

Trained operators for Ravenswood Unit No. 3, a 1000 MWe oil fired unit; and participated in startup program of Ravenswood Unit No. 3 as Shift Engineer.

1963 - 1965 Cadet Engineer

Participated in a rotational training program that included job assignments in Engineering, Construction and Production.

EDMUND TAGLIAMONTE
OPERATIONS SUPERINTENDENT
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: Harren High School of Aviation
Brooklyn Technical School
American School of Chicago Correspondence School
Licensed at Senior Reactor Operator Level for Indian Point Unit 1, Unit 2 and Unit 3

Special Training:

Indian Point Unit No. 1 Reactor Operator Training Program - 1960
One Week Training at Westinghouse Zion Simulator 1973

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Operations Superintendent
Indian Point 3 Nuclear Power Plant

Responsible for overall day to day operations of the plant including the review of operating data to ensure safe reliable plant operation and supervision of operating personnel both union and management. Coordinate the licensing and requalification of operating personnel.

Direct the activities of NRC licensed personnel within the framework of the technical specifications for Indian Point 3.

Responsible for coordinating plant outages involving major maintenance.

1973 - 1976 — CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point Station
Watch Coordinator

Responsibilities included work load planning for Indian Point Unit No. 3. These duties included the direct management of evolutions for normal and testing operations.

Responsible for the qualification of Senior Reactor Operators, Reactor Operators and Nuclear Plant Operators.

Attained intimate knowledge of the Indian Point Site through personal involvement in the startup, testing and operating phase of all three units.

Responsible for interface with the station maintenance forces for the planning and implementation of maintenance work and procedures.

Supervised 30 employees; 5 management and 25 union people.

1970 - 1973 CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point Station
Senior Reactor Operator and Watch Foreman Unit 2

Held Senior Reactor Operators license on Unit 1 270 MW Electric and Unit #2 1000 MW Electric. Responsible for overall operation of Unit 2.

1961 - 1970 CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point Station
Senior Reactor Operator Unit 1

Responsible for overall operation of reactor and oil fired plant. On numerous occasions assumed the duties of Watch Foreman.

1954 - 1960 CONSOLIDATED EDISON COMPANY OF NEW YORK
Gold Street Generating Station - Brooklyn, New York
Electric Mechanic B, Senior Production Operator A

Control of high and low tension boards in 90 MW Conventional Station.

SALVATORE S. ZULLA
TECHNICAL SERVICES SUPERINTENDENT
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: B.E.E. Manhattan College - Riverdale, New York 1963

EXPERIENCE:

1976 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Technical Services Superintendent
Indian Point 3 Nuclear Power Plant

Responsible for all onsite technical support related to plant performance. These duties include onsite engineering support, reactor performance monitoring, surveillance testing and establishment of the document control and record retention system.

1975 - 1976 — CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point Station
Operations Engineer - Unit 3

Responsible for the overall administration of Unit 3 Operations and the Startup Test Program.

1971 - 1975 — CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point Station
Engineer - Unit 3

Provided technical support for the Unit 3 Startup Program. Coordinated the preparation of system descriptions, operating procedures and training material for Unit 3 personnel.

1969 - 1971 — CONSOLIDATED EDISON COMPANY OF NEW YORK
Astoria Station
Production Engineer

Responsible for maintenance and operation of the Astoria Gas Turbine Station.

1967 - 1969 — GENERAL DYNAMICS/ELECTRIC BOAT DIVISION - Groton, Connecticut
Assistant Chief Nuclear Test Engineer

Responsible for the overall administration of the test program on S5W and S4G Naval Nuclear Power Plants.

1968 - 1968 GENERAL DYNAMICS/ELECTRIC BOAT DIVISION, Groton, Connecticut
Senior Test Engineer

Responsible for the direction and performance of all phases of testing on S5W Naval Nuclear Power Plants including initial criticality and power range testing of new reactor cores.

1963 - 1965 GENERAL DYNAMICS/ELECTRIC BOAT DIVISION, Groton, Connecticut
Test Engineer

Assisted in testing of Naval Nuclear Power Plants. Participated in a one year training program to become qualified by the Atomic Energy Commission and General Dynamics Management Personnel as a Senior Test Engineer for S5W Nuclear Power Plants.

JOHN JOSEPH KELLY
RADIOLOGICAL AND ENVIRONMENTAL SERVICES SUPERINTENDENT
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION:

B.S. (Chemistry) Manhattan College - Riverdale, N.Y. 1963
M.S. (Analytical Chemistry) Polytechnic Institute of Brooklyn 1967
M.S. (Management) Manhattan College (in progress)
Riverdale, N.Y.

Honors

New York Regents Scholarship
New York Graduate Teaching Fellowship

Published Articles

"Manganese 54: Fractional Distribution in Wheat and Occurrence in Other Foods." Nature 209, 1081-3 (1966). "Prediction and Measurement of Effect of Chelating Selectivity on Precipitation Reactions." Talanta 13, 1573-85 (1966). "The Relative Dissociation Constants of Hydrochloric, Hydrobromic, Hydriodic, Nitric and Perchloric Acid in Pyridine. A Hydrogen Electrode Study." J. Phys. Chem 71, 2348-50 (1967)
"Strontium-90 and Cesium-137 Measurements of Large Volume Sea Water Samples." Government report HASL-196 (April, 1968).
"Equilibria in Pyridine I." J. Phys. Chem. 72, 3410-5 (1968).
"Equilibria in Pyridine II." J. Phys. Chem. 73, 580-4 (1969).
Chapter: "Neutron Activation Analysis." in the book "Techniques of Ultrapurity," edited by Zief & Speights, Marcel Dekker, New York (1972)

EXPERIENCE:

1976 to date

POWER AUTHORITY OF THE STATE OF NEW YORK
Radiological and Environmental Services Superintendent
Indian Point 3 Nuclear Power Plant

Overall responsibility for the onsite Health Physics Program, Environmental Services, chemical and radiochemical control of process systems. Interview and select staff personnel and develop policies and procedures attendant to these responsibilities. Organize radiation and environmental monitoring programs in accordance with regulatory requirements. Responsible for the Emergency Plan Procedures, custodianship of calibration source material, and nuclear shipments leaving the plant. Direct personnel training for the aforementioned disciplines and evaluate training program results.

1970 - 1976 CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point Station
Station Chemistry Director

Managed an organization responsible for all chemical and radiochemical analyses of plant and effluent samples for a nuclear site with three pressurized water reactors. This has included personnel and equipment budget planning, preparation of purchase specifications and evaluation of equipment vendors. Supervised training of chemistry personnel and the chemistry and radiochemistry training of operations and maintenance personnel. Directed the preparation of all chemistry administrative directives and procedures, and participation in development of plant technical specifications. Responsible for design and supervision of quality control for chemical and radiochemical analyses performed in-house and by vendor laboratories. Evaluated results of chemical and radiochemical analyses. Prepared external and internal reports on plant chemistry and effluents and provided coordination of inspections of chemistry by regulatory agencies and others.

Responsible for planning, staffing and equipping a laboratory to provide for compliance with the offsite radiological environmental monitoring requirements of the site technical specifications. This included the establishment of a whole body counting facility for monitoring plant personnel and overall responsibility for the operation of these facilities and preparation of reports summarizing the results of these programs.

1968 - 1970 INDUSTRIAL REACTOR LABORATORIES - Rutgers University
Chief Chemist

Industrial Reactor Laboratories utilized a 5 megawatt swimming pool type nuclear reactor for the production of radioisotopes and for research and development. Primary responsibility was the establishment and operation of a neutron activation analysis laboratory to perform trace element analyses for state agencies, the university and industry in the area. This included budget planning, preparation, and purchasing, as well as providing the professional skills necessary to the program. The position involved supervision of two skilled technicians in the development of analytical procedures for use in the laboratory and the presentation of lectures on radiochemistry and neutron activation at the university,

professional society meetings and local industrial organizations. Directed the training of power reactor operating personnel in a radiochemistry laboratory course held at Industrial Reactor Laboratories. Initiated the use of a time-shared computer service at the laboratory for processing of experimental data, computer simulation of experiments and for maintaining a continuous uranium inventory for the reactor operations group. Responsible for performing dosimetry and radiation chemistry experiments and quality control related to the production of radioisotopes in the reactor. The position involved the handling of millicurie to curie amounts of radioactivity.

1962 - 1968 U. S. ATOMIC ENERGY COMMISSION - New York, New York
Chemist

Duties involved development of new analytical procedures for determining radioisotopes and elements of interest in the atomic energy program. The position involved extensive use of nuclear instruments such as alpha and gamma spectrometers as well as beta counters and non-dispersive X-ray fluorescence spectrometers. Performed trace element analysis using an atomic absorption spectrometer and a polarograph. My duties included the writing of several computer programs in the FORTRAN IV language for an IBM 360/30 computer. These programs were written for the processisng of experimental data. The handling of microcurie to millicurie amounts of radioactivity was required in this position.

EDWARD G. BROCKBANK
TRAINING CO-ORDINATOR
INDIAN POINT 3 NUCLEAR POWER PLANT
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: U. S. Navy Schools in Nuclear Power, Submarines, Interior Communications Technician - 1963
DeVry Technical Institute, Chicago, Illinois - 1967
IBM - Lansing, Michigan - Office Products Training - 1968
Lansing Community College, Lansing, Michigan - 1973

EXPERIENCE:

1977 to date — POWER AUTHORITY OF THE STATE OF NEW YORK
Training Coordinator
Indian Point 3 Nuclear Power Plant

Responsible for development, conduct and documentation of training for all plant employees.

1974 - 1977 — WESTINGHOUSE NUCLEAR TRAINING CENTER - Zion, Illinois
Training Engineer and Licensed Senior Reactor Operator

Responsibilities consisted of simulator training and classroom instruction on these units. Qualified numerous operators for NRC hot licensing exams and have been involved in retraining and cold licensing certification programs.

Also maintained simulator training materials, wrote lesson plans and assisted with program development. Completed a comprehensive comparison study between Indian Point Unit Three and Zion Station. Prior to this I prepared a study between the Indian Point and Westinghouse simulators.

1973 - 1974 — CONSOLIDATED EDISON COMPANY OF NEW YORK
Indian Point
Instructor of Simulator Training - Units Two and Three

Assisted in the factory acceptance tests for the Simulator when located in Silver Springs, Maryland and at its installation at the Indian Point Site. Assisted in the training of the Unit Three Reactor Operators in preparation for AEC licensing examination. Sixteen persons were trained on the Simulator, of which three are Watch Foremen. All satisfactorily passed a Westinghouse examination.

Wrote procedures for the start-up of the Isolation Valve Seal Water System, the filling and draining of the Component Cooling Water System and assisted in the preparation of the Pump Maintenance Schedule.

1969 - 1973 MICHIGAN STATE UNIVERSITY
AEC Licensed Senior Reactor Operator

Assisted Gulf with the initial fuel loading for criticality and worked with them on the post-critical data collection for the facility.

As an AEC licensed Senior Reactor Operator I was charged with the complete day to day operation of the reactor. These duties included reactor usage and maintenance scheduling, daily and weekly checks, parts and supply acquisition, and the assurance of the proper health physics procedures.

Time was spent in operator training, equipment testing and calibration, and record keeping for the facility and for periodic AEC inspections. Responsible for the updating of the maintenance and training manuals to keep with the current facility philosophy and operation. Completed a survey studying the potential users of the facility with recommendations for facility expansion, education, and areas of research potential.

1963 - 1969 IBM CORPORATION
Customer Engineer

Responsible for the inspection and maintenance of 400 pieces of typewriter and dictation equipment. A portion of the job included training of new men and aiding customers with problems in application and use of their equipment.

1959 - 1963 UNITED STATES NAVY
Interior Communications Electrician, 2nd class (SS)

Various Electrical and Electronic Naval Schools pertinent to rating. Volunteered for and received submarine training. Applied for Nuclear Power School, New London, Connecticut.

Second six months practical training on General Electric S3G, West Milton, New York.

Orders received for USS Skipjack, SSN585. Complete submarine qualification.

PAUL F. AHERN
NUCLEAR OPERATIONS ENGINEER
POWER OPERATIONS
POWER AUTHORITY OF THE STATE OF NEW YORK

EDUCATION: Worcester Junior College, Worcester, Massachusetts, A. E. Electrical Engineering, 1954
Holy Cross College, Worcester, Massachusetts, 1951-1952

Special Training:

1955 - Attended course on mechanical maintenance sponsored by Worcester County Electric Company Worcester, Massachusetts - Certificate of Achievement

1954-1959 - Attended preparation courses for Massachusetts Stationary Steam Fireman and Engineer Licenses - Worcester Boys Trade School Worcester, Massachusetts

1961 - Reactor Operator Training and License Preparation Course, Yankee Atomic Electirc Company Rowe, Massachusetts

1966-1967 - Site Training Course - Connecticut Yankee Atomic Electric Company, Haddam Neck, Connecticut

1977 - Nuclear Safety Short Course - Georgia Institute of Technology, Atlanta, Georgia

REGISTRATION: Second Class Stationary Steam Engineer's License, Massachusetts
Senior Reactor Operator License, Connecticut Yankee Atomic Power Company, Haddam Neck Plant, 1967-1974
Reactor Operator License, Yankee Atomic Electric Company, Yankee-Rowe Plant, 1962-1967

EXPERIENCE:

POWER AUTHORITY OF THE STATE OF NEW YORK
Nuclear Operations Engineer
Power Operations

1976-Present

Responsible for providing primary contact for Headquarters/site communications. Provides operational review and comment on new plant design, proposed plant modifications; bid specifications, and purchase orders. Provides input in the preparation, review and commenting on proposed changes to the Technical Specifications, Standards, Regulatory Guides, NRC submittals, and applicable headquarters programs. Acts as member of special study groups on operational matters with other utilities as well as within the Authority. Maintains status of and coordiantes the activities of various Headquarters and outside groups in support of plant operation.

1974-1976

NUS CORPORATION - ROCKVILLE, MD., PRINCIPAL TRAINING ENGINEER

Responsible for the development of plant operator training programs, plant operational procedures, off-site review board charters and operational quality assurance training programs for nuclear power stations. Conducted lectures and presentations in these subjects.

1973-1974

CONNECTICUT YANKEE ATOMIC POWER COMPANY
Operating Supervisor - Haddam Neck Plant

Was responsible for reactor safety, scheduling and directing plant operations, coordinating operating, testing and maintenance activities, training and qualification of plant operating personnel, review of surveillance test results and plant procedures, issuance of special procedures, and revision of plant operating and emergency procedures.

1971-1973

Shift Supervisor

Functioned as Training Coordinator and assistant to the Operating Supervisor in the operation of the facility and administration of the Operating Department. Acted for the Operating Supervisor in his absence. Functioned as Duty Officer in advisory capacity to the operating shifts on assigned rotating schedule.

1965 - 1971 Technical Assistant and Shift Supervisor

Instructed in original site training school prior to plant startup. Participated in initial fueling and startup test phases of the plant and plant systems. Was also responsible for following, check-out, and acceptance of various systems during construction phase. As Technical Assistant, participated in initial drafting of plant operating and emergency procedures. As Shift Supervisor was responsible for the safety and operation of the plant on a shift basis. Acted as shift coordinator during refueling activities.

1960 - 1965 YANKEE ATOMIC ELECTRIC COMPANY
Control Room Operator, Yankee-Rowe Plant

Performed all duties required of the Control Room Operator for safe and efficient operation of the plant. Participated in initial fueling and subsequent refueling operations and initial system checkout and testing. Participated in startup testing and power escalation test program as well as normal plant operation. In 1965 was placed on special assignment to the Connecticut Yankee Atomic Power Company project to participate in program for drafting normal and emergency operating procedures.

1954 - 1960 WORCESTER COUNTY ELECTRIC COMPANY

Various positions involved in the startup, operation and shutdown of 14 stoker fired boilers and 5 turbine - generators, and associated auxiliary equipment.

PUBLICATION

Ahern, P. F. "Written Procedures - Blueprints for Safe Operations"

Presented at the ANS Topical Meeting, Albuquerque, New Mexico, August, 1975.

EMERGENCY PLAN

INDIAN POINT 3 NUCLEAR POWER PLANT

Docket #50-286

POWER AUTHORITY OF THE STATE OF NEW YORK

1 April 1977

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INDIAN POINT 3 NUCLEAR POSER PLANT EMERGENCY PLAN

1.0 INTRODUCTION

The Indian Point 3 Nuclear Power Plant (IP3) is situated on a 103 acre tract of land on the east bank of the Hudson River at Indian Point, Village of Buchanan in Upper Westchester County, New York. IP3 is located adjacent to and south of Indian Point Unit No. 1. The Indian Point Unit No. 2 plant is adjacent to and north of Unit No. 1. Units Nos. 1 & 2 are owned by the Consolidated Edison Company of New York, Inc. (Con Ed). IP3 is owned and operated by the Power Authority of the State of New York (Authority).

The IP3 Emergency Plan describes the organization, responsibilities, and actions to be taken in the event of the occurrence of either a radiological or non-radiological emergency. Written procedures to implement this Emergency Plan are contained in the Emergency Plan Procedures Document.

2.0 SUMMARY OF EMERGENCY PLAN

The plan encompasses the effects of IP3 accidents and incidents upon the public, plant employees and property both on and off-site. This plan prescribes the action which is to be taken in order of priority, the responsibilities of personnel for taking such action and summarizes the personnel and material resources available for assistance.

There are three phases of responsive action. The first phase includes the initial actions directed toward the protection of personnel and evaluating the category of the emergency. The second phase includes the planned action to terminate the incident; monitoring both on-site and off-site areas to assess the extent of any release of radioactivity; and notification of off-site supporting agencies. The third phase is to restore the facility to its normal operating condition.

The first phase will be conducted by in-plant watch operations personnel with the assistance of other on-site personnel. The second phase will be controlled by the Emergency Director from the Emergency Control Center with the assistance of appropriate non-watch personnel. The Emergency Director will also work with supporting groups for medical, fire fighting and civil control to protect the general public. The third phase will be the responsibility of the Resident Manager.

During normal working hours, Monday through Friday, non-watch personnel can provide immediate response to emergencies. Additional time may be required to "man" the Emergency Control

2.0 (Continued)

Center on the off-watches. Until "manned," the Shift Supervisor will be in charge.

Figure 1 shows the IP3 Staff and Operations Organization. The Staff will assist Operations personnel as required. Figure 2 shows the IP3 Watch Organization.

3.0 EMERGENCY CONDITIONS

Refer to Table 1, Emergency Conditions, on the following page for a listing of the Emergency Classification, the Description thereof, associated Conditions, and Possible Actions which may be performed.

This Table covers a spectrum of potential situations, and enumerates some possible preliminary actions to be taken by the designated emergency organization personnel.

A description of each emergency classification is given which will allow the Emergency Director to characterize the emergency.

3.0 EMERGENCY CONDITIONS

Table 1

Emergency Classification	Description	Conditions	Possible Actions
Personnel Emergency	Accidents or occurrences involving a few individuals which have no potential for escalation to more severe emergency conditions.	Usually no effect on plant. Personnel injuries may involve contamination or excessive radiation exposures.	Emergency Treatment of individuals. No need to alter plant status. Possible activation of first aid team and/or ambulance and medical services. NRC notification.
Local Emergency	Condition caused by a radiological condition (or an act of nature) that makes an area within a building unsafe.	Unexpected high radiation within local area. One Radiation Monitoring System (RMS) channel (or a local monitor) is in high alarm. Flooding or localized fire.	Local area evacuation. Possible evacuation of an entire building or the controlled area. Possible activation of Fire or Police services. Perform personnel accountability for the affected areas. NRC notification.
Plant Emergency	Radiological condition (or an act of nature) that may require personnel evacuation of Reactor and Auxiliary Buildings; or high radiation area in the Assembly Area.	Unexpected high radiation area throughout several buildings. Two or more RMS channels alarming simultaneously. Forty times MPC_a levels outside the controlled area.	Evacuation of all affected buildings. Possible evacuation of all IP 3 buildings. Possible activation of Fire or Police services. Accountability of evacuees. NRC notification.

4.0 (Continued)

4.2 (Continued)

4.2.2 Indian Points Units 1 & 2 (Con Ed) Support

Units 1 & 2 can supply the following services and personnel:
First Aid Personnel
Nursing and Medical Personnel
First Aid Room - Decontamination Suite at Unit 1
Vehicles, radio and equipment and staff for off-site radiological environmental monitoring
Watch, Health Physics and Chemistry Personnel
Availability of a Radiological Environmental Laboratory including staff for sample preparation, counting and data interpretation
Radiological Protection Personnel

4.2.3 Local Services Support

Ambulance - Verplanck Volunteers Ambulance Corps (24 hour coverage with backup available)
Fire - Buchanan and Verplanck Fire Departments
Medical - Con Ed contract physicians are available locally for Authority use
State Police - Troop K in Hawthorne, N.Y.
Local Police - Peekskill and Buchanan Police Departments

4.3 COORDINATION WITH STATE AND COUNTY AGENCIES

The principal state agency responsible for radiation accident emergency planning is the N.Y. State Department of Health (Section 201, N.Y. Public Health Law, Part 16). The N.Y. State "Emergency Plan for Radiation Accidents" is the applicable coordinating document (located in the Emergency Plan Procedures Document). The N.Y. State Commissioner of Health is empowered to recommend implementation of off-site protective actions. The N.Y. State Division of Military and Naval Affairs (when directed by the Governor) will coordinate the assistance to be furnished by various Federal and State departments and agencies, and the governmental forces from political subdivisions.

4.3.1 Participating Agencies

Name	Location	Notification
Department of Health	Albany, N.Y.	To N.Y. State Warning Point

3.0 EMERGENCY CONDITIONS

Table 1 - Continued

Emergency Classification	Description	Conditions	Possible Actions
Site Emergency	Conditions described in Plant Emergency which carry over to Units 1 or 2, or LOCA with high containment pressure, or large release of activity from spent fuel storage buildings.	Conditions described above which carry over to Units 1 or 2. Vent radiogas monitor maintains full scale. A high Radiation Area (125 mR/hr or greater) at the Unit 1/2 and IP3 common fence. RMS R-10 reads less than 300 mR/hr.	Possible evacuation of IP 3 & Units 1 & 2 sites large sections thereof. Accountability of evacuees. State notification. Perimeter monitoring. NRC notification.
General Emergency	Emergency conditions extend or threaten to extend beyond the site boundary and affect off-site personnel or property.	LOCA with RMS R-10 greater than 300 mR/hr. Vent monitor full scale. 125 mR/hr at site perimeter or 8.1×10^{-7} μCi/cc of ^{131}I at IP 3 site perimeter.	Actions as per Site Emergency plus off-site monitoring. Notifications of State, NRC, etc. Establish ECC as soon as possible.

4.0 EMERGENCY ORGANIZATION

4.1 IP3 Staff and Operations Organization (Figure 1)

The normal shift operations crew (Watch Organization - Figure 2) consists of five (5) plant personnel: One (1) Shift Supervisor, one (1) Senior Reactor Operator, one (1) Reactor Operator, and two (2) Nuclear Plant Operators. All have been trained in fire fighting, radiation protection and rescue and are capable of self-monitoring.

During emergencies this operati
an emergency survey team, as the fire brigade, and as a rescue brigade. The Shift Supervisor on duty will act as the Emergency Director until other members of the operating staff arrive at the plant; the ranking member will then act as the Emergency Director. The order of rank is as follows:

1. Resident Manager
2. Superintendent of Power
3. Radiological and Environmental Services Superintendent
4. Technical Engineering Superintendent
5. Shift Supervisor called in
6. Shift Supervisor on duty

The Emergency Director (ED) will direct all emergency operations in accordance with the Emergency Procedures. He will assign duties and delegate responsibilities to members of the operating staff. He will ensure that all personnel present on the IP3 Site are accounted for. He will also promptly notify Unit 2 Control Room and ensure that all necessary contacts with Local, State, and Federal authorities are made.

The Radiochemistry, or Radiation Protection Supervisor or his designatee will direct survey teams, tablulate and evaluate survey results and apprixe the ED of the status of radiological conditions. Other plant personnel will be utilized as required for surveying and observing.

4.2 AUGMENTATION OF IP 3 EMERGENCY ORGANIZATION

4.2.1 Headquarters' Support - (Figure 4)

Authority headquarters in New York City can supply qualified personnel in the following areas:
Radiation Protection (including consultants specializing in Emergency Response)
Environmental Surveillance and Effects Analysis
Engineering
Public Relations and Information Release
Security and Safety Services
Administration

4.0 (Continued)

4.3 (Continued)

4.3.1 (Continued)

Name	Location	Notification
Dept. of Health (cont)	Albany, N.Y.	Via telephone or State Police radio.
(Bureau of Rad. Health is the cognizant subdivision)		
Westchester County CD	White Plains, N.Y.	To 24 hour County Communications center via telephone or State Police radio.
Rockland County CD	New City, N.Y.	To 24 hour County Communications Center via telephone or State Police radio.

4.4 COORDINATION WITH FEDERAL AGENCIES

4.4.1 Energy Research & Development Administration (ERDA)

The ERDA has the responsibility for the nationwide Radiological Assistance Plan (RAP). Specializing in radiation safety, medicine and public information and safety, they assist the Emergency Director at his request. He may obtain this assistance by dialing the 24 hour telephone number listed in the Emergency Plan Procedures Document.

4.4.2 U.S. Coast Guard

During a radiation incident which could involve exposure to off-site personnel, the U.S. Coast Guard will assist by maintaining traffic control on the Hudson River. The Coast Guard may also be utilized to keep unauthorized personnel from entering the IP3 site until the emergency conditions are remedied. Assistance is obtained by calling the 24 hour telephone number listed in the Emergency Plan Procedures Document.

4.4.3 Nuclear Regulatory Commission - Region I

Early notification is required as per IP3 Technical Specifications and Code of Federal Regulations Title 10, Part 20. The role of the NRC is as a regulatory and investigatory agency, rather than as rendering emergency assistance.

5.0 ASSESSMENT ACTIONS

5.1 ACTIVATION OF EMERGENCY ORGANIZATION

Notification of the emergency and the subsequent call in of the support personnel will be accomplished by the Emergency Director (or an assistant, when directed by the Emergency Director). An audible variable pitch generator tied to the Public Address System is used to alert personnel who are working within the IP3 buildings or on the site property of such emergencies as fire, natural disaster, or evacuation due to radiological problems.

5.2 ASSESSMENT ACTIONS

Effective coordination and direction of all elements of the emergency organization require continuing assessment throughout the duration of the emergency situation. These assessment functions include the following:

Surveillance of control room instrumentation and emergency control center monitors (installed radiological readouts)
Surveillance of containment integrity
In-plant radiological surveys
Site and site boundary surveys
Environmental surveys and monitoring
Data report reduction and analysis
Notification of assessment results

5.3 CORRECTIVE ACTIONS

5.3.1 Radiological Emergencies

If 2 or more area monitors are in high alarm, or if an airborne monitor is in high alarm in the restricted area, this area would be evacuated to the appropriate assembly area until the condition was investigated and corrected. If surveys of the assembly area or any other unrestricted area indicate high radiation (greater than 100 mR/hr) or high airborne activity (greater than 40 times MPC_a) the applicable area or building will be evacuated. Essential operations personnel will be assembled in the control room which may be put on emergency ventilation supply. As soon as practicable, the Emergency Director and his staff will occupy the Emergency Control Center, which is located in the main building at the Consolidated Edison Indian Point Service Center, which is adjacent to the Units 1 & 2, and IP3. Should it be necessary to evacuate this Emergency Control Center, an alternate is available at the Consolidated Edison Peekskill Substation (800 Central Avenue, Peekskill, N.Y.).

5.3.2 Fire Fighting

5.0 (Continued)

5.3 (Continued)

5.3.2 (Continued)

The purpose of the fire fighting plan is to provide for the prompt and effective handling of any fire, regardless of the size or presence of radioactivity. The fire protection system at the IP3 site is designed to handle the outbreak of fire anywhere in the plant. The system is composed of various subsystems to permit maximum flexibility of response to contain and extinguish major fires. These subsystems include a water supply, fire extinguishing systems of both automatic and manual types covering hazardous points, with related automatic detection devices, and manual fire fighting equipment consisting of hose reels and fire extinguishers.

The fire fighting group at IP3 is known as the Permanent Fire Fighting Brigade. The initial response would be to alert the station and report with fire fighting equipment located throughout the station to the scene of the fire. The fire fighting activities are directed by the Shift Supervisor on duty. Additional fire fighting equipment and manpower is available from both the Verplanck and Buchanan fire departments. All members of the Permanent Fire Fighting Brigade have undergone training in fire fighting techniques.

5.3.3 Repair and Damage Control

The repair or damage control team will usually be dispatched by the Shift Supervisor. He will obtain up to date radiological conditions for the areas of interest, determine the best route to take to the job site, and ensure that each member of the team has proper protective clothing, dosimeters and tools and materials required to carry out the assignment. A person trained in health physics will accompany this team if they are entering a radiologically hazardous area.

5.4 PROTECTIVE ACTIONS

5.4.1 Exposure of Search, Rescue, and Monitoring Teams

In the event of a serious emergency, a dose up to 100 rem may be received once in a lifetime to save the life of a person. If time permits adequate planning and protection, this dose should be limited to 12 rem. The Emergency Director, with the assistance of the operations staff, will make the judgement based on monitoring, survey data, and the risk/benefit factors

5.0 (Continued)

5.4.1(Continued)

involved for each situation. Radioiodine prophylaxis will be practiced whenever needed.

5.4.2 Rescue

The purpose of the Rescue Plan is to rescue a person who may be trapped or disabled in some area of the site.

Upon discovery of a trapped or disabled person a Rescue Team is dispatched to the location, bringing with them proper equipment. On the basis of inspection of the area, the rescue may be complicated by conditions such as fire or high radiation. In this case the brigade will retire to a safe location and plan a method of rescue. If the situation involves a contaminated injury steps outlined for contaminated injury treatment will be followed.

5.4.3 Contaminated Injury

The purpose of the Contaminated Injury Plan is to assure that prompt medical care is given to the patient without unnecessary spreading of contamination.

Upon discovery of a contaminated-injured individual, normal first aid techniques are used and a survey is made to determine contamination levels. If practicable, gross contamination is flushed away using water.

As soon as practicable, the patient will be taken to the First Aid-Decontamination Suite located at Unit 1 where extensive first aid and decontamination can be carried out. If necessary, attendant first aid/nursing personnel can talk directly to the Peekskill Community Hospital Emergency Room Physician utilizing the radio or the telephone provided in this Suite.

The appropriate hospital can be notified and asked to prepare for the arrival of a contaminated-injured patient. Once at the hospital, a person trained in health physics techniques will provide assistance to the medical staff in handling any problems associated with contamination and radiation.

5.0 (Continued)

5.4 (Continued)

5.4.4 Personnel Accountability

All persons within the IP3 Security Fence will be either trained in Personnel Accountability Procedures or will be escorted by someone who is trained in these Procedures. All persons being instructed to evacuate or assemble will proceed to their respective Assembly Areas for accountability. Specific accountability procedures for both the 8 to 4 Watch as well as the Off-Watch are found in the Emergency Plan Procedures Document.

5.4.5 Notification of Off-Site Groups Near The IP3 Site

The State of New York, Department of Health is responsible for coordinating and ordering all notifications and protective actions off-site during a Site emergency. Reference the "New York State Emergency Plan for Major Radiation Accidents Involving Nuclear Facilities" prepared by New York State Department of Health and New York State Division of Military and Naval Affairs. This includes any protective actions which may be required for the general public, and nearby businesses.
cooperation of nearby businesses have been obtained by New York State.

5.4.6 Use of Protective Equipment and Supplies

Whenever needed, the Emergency Director will order the use of protective equipment and supplies in order to minimize the effects of radiological exposures or contamination. Included in this supply list are respiratory equipment, protective clothing, eye shields, radioiodine prophylaxis, and proper dosimetry. The specific lists of these items, their locations, and the criteria for issue are found in the Emergency Plan Procedures Document.

5.5 MEDICAL SUPPORT

5.5.1 Decontamination and First Aid

Because of the potential need for Medical Services to accident victims during and after an accident, medical facilities have been provided for at the Site and, if necessary, hospital facilities are available off-site.

5.0 (Continued)

5.5 (Continued)

5.5.1 (Continued)

The nuclear First Aid-Decontamination Suite facilities are housed in two (2) rooms located at 72 feet elevation of Unit No. 1 Nuclear Service Building. This Suite includes a stainless steel decontamination (autopsy) table, foot sink and hand sink, stainless flooring with drains to holdup tank, complete first aid and medical supplies for life support and minor surgery. Here a Medical team of a Doctor, Nurse and Health Physics Technician can minister to a spectrum of medical emergencies from first aid for cuts and bruises to minor surgical procedures for the removal of radioactive foreign bodies imbedded in the patient. Preliminary treatment including decontamination is accomplished at this facility before moving the patient off-site.

IP3 has a small First Aid Room located on elevation 35 feet. This room contains general first aid equipment, oxygen breathing apparatus and an examining table where patients can be treated prior to being transferred to the First Aid-Decontamination Suite in Unit 1.

5.5.2 Medical Transportation

Arrangements have been made for transporting injured persons via the Verplanck Ambulance Association who provide 24 hour service with backup from other local communities. The Verplanck Ambulance Drivers participate at least once per year in the annual medical emergency drill. In addition, a training program is provided at least every other year.

Shadow shielding and plastic sheets are available in the First Aid-Decontamination Suite for use in case residual contamination remains on a patient.

5.5.3 Physicians

Arrangements have been made with Consolidated Edison for both routine and emergency medical services. Physicians at the nearby Peekskill Community Hospital will participate in at least one drill per year and will be given a seminar to acquaint them with the special precautions and techniques required for care of patients with radiocontamination.

5.0 (Continued)

5.5 (Continued)

5.5.4 Physicians Specializing in Radiation Emergency Patient Care

In the unlikely event that a patient should receive a massive radiation exposure, Dr. Eugene Cronkite from Brookhaven National Laboratory Hospital (Chairman, Medical Department) would supervise the case. Dr. Cronkite is a consultant to the Consolidated Edison Medical Department and is available to supervise such cases, as well as assist in specialized training of medical personnel.

5.5.5 Hospital Facilities

The Peekskill Community Hospital has agreed to accept an injured/contaminated/irradiated patient from IP3. This is a modern 100 bed hospital with facilities to include a complete emergency room laboratory, radiology department and Nuclear Medicine Department.

5.5.6 Brookhaven National Laboratory Hospital

This hospital has a specialized facility for the care and definitive treatment of highly irradiated/contaminated patients. It has a sophisticated radiosurgery decontamination suite as well as a reverse isolation ward. This hospital would only be utilized in the highly unlikely situation of a massive exposure or an unusually difficult contamination case or an overflow of patients which could not be handled locally.

6.0 EMERGENCY FACILITIES

6.1 EMERGENCY CONTROL CENTER (ECC)

With the declaration of a Site or General Emergency, the activities of supporting personnel will usually be coordinated from the ECC (an office in the Consolidated Edison Service Center, adjacent to the IP3 Site). At this location there are numerous telephone connections with the Control Rooms of Units 2 & 3 and IP3 with the Authority/Indian Point Site Personnel Headquarters, with the Authority New York Corporate Offices, and with the Consolidated Edison Eastview Service Center. A full spectrum of emergency equipment is stored in the ECC for personnel protection and for determining the magniture of releases. Extensive parking areas are available for called in supporting personnel. Located at this center are emergency radiological monitoring equipment, protective clothing, and respiratory devices. Access to this facility is by either interior or exterior roads.

6.0 (Continued)

6.1 (Continued)

The Service Center is not part of the Site Exclusion Area. The facility includes, besides the Emergency Control Center, the following:

Gasoline service for vehicles
Garage repair facilities
Indian Point Units 1 & 2 Storeroom
Indian Point Units 1 & 2 Medical Facility (Clinic)
Toilet, shower and locker facilities, as well as miscellaneous office spaces.

6.2 ALTERNATE EMERGENCY CONTROL CENTER (AECC)

When and if the Emergency Control Center becomes untenable an alternate location available at the Peekskill Substation (800 Central Avenue, Peekskill, N.Y.) will be utilized. Communication facilities have been installed at this alternate center to allow the Emergency Director to maintain control of the emergency. Refer to Figure 3 for a map showing the location of both the ECC and AECC.

6.3 COMMUNICATIONS

There exists different avenues for communication within the Units 1 & 2, and IP3, between the Units 1 & 2 and IP3, between the Units 1 & 2, IP 3, and the Emergency Control Center, and between the Emergency Control Center and State and Government Agencies.

The public address system is designed for paging throughout Units 1 & 2, and IP3 from the IP3 Control Room (CR). Personnel paged over the P.A. system have the ability to talk to the CR operator via party line phones that are strategically located throughout the units. The individual may initiate the Communication to the CR from the outlying party line.

Regular dial phone communication is available throughout IP3 to Units 1 & 2 and to the Emergency Control Center. Outside lines into the Bell System are available from the Units 1 & 2, IP3 and the Emergency Control Center. In addition there is a special "red phone" with an unlisted number (number will be communicated by the Emergency Director at the time he notifies the State of the Emergency) which allows the New York State Department of Health to have a direct line to the Emergency Director. These "red phones" are located at the IP3 Control Room, the Unit 1&2 Control Room, and the Emergency Control Centers.

A telephone tie line is available for communication with Authority Corporate Headquarters in New York City.

Base station radio facilities utilizing 451.05 MHz of the UHF

6.0 (Continued)

6.3 (Continued)

system provides communication from each of the Emergency Control Centers and the IP3 Control Room, the Unit 1&2 Control Room.

Radio communication is also provided using the 451.10 MHz frequency to tie together the Emergency Control Centers, IP3 Control Room, Units 1&2 Control Room, the two (2) Emergency Environmental Sampling Vehicles and the portable walkie talkies used by the Security Guards, Search and Rescue Teams and Survey Teams.

In addition, a direct radio link has been established from the First Aid-Decontamination Suite to the Peekskill Community Hospital Emergency Room. This Suite also has an outside telephone line.

6.4 ASSESSMENT SYSTEMS

6.4.1 Natural Phenomena Monitors

The Site Meteorological tower is 400' tall with wind speed and direction instrumentation at 400', 280', 126', and 33'. Temperature differential is also installed on the tower.

Seismic Monitors are located in IP3 containment.

6.4.2 Radiological Monitors

A Radiation Monitoring System with local and remote readouts is installed throughout IP3. There are 11 fixed process (air, liquid or gas) monitors and 8 fixed area radiation monitors. All 19 of these monitors have local readouts as well as a remote readout in IP3 Control Room where the monitor alarms are indicated. Refer to FSAR Section 11.2.3 for details.

6.4.3 Non-Radiological Monitoring

The following monitors are discussed in detail in the listed IP3 FSAR Sections:
Reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates: Sections 4 through 7
Fire Detection Systems: Section 9

6.4.4 Environmental Monitoring Facilities and Equipment

Two Mobile Survey Vehicles are equipped with 2 way radios, air

6.0 (Continued)

6.4 (Continued)

6.4.4 (Continued)

samplers, single channel analyzers and portable survey meters, as well as personnel dosimetry, protective clothing, respirators and KI.

The ongoing off-site Indian Point Radiological Environmental Monitoring Program routinely includes direct γ measurements (TLD) at 17 points within a 7½ mile radius of the plant, 11 air particulate and 11 radioiodine sampling stations, 10 water sampling points, 3 milk sampling points, as well as seasonal aquatic and land vegetation samples at 8 points.

Sixty pre-selected locations have been established within 7½ miles for emergency radiological monitoring. Radio communication tests and ease of access checks have been performed at each location.

Laboratory facilities exist on site for personnel whole body counting as well as for environmental sample preparation and counting.

7.0 MAINTAINING EMERGENCY PREPAREDNESS

7.1 TRAINING

Extensive emergency planning training will be given to each Emergency Director, as well as to each Shift Supervisor. The Senior Reactor Operators and Reactor Operators, as well as each Nuclear Plant Operator are trained to cope with emergency situations. General emergency plan training will be given to all Authority IP3 personnel within the first day of reporting to work on site.

Radiation Safety Supervisory personnel will be trained in the supervision of monitoring teams, interpretation of data, estimates of radiation dose, operation of survey equipment, contamination surveys and radiation field determinations.

The Verplanck and Buchanan Fire Departments will be invited annually to visit IP3 and familiarize themselves with the location and types of hydrants, extinguishers, first aid equipment, etc. During the visit, they will be informed of the location and boundaries of the Radiation Area and the precautions required within this area.

The Consolidated Edison Medical Department conducts additional train-

7.0 (Continued)

7.1 ing in First Aid and personnel decontamination for the Verplanck Volunteer Ambulance Association. Included in this training is practice in the use of the plant decontamination facilities and the portable decontamination kits.

7.2 TESTS

On a periodic basis (at least monthly), communication by radio shall be made between the Emergency Control Centers, IP3 Control Room and Units 1 & 2 Control Room, survey vehichles, and portable handi-talkies.

7.3 DRILLS

An annual drill will be held on the IP3 Site in each calendar year, no earlier than in the quarter that preceded the previous year's drill, not later that in the quarter that followed the previous year's drill. This will provide that our annual drill will be performed from nine to fifteen months since the last annual drill. Quarterly drills designed to test various aspects of the Emergency Plan will be scheduled between the annual drills. The NRC shall be notified of the impending annual drill approximately one month in advance.

The Emergency exercises will be observed and evaluated by qualified personnel. A meeting shall be held following each exercise at which time observers will report on items which need correcting and suggest any improvement which could be made to the Plan

7.4 REVIEW AND UPDATING OF EMERGENCY PLAN

The Safety Review Committee shall annually review the Emergency Plan and, if appropriate, shall submit recommended changes to the General Manager with a copy of the report to the chairman of the Plant Operating Review Committee (PORC).

Recommendations for changes to the Emergency Plan will be submitted to the PORC for review, then to the headquarters Radiological Engineer and Resident Manager for approvals, after which RESS or his designee will prepare the necessary changes and will distribute the changes to all controlled copy holders of the Emergency Plan.

On an annual basis, the Radiation and Environmental Services Superintendent will review the listing of all Authority and Medical personnel listed in the Emergency Procedures Document relative to their address and phone numbers. He will modify the Plan and immediately distribute changes to all controlled copy holders.

7.0 (Continued)

7.4 (Continued)

The Resident Manager will notify by letter all holders of Emergency Plans of any temporary changes in organization or operations which could affect the Plan.

8.0 RECOVERY AND REENTRY

Once the emergency situation has passed, such that re-entry can be considered, a series of surveys progressing toward the source of the hazard will be made. Each step in this series will be carefully carried out such that exposures are kept to a minimum.

A careful analysis of the situation will be accomplished prior to re-entry. The Resident Manager or his designee will personally supervise the re-entry procedures.

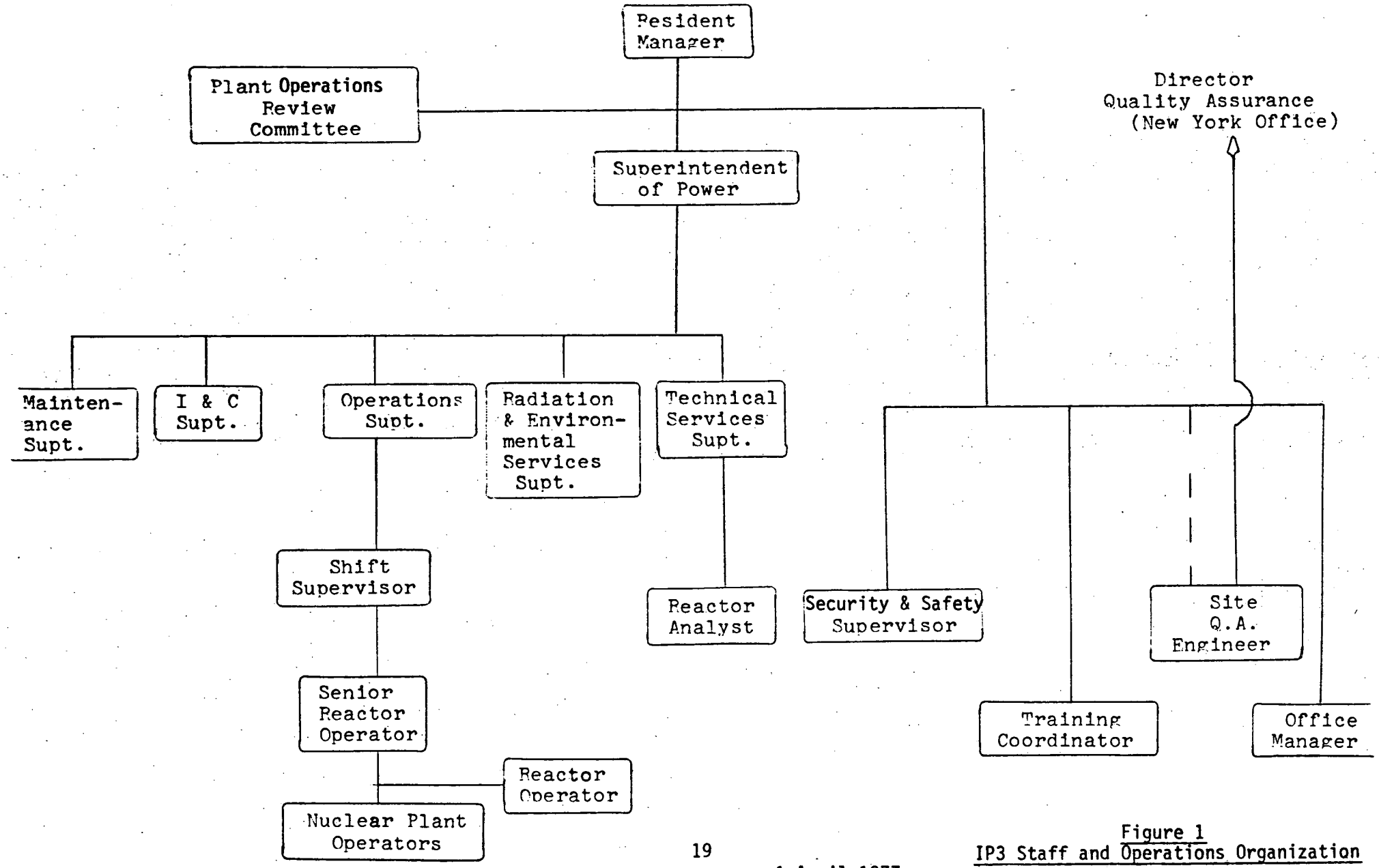

Figure 1
IP3 Staff and Operations Organization

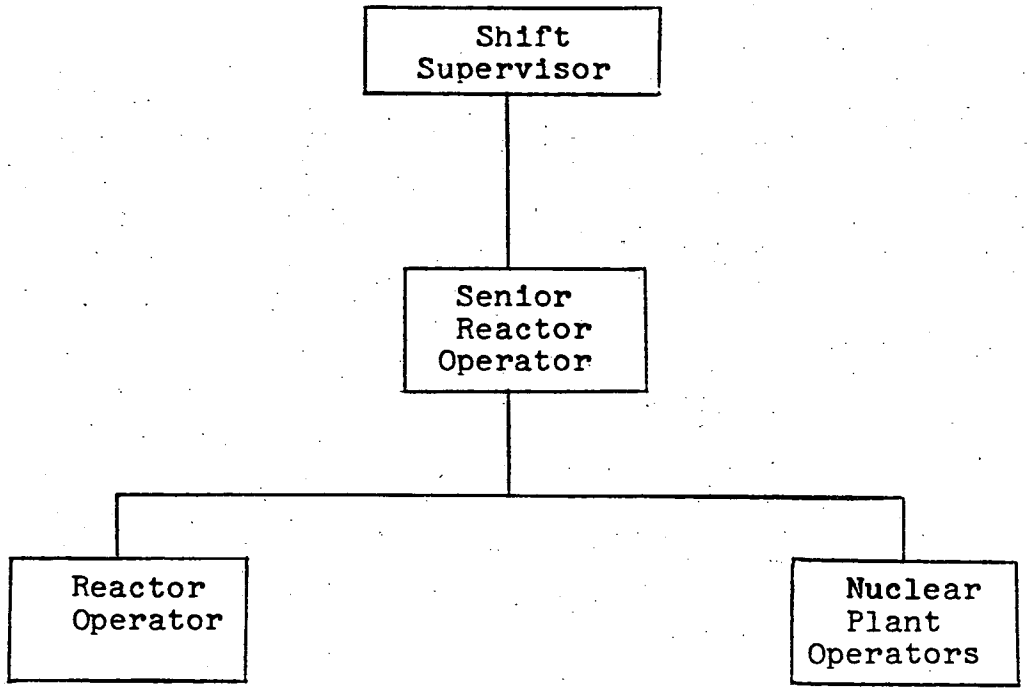

Figure 2
IP3 Watch Organization

1 April 1977

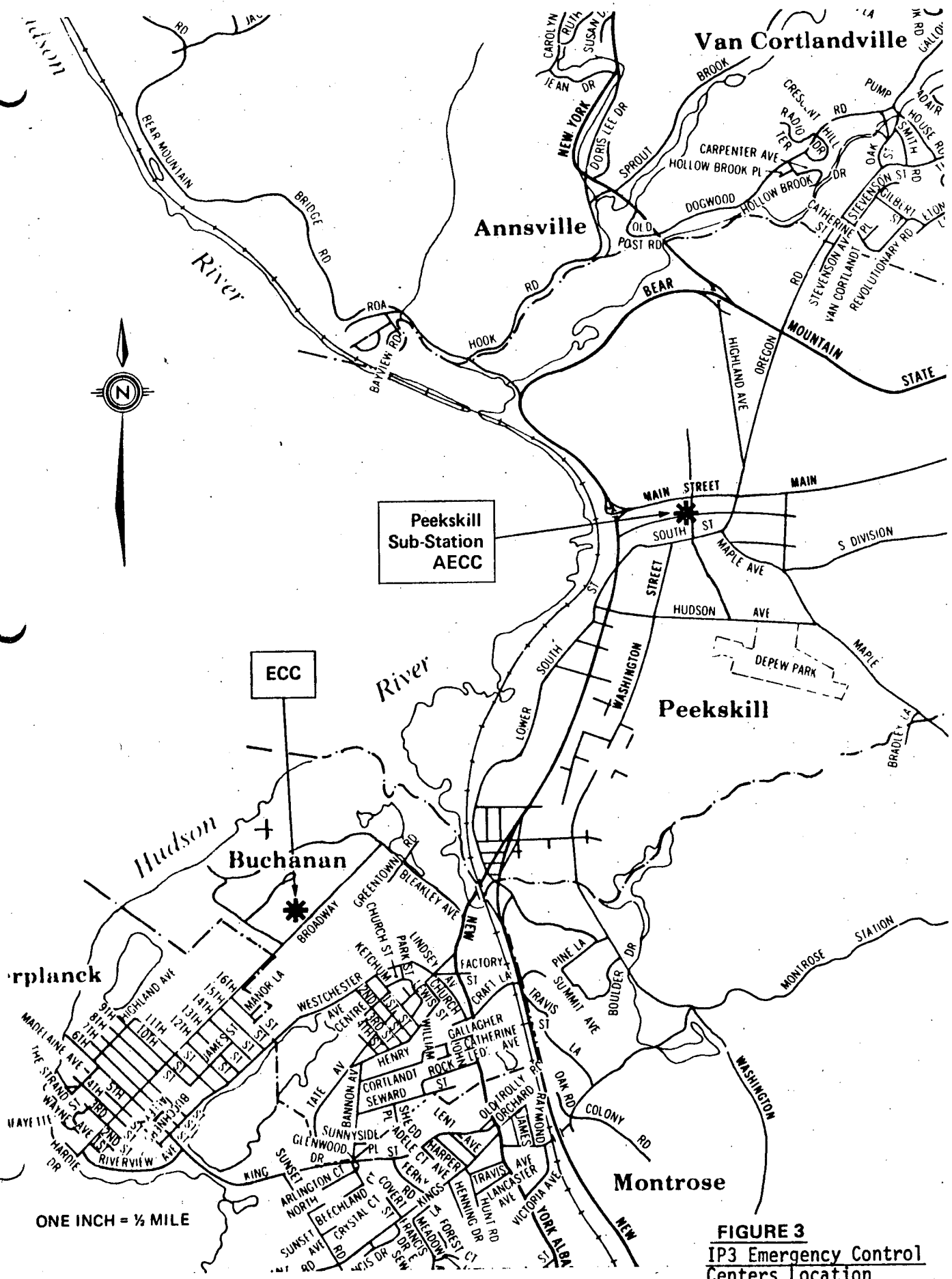

FIGURE 3
IP3 Emergency Control Centers Location

1 April 1977

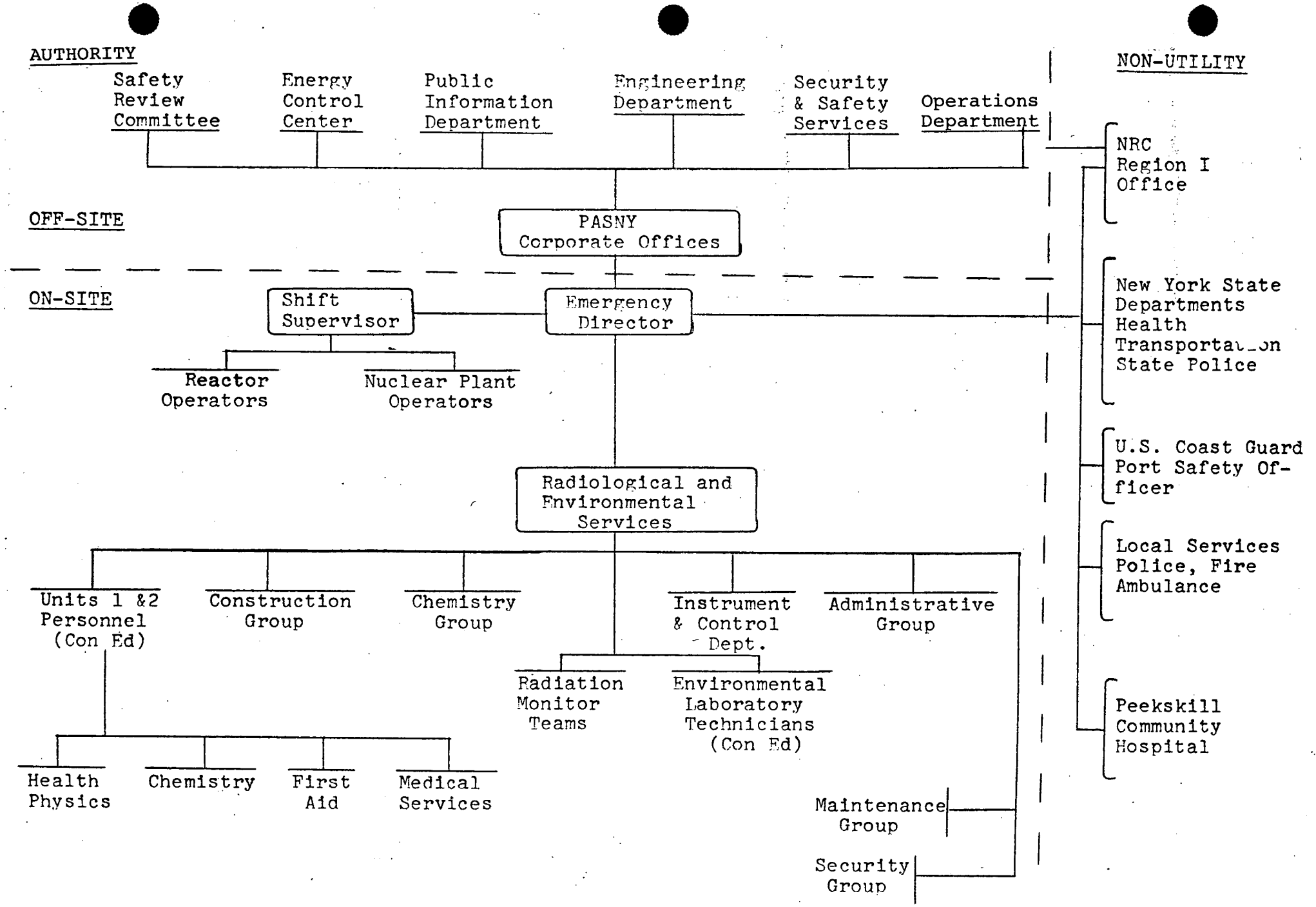

FIGURE 4
IP3 EMERGENCY
ORGANIZATION

INDIAN POINT 3 NUCLEAR POWER PLANT

CHAPTER 17

QUALITY ASSURANCE-OPERATIONS PHASE

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CHAPTER 17.2.2

QUALITY ASSURANCE - OPERATIONS PHASE

17.2.0 INTRODUCTION

The Power Authority of the State of New York, hereinafter called the Authority has the ultimate responsibility to assure that the operation, testing design changes, modifications, maintenance, repairs and refuelling are in accordance with applicable codes, standards, regulatory requirements, regulatory guides and specifications for the Indian Point 3 Nuclear Power Plant (IP3NPP). The Authority Operation Organization, hereinafter called the Operating Organization, has the overall responsibility for the safe and efficient production of electrical energy in accordance with the IP 3NPP Operating License and other applicable Government Regulations. Accordingly, the Authority has initiated a comprehensive Quality Assurance Program detailed in the Authority's Operations Quality Assurance Program Manual for IP3NPP, and described herein which applies to those structures, systems, and components of the IP3NPP that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. This program has been developed to comply with NRC requirements and is organized in 18 sections which correspond to the management principles delineated in Appendix B to 10CFR50. The program complies with the guidance set forth in WASH 1283 (Guidance on Quality Assurance Requirements During the Design and Procurement Phase of Nuclear Power Plants Rev 1), dated May 24, 1974, WASH 1309 (Guidance on Quality Assurance Requirements During the Construction Phase of Nuclear Power Plants), dated May 10, 1974, and WASH 1284 (Guidance on Quality Assurance During the Operation Phase of Nuclear Power Plants), dated October 26, 1973. The Quality Assurance Program also complies with the Quality Assurance related NRC Regulatory Guides referenced in the WASH documents or with an acceptable alternative. The Authority's position on these regulatory guides is delineated in Appendix 17.2.0-1.

Managerial and administrative controls to be used to ensure safe operations are described in Section 13, Conduct of Operations of the FSAR for IP3NPP.

The General Manager and Chief Engineer, hereinafter referred to as the Chief Engineer, has the overall responsibility for the development, implementation, and maintenance of the Authority's Operations Quality Assurance Program for IP3NPP.

The Chief Engineer has assigned the direct responsibility and authority for development, implementation and maintenance of this Operations Quality Assurance Program to the Director - Quality

Assurance who shall report conditions adverse to quality or in conflict with program requirements to the Chief Engineer and affected Department Heads as necessary and appropriate to ensure corrective action.

The Authority in its Quality Assurance Program Manual and here in Section 17.1.1 describes the Authority's Quality Assurance Organization which has been established to administer the total Quality Assurance Program.

The Authority may delegate portions of their Quality Assurance Program to an Architect Engineer (A-E) during plant operations. For information relating to the A-E QA program, see Table 17.2.2-2. The Authority may elect to delegate other portions of their Quality Assurance Program to other organizations during plant operations, and in either instance, the A-E and other delegated organizations' Quality Assurance Program will be considered extensions of the Authority's Operations Quality Assurance Program and as such will have been reviewed and concurred with by the Authority. Portions of the Quality Assurance Program which may be delegated to an A-E and/or other organizations shall consist of quality related activities such as, design changes, modifications, repairs, inspections, refueling, procurement, etc.

Conformance to approved requirements and programs will be assured through liaison between the Quality Assurance Organizations of the Authority and the A-E, as applicable. Fig. 17.2.1-2 shows the managerial and quality assurance lines of direction, responsibility and communications between the Authority's QA and Operating Organization. Fig. 17.2.1-3 shows the Quality Assurance lines of responsibility and communication between the Authority and the A-E. Fig. 17.2.1-1 depicts the independence of the Authority's Director - Quality Assurance and his staff from all other Authority Departments.

The Quality Assurance Organizations and Programs are described in Section 17.2.1 and 17.2.2 for the Authority.

The lines of authority and communication from the Authority's Director - Quality Assurance, as depicted on Fig. 17.2.1-2 are normally used to resolve impasses which may arise between Authority Quality Assurance personnel and personnel of the operating organization. Impasses which may arise between Authority QA personnel and operating organization personnel are normally resolved between the Authority Site Quality Assurance Engineer/Director-Quality Assurance and IP3NPP Superintendent of Power/Resident Manager. The Chief Engineer is the final authority when impasses cannot be resolved through normal channels.

Impasses which may arise between Authority Quality Assurance personnel and other Authority project personnel are normally resolved on the project level whose organizational relationships are shown on Fig. 17.2.1-1. Impasses which cannot be resolved through normal channels are resolved by the Chief Engineer.

Impasses which may arise between Authority Quality Assurance personnel and A-E personnel will normally be resolved between the Authority's Director-Quality Assurance and a designated member of the A-E QA staff. Impasses which cannot be resolved through normal channels are resolved by the Chief Engineer.

Audits

The Authority's and delegated organizations' quality assurance programs are described by written procedures contained in the appropriate company QA/QC manuals.

Assurance by the Authority that these programs are properly implemented is gained by (1) audits conducted by the Authority of other delegated organizations, (2) Authority audits of other delegated organizations which may include A-E participation, (3) surveillance and audits of the plant operating organization, (4) Authority participation in vendor audits and surveillance performed by the other delegated organizations.

THE AUTHORITY's QUALITY ASSURANCE PROGRAM DURING OPERATIONS

17.2.1 Organization

The Authority has established the organizational structure shown in Fig. 17.2.1-1 for the QA aspects of the operation phase of the IP3NPP.

This figure shows the lines of administrative authority and communication as it relates to the Authority's organization.

17.2.1.1 QA Responsibility Description

The Chief Engineer has the overall responsibility for the Quality Assurance Program during the operation phase including administrative control such as salary review, hire/fire and position assignment.

The Chief Engineer is responsible for the operation of the IP3NPP meeting quality, operation and budget requirements. He is responsible for approving the Authority's Quality Assurance policy and authorizing the implementation of the Operation

Quality Assurance Program. The Chief Engineer has delegated project and engineering responsibility to the Assistant General Manager-Engineering and responsibility for Quality Assurance has been delegated to the Director-Quality Assurance.

The Assistant General Manager-Engineering reports to the Chief Engineer and is responsible for activities of the Engineering Department. (For details see Chapter 13, "Conduct of Operations".)

17.2.1.2 Authority Operating Organization and Special Committees

Details related to Power Operations, Operating Organization, Safety Review Committee (SRC) and Plant Operations Review Committee (PORC) are delineated in Chapter 13 of the IP3NPP FSAR, and the plant Technical Specifications.

17.2.1.3 QA Program Management

The Authority's Director-Quality Assurance reports to the Chief Engineer and is responsible for establishing, administrating and coordinating the Authority's Operations Quality Assurance Program. The Director-Quality Assurance has the responsibility, authority and organizational freedom to identify quality problems; initiate, recommend, or provide solutions through designated channels; and to verify implementation of solutions. He has the authority to initiate stop work action when he considers it to be degraded of quality. This includes the authority to stop further processing, delivery or installation of a nonconforming item.

The Authority will maintain at the plant a Site Quality Assurance Engineer with a staff of Quality Assurance Engineers, a Quality Control Supervisor and Quality Control Inspectors to provide for inspection, audit and surveillance of plant operation activities.

The Site Quality Assurance Engineer reports directly to the Director-Quality Assurance or his designee. He is responsible for implementing the Authority's QA Program at the plant.

The Quality Assurance Engineers report directly to the Site Quality Assurance Engineer and are responsible for assisting the Site QA Engineer in assuring that the Authority's QA Program at the plant is implemented.

The Quality Control Supervisor reports directly to the Site Quality Assurance Engineer and is responsible for implementing all required quality control activities in accordance with the applicable Quality Control and Administrative Procedures. He is authorized to perform all functions necessary to discharge his assigned responsibilities.

The Quality Control Inspectors report directly to the Quality Control Supervisor. They are responsible for performing the following activities.

1. Providing surveillance or inspection, as appropriate, of operation, refueling, maintenance, modification, repair and testing of the plant.

2. Providing for evaluation of results of nondestructive examinations performed on materials, equipment and components.

3. Providing for indoctrination of plant personnel in the duties and functions of Quality Control Operations.

4. Monitoring the in-service inspection program.

5. In situations requiring special expertise in nondestructive examination, coordinating the work of outside consultants and/or technical personnel.

The Site Quality Assurance Engineer and the Quality Control Supervisor have the authority to initiate stop work orders through the Superintendent of Power or other appropriate authorized personnel when such work is not being performed in accordance with approved drawings, specifications, procedures or regulatory requirements.

Various Departments of the Authority assist the Director-Quality Assurance in the overall Quality Assurance Program. Assistance from the Authority Engineering Department is available to the Quality Assurance Staff whenever necessary.

For additional information related to Authority QA Department responsibilities and functions see Section 17.2.1.5.E of this document.

17.2.1.4 Delegation of QA Activities

The Authority may delegate to an A-E, and to other organizations the administration and execution of portions of the Quality Assurance Program.

The interface between the Authority and A-E is depicted in Fig. 17.2.1-3. The communication between the Authority Director-Quality Assurance and the A-E for day to day operations is as shown in Fig. 17.2.1-3. In addition, the Authority Director-Quality Assurance has direct access to higher levels of A-E QA management as may be required.

17.2.1.5 Authority Controls

The Authority maintains control of the overall Quality Assurance Program whether quality related activities are delegated or performed by the Authority. Activities and duties of the Authroity for maintaining control of the Quality Assurance Program include, but are not limited to the following:

A. Authority Operating Organization

The Operating Organization shall perform day to day quality related activities for the IP3NPP. The major quality related areas and duties shall be performed in accordance with written approved procedures which are in conformance with the Authority's Operations Quality Assurance Program, and include but are not necessarily limited to the following:

1. Prepare, review, approve and implement quality related plant administrative procedures, any changes thereto and control their distribution.

2. Indoctrinate, train and provide retraining for plant operating personnel performing activities affecting quality.

3. Employ and maintain a staff of qualified plant operations personnel and maintain records of personnel qualifications and certifications for all operational disciplines as required.

4. Perform or supervise plant modifications in accordance with approved administrative procedures.

5. Establish the procedural system for control of drawings specifications, instructions and procedures to assure the most current documentation is in use at the work locations.

6. Recommend plant modifications.

7. Prepare Purchase Requisitions for the purpose of obtaining spare and replacement parts.

8. Prepare for review and approval the necessary procedures and changes thereto which implement plant administrative controls delineated in Chapter 13.

9. Provide for the sequence of actions to be accomplished in the preparation, review, approval and control of plant instructions and procedures that relate to safety related activities.

10. Maintain a master list or provide for equivalent to identify the current revision of quality related plant instructions, procedures and drawings.

11. Establish and implement a documented, approved system for the control of materials, parts, components and equipment upon receipt at the plant, including segregation of nonconforming items.

12. Establish and implement a controlled system, when applicable, for the return of rejected materials, parts and components and equipment to the vendor.

13. Provide for overall direction of delegated organizations performing services at the plant.

14. Identify and control nuclear safety related materials, parts, and components prior to their release for installation or use.

15. Maintain the identification of nuclear safety related items by heat number, serial number, part number or other established methods to such documents as specifications, drawings, instructions, procedures, deviation reports or mill test reports, as applicable.

16. Provide a system for the identification of materials, parts or components on records prior to release for installation to verify that the correct item was used.

17. Review and concur with special process procedures which are used at the plant, as applicable.

18. Maintain at the plant and keep current, qualification records of those plant personnel performing special process activities as applicable.

19. Assure that only qualified personnel are assigned and perform activities involving special processes.

20. Provide technically competent personnel to perform selected QC inspections at the plant.

21. Provide notification to Quality Control when an inspection hold point is reached.

22. Establish a test control program for operational testing at the plant and conduct tests, when required, in accordance with the approved programs.

23. Establish a program for the control of measuring and test equipment used at the plant.

24. Prepare and implement procedures, directives, and instructions for the performance of handling, shipping, cleaning, preservation and preventative maintenance activities at the plant, as required.

25. Maintain inspection, test and operating status of plant systems and components in accordance with approved procedures.

26. Develop and implement a procedure for reporting significant variances from normal plant operations.

27. Provide for storage and maintenance of records, generated during the design, procurement, construction, testing and operation of the plant.

28. Review and comment on new designs, plant modifications, performance programs and provide input related to radiological, performance and reliability aspects.

29. Formulate training and retraining programs for site personnel.

B. Nuclear Operations Section (Headquarters)

1. Maintain current knowledge of the status of each nuclear plant and provide reporting as required, working with plant personnel.

2. Provide coordination and liaison between nuclear plants and headquarters groups providing support to nuclear plant operations.

3. Maintain primary communications contact between headquarters and the nuclear plant staff as necessary to monitor and support plant operations.

4. Maintain up-to-date knowledge of industry operating experience and trends; provide communication of information to plant staff and to other Authority departments supporting plant operations.

5. Review and comment on new designs, plant modifications, performance programs and provide input related to radiological, performance and reliability aspects.

6. Maintain state-of-the-art knowledge on plant, system and equipment performance and reliability monitoring, analysis, and improvement programs and techniques.

7. Provide technical advice and guidance to plant personnel, as applicable, to effect implementation of corporate programs.

8. Provide assistance to plant personnel in the resolution of plant performance problems and provide for special studies as may be required to resolve operating problems.

9. Maintain current knowledge on regulatory agency training requirements.

10. Maintain state-of-the-art knowledge of training method, techniques, facilities, and vendor capabilities.

11. Formulate training and retraining programs for plant operations and support personnel, headquarters engineering personnel and other groups as may be required.

12. Provide technical support and guidance to plant and headquarters training personnel in the implementation of the Authority training programs.

13. Provide principal technical interface with NRC in the training and radiological areas.

14. Formulate and direct implementation of Authority programs in radiation protection, radiochemistry and radiological aspects of meteorological and environmental areas, performance and reliability.

15. Provide state-of-the-art knowledge in equipment and techniques in support of site operations in radiation protection, radiochemistry and radiological aspects of meteorological and environmental areas.

16. Provide headquarters expertise and backup for site emergency plans.

17. Provide necessary headquarters interface with NRC Office of Inspection and Enforcement.

C. Engineering Department - Authority

1. Initiate and/or review and coordinate engineering and design work relating to design changes or modifications for the nuclear power plant.

2. General direction and coordination of design changes or modifications which are performed by Authority Engineering Department or delegated organizations.

3. Assure that project interfaces are adequately identified and documented and subsequently monitor these interfaces.

4. Review the safety analysis for equipment prepared by an outside organization, if an unreviewed safety question per 10CFR50.59 is involved.

5. Provide technical assistance to the nuclear power plant operating staff or delegated organizations when requested.

6. Accumulate, and maintain in the central engineering document files, the selected Engineering documents and drawings, and the specifications related to the IP3NPP.

7. Provide specialists to SRC as necessary for resolving specific problems.

8. Assist with shop or plant inspections, audits, tests and vendor or contractor surveillance when required or requested by the QA Department.

9. Provide for management systems and methods to implement the Quality Assurance Program for Engineering activities. Procedures shall be prepared, reviewed and approved by Engineering Department management and maintained in a controlled system.

10. Indoctrinate and provide continuing education for personnel performing activities affecting quality related to engineering and design to assure that suitable proficiency is achieved and maintained.

11. Coordinate with plant and headquarters personnel the program for establishing the Authority's position guidelines on NRC Regulatory Guides for the operation phase of the plant and maintain a controlled listing of these positions. Review position guidelines established by delegated organizations for NRC Regulatory Guides, as applicable.

12. Coordinate the formulation of the Authority's position with respect to code requirements and the preparation of requests for codes, special rulings or interpretations of codes and standards, all upon request.

13. Review and approve proposed modifications to plant design.

14. Review and approve internal distribution for engineering and design documents.

15. Review new NRC regulations and guides related to design, develop Authority positions, and make available to other affected Authority personnel.

16. Provide overall technical direction for design activities performed by delegated organizations.

17. Review, comment on and concur with preliminary procurement documents, final bid documents and any changes thereto.

18. Review and approve recommended bidder lists.

19. Review engineering aspects of delegated organizations recommendations for contract award and provide the Chief Engineer with Authority recommendation.

20. Review, comment on and concur with engineering specifications, selected drawings, procedures and instructions prepared for the performance of a quality related activity.

21. Control the preparation, review, approval and distribution of engineering documents including changes thereto, which prescribe activities affecting quality.

22. Control and distribute to affected Authority internal and/or the operating organization correspondence generated by external organizations or generated by the Authority Engineering Department which address quality affecting activities.

23. Review, comment on and concur with selected special process procedures, submitted by designated organizations in accordance with specification requirements.

24. Review and approve the procedure for complying with paragraph 50.55(e) of 10CFR50 regarding the reporting of significant deficiencies.

25. Review and comment on engineering aspects of deficiency reports generated at vendor facilities or at the plant.

26. Review and concur with engineering related corrective action in conjunction with nonconformance documents.

27. Provide the necessary contact with the NRC Division of Operating Reactors and other regulatory agencies for processing the proper documentation.

28. Provide technical responses to NRC inquiries and resolve engineering and other technical problems.

29. Coordinate the overall licensing efforts related to engineering and design modification activities.

D. Contract Administration - Authority

1. Prepare standard non-technical purchase contract provisions and verify that final procurement documents are consistent with Authority policy.

2. Control the receipt and distribution of procurement documents, including changes thereto, for review and comment by cognizant Authority Departments.

3. Assure that only authorized procurement documents and the latest revisions are submitted to vendors.

4. Provide for review of recommended bidders lists and bids evaluation and prepare contract or purchase order award documents.

5. Maintain review comments from all applicable Authority departments related to procurement specification, reviews, including records of compliance checks.

6. Maintain master set of procurement documents and all changes thereto.

E. Authority Quality Assurance Department

1. Review proposed plant modifications to assure quality requirements have been included.

2. Review and comment on preliminary procurement documents, final bid document and any changes thereto to assure that the applicable requirements of Appendix B to 10CFR50 are included.

3. Review and approve purchase orders prepared and issued by plant personnel to assure that applicable quality requirements are specified.

4. Review and approve recommended bidders lists.

5. Review recommendations for contract award and assure that any exceptions to the contract by the vendor will not affect quality requirements.

6. Establish format and procedure for the preparation review and approval of Authority Quality Assurance procedures.

7. Review and comment on quality related aspects of the administrative controls developed for the preparation, review and approval of procedures for such activities as operation, maintenance, modifications, procurement, repairing, fuel handling, cleaning, chemical and radiochemical control, security and access control.

8. Control the preparation, review, approval and changes thereto, of the Authority's Quality Assurance Manuals including policies, procedures and instructions.

9. Perform selected surveillance at vendor facilities to assure that delegated organizations source inspection activities are performed in accordance with approved QA Program, procedures and procurement document requirements.

10. Participate in selected audits, at vendor facilities with delegated organizations personnel to verify vendor compliance to approved QA Program and procurement document requirements.

11. Monitor source inspection/audit reports to maintain cognizance of activities performed at vendor facilities.

12. Provide operations personnel with vendor qualifications for replacement items purchased by plant personnel. The designated A-E vendor rating list may be utilized as the source for such information.

13. Perform and/or monitor receipt inspection activities at the plant.

14. Review and concur with selected special process procedures used at the plant.

15. Review selected special process procedures required by procurement documents and approved by other delegated organizations.

16. Provide surveillance or inspection as appropriate of operation, refueling, maintenance, modification, repair and testing of the plant.

17. Provide for evaluation of results of nondestructive examination performed on materials, equipment and components.

18. Monitor the inservice inspection program.

19. Provide for indoctrination and training of QA personnel and assist in indoctrination of plant personnel.

20. In situations requiring special expertise in nondestructive examination, coordinating the work of outside consultants and/or technical personnel.

21. Review selected documents prescribing quality affecting activities that require inspection hold points.

22. Witness selected tests at vendor facilities.

23. Witness selected tests performed at the plant.

24. Provide for the distribution of deficiency reports generated at vendor facilities and at the plant to the Engineering Department for review.

25. Provide for the review of deficiency reports by QA personnel to assure that disposition does not degrade quality requirements.

26. Verify, at the plant, that rework and repair activities are accomplished in accordance with disposition instructions.

27. Provide for and monitor the corrective action program.

28. Retain records, generated by Authority QA personnel both on and offsite which provide documentary evidence of the implementation of the QA Program.

29. Establish and implememnt a comprehensive system of planned and periodic audits, to verify that all aspects of the QA Program are complied with.

30. Perform audits, of Authority Departments implementing quality affecting activities to assure compliance with the Authority's Quality Assurance Program.

31. Perform audits of delegated organizations in accordance with the QA program requirements.

17.7.2 Quality Assurance Program

17.2.2.1 General Description

The Authority's Quality Assurance policy is to control those activities needed to provide assurance that quality objectives are satisfied during the operation phase of the IP3NPP. To achieve this end, the Authority has established a Quality Assurance Program. This program has been developed to comply with NRC requirements and is organized in 18 sections which correspond to the management principles delineated in Appendix B to 10CFR50. The program complies with the guidance set forth in WASH 1283 (Guidance on Quality Assurance Requirements During the Design and Procurement Phases of Nuclear Power Plants, Rev. 1), dated May 24, 1974, WASH 1309 (Guidance on Quality Assurance Requirements During the Construction Phase of Nuclear Power Plants), dated May 10, 1974, WASH 1284 (Guidance on Quality Assurance During the Operation Phase of Nuclear Power Plants), dated October 26, 1973. The Quality Assurance Program also complies with the Quality Assurance related NRC Regulatory Guides referenced in the WASH documents or with an acceptable alternative. The Authority's position on these regulatory guides is delineated in Appendix 17.2-0-1.

The Authority's Operations Quality Assurance Program imposes on delegated organizations, the requirement to establish adequate programs for their internal operations and in turn, to impose applicable QA Program requirements on suppliers of safety-related materials, components, equipment or services. The quality programs of delegated organizations are considered extensions, to the extent necessary, of the Authority's program and as such are subject to review, audit and concurrence by the Authority, whenever applicable for the activities being engaged in.

The operating organization will perform quality related activities at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

An A-E may be delegated the work of performing quality affecting activities related to plant operation, not normally performed by Authority personnel or other Authority contractors, or to supplement Authority personnel activities. Any work so delegated shall be accomplished in accordance with the information delineated in table 17.2,2-2.

The program which will be in effect has been reviewed and concurred with by the Authority and audits will be performed to ascertain A-E compliance in applicable areas. The work assigned to A-E shall be through Authority direction on a case by case basis. Following is a summary of major quality affecting areas that an A-E may

undertake when authorized by the Authority. This does not preclude the possibility that these delegated activities will be expanded or diminished in scope.

1. Design modifications and reviews
2. Procurement document preparation
3. Vendor qualification
4. Vendor surveys and audits
5. Source inspection
6. Shipment release
7. Document control
8. Nonconformance and corrective action
9. Control of special processes
10. Shipping
11. Installation

The Authority's Quality Assurance Program is described in the Authority's Operation Quality Assurance Program Manual and supplemented by Quality Assurance Procedures.

The Authority's Quality Assurance Program specifies that all Quality Assurance policies, manuals and procedures are mandatory requirements, and it describes control and distribution of the Operations Quality Assurance Program Manual, Procedures and Instructions. The Chief Engineer has approved each of the 18 sections of the Operations Quality Assurance Program Manual and has issued it for implementation.

The Quality Assurance Manual contains an introductory letter communicating to the organizations and individuals involved in the QA program that the requirements of the manual are mandatory and must be implemented. The control and distribution of the Authority's Quality Assurance Manual are in accordance with 17.2.6.2 and these controls are the responsibility of the Director, Quality Assurance.

The Authority's Quality Assurance Program Manual indicates that the Chief Engineer has overall responsibility for implementation and execution of the Quality Assurance Program during operations.

The Chief Engineer has delegated the responsibility of defining and implementing the QA Program, and of maintaining the QA Manual, Procedures and Instructions, to the Director - Quality Assurance. The Director - Quality Assurance, through a comprehensive system of audits and surveillance of internal, plant, and delegated organizations quality activities assesses the scope, implementation and effectiveness of the overall QA Program and reports results to the Chief Engineer. The Director - Quality Assurance, is responsible for the training and indoctrination of Authority Quality Assurance personnel. This includes, as applicable, training as to purpose, scope and implementation of quality-related documents, and both training and qualification in the principles and techniques of activities being performed.

17.2.2.2 QA Program Applicability

The Quality Assurance Program is applied to those structures, systems, equipment and components that are necessary to assure the integrity of the reactor coolant pressure boundary and primary containment, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures exceeding the limits of 10CFR100. The safety-related structures, systems, and components controlled by the Quality Assurance Program are identified in Appendix B of the Indian Point Unit No. 3 FSAR.

17.2.2.3 Establishment and Management of the Authority's QA Program

The Authority's Operation Quality Assurance Program has been established prior to the Authority assuming operation activities. The requirements are in a continual state of review as required to improve implementation of the Quality Assurance Program as activities warrant.

17.2.2.4 Quality Assurance Program Documentation

The Quality Assurance Programs of the Authority and other delegated organizations establish written policies, procedures, instructions, and compliance to 10CFR50 Appendix B, specifications and applicable codes, regulatory requirements, regulatory guides and standards.

The Authority's Quality Assurance Program and implementing Quality Assurance procedures and their relationship to applicable criteria of Appendix B to 10CFR50 are referenced in Figure 17.2.2-1. The operating organization has prepared administrative procedures which will be utilized as part of the QA Program at the plant. These

procedures are listed on Figure 17.2.2-2. The A-E's implementing Quality Assurance procedures are listed in the document referenced in Table 17.2.2-2 Paragraph 17.2.2.1 of this FSAR.

17.2.2.5 Indoctrination and Training

The Director - Quality Assurance is responsible for the training and indoctrination of Authority Quality Assurance personnel.

The Authority's Operation Quality Assurance Program requires that personnel performing activities affecting quality are appropriately trained in the principles and techniques of the activity being performed. Personnel performing activities affecting quality are instructed as to purpose, scope and implementation of governing manuals, policies, and procedures. Appropriate training and indoctrination procedures are established in the Quality Assurance Program as referenced in Figure 17.2.2-1.

17.2.2.6 Qualification Requirements of QA Management

The qualification requirements of the Director - Quality Assurance and minimum requirements of Authority QA personnel performing quality-related activities are indicated in Table 17.2.2-1.

17.2.2.7 Control of Activities Affecting Quality

The Authority's Operations Quality Assurance Program specifies that design and purchase specifications, drawings, procedures and instructions shall be prepared with the necessary test and inspection requirements and criteria. The program requires that only qualified personnel and appropriate and properly calibrated equipment shall be used and that results be adequately documented. The program requires that special processes and qualification testing shall be performed under controlled conditions.

17.2.2.8 Management Review of QA Program

The Chief Engineer is responsible for assigning the responsibility to an organization within the Authority or to an outside agency for independently assessing the Authority's QA Program on a regular basis. If an internal group performs this activity, they shall be independent of any quality related activities which they must assess.

The Director - Quality Assurance is responsible for reviewing the status and adequacy of the QA Program on a continuing basis including activities delegated to others and shall notify the Chief Engineer of any noted program deficiencies.

17.2.2.9 Authority Controls

The Authority will provide for review and concurrence of the Quality Assurance Programs of delegated organizations for the quality affecting activities which they may implement.

The Authority performs planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.3 Design Control

17.2.3.1 General Description

The Authority's internal design review system is devised to handle procurement documents, design changes and modifications, and selected drawings.

The Authority Engineering Staff reviews, comments and concurs with specifications and selected drawings, and revisions thereto.

The Authority, through planned and periodic audits of its internal design review activities, assures conformance with the Authority's Quality Assurance Program.

The Authority may delegate design control activities for plant structures, systems and components, and review of other delegated organizations design criteria and design specifications to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

The Authority's Operation Quality Assurance Program requires that there are written procedures to perform design activities in a planned, controlled and orderly manner, and that applicable regulatory requirements and design basis are correctly translated into specifications, drawings, written procedures and instructions.

Design documents specify appropriate quality standards and provide methods for controlling deviations and changes from the standards.

17.2.3.2 Design Policy

The Authority's Operation Quality Assurance Program requires that adequate review and selection for suitability of application are conducted for materials, parts, equipment and processes that are essential to safety related functions of the structures, systems and components. The Authority's Operation Quality Assurance Program does not differentiate between safety-related materials, parts and equipment that must be specifically designed to meet functional requirements, and "off the

shelf" safety related material, parts and equipment that meet established functional requirements. In either case the Authority's design control requirements are applied in accordance with the measures established in this Section of the FSAR and the Operation Quality Assurance Program.

17.2.3.3 Design Control Measures

The Authority's Quality Assurance Program requires that design control measures, as applicable, be applied to such items as stress, thermal, hydraulic, radiation and accident analysis, intended performance, reactor physics, compatibility of materials, systems, inspection and test criteria, and accessibility of materials, systems, inspection and test criteria, and accessibility for inservice inspection, monitoring of operation, maintenance and repair.

17.2.3.4 Design Review

The Authority's Quality Assurance Program requires that design verification or checking such as design reviews, alternate calculations and qualification testing are properly selected and performed. The individuals or groups who perform design verification or checking are other than those who performed the original design.

17.2.3.5 Design Interface Control

The Authority may delegate to an A-E design & design control measures for any delegated design activities. The A-E method of design interface control is delineated in the document referenced in Section 17.2.2, Paragraph 17.2.2.1 of this FSAR.

Design documents and revisions thereto, related to the design interface, are distributed to the responsible organizations in a timely and orderly manner and controlled to prevent inadvertent use of superseded documents.

These design documents are collected, stored and maintained in a systematic and controlled manner.

17.2.3.6 Design Change Control

Procedures are established to ensure that design changes including plant changes receive review and approval by the organization responsible for establishing the adequacy of the design or by other organizations with comparable expertise designated to review and approve changes.

17.2.3.7 Authority Controls

The Authority monitors interfaces between organizations performing design activities, reviews specifications and revisions thereto.

The Authority performs planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.4 Procurement Document Control

17.2.4.1 General Description

The Authority's Operation Quality Assurance Program provides for procurement documents of safety-related equipment to be controlled within the requirements established by 10CFR50, Appendix B, and in accordance with the guidelines of applicable codes, standards, regulatory requirements and regulatory guides.

Procurement documents for spare or replacement parts shall be subject to requirements at least equivalent to those used for the original procurement. The original procurement documents may be used as a basis for purchase of spare or replacement parts.

The Authority's Operation Quality Assurance Program requires that purchase specifications contain or reference as applicable: design information and technical requirements including, component and material identification requirements; drawings, specifications, codes and industrial standards, regulatory guides and regulatory requirement; tests and inspection requirements; and special process instructions for such activities as fabrication, cleaning, erecting, packaging, handling, shipping, storing, and inspecting. The specification contains, as appropriate, requirements which identify the documents to be prepared, maintained, submitted, and made available to the purchasing agent for review and/or approval. These documents include drawings, specifications, procedures, inspection and test records, inspection and fabrication plans, personnel and procedure qualifications, materials, chemical and physical test results. The specifications contain applicable requirements for the retention, control and maintenance of records, and the purchasing agents rights of access to the vendor's facilities and records for source inspection and audit. The specifications contain provisions for extending applicable requirements of the document to subcontractors and suppliers including purchaser's right of access to such subvendor's facilities and records.

17.2.4.2 Preparation, Review, Approval and Issuance of Procurement Documents and Changes

The Authority's Quality Assurance requirements for procurement document control requires that document review procedures be established. The reviews of procurement documents in accordance with these procedures are performed by knowledgeable Quality Assurance personnel who can determine if quality requirements are completed and correctly defined, that the procured items can be properly inspected and controlled, and that acceptance criteria are adequately specified.

Authority purchase specifications, and changes thereto, are reviewed by the Authority's Engineering Department in accordance with requirements contained in the Authority's Operation Quality Assurance Program. The Authority Quality Assurance Department reviews purchase specifications and changes thereto, for quality requirements in accordance with the Operation Quality Assurance Program. Purchase orders are processed following approval of the specification by both the Authority's Engineering and Quality Assurance Department. Any revisions or addenda to the purchase specifications will be subject to the same review cycle as the original document prior to release.

The operating organization will perform Procurement Document Control activities at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

17.2.4.3 Vendor QA Program Requirements

The Authority requires that delegated organizations have documented Quality Assurance Programs and that subcontractors have and implement documented Quality Assurance Programs for materials, equipment and services to an extent consistent with their importance to safety.

The Authority may delegate Procurement Document Control activities of plant structures, systems and components, for plant design changes and modifications management, procurement quality control, and review of delegated organizations' procurement specifications to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.4.4 Authority Controls

The Authority reviews, comments, and concurs with preliminary procurement documents, final bid documents and any changes thereto, to assure that the applicable requirements of Appendix B to 10CFR50 are included.

The Authority will review recommendations for contract award and will assure that any exceptions to the contract will not affect quality requirements.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.5 Instruction, Procedures, Drawings

17.2.5.1 General Description

The Authority's Operation Quality Assurance Program requires that documents such as instructions, procedures and/or drawings which prescribe quality affecting activities be controlled and that quality affecting activities be performed in accordance with these instructions, procedures and/or drawings as applicable.

The operating organization will control instructions, procedures and drawings at the plant in accordance with approved written procedures which conform to the requirements in the Authority's Operation Quality Assurance Program. Quality affecting activities performed by the Operating Organization shall be accomplished in accordance with these instructions, procedures and/or drawings as applicable.

The Authority and/or delegated organizations shall have established measures for the control and implementation of instructions, procedures, and drawings for quality-related activities applicable to the scope of their responsibilities. The measures described by a designated A-E, if applicable, are delineated in the document referenced in Section 17.2.2, Paragraph 17.2.2.1 of this FSAR.

The Authority may delegate Procurement Document Control activities of plant structures, systems and components, for plant design changes and modifications management, procurement quality control and review of delegated organizations' procurement specifications to an A-E in accordance with Section 17.2.2 Paragraph 17.2.2.1

17.2.4.4 Authority Controls

The Authority reviews, comments, and concurs with preliminary procurement documents, final bid documents and any changes thereto to assure that the applicable requirements of Appendix B to 10CFR50 are included.

The Authority will review recommendations for contract award and will assure that any exceptions to the contract will not affect quality requirements.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.5 Instruction, Procedures, Drawings

17.2.5.1 General Descriptions

The Authority's Operation Quality Assurance Program requires that documents such as instructions, procedures and/or drawings which prescribe quality affecting activities be controlled and that quality affecting activities be performed in accordance with these instructions, procedures and/or drawings as applicable.

The operating organization will control instructions, procedures and drawings at the plant in accordance with approved written procedures which conform to the requirements in the Authority's Operation Quality Assurance Program. Quality affecting activities performed by the Operating Organization shall be accomplished in accordance with these instructions, procedures and/or drawings as applicable.

The Authority and/or delegated organizations shall have established measures for the control and implementation of instructions, procedures, and drawings for quality-related activities applicable to the scope of their responsibilities. The measures described by a designated A-E, if applicable, are delineated in the document referenced in Section 17.2.2 Paragraph 17.2.2.1 of this FSAR.

17.2.5.2 Acceptance Criteria

The Authority through planned and periodic surveillance and audits of delegated organizations as well as selected audits of their vendors and subcontractors assures that the instructions, procedures, drawings and checklists used on safety-related equipment are controlled and implemented to meet the requirements of applicable codes, standards, regulatory guides and QA Program requirements.

Activities affecting quality are defined in specifications, drawings, procedures, and instructions and include criteria for the acceptance of specific activities. These instructions, procedures, or drawings shall delineate the applicable requirements of codes, standards, regulatory requirements and regulatory guides and shall specify acceptance criteria. Accomplishment of task shall be documented and shall include appropriate information that acceptance criteria has been met when required.

17.2.5.3 Authority Controls

The Authority will control and implement instructions, procedures, and drawings for quality related activities as follows:

1. Review, comment and concur with engineering specifications, selected drawings, procedures and instructions prepared for the performance of a quality-related activity.

2. Prepare procedures related to the activities of this section which identify individuals or groups responsible for these activities.

3. Review procedures for design changes, modification, maintenance, refuelling procurement, fabrication, handling, shipping and storage, erection, installation, inspection, inservice inspection and cleaning.

4. Establish format and procedure for the preparation, review and approval of Authority Quality Assurance procedures.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.6 Document Control

17.2.6.1 General Description

The Authority's Operation Quality Assurance Program requires that documents affecting the quality of safety-related structures, systems and equipment during the operation phase of the IP3NPP be controlled.

The program establishes controls such that obsolete or superseded documents shall not be inadvertently used, that changes are approved by the same group or individuals having authority and responsibility for the initial issue or another authorized organization, that a method of revision level verification is provided, that approved changes are promptly distributed, and that applicable documents are available prior to the start of the work for which they are required

The operating organization will control documents affecting the quality of safety-related structures, systems and equipment at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operations Quality Assurance Program.

17.2.6.2 Review and Approval of Documents

The Authority's Operation Quality Assurance Program requires that procedures and instructions be prepared to control the preparation, review, concurrence or approval, change or revision, issuance, and distribution of documents such as the following:

1. Quality Assurance Manuals, operating procedures and instructions
2. Design specifications and drawings
3. Manufacturing, design, construction, installation drawings
4. Manufacturing and inspection, test and special process procedures and instructions
5. Procurement documents
6. Administrative Procedures
7. Maintenance Procedures
8. FSAR and related design criteria documents

Figure 17.2.2-1 itemizes the Authority Operation Quality Assurance Program and QA Procedures and their relationship to the 18 criteria of 10CFR50 Appendix B.

The Authority may delegate Document Control activities of plant structures, systems, and components for plant design changes, modification and repair activities to an A-E in accordance with Section 17.2.2 Paragraph 17.2.2.1.

17.2.6.3 Authority Controls

The Authority will control the preparation, review, approval and distribution of Authority documents including changes thereto which prescribe activities affecting quality performed by Authority personnel and assure that the latest issue of such documents are used. The Authority will provide for distribution of correspondence, which address quality affecting activities to affected Authority personnel. The Authority will maintain a master list or equivalent of issued Authority documents affecting quality-related activities, such as, procedures, instructions, and drawings.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with

approved QA Program requirements.

17.2.7 Control of Purchased Material, Equipment, and Services

17.2.7.1 General Description

The Authority's Operation Quality Assurance Program establishes controls to assure that purchased safety-related material, equipment and services, whether purchased directly or through contractors and subcontractors, conform to the procurement document requirements. These measures include as appropriate provisions for source evaluation and selection of equipment vendors, objective evidence of quality furnished by contractors or subcontractors, inspection and audit at the source, and examination of products upon delivery.

Objective evidence of quality furnished by the contractors or subcontractors shall identify the purchased material or equipment and the specific procurement requirements (e.g. codes, standards, specifications) met by the materials or equipment. The contractors or subcontractors are also required to identify any procurement requirements which have not been met together with a description of those nonconformances dispositioned "accept as is" or "repair" as part of this objective evidence of quality.

Vendor selection and evaluation is based on qualifying data such as the seller's QA Program and past performance data of similar items and vendor surveys to determine the adequacy of the facilities and the effectiveness of the QA Program. Source inspection shall be required when the conformance of materials, parts and components to procurement documents cannot be verified upon receipt or the service contracted is of a nature requiring witnessing or verification functions. Receipt inspection includes verification that the required documentation has been received and that the items conform to the procurement documents. Receipt inspection shall be performed in accordance with written procedures and instructions and receiving activities shall be documented.

The operating organization will perform activities related to the control of purchased material, equipment, and services at the plant, in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

17.2.7.2 Major Suppliers Evaluation

The Authority's Quality Assurance Department provides for the evaluation of Quality Assurance Programs of delegated organizations.

These evaluations assure that they are capable of providing equipment, material and services which meet the applicable regulatory guides, codes, industry standards and regulatory requirements. Audits will be performed to verify that the delegated organizations are satisfactorily implementing approved QA Program requirements.

17.2.7.3 Source and Vendor Evaluations

Based upon complexity of purchased items and supplier performance history, source inspections or audits of vendors shall be performed as necessary to assure that the required quality of the purchased items is obtained. Surveillance of suppliers' fabrication, inspection, testing, and shipment of materials, equipment and components will be planned, performed and reported in accordance with written procedures which assure conformance ot the purchase order requirements.

The Authority may delegate Control of Purchased Material, Equipment and Service activities for plant structures, systems, components, and procurement quality control and activities including plant receiving inspection to an A-E in accordance with Section 17.2.2 Paragraph 17.2.2.1.

A-E responsibility may include the preparation of specifications, drawings, and requisitions for the purchase of materials, equipment and services by the Authority. Included in this activity will be the quality evaluation of those vendors recommended for procurement. A-E may provide inspection, surveillance and audit service at vendor facilities for plant equipment and on established notification points of selected delegated organization items.

17.2.7.4 Authority Controls

Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.8 Identification and Control of Materials, Parts and Components

17.2.8.1 General Description

The Authoritv's Operation Quality Assurance Program requires that all organizations performing safety-related activities establish procedures to provide identification and maintain control of materials, parts, and components, including partially fabricated assemblies, to prevent the use of defective, unapproved or incorrect materials and equipment. These procedures, as applicable, shall provide for the unique identification of items by serial numbers, part number or other appropriate means. The identification shall be on the item whenever practical and shall not degrade the quality

or function of the item or on records directly and readily traceable to the item. Verification of identification shall be accomplished at appropriate stages throughout manufacturing, shipment, receipt, and installation.

The program has provided measures which assure that traceability of items to records, which will verify conformance of the materials, parts and components to specified requirements (e.g. chemical and physical properties, tests, inspections, etc.) shall be provided from initial receipt of materials to installation, use, testing, and throughout the life of the item during operation, modification and repair. For consummable items traceability requirements shall be met by documentation which indicates that only acceptable materials have been used.

The operating organization will identify and maintain control of materials, parts and components at the plant in accordance with approved written procedures which conform to the Authority's Operation Quality Assurance Program.

The Authority may delegate Identification and Control of Material, Part, Component activities for plant structures, systems, components, and procurement quality control activities to an A-E in accordance with Section 17.2.2 Paragraph 17.2.2.1.

17.2.8.2 Authority Controls

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.9 Control of Special Processes

17.2.9.1 General Description

The Authority's Operation Quality Assurance Program requires that special processes be adequately controlled. A special process is defined as a unique manufacturing, inspection or test process that is required to accomplish a task which affects quality of the product. Special processes include, but are not limited to, welding, cadwelding, studwelding, heat treating, nondestructive examination, and cleaning.

The Authority's program requires that all organizations performing special processes on safety-related equipment at the plant or at manufacturing plants shall do so in accordance with approved procedures under controlled conditions, and that procedures, equipment and personnel shall be qualified in accordance with the applicable codes, standards and specifications. Special process procedures shall

reference the applicable codes, standards or specifications and provide methods of documenting accomplished activities.

The operating organization will control special processes at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

The Authority may delegate Control of Special Process activities of plant structures, systems, and components, and modification and repair activities to an A-E in accordance with Section 17.2.2 Paragraph 17.2.2.1.

17.2.9.2 Authority Control

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.10 Inspection

17.2.10.1 General Description

The Authority's Operation Quality Assurance Program defines the program requirements that are applicable to inspections performed on safety-related equipment throughout all phases of operations.

The Authority's Operation Quality Assurance Program requires that design specifications, drawings, procedures or instructions shall include the necessary inspection requirements, with acceptance criteria to provide assurance that items and work conform to the design requirements. These requirements, based on applicable requirements of codes, standards and regulatory guides, are then translated into inspection programs or plans, by the manufacturing activities, to provide documented records of the inspection efforts required to assure quality. Inspection plans shall make use of in-process and final inspection operations as required. Qualified inspectors shall perform inspection using proper equipment that has been calibrated in compliance with the requirements of Section 17.2.12. Inspectors shall be qualified in accordance with applicable codes, standards and training programs, and their qualifications and certifications shall be kept current. Inspection procedures, instructions or plans shall be made available where the activity is to be performed prior to the start of work. Inspection of repair or modification shall be by the same method and to the same criteria as the original inspection or by an approved alternate. Where direct inspection is not practicable, control of processing, equipment and personnel shall be used to determine acceptability. When sampling plans are used, they shall be based on recognized standard sampling plans.

Maintenance and modification procedures are reviewed by qualified personnel, knowledgeable of QA, to determine the necessary requirements related to such items as inspection, designation of inspection personnel and the need for documenting the results of subsequent inspections.

The operating organization will perform QC inspections at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

When notification or hold points have been established, either contractually by purchase documents or internally by the fabricator, or at the plant by the operating organization, the inspection program or plan provides that work does not progress beyond the notification points until released by the designated authority. Acceptance inspection activities are performed by qualified inspection personnel who have not performed the work to be inspected and the inspection results are evaluated to determine that requirements have been satisfied.

The Authority may delegate Inspection activities at vendor facilities of plant structures, systems, and components to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.10.2 Authority Control

The Authority will perform planned and periodic audits of delegated organizations and participates in inspections at selected vendors' facilities, to verify program implementation in accordance with approved QA Program requirements.

17.2.11 Test Control

17.2.11.1 General Description

The Authority's Operation Quality Assurance Program defines the basic requirements for all organizations performing tests on safety-related materials, equipment, component systems and structures throughout all phases of operation.

Tests performed after modification, repairs or replacements shall be in accordance with the original design, testing requirements or acceptable alternatives. The extent of testing shall be based on the complexity of the modifications, replacements or repairs. Acceptable alternatives must be approved by an appropriately designated organization.

The Authority's program requires that testing necessary to demonstrate that materials, equipment, components, systems and structures will perform satisfactorily in service shall be accomplished in accordance with written procedures, as required. These procedures are based on regulatory requirements, codes, standards, and applicable regulatory guides. The test procedures, to the extent applicable, include provisions to assure that all prerequisites have been met prior to further processing such as the availability of appropriate calibrated equipment, completeness of the item, condition of the item, proper environmental conditions and arrangements, if necessary, for witness of mandatory tests by the Authority, contractor or authorized inspector. Test procedures are sufficiently detailed, including caution or safety notes such that test operator interpretation is not required. Test personnel will be trained, qualified and certified if necessary for the various test functions. Test results shall be documented with sufficient detail to prevent misinterpretation. The organization that developsthe design objectives or test limits or another duly authorized organization, establish the acceptance criteria. Test results will be evaluated to the established criteria, by a qualified, responsibile individual or group. Test records will be filed and stored in an appropriate manner upon completion of the test and evaluation.

The operating organization will conduct tests and test control activities at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

The Authority may delegate Test Control activities of plant structures, and components for plant design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.11.2 Authority Controls

The Authority will review, comment and concur with selected written test procedures and specifications related to: testing, instrumentation, and its maintenance and calibration and environmental conditions required for the performance of test, and the acceptance limits relating to test.

The Authority will review, comment and concur with tests specified in procurement documents.

The Authority reviews and comments on methods of documenting and recording test data and results.

The Authority will witness selected tests at vendor facilities and witness selected tests at the plant.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.12 Control of Measuring and Test Equipment

17.2.12.1 General Description

The Authority's Operation Quality Assurance Program defines the requirements for the control of measuring and test equipment throughout all phases of measurement, inspection and monitoring of safety-related materials, components, systems and structures during operations.

The Authority's program requires that all organizations performing measurement, inspection and testing of safety-related materials, components, systems, structures, and installation have written procedures that are based on applicable requirements of codes, standards and regulatory guides, describing the identification, control, maintenance, and calibration of all measuring and test equipment. The procedures must include calibration techniques, calibration frequency, and reference and transfer standards that are required. All measuring and test equipment shall be uniquely identified and have traceability to the calibration records and technical data. Identification shall include the use of labels, tags, decals, etc. affixed to the equipment, when practical, denoting the date of calibration and the due date of the next calibration. Calibration frequency shall be dependent on the required accuracy, purpose, degree of usage, stability characteristics, manufacturer's recommendations, or other conditions affecting the measurement.

The reference and transfer standards shall be traceable to nationally recognized standards and, for any exceptions, provisions shall exist to document the basis for calibration. Calibration standards shall have an uncertainty (error) requirement of no more than 1/4th of the tolerance of the equipment being calibrated. A greater uncertainty may be acceptable limited by the "state-of-the-art".

In the event measuring or test equipment is determined to be out of calibration, an investigation shall be conducted to determine the validity of previous inspections performed with this equipment. The results of this investigation shall be documented and if required, previous inspection requirements will be repeated using calibrated equipment.

The operating organization will control measuring and test equipment used at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

The Authority may delegate Control of Measuring and Test Equipment activities of plant structures, systems, and components for design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.12.2 Authority Controls

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.13 Handling, Storage and Shipping

17.2.13.1 General Description

The Authority's Operation Quality Assurance Program defines the requirements for handling, storage, and shipping activities performed on all safety-related equipment, during operations.

The Authority's program requires that organizations performing handling, storage and shipping activities do so to written procedures, as appropriate. These procedures, based on applicable requirements of codes and standards have provisions for handling, cleaning, preservation, storage, packaging and shipping of equipment, as required. These provisions include detailed requirements for cleaning, coating and specifying environmental conditions. They also describe special handling and precaution required during unloading or storage at the plant and other storage locations. The procedures contain the inspection instructions necessary to verify conformance to established criteria using qualified personnel as required. Where necessary, the procedures specify the inspection and the inspection frequency of items in storage to preclude damage, loss, or deterioration from environments such as corrosive atmosphere, moisture and temperature.

The operating organization will control handling, storage and shipping activities at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

The Authority may delegate Handling, Storage and Shipping activities of plant structures, systems, and components for design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.13.2 Authority Controls

The Authority will review specifications, drawings, procedures and instructions which contain the requirements for handling, storage, shipping, cleaning, preservation and maintenance of material and equipment whether in storage or installed at the plant as structures, systems, or components.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.14 Inspection, Test, and Operating Status

17.2.14.1 General Description

The Authority's Operation Quality Assurance Program describes the requirements for the control of inspection, test, and operational status of all safety-related material, equipment, and structures.

A system, based on applicable requirements of codes, standards, and regulatory guides, is established by affected organizations fabricating equipment, test, or inspection operations to identify the status of inspections and tests of these items during all phases of operation. The system is implemented by written procedures which describe the use of indicators such as tags, markings, shop travellers, stamps, route cards or inspection checklists that identify the status of the item or equipment at any given time.

The procedures provide for the positive identification and control of nonconforming items in accordance with Section 17.2.15 to prevent their inadvertent use.

The program assures that operations performed out of sequence are adequately documented and do not compromise system integrity. Only authorized personnel are permitted to apply or remove tags, markings or stamps to the equipment and/or the documentation. Stamps such as for welding, inspection or test are controlled and documented such that the individual using the stamp is readily and uniquely identified.

The program requires that bypassing or waiver of a designated QC inspection, test or critical work operation shall be controlled under the cognizanced QA personnel.

The operating organization will maintain the inspection, test, and operational status of all safety related material, equipment, and structures at the plant in accordance with approved written procedures which conform to the Authority's Operation Quality Assurance Program.

The Authority may delegate Inspection, Test, and Operating Status activities of plant structures, systems, and components for design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.14.2 Authority Controls

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.15 Nonconforming Materials, Parts, and Components

17.2.15.1 General Description

The Authority's Operation Quality Assurance Program describes the requirements for the disposition, handling and control of nonconforming material during operation.

The Authority's system for control of nonconformances provides measures for nonconformances, observed by Authority personnel, to be documented, reviewed, dispositioned and transmitted to the responsibile delegated organization for corrective action. Documentation shall fully identify the item, nonconforming characteristics, inspection requirements, the specific requirement(s) violated, the disposition of the nonconformance and the signature approval of the disposition. The program provides for the identification of personnel or group(s) responsible for assigning dispositions to nonconforming items. Dispositions authorizing a change in requirements shall be made by the same personnel or group(s) responsible for establishing the original requirement or by another authorized organization.

The Authority's program provides measures to prevent inadvertent use or installation of safety-related materials, parts and components when determined to be in noncompliance with the requirements of applicable codes, standards, drawings, specifications and procurement documents. The program requires identification, classification, resolution and follow up of material nonconformances which are detected during the course of operation activities.

The Authority's program also requires that nonconforming items be clearly identified by appropriate means (tags, labels, stickers, marking, etc.) and segregated, if practical, until the disposition instructions for the nonconforming item has been received. Measures have been established in the program to assure that nonconformance data related to work performed at a vendor's facility, relative to "accept as is" or "repair" dispositions are reflected in the inspection records and forwarded to the plant to be retained as part of the plant records.

Periodic reviews are made of material nonconformance reports by the Authority's Quality organization. These reviews are performed and results are documented and reported to appropriate management.

The operating organization will control nonconforming items at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

The Authority may delegate Nonconforming Materials, Parts or Component Control activities of plant structures, systems, and components for plant design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.15.2 Authority Controls

The Authority will review and comment on selected deficiency reports generated by delegated organizations at vendor facilities.

The Authority will verify, at the plant, that rework and repair activities are accomplished in accordance with disposition instructions.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.16 Corrective Action

17.2.16.1 General Description

The Authority's Operation Quality Assurance Program describes the requirements for a corrective action program and assures that conditions adverse to or affecting quality are promptly identified, reported and corrected.

The Authority's Program provides for systematic analysis of deficiencies, including nonconformance reports, the determination of the need for corrective action and the reporting to an appropriate level of the management the condition, cause, and corrective action taken. Records are maintained to substantiate that these corrective action measures have been properly implemented. This corrective action system is implemented through the use of approved written procedures.

The Authority's Program requires identification of the significant conditions adverse to or affecting quality and the need for corrective action to be documented. Reports of the conditions adverse to quality are formally issued to appropriate levels of management of affected organizations. The circumstances creating or contributing to the adverse condition, the action necessary to correct the condition, and measures taken to preclude recurrence are determined and documented by the organization responsible for implementing the needed corrective action. If the specified disposition for corrective action affects design of structures, systems or equipment, a technical review shall be made by the organization that established the original design criteria, or another duly authorized organization, to verify adequacy of the stated disposition.

Follow-up action is taken to verify that specified corrective action has been properly implemented. Verification of proper implementation, or any action taken which is not considered acceptable, is documented and distributed to appropriate levels of management. This distribution includes management of the organization responsible for implementation of the specified corrective action.

A corrective action system will be implemented at the plant in accordance with approved written procedures which conform to the requirements of the Authority's Operation Quality Assurance Program.

The Authority may delegate Corrective Action activities of plant structures, systems, and components for design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.16.2 Significant Deficiencies

Significant deficiencies which are determined to be within the scope of requirements of Section 50.55 (e), of 10CFR50, will be reported to the NRC Directorate of Inspection and Enforcement in accordance with the Authority's Quality Assurance Program.

17.2.16.3 Authority Controls

The Authority will review and concur with corrective action in conjunction with nonconformance documents.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementation in accordance with approved QA Program requirements.

17.2.17 Quality Assurance Records

17.2.17.1 General Description

The Authority's Operation Quality Assurance Program requires that quality records of safety-related items and activities shall be identified, reviewed, retained and retrievable. These requirements are imposed on all organizations performing safety-related functions during operation.

The Authority's program requires that records generated during the operation phase, documenting evidence of quality of items and activities include such items as: operating logs, principal maintenance and modification activities, results of reviews, inspections, tests audits; significant events, monitoring of work performance and material analysis; the qualification of personnel, procedures, and equipment; and other documentation such as drawings, specifications procurement documents, calibration procedures, calibration reports, design changes, and nonconforming and corrective action reports. Requirements for identification, transmittal, retention, maintenance, and review of quality-related records are indicated in specifications, quality programs and procedures. Documentary evidence of these activities shall be available at the plant prior to release of material or equipment for installation. The quality program specifies the type of information and data to be compiled for the inspection records, such as: description of operation; evidence of completion or verification of manufacturing, inspection or test operation; inspection and test results; information concerning nonconformances; inspection and qualifications of test and inspection personnel; and acceptability of the item tested or inspected. The quality program describes the requirements for record storage facilities which shall be constructed, located and secured in such a manner as to prevent destruction of the records through fire, flooding, theft and deterioration by environmental conditions. Records generated during the design, procurement and construction phases, shall be maintained and stored in the same described manner.

The operating organization will maintain and store records at the plant in accordance with approved written procedures which conform to the Authority's Operation Quality Assurance Program.

The Authority may delegate Quality Assurance Record activities of plant structures, systems, and components for design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.17.2 Authority Controls

The Authority will perform planned and periodic audits of delegated organizations to verify implementation in accordance with approved QA Program requirements. The Authority maintains records generated by Authority personnel, both onsite and offsite, in accordance with the requirements in the Authority's Quality Assurance Program Manual.

17.2.18 Audits

17.2.18.1 General Description

The Authority's Operation Quality Assurance Program includes a comprehensive system of planned and periodic audits to be carried out by the Authority Quality Assurance Organization as activities are performed to verify compliance with all aspects of the program. In addition, this audit system provides data for a continuing evaluation of the effectiveness of the program.

The Authority's audit program, as defined in the Authority's Operation Quality Assurance Program, includes the following types of audits to provide a comprehensive, independent verification and evaluation of all quality-related procedures and activities to assure they are in compliance with the Authority's established program requirements:

1. Audits of delegated organizations.

2. Audits of selected vendors and contractors.

3. Audits of plant operation activities.

4. Audits internal to the Authority.

The Authority will perform planned and periodic audits of delegated organizations to verify program implementations in accordance with approved QA Program requirements. Specific program areas are subsequently audited, consistent with the project schedule or where quality concerns are noted, so that the total program is reaudited within a scheduled period of time.

Independently, or concurrent with the audits and inspections by delegated organizations, the Authority may conduct audits of vendors and contractors such as equipment fabricators, material suppliers, consultants and various contractors working on plant activities.

The Authority's audit program requires audit results to be documented, reviewed by or with management responsible for the area audited, and appropriate action initiated to correct any deficiencies. The organization conducting the audit is responsible for conducting follow-up actions including reaudit of deficient areas to assure correction of the discrepancies. Results of audits are summarized in audit reports which are reviewed by Quality Assurance.

The Authority may delegate Audit activities of plant structures, systems, and components, and procurement for design changes, modification and repair activities to an A-E in accordance with Section 17.2.2, Paragraph 17.2.2.1.

17.2.18.2 Authority Controls

The Authority will perform planned and periodic audits of delegated organizations and participates in audits at selected vendors' facilities to verify program implementation in accordance with Approved QA Program requirements.

The Director-Quality Assurance, based on his review, reports audit findings and the actions to be taken to correct the deficient conditions to the Chief Engineer. These reports also serve as a source of information for the Authority's Quality Assurance Program Evaluation by management.

TABLE 17.2.2-1

QA PERSONNEL QUALIFICATIONS

Qualification requirements have been established for various levels of activity for personnel on an individual basis. Personnel assigned to perform Quality Assurance activities will have qualifications that are commensurate with the responsibilities with which they are charged. Quality Assurance personnel will have demonstrated their ability to perform competently in those areas for which they will be held responsible. Qualifications of personnel performing QA functions shall be determined from the following data:

Education

A. A degree in engineering or a related field of study.

B. Where a college degree has not been obtained, two years of experience in the Experience Requirements - Area below, will be acceptable in lieu of each year of education. This requirement is based on a four-year accredited curriculum.

Experience Requirements - Area

A. Design

B. Construction

C. Operation

D. Quality Assurance

E. Plant Maintenance

Experience Requirements - Years

The required number of years of experience, listed hereinafter, shall be the sum of all the years in either or any combination of the areas listed in the Experience paragraph above, plus a degree in engineering or a related field of study.

Position	Experience Years
Director - Quality Assurance	10
Quality Assurance, Project Engineer	7
Site QA Engineer	7
QA Engineer	5

QC personnel shall be certified based on the experience and education requirements as defined in Regulatory Guide 1.58 and ANSI N45.2.6. The experience level certification shall be commensurate with the activity to be performed.

TABLE 17.2.2-2

ARCHITECT-ENGINEER

The Authority shall delegate to United Engineers and Constructors, Inc., the original plant designers, quality affecting activities as described in Section 17.2.2-1 of this chapter. Any work so delegated shall be in accordance with an acceptable QA Program and implementing procedures, as may be required for the performance of such tasks.

PLANT ADMINISTRATIVE PROCEDURES

FIGURE 17.2.2.-2

Procedure No.	Title
AP-1	Plant Organization
AP-2	Plant Operating Review Committee
AP-3	Procedure Approval
AP-4	Procedure Adherence
AP-5	Security Plan
AP-6	Emergency Plan
AP-7	Radiation Safety Program
AP-8	Reporting of Significant Occurrences
AP-9	Work Requests
AP-10	Work Permits
AP-11	Waste Release Permits
AP-12	Plant Modifications
AP-13	Jumper Control
AP-14	Availability of On-Call Personnel
AP-15	Training Program
AP-16	Quality Control
AP-17	Calibration of Measuring and Test Equipment
AP-18	Document Control
AP-19	Surveillance Test Program
AP-20	Special Nuclear Material Controls
AP-21	Conduct of Operations
AP-21.1	Operating Procedure Controls
AP-21.2	Shift Organization Requirements
AP-21.3	Watch Relief
AP-21.4	Log Keeping
AP-21.5	Confines of the Control Room
AP-21.6	Night Order Book
AP-22	Conduct of Maintenance
AP-22.1	Maintenance Procedure Controls
AP-23	Conduct of I & C
AP-23.1	I & C Procedure Controls
AP-24	Conduct of Radiological and Chemical Services
AP-24.1	Radiological and Chemical Procedures Controls
AP-25	Conduct of Technical Services
AP-26	Conduct of Office Services
AP-26.1	Procurement
AP-26.2	Accounting
AP-26.3	Time Keeping
AP-26.4	Personnel Procedures
AP-27	Plant Safety
AP-27.1	Safety Committee
AP-27.2	Housekeeping
AP-27.3	Fire Protection
AP-27.4	Fire Drills
AP-27.5	Accident Reports
AP-28	Warehouse Controls
AP-28.1	Material Controls

APPENDIX 17.2.0-1

CONFORMANCE WITH NRC REGULATORY GUIDES

1. Personnel Selection and Training (Regulatory Guide 1.8, March 1971)

   The selection and training of personnel to be used at the Indian Point 3 Nuclear Power Plant conforms with Regulatory Guide 1.8.

2. Quality Assurance Program Requirements (Design and Construction) (Regulatory Guide 1.28, June 1972)

   The design and construction of safety related structures, systems, and components resulting from modifications or design changes are subject to quality assurance requirements that comply with the positions defined in Regulatory Guide 1.28, which endorses ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants".

3. Quality Assurance Requirements for Installation, Inspection, and Testing of Instrumentation and Electric Equipment (Regulatory Guide 1.30, August 1972)

   The installation, inspection, and testing of all IEEE Class IE electric power, instrumentation, control equipment and systems, including auxiliary equipment and associated material, comply with the requirements of Regulatory Guide 1.30.

4. Quality Assurance Program Requirements (Operation) (Regulatory Guide 1.33, November 1972)

   The Quality Assurance requirements for the operation of the IP3NPP comply with Regulatory Guide 1.33.

5. Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants (Regulatory Guide 1.37, March 1973)

   The Quality Assurance requirements for cleaning of fluid systems and associated components comply with Regulatory Guide 1.37, with the following exceptions:

Regulatory Position C3 - Safety related systems other than the following:

1. Reactor coolant pressure boundary
2. Systems required for reactor shutdown
3. Systems required for emergency core cooling
4. Reactor vessel internals that are relied upon to permit adequate core cooling for any mode of normal operation or under credible postulated accident conditions

are flushed with water in accordance with ANSI N45.2.1-73, except that the quality of water is as close as practical to that of the operating system water. The systems listed comply with NRC Regulatory Position C.3. These are the most critical systems in a plant and must be carefully protected from contamination, especially for stainless steel systems. For other QA Category I systems it is adequate to use water defined by ANSI N45.2.1-73, except that the flush water is matched as close as practical to that intended for system operation. For example, demineralized water is used for systems that operate with demineralized/deionized/condensed water. It is not necessary to flush such systems with water containing 0.15 ppm chlorides when the 1.0 ppm maximum chlorides required by ANSI would be adequate to prevent contamination.

6. Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants (Regulatory Guide 1.38, March 1973)

The quality assurance requirements for packaging, shipping, receiving, storage and handling comply with Regulatory Guide 1.38 with the following exceptions:

a. Regulatory Position C.3 - Tapes, dessicants, and dessicant bags do not contain the following as a basic and essential chemical constituent: lead, zinc, copper, mercury, cadmium and other low melting point metals, their alloys, and/or compounds.

b. As prescribed in ANSI N45.2.2-1972 maximum levels of water leachable chlorides, total halogens, and sulfur and their compounds are imposed upon tapes.

c. Dessicants and dessicant bags contain nonhalogenated and nonsulfur bearing materials.

7. Housekeeping Requirements for Water-Cooled Nuclear Power Plants (Regulatory Guide 1.39, March 1973)

The housekeeping program complies with Regulatory Guide 1.39.

8. Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Plant (Regulatory Guide 1.54, June 1973)

The Quality Assurance requirements for protective coatings comply with Regulatory Guide 1.54 with the following exceptions:

In lieu of the inspection defined in Section 6.2.4 of ANSI N101.4-1972, inspection is in accordance with ANSI N5.12-1974 Section 10, Inspection For Shop and Field Work.

Regarding the extent of coverage, the following offers clarification of paragraph 1.2.4 of ANSI N101.4-72:

Regulatory Guide 1.54 will be applied as follows:

A. Surfaces within the primary containment liner boundary:

   a. For large surface area components, the documents shall be retained by the Authority as required by ANSI N101.4-72. These components include such items as the reactor building crane, containment, structural steel (including miscellaneous steel and handrails), concrete, ductwork, uninsulated pipe, exterior of uninsulated tanks and vessels, and major equipment supports.

   b. For manufactured equipment such as pumps, motors, pipe hangers and supports, the documentation required by ANSI N101.4-72 shall be maintained in the Seller's files for the complete duration of the contract warranty/guarantee period. A certificate of compliance signed by responsible management personnel shall be furnished by the Seller.

B. Other surfaces where coating failure could compromise the design function of equipment or components intended to prevent or mitigate the consequences of postulated accidents which could affect the public health and safety.

Because of the impracticability of imposing the Regulatory Guide requirements on the standard shop process used in painting valve bodies, handwheels, electrical cabinetry and control panels, loudspeakers, emergency light cases and like components, the Regulatory Guide will not be invoked for these items since the total surface of such items is relatively small when compared to the total surface area for which the requirements will be imposed.

The reference substitution of ANSI N5.12 as the basis for inspection, rather than ANSI N5.9 reflects a revision to a standard referenced in the based document, ANSI N101.4.

9. Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel (Regulatory Guide 1.58, August 1973)

Qualification of nuclear power plant inspection, examination, and testing personnel complies with Regulatory Guide 1.58.

10. Quality Assurance Requirements for the Design of Nuclear Power Plants (Regulatory Guide 1.64, October 1973)

The Quality Assurance requirements for the design or design change resulting in modification of the Indian Point 3 Nuclear Power Plant comply with Regulatory Guide 1.64.

11. Quality Assurance Terms and Definitions (Regulatory Guide 1.74, February 1974)

The Indian Point 3 Nuclear Power Plant Quality Assurance Program degree of compliance with Regulatory Guide 1.74 is as follows:

A. The Authority uses the appropriate definitions of ANSI N45.2.10-1973 and supplements these terms with others defined in the Authority's Quality Assurance Program Manual.

12. Preoperational and Initial Startup Test Programs for Water-Cooled Power Reactors (Regulatory Guide 1.68)

Not applicable for our phase of operations.

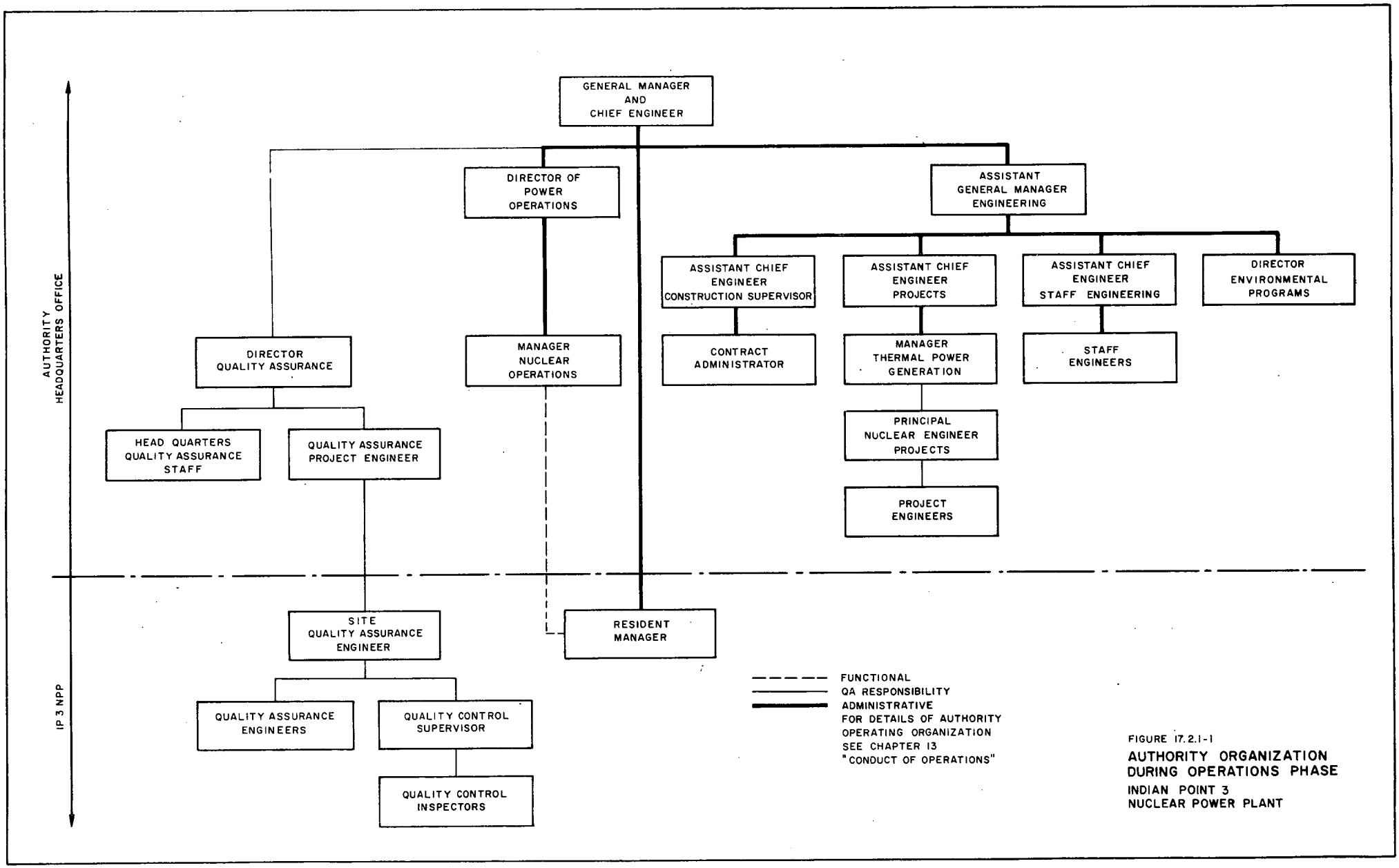

FIGURE 17.2.1-1

AUTHORITY ORGANIZATION DURING OPERATIONS PHASE

INDIAN POINT 3
NUCLEAR POWER PLANT

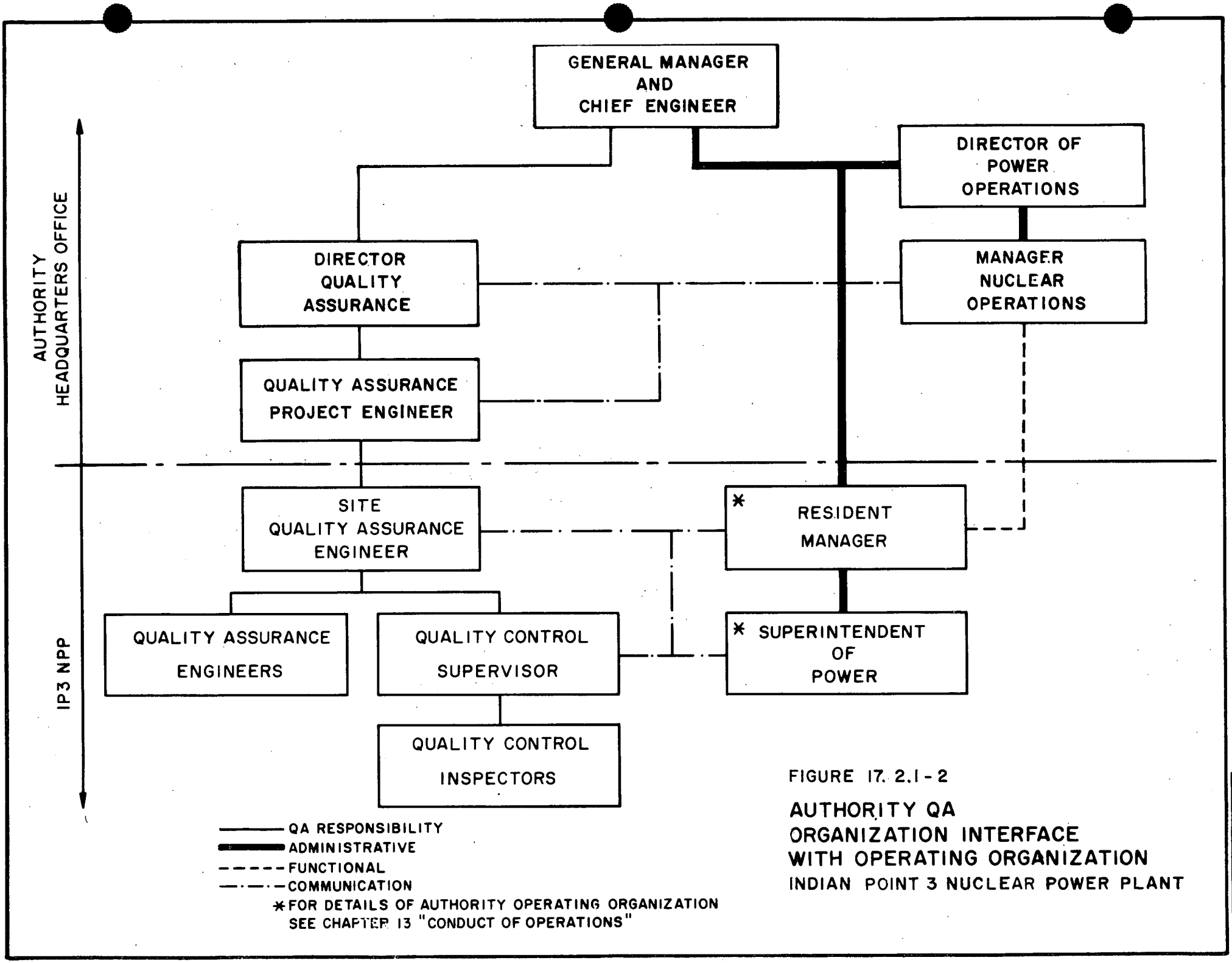

FIGURE 17.2.1-2

AUTHORITY QA ORGANIZATION INTERFACE WITH OPERATING ORGANIZATION

INDIAN POINT 3 NUCLEAR POWER PLANT

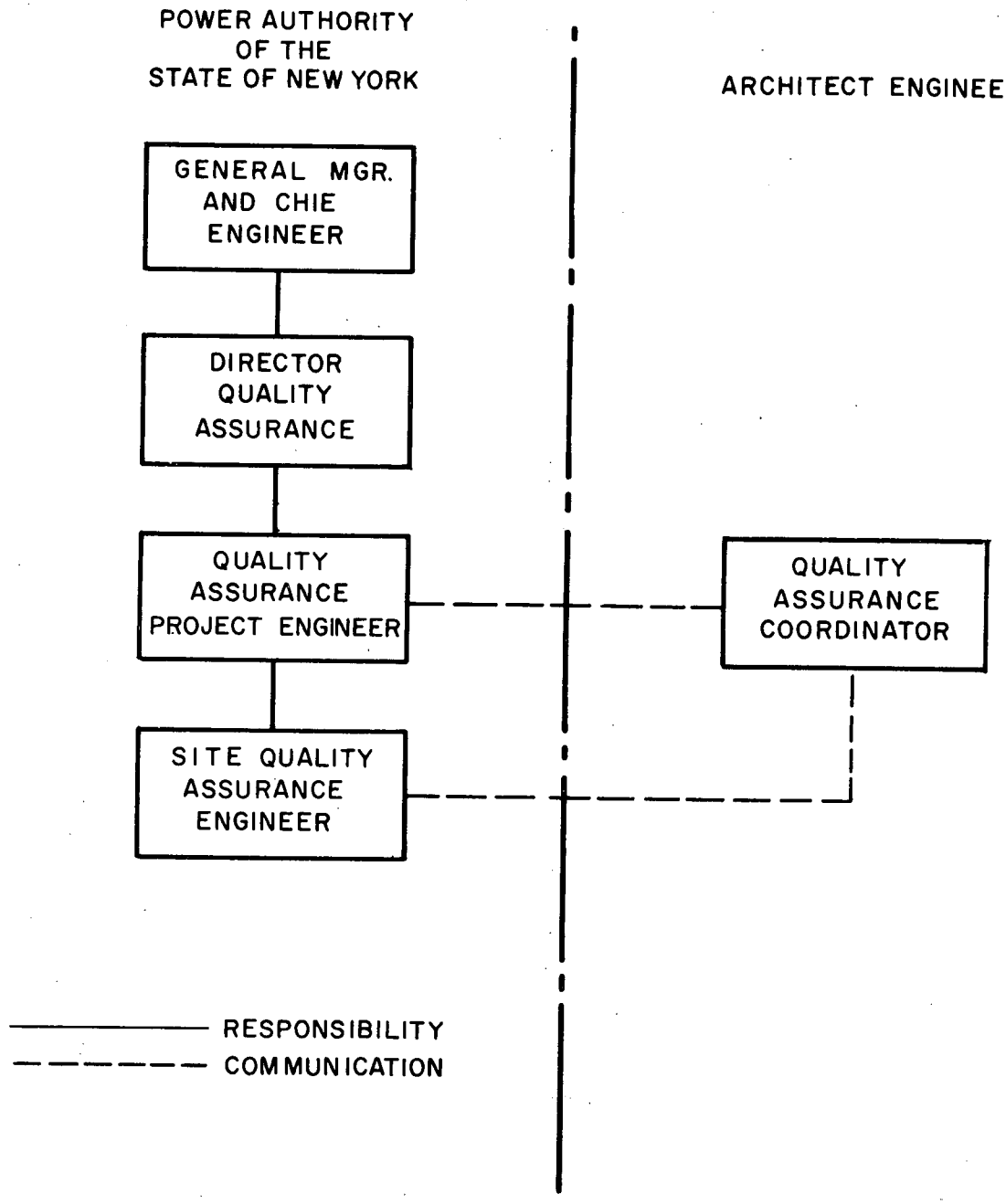

FIGURE 17.2.1-3

AUTHORITY AND ARCHITECT ENGINEER INTERFACE

INDIAN POINT 3 NUCLEAR POWER PLANT

10CFR50 APPENDIX B QUALITY ASSURANCE CRITERIA	SECTION 1 ORGANIZATION	SECTION II QUALITY ASSURANCE PROGRAM	SECTION III DESIGN CONTROL	SECTION IV PROCUREMENT DOCUMENT CONTROL	SECTION V INSTRUCTIONS, PROCEDURES & DRAWINGS	SECTION VI DOCUMENT CONTROL	SECTION VII CONTROL OF PURCHASED MATERIAL, EQUIPMENT & SERVICES	SECTION VIII IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS	SECTION IX CONTROL OF SPECIAL PROCESSES	SECTION X INSPECTION	SECTION XI TEST CONTROL	SECTION XII CONTROL OF MEASURING AND TEST EQUIPMENT	SECTION XIII HANDLING, STORAGE AND SHIPPING	SECTION XIV INSPECTION, TEST, & OPERATING STATUS	SECTION XV NONCONFORMING MATERIALS, PARTS, OR COMPONENTS	SECTION XVI CORRECTIVE ACTION	SECTION XVII QUALITY ASSURANCE RECORDS	SECTION XVIII AUDITS
AUTHORITY QUALITY ASSURANCE PROGRAM MANUAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AUTHORITY QUALITY ASSURANCE PROCEDURE MANUAL*	1.1 1.2 1.3 1.4 1.5	2.1 2.2 2.3 2.4	N/A	4.1	5.1 5.2	6.1 6.2 6.3	7.1 7.2 7.3	N/A	9.1	10.1	11.1	N/A	N/A	N/A	15.1 15.2	16.1 16.2	17.1	18.1 18.2 18.3

QAP NO.	QUALITY ASSURANCE PROCEDURE TITLE
1.1	ORGANIZATION
1.2	ORGANIZATION INTERFACE - MAJOR CONTRACTORS
1.3	STOP WORK PROCEDURE
1.4	CERTIFICATION OF AUTHORITY NDE PERSONNEL
1.5	QUALIFICATION OF QA AUDITING PERSONNEL
2.1	QA PROGRAM SCOPE
2.2	MANAGEMENT REPORTS
2.3	INDOCTRINATION AND TRAINING
2.4	QA PROGRAM ASSESSMENT
4.1	PROCUREMENT DOCUMENT REVIEW
5.1	PREPARATION AND PROCESSING OF QA PROCEDURES
5.2	PREPARATION AND PROCESSING OF QA PROGRAM
6.1	CONTROL OF QA MANUALS AND PROCEDURES
6.2	CONTROL OF QA CORRESPONDENCE
6.3	PROCESSING QA DOCUMENTS
7.1	VENDOR SELECTION AND EVALUATION
7.2	CONTRACTOR/VENDOR FACILITY SURVEILLANCE
7.3	RECEIVING INSPECTION - MATERIALS, PARTS AND COMPONENTS
9.1	SPECIAL PROCESSES
10.1	INSPECTION OF QA RELATED ACTIVITIES
11.1	TEST CONTROL
15.1	DEFICIENCY REPORT CONTROL - MAJOR CONTRACTORS
15.2	NON-CONFORMING MATERIALS, PARTS OR COMPONENTS
16.1	CORRECTIVE ACTION CONTROL
16.2	DEFICIENCY AND CORRECTIVE ACTION REPORT
17.1	AUTHORITY QA RECORD RETENTION
18.1	QA AUDITS
18.2	QA FOR CONTRACTORS AND SUBCONTRACTORS
18.3	AUDITS OF MAJOR CONTRACTORS

X - MANUAL SECTION NUMBER - DIRECT CORRELATION

NA - FUNCTIONS PERFORMED BY OPERATING ORGANIZATION AND/OR A-E - CONTROLLED BY AUTHORITY QA STAFF VIA AUDIT AND/OR SURVEILLANCE

* - THESE PROCEDURES ARE IN A CONTINUAL STATE OF REVIEW, UPGRADING AND REVISION AS REQUIRED TO IMPROVE IMPLEMENTATION OF THE AUTHORITY'S QA PROGRAM. THE AUTHORITY MAY ADD, REVISE AND/OR DELETE PROCEDURES OF PORTIONS THEREOF, WITHOUT CHANGING THE INTENT OF THE OVERALL QA PROGRAM. THEREFORE THIS LIST SHOULD ONLY BE CONSIDERED AS REPRESENTATIVE.

Δ - PLANT ADMINISTRATIVE PROCEDURES AND THEIR RELATIONSHIP TO APPENDIX B, 10CFR50 ARE DELINEATED IN FIGURE 17.2.2-2

FIGURE 17.2.2-1

CROSS REFERENCE MATRIX OF IMPLEMENTING DOCUMENTS

INDIAN POINT 3 NUCLEAR POWER PLANT