ENCLOSURE

TVA TOPICAL REPORT TR75-1A

REVISION 5

17.0.1 TVA Organization

The overall relationship among the principal TVA organizational elements is shown in Figure 17.0-1. 3

17.0.1.1 Board of Directors. The Board of Directors is vested with all the powers of the Corporation. It establishes general policies and programs; reviews and appraises progress and results; and approves projects, programs, and specific items of major importance.

17.0.1.2 Office of the General Manager. The General Manager is the principal TVA administrative officer. He serves as liaison between the Board and the offfices and divisions in the handling of matters of Board concern and is responsible for coordinating the execution of programs, policies, and decisions which the Board of Directors approves or adopts.

17.0.1.3 Office of Power. The Office of Power has overall responsibility for the TVA power program. POWER,s organizational structure and responsibilities are discussed in Section 17.2.1.

17.0.1.4 Office of Management Services. The Office of Management Services plans and manages logistical and administrative management support services to TVA programs and organizations. It provides building, office, land acquisition, computing, and transportation services and provides for law enforcement and the protection of TVA property. it develops and administers policies and procedures relating to finances and for procurement, transfer, disposal, and shipping of equipment, materials and services needed by TVA. it is also responsible for the radiological hygiene program at operating nuclear plants. 3

17.0.1.4.1 Division of Purchasing. The Division of Purchasing within the Office of Management Services administers all procurements but is not responsible for determining the technical and quality assurance requirements of any procurement; these requirements are obtained from or established by, and are administered by, the organization initiating the procurement. The Division of Purchasing is responsible for assemblying and issuing the Invitation to Bid; opening and reading bids in public; evaluating responsiveness to the terms and conditions; submitting the bids to the requisitioner for technical and quality assurance evaluation and recommendations; obtaining the necessary administrative approvals; awarding and issuing contracts; and negotiating and making changes of contract. A contracting office is named for each contract by the Division of Purchasing. The contracting officer is responsible for assuring that provisions of the contract are met. Changes affecting technical or quality assurance requirements are approved by the requisitioning organization and the contracting officer. These responsibilities are defined by interdivisional procedures listed in Table 17.0-1. This list is of 5 5

the present procedures and will not be kept current. TVA may unilaterally delete, add, or renumber those procedures without revising Chapter 17 of the SAR, but will maintain the same overall program coverage. 5

17.0.1.5 Office of Engineering Design and Construction. The Office of Engineering Design and Construction (OEDC) has engineering, design, and construction responsibilities for major projects in the overall TVA program, including nuclear power plants. OEDC's organizational structure and responsibilities are discussed in Section 17.1A.1.

17.0.1.6 TVA QA Program Assessment. The Office of Power and OEDC at least annually will either jointly or separately conduct independent management reviews of selected parts of their respective portions of the TVA QA Program to assess its scope, implementation, and effectiveness and to assure that each portion is meaningful and effectively complies with Appendix E. A review of all parts of the TVA QA program will be completed in a two year cycle. Reports of these reviews will be made to the Manager of OEDC and the Manager of Power for their action. In addition to the reviews described above, the QA programs are raeviewed on a continuing basis by the Manager of OEDC as described in Section 17.1A.1.1.1 and the Manager, Nuclear Regulation and Safety as described in Section 17.2.1.1.3. 5

17.0.1.7 Interoffice Lines of Communication. To assure proper overall direction of the QA programs and resolution of Qa problems, lines of communication have been established between the Manager of Quality Assurance for OEDC and the Manager of Quality Assurance for the Office of Power. Audit reports are exchanged between organiztions, procedures, and instructions are exhanged for information, audit team members are exchanged for audits of interface functions, and periodic management meetings are held to discuss and resolve mutual problems. Table 17.0-1 is a listing of TVA Interdivisional Quality Assurance Procedures. 3 5 3

17.0.1.8 TVA QA Steering Committee. A TVA Quality Assurance Steering Committee has been established to assure uniform interpretation and application of the quality assurance policies of TVA and requirements established by regulations, codes, and standards. The committee is comprised of executive, line, and QA management members from appropriate office level and division level organizations. In carrying out its objectives, the committee: recommends new quality assurance policies; reviews quality trends and recommends corrective action; considers and recommends solutions to interdiviional quality assurance problems; arranges independent management reviews of the QA programs; and recommends ways of improving the effectiveness of these programs. 3 5 3

TABLE 17.0-1
TVA INTERDIVISIONAL QUALITY ASSURANCE PROCEDURES
(Sheet 1)

	Criteria I - Organization	
ID-QAP-1.1	Preparation, Review, Revision, and Approval of Interdivisional QA Procedures	This procedure defines the responsibility and procedures for preparing, reviewing, revising, and approving TVA interdivisional quality assurance procedures.
ID-QAP-1.2	Transfer of Construction and Engineering Design Responsibilities	This procedure covers the transfer of design and construction responsibilities at various milestones as construction is completed, systems or subsystems are transferred to NUC PR, and the unit is operated and maintained by NUC PR.
ID-QAP-1.3	Work Control	This procedure defines and implements the responsibilities and functions of EN DES, CONST, and NUC PR for controlling work on licensed units.
	Criterion II - QA Program	
ID-QAP-2.2	EN DES-NUC PR-CONST Interfaces and Responsibilities During and Following Transition from Design and Cosntruction to Operation	This procedure establishes the policy for interface and responsibilities of EN DES, CONST, and NUC PR during and following the transition from design and construction to operation of a nuclear power plant.
ID-QAP-2.3	Physical Interfaces Between Licensed and Unlicensed Units	This procedure defines the responsibilities and functions of EN DES, CONST, and NUC PR in identifying and maintaining physical and functional interfaces (separation) between licensed and

TABLE 17.0-1
TVA INTERDIVISIONAL QUALITY ASSURANCE PROCEDURES
(Sheet 2)

		unlicensed units.
ID-QAP-2.4	Future Modification	This procedure defines the methods and interactions between EN DES, CONST, and NUC PR and the responsibilities for the implementation of modifications to licensed nuclear units.
ID-QAP-2.5	Major Modifications	This procedure defines the methods and interactions of CONST and NUC PR and the responsibilities for the implementation of major modifications at a licensed nuclear plant. This procedure implements the applicable sections of ID-QAP-2.2 and ID-QAP-2.4. 5
	Criterion III - Design Control	
ID-QAP-3.1	OEDC Site Investigation for Design Purposes	This procedure defines the responsibilities and procedures required for OEDC site investigations for design purposes.
	Criterion IV - Procurement Document Control	
ID-QAP-4.1	Responsibilities and Functions of the Division of Purchasing	This procedure defines the responsibilities and functions of the Division of Purchasing in procurement for nuclear power plants as related to quality assurance activities.

TABLE 17.0-1
TVA INTERDIVISIONAL QUALITY ASSURANCE PROCEDURES
(Sheet 3)

ID-QAP-4.2	Procurement Document Control by the Division of Purchasing	This procedure defines the Division of Purchasing's responsibilities and procedures for controlling the awarding and changing of contracts for nuclear power plants.
ID-QAP-4.3	Transfer of Items	This procedure defines the responsibility and procedures used for transfer of safety-related items between TVA organizations.
ID-QAP-4.4	Vendor Quality Assurance Evaluation Information Center	This procedure describes the Vendor Quality Assurance Evaluation Information Center. The information contained in the center is available for reference by any organizaton within TVA to assist in the preaward evaluation of potential suppliers of quality-related items or services.
	Criterion VI - Document Control	
ID-QAP-6.1	Configuration Control	This procedure applies to the control of Functional Configuration Control (FCC) drawings which represent the as-constructed functional status of a system in a nuclear plant. It covers the development and approval of the list of FCC drawings for each system which is defined as the System Configuration Control Drawing List (SCCDL). It also covers the control of FCC drawings from the time of the first transfer of equipment until 5

TABLE 17.0-1
TVA INTERDIVISIONAL QUALITY ASSURANCE PROCEDURES
(Sheet 4)

		licensing of the last unit. It also includes responsibilities for and a description of the Drawing Information System which maintains the status of FCC drawing.
	Criterion XI - Test Control	
ID-QAP-11.1	Preoperational Testing	This procedure defines the responsibilities of EN DES, CONST, and NUC PR with regard to preoperational testing activities.
ID-QAP-11.2	Construction Test Control	This procedure defines organization functions and and responsibilities and establishes divisional interfaces in support of the construction test program. 5
	Criterion XVII - QA Records	
ID-QAP-17.1	Transfer of Quality Assurance Records	This procedure establishes the method and defines the interfaces and responsibilities for the transfer of Quality Assurance Records from EN DES and CONST to NUC PR.
	Criterion XVIII - Audits	
ID-QAP-18.1	Qualification, Certification and	This procedure delineates the manner in which

TABLE 17.0-1
TVA INTERDIVISIONAL QUALITY ASSURANCE PROCEDURES
(Sheet 5)

Recertification of Quality Assurance Audit Personnel	personnel performing quality assurance audits are qualified, certified, and recertified.

17.1 QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION

17.1A QUALITY ASSURANCE - Office of Engineering Design and Construction

17.1A.1 Organization

17.1 A.1.1 Office of Engineering Design and Construction (OEDC). TVA's Office of Engineering Design and Construction is responsible to the TVA General Manager and Board for the engineering, design, and construction functions for the Tennessee Valley Authority. OEDC is composed of two corporate-level divisions with the Division of Engineering Design being responsible for the general architectural and engineering functions and the Division of Construction responsible for the construction, erection, and testing of TVA projects and plants. The Division of Engineering Design and the Division of Construction are headed by managers who have corporate-level responsibility for cost and schedule, quality, and safety for TVA programs and projects. In a decentralized organization structure such as TVA they act as an independent Architect Engineer and Constructor. Each, in carrying out its mission, utilizes services from other TVA organizations for items such as personnel, legal services, purchasing, control of property and supplies, and security, and receive some services provided direct by OEDC's staffs. These OEDC staffs provide policy, guidance, and overview control on such matters as budgets and overall schedule, personnel matters, and quality assurance. 5

Three separate quality assurance organizations exist within the Office of Engineering Design and Construction. See Fig.17.1A-1.

(1) The OEDC QA staff acts for the manager OEDC in establishing basic QA program requirements, and coordinating and auditing the activities of the EN DES and CONST Quality Assurance Branches as is described in 17.1 A.1.5.

(2) The EN DES Quality Assurance Branch performs the Architect Engineer Quality Assurance function described in 17.1A.1.2.2.

(3) The CONST Quality Assurance Branch performs the Constructor Quality Assurance function as described in 17.1A.1.3.1.1.1.

These three Quality Assurance organizations and the Quality Assurance engineers, evaluators, and auditors in these organizations have the authority, responsibility, and organizational freedom to:

(1) Identify quality problems

(2) Initiate, recommend, and provide solutions

(3) Verify implementation of the solutions and corrective

action

17.1 A.1.1.1 Manager of Engineering Design and Construction. The highest officer in the Office of Engineering Design and Construction is the Manager of OEDC. He is responsible to the TVA General Manager for all activities of OEDC including quality. The Manager of OEDC establishes quality assurance policies and overall objectives and requirements for OEDC. These are included in the Quality Assurance P.ogram Requirements Manual for OEDC. He delegates the responsibility of organizing for, attaining, and assuring quality as follows:

(1) The OEDC Quality Assurance Staff is responsible for providing basic policy and overseeing the divisions' quality functions.

(2) The engineering, design, and procurement including quality and Quality Assurance for these functions is delegated to the Manager of Engineering Design.

(3) The construction, erection, and testing including quality and Quality Assurance prior to operation, is delegated to the Manager of Construction. 5

The Manager of OEDC receives oral reports on quality assurance program status at regular staff meetings involving the Assistant Managers of OEDC, the OEDC Manager of Quality Assurance, and Managers and Assistant Managers of the Divisions of Engineering Design and Construction. There are daily staff meetings and frequent contacts between the Manager of OEDC, the Assistant Manager of OEDC, the OEDC Manager of Quality Assurance and the Managers of Engineering Design and Construction. In addition to these oral contacts, the Manager of OEDC receives regular written reports and copies of audit reports prepared by the OEDC QA Staff. As necessary he attends and has special meetings related to quality problems.

17.1A.1.1.2 Manager's Office Quality Assurance Staff. The Quality Assurance Manager reports directly to the Manager of OEDC on significant matters related to quality. He reports to the Assistant to the Manager of OEDC on routine and administrative items. The QA Manager supervises and directs the QA staff activities in the Manager's Office. He participates in staff meetings of the Manager of OEDC at which QA review is a regular topic. He regularly meets with the EN DES and CONST QA Branch Chiefs to discuss and coordinate quality related activities and to resolve quality problems.

Actions of the Staff include:

(1) Setting basic QA Program requirements for OEDC and assuring that the basic QA Program for engineering, design, and construction

activities meets the established quality and regulatory requirements.

(2) As the QA representative of the Manager of OEDC assures the implementation, measurement of effectiveness, and maintenance of the OEDC QA Program and, through periodic written and oral reports, keep the Manager of OEDC apprised of the QA Program status.

(3) Performs regularly scheduled quality audits of portions of the QA program that EN DES and CONST cannot do without conflict of interest covering each proper element once a year. Also performs special audits in problem areas as directed by the QA Manager or the Manager of OEDC.

(4) Reviews and approves selected procedures issued by the Division of Engineering Design and the Division of Construction. When necessary, directs modification of procedures and subsequent corrective action to assure that program requirements are met.

(5) Is responsible for coordinating QA activities between the Division of Engineering Design and the Division of Construction and between these divisions and other interfacing TVA organizations.

(6) Coordinates development of and provides maintenance of the manual for TVA interdivisional procedures involving elements of OEDC and other TVA offices and divisions.

(7) Is the OEDC contact for NRC-OIE, Region II for activities concerning the overall OEDC QA Program commitments and compliance.

(8) Provides the interface and coordination between elements of OEDC and NRC during announced inspections of design, procurement, and construction activities in Knoxville by NRC-OIE.

(9) Coordinates and approves the overall OEDC QA Program description (Section 17.1A of the SAR).

(10) Provides recommendations to the Manager of OEDC relative to the adequacy of the QA/QC organizations in terms of numbers, qualifications, and efficiency.

17.1A.1.1.3 Quality Requirements Section. The Quality Requirement Section establishes the basic QA program requirements for OEDC; and coordinates the establishment of safety related interfaces between EN DES and CONST and outside organizations; and provides guidance on QA matters to EN DES and CONST.

The Supervisor, Quality Requirements Section, is responsible for: (a) coordinating and maintaining the OEDC QA Program Description, the OEDC QA Program Requirements Manual, and the OEDC responsibilities for the TVA Interdivisional QA Procedures Manual; and

(b) reviewing the divisions procedures for conformance with OEDC QA Program requirements.

17.1A.1.1.4 Quality Compliance Section. The Quality Compliance Section assesses compliance to the OEDC QA Program by auditing and monitoring deficiencies and their resolution.

The Supervisor, Quality Compliance Section, is responsible for: (a) the planning, conducting, reporting, and following up of management level audits of the OEDC Quality Assurance Program in the Division of Engineering Design, the Division of Construction and interfacing organizations, (b) special audits and investigations of problem areas, (c) review of divisions' actions for repeated significant deficiencies, (d) monitoring divisions' reported nonconformances and audit deficiences for satisfactory resolution and corrective action, (e) coordination within OEDC during announced NRC inspections, and (f) review and concurrence with OEDC responses to violations contained in NRC inspection reports.

17.1A.1.2 Division of Engineering Design. The Division of Engineering Design (EN DES), as shown on Figure 17.1A-2, is responsible for establishing and implementing a quality assurance program for the design and procurement of nuclear power plants. EN DES performs the following functions which relate directly to quality: 5

(1) Identifies nuclear plant safety-related structures, systems, and components during design, construction, and modification.

(2) Develops and identifies design input requirements (design criteria).

(3) Prepares portions of the PSAR and FSAR covering TVA designed components and systems. Reviews and/or approves* portions of the PSAR and FSAR which are prepared by the NSSS vendor and other organizations.

(4) Prepares and reviews specifications for equipment designed and procured by TVA including the Nuclear Steam Supply System (NSSS). Reviews specifications of equipment designed by others and procured by TVA. Coordinates the complete plant design with the NSSS vendor, the Office of Power (POWER), and other organizations as appropriate.

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*The words "approve," "approves," "approval," or "approved," as used in this Chapter, include the meaning of words "accept," "accepts," "acceptance," or "accepted."

(5) Designs and reviews the design of all structures, systems, and components as identified in the TVA Scope of Supply. Reviews specifications for NSSS vendor furnished components and reviews design within the NSSS vendor Scope of Supply.

(6) Reviews and/or approves manufacturer's drawings, procedures, qualifications, and test results for components procured by TVA to the extent required to ensure confromance with procurement requirements. Reviews selected manufacturer's drawings, procedures, and test results for components procured by NSSS vendor to ensure compatibility with the TVA design and for conformance to TVA contract requirements.

(7) Performs surveillance in manfacturer's shops of TVA procured equipment and reviews NSSS manufacturing and vendor surveillance of major components. Performs audits and preaward surveys for TVA procurements.

(8) Prepares preoperational test scoping documents, reviews and approves preoperational test procedures, and approves final preoperational test results. Reviews construction test selection, testing procedures, and selected test results.

(9) Prepares construction specifications and construction drawings for use by CONST.

(10) Provides engineering and design support for operating plants. 5

17.1A.1.2.1 Manager of Engineering Design. The manager is the corporate officer responsible for design and procurement--including quality assurance. He determines the area of responsibility assigned to each branch of the division. He assures that responsibility for quality assurance is clearly defined and understood by the respective branches and that each organization is adequate to accomplish its task. He also participates in management reviews of quality assurance program activities.

17.1A.1.2.2 EN DES Quality Assurance Branch. The EN DES Quality Assurance Branch (QAB) shown on Figure 17.1A-3 is responsible for establishing, directing, and assessing the implementation of the divisions' QA program and coordination of quality assurance between EN DES and CONST and between EN DES and OEDC QA.

The branch chief is responsible for the overall administration and performance of the branch. This includes the formulation of branch policies, adequate staffing, and general work assignments to provide technical direction to personel in his branch. He also coordinates activities between his branch and other EN DES engineerng branches and projects.

Qualifications of the Chief. Quality Assurance Branch, include

the following: a degree from an accredited school of engineering or the equivalent in experience and training; demonstrated technical and administrative competence necessary to manage a large engineering quality organization; demonstrated proficiency in planning, organizing, staffing, directing, controlling, and coordinating varied activities of an engineering quality service.

The Quality Assurance Branch has the following duties and responsibilities:

(1) Establish, assess, and control the implementation of the quality assurance program for the Division of Engineering Design.

(2) Development of some and review and approval of all EN DES procedures and instructions which control quality assurance activities. Coordinates review of industry standards and the review and approval of material for the OEDC QA Program Requirements Manual and the Interdivisional QA Procedures Manual.

(3) Audit EN DES organizations for compliance to QA program requirements (except where conflict of interest may exist, such as criteria I, II, and part of XVIII or 10CFR50, Appendix B).

(4) Review and sign purchase requisitions for EN DES QA procurements to assure that QA requirements are adequately specified. Evaluate bidder's QA programs for adequacy to fulfill specified and approved requirements for EN DES and CONST QA procurements. Review and sign recommendations of award of contracts to assure that suppliers' QA programs have been evaluated and will be adequate. Audit suppliers for compliance with QA program requirements as specified in contracts. 5

(5) Report regularly to the division manager on all major matters related to quality assurance as deemed necessary to keep the manager informed. Act through the line managers when necessary to resolve problems related to quality assurance or when necessary to provide compliance with quality assurance requirements.

(6) Resolve or coordinate QA problems related to EN DES which may be raised by the NRC inspectors. Prepare and coordinate or review replies to formal letters from NRC which cite alleged violations or other QA areas of NRC concern. Review coordinated inputs from elements of OEDC for reporting significant deficiencies to NRC-OIE.

(7) Develop, implement, and maintain a quality trend analysis program to provide EN DES management visibility of recurring problem areas.

(8) Establish, maintain, and evaluate the division QA training program in conjunction with the division training officer. Assure

implementation of a system of records which identifies employee qualifications.

17.1A.1.2.3 EN DES Quality Engineering Branch. The Quality Engineering Branch (QEB) shown on Figure 17.1A-4 is responsible for assuring that the manufacturers and suppliers of equipment and materials for the nuclear power plants fulfill the technical and quality requirements as defined in the procurements specifications. The QEB role is that of surveillance for the purpose of verifying that the required inspection and testing activities have been accomplished as specified at the location of procurement or manufacture.

The central quality surveillance staff is responsible for reviewing procurement contracts to determine specified requirements and for assigning quality surveillance responsibilities to the appropriate regional offices. It reviews and approves surveillance reports and records submitted by regional offices, furnishes regional offices with advice and decisions on matters pertaining to quality, obtains decisions from the technical engineer on matters requiring engineering resolutions as related to tests results and fabrication problems, and provides special instructions to regional offices as required.

The regional offices are responsible for performing surveillance activities as necessary to assure that suppliers meet the requirements of procurement documents and for reporting results of surveillance activities to the central quality surveillance staff. 5

17.1A.1.2.4 Thermal Power Engineering Branches (Mechanical, Nuclear, Electrical, and Civil)

Engineering Branches. Within its discipline, each Engineering Branch, as shown in Figure 17.1A-5, develops, verifies and issues the general criteria and basic design parameters for engineering features of thermal power plants. Its responsibilities include:

(1) Preparation of a list of safety-related systems; specifying performance requirements and stating any limitations; listing any service functions required such as normal and emergency cooling and electrical power requirements; specifying any imposed environmental requirement or constraint; and identifying the applicable Codes, Standards, and Regulatory Requirements.

(2) Preparation of specifications and other procurement activities for materials and equipment, including nuclear steam supply systems. Obtaining input to all procurement specifications from other organizations relating to each organization's responsibility and for assuring that the finished procurement document is independently reviewed for adequacy and for interface requirements.

(3) Assuring that all technical requirements of its contracts are met and for assuring that vendor-submitted information is sent to the other organizations as appropriate for design and interface review.

(4) Developing the general layout and arrangement of thermal power plant structures and major equipment.

(5) Participation in development, execution, and review of the preoperational testing and startup testing of nuclear power plants.

(6) Preparing and assuring the review of information, drawings, and data for Preliminary Safety Analysis Reports and Final Safety Analysis Reports.

(7) Reviewing proposed modifications to operating nuclear power plants and for assuring that an evalution is made to determine if an unreviewed safety question is involved.

(8) Each branch chief is responsible for implementing quality assurance in his branch and for coordinating quality assurance matters with other branches and with the QAB. All quality assurance matters of major importance affecting other branches or divisions are handled formally through established administrative channels.

17.1A.1.2.5 Detailed Responsibilities of Thermal Power Engineering Branches. Responsibilities for NSSS contract control, licensing, safety analysis, and site preparation are discussed in more detail due to the significance of these activities. 5

(1) NSSS Contract Control. The Nuclear Steam Supply, Materials, and Radwaste Group in the Nuclear Engineering Branch is responsible for technical administration and control of the NSSS contract and for coordinating EN DES activities relative to the NSSS.

The Nuclear Steam Supply Systems Section is responsible for preparation of specifications and other procurement documents for nuclear steam supply systems; assuring that appropriate parts of the specification and contract documents are reviewed by other organizations within EN DES which have defined responsibilities for nuclear plant design which interface with or which fall within the NSSS vendor scope of supply; and coordination of the specification preparation through established administrative channels with the Division of Purchasing, Division of Law, and Office of Power. This section also is the lead group for evaluation of responsible bids and for recommendation of award to the successful bidder which includes evaluation of the bidder's capabilities to meet all technical and QA requirements of the contract; technically administers the contract; coordinates and reviews all NSSS vendor submittals; and assures that all technical requirements including quality requirements of the

contract are met.

(2) Nuclear Plant Licensing. Responsibility for coordinating all OEDC licensing activities is assigned to the Nuclear Safety Systems Group in the Nuclear Engineering Branch (NEB). The Nuclear Licensing Section is responsible for:

a. Scheduling and coordinating OEDC activities involving licensing of nuclear power plants including preparation and assembly of information, drawings, data, and responses to NRC inquiries for Safety Analysis Reports; assuring that OEDC input to SAR's is prepared by and reviewed by the responsible organizations; and assuring that SAR input prepared by other TVA organizations and by the NSSS vendor are reviewed by proper organizations within OEDC to assure proper coordination of interfaces between organizations.

b. Determining reportability and coordinating reports of significant deficiencies to the NRC in accordance with 10CFR50.55(e) and 10CFR21.

c. Reviewing proposed modifications to operating plants and checking the evaluation of unreviewed safety question determinations.

d. Coordinating OEDC participation, and assuring proper attendance at meetings with NRC relative to nuclear plant license applications. 5

e. Resolving or coordinating problems related to EN DES which may be raised by the NRC inspectors and for assembling and coordinating replies through TVA channels in response to formal letters from NRC which cite alleged violations or other areas of NRC concern.

(3) Nuclear Safety Analysis. The Nuclear Safety Systems Group is assigned EN DES responsibility for performing selective review of plant and system features to assure overall plant safety which includes: review of overall nuclear plant design and arrangement; development of general criteria and safety-related design basis for nuclear plants including interpretations of NRC requirements as they apply to specific plants; review of criteria developed by others in EN DES; review of the design of safety-related systems developed by TVA; and review of design documents furnished by the NSSS vendor and other contractors to assure that they comply with applicable NRC regulatory requirements and other requirements of the contract which affect plant safety.

It is also responsible for coordinating EN DES effort in developing and executing the preoperational testing and startup/testing of nuclear power plants. This includes responsibility for assuring that EN DES input is prepared and reviewed by the responsible organization.

(4) Site Preparation. The Civil Engineering Branch of the Division of Engineering Design is responsible for initiating requests for soil and rock investigations for a site. The Civil Engineering Branch, coordinating with the Construction Services Branch, is also responsible for determining the number and locations of exploratory holes and other observations, the techniques to be used in the investigation, and for the interpretation and reporting of the foundation rock investigation.

The Construction Services Branch of the Division of Construction is responsible for performing the drilling required at the site prior to the assignment of a Construction Project Manager. After the assignment of a Construction Project Manager, this responsibility lies with him.

The Construction Services Branch (Singleton Materials Laboratory) of the Division of Construction is responsible for the logging, interpretation, laboratory testing, and reporting of soil investigations.

17.1A.1.2.6 Thermal Power Engineering Design Project. The Thermal Power Engineering Design Project as shown in Figure 17.1A-6 is responsible for the design of the plant in accordance with criteria, procedures, and other guidelines established by the Thermal Power Engineering Branches. It coordinates all activities involving the Division of Construction (CONST) for EN DES during the construction phase. 5

The design project manager is responsible for implementing quality assurance in his project and for coordinating quality assurance matters with other EN DES branches including the Quality Assurance Branch (QAB). All quality assurance matters of major importance affecting other branches or divisions are handled formally through established administrative channels.

17.1A.1.2.7 Architectural, Hydro, and Special Projects Engineering and Design Branches. Responsibilities of the Architectural, Hydro, and Special Projects Engineering and Design Branches, as shown in Figure 17.1A-7, include: (1) the design of assigned portions of the plant in accordance with criteria, procedures, and other guidelines established by the Thermal Power Engineering Branches; and (2) primary engineering responsibility in certain assigned areas.

The branch chief is responsible for implementing quality assurance in his branch and for coordinating quality assurance matters with other branches including QAB. All quality assurance matters affecting other branches or divisions are handled formally through established administrative channels.

17.1A.1.3 Division of Construction. The Division of Construction is the corporate-level organization whin OEDC responsible for construction, erection, and testing (excluding preoperational testing) of TVA projects and plants. The Division for Construction (CONST), as shown on Fig. 17.1A-8, is responsible for quality assurance in the receipt and storage of materials and in field fabrication, construction, erection, and preliminary tests and ches for the nuclear plant. It performs the following which relate directlto quality assurance.

(1) Plan, organize, coordinate, and control the construction sequence and procedures.

(2) Develop and issue construction procedures and maintain construction site quality assurance documentation.

(3) Site investigations, exploratory drilling, and soil and rock core analysis testing.

(4) Site preparation, including, excavation, backfilling, and compaction.

(5) Receive, inspect, and store materials and equipment at th construction site (except nuclear fuel, and in-core equipment for which the Office of Power is responsible). 5

(6) Construction of foundations and structures.

(7) Fabricate and install assigned parts, components, and apurtenances.

(8) Construct and erect all parts of the plant including the NSSS except portions which are contracted.

(9) Inspect all fabrication, installation, construction, and erection activities at the site, including work by field contractors. (10) Conduct construction tests in accordance with approved procedures. (11) Conduct QA audits of construction activities for conformance with established rquirements. The Chief QAB, CONST is responsible for conducting QA audits of construction activities

17.1A.1.3.1 Manager of Construction. The Manager of Construction reports directly to the manager OEDC a is responsible for construction including quality assurance. He assures that the construction organization is adequate to accomplish its quality assurance responsibilities. The Manager assigns responsibility for quality assurance within the division.

17.1A.1.3.1.1 Assistant Manager of Construction (Nuclear). The Assistant Manager of Construction (Nuclear) reports directly t the

Manager of Construction and in the absence of the Manager represents Construction in all nuclear construction activities. He is responsible for construction of TVA nuclear power plants.

17.1A.1.3.1.2 Assistant Manager of Construction (Non-Nuclear). The Assistant Manager of Construction (Non-Nuclear) reports directly to the Manager of Construction and in the absence of the Manager represents Construction in all non-nuclear activities. The Assistant Manager of Construction is charged with providing laboratory, services, testing and construction support to nuclear facilities.

17.1A.1.3.1.3 Chief, Construction Services Branch. The Chief, Construction Services Branch (CSB) reports directly to the Assistant Manager of Construction (non-nuclear). The Chief is responsible for preliminary site investigations, material analysis and testing at the Singleton Materials Engineering Laboratory and construction of major modifications to licensed nuclear projects.

17.1A.1.3.1.4 CONST Project Manager. The Project Manager reports directly to the Assistant Manager of Construction (nuclear). The Manager is responsible for constructing the plant in accordance with design and quality requirements. The Manager is responsible for ensuring the adequacy of the organization to accomplish its quality responsibilities and ensuring the importance of quality requirements are understood by the project personnel. The Project Manager periodically reviews the status and adequacy of the project QA program and keeps the Manager and Assistant Manager of CONST informed of all matters relating to quality. 5

17.1A.1.3.1.5 Chief, QA Branch, Division of Construction. The Chief, QA Branch, CONST, reports directly to the Manager of Construction and coordinates, as appropriate, with the OEDC QA Manager. The Chief is responsible for directing QA Branch activities in the office of the Manager of Construction and at the nuclear plant projects. The Chief directs the development and maintenance of the CONST QA Program which includes but is not limited to the QA/QC procedures necessary to implement the QA program and achieve compliance with applicable design requirements, regulatory guides, codes and standards; the CONST QA audit program and the QA/QC training program.

The Chief, QAB, CONST, meets the following qualification requirements: a degree in engineering or scientific discipline or the equivalent in experience and training; five years of responsible experience in a position requiring quality assurance, administrative, and/or inspection work; must possess a sound knowledge and understanding of quality assurance codes, standards, procedures, and measures practiced or utilized in nuclear plant construction.

17.1A.1.3.1.6 Supervisor, Quality Compliance Section (QCS). The Supervisor, QCS, reports directly to the Chief, QA Branch and serves

as assistant to the Chief. In the absence of the Chief, the Supervisor represents CONST in all QA/QC matters. The Supervisor is responsible for: establishing and maintaining a consistent and comprehensive audit system; identifying and coordinating the Division's committment position to NRC and TVA requirements; providing Branch input to TVA,s communication with the NRC and verifying proper follow up of corrective action; establishing and maintaining the Division Trend Analysis Program; and providing liaison between Branch QA Units and internal and external contacts.

17.1A.1.3.1.7 Supervisor, Quality Assurance Unit. The project Supervisor, QA Unit (QAU), reports to the Chief, QA Branch, CONST, through the Suprvisor, QCS, and serves as the Chief's representative at the project in QA/QC matters . The Supervisor is responsible for: reviewing project standard operating procedures; reviewing project originated purchase requisitions; reviewing project selection of suppliers; review and approve construction test procedures; observe selected construction test; preparing project trend analysis reports; training project personnel; conducting project audits; and reviewing project responses to the NRC. 5

17.1A.1.3.1.8 Supervisor, Quality Assurance Training Section (QATS). The Supervisor, QATS, reports directly to the Chief, QA Branch, CONST. The Supervisor is responsible for: developing and maintaining the QA Training Program Plan and the associated training procedures and instructions; training and certification of NDE and audit personnel for the Division of Construction; training and certifying QC personnel for the project.

Pages 17.1A-14 through 17.1A-25 intentionally left blank.

17.1A.2 Quality Assurance Program

A policy memorandum "Quality Assurance for Nuclear Power Plants" by the Manager of OEDC is included in the OEDC QA Manual and contains QA polciies, goals, and objectives. These policies, goals, and objectives are transmitted down through the various levels of management via policies, directives and procedures described in Section 17.1A.2.2. An excerpt from the Manager of OEDC's policy memorandum is found in Section 17.1A.1.1.1.

17.1A.2.1 Scope. TVA has overall responsibility for quality assurance of its nuclear plans.

The quality policies, manuals, and approved procedures comprise the documented QA program which TVA has committed to in the SAR's for nuclear plants. These items are mandatory because the Manager of OEDC has established requirements and policies for OEDC.

These policies are transmitted to OEDC personnel who perform quality affecting and quality assurance activities through the Indoctrination and Training program described in Section 17.1A.2.1.2 and through supervisory personnel.

A general summary of the assignment of design and procurement responsibility between TVA and the NSSS vendor is given in Table 17.1A-3. Table 17.1A-3 is incorporated in the SAR for each plant. This talbe also identifies the structures, systems, and components to which this section applies, and the responsibility for design review of these structures, systems, and components.

The QA program controls over quality related activities pertaining to design and procurement initiated prior to submitting the PSAR are described in this Topical Report. QA program controls over safety related site preparation are provided by Engineering Procedure "Site Investigations - Soils and Foundation Rock," which distributes responsibilities among the various TVA branches involved. Further discussion of responsibilities is provided in Section 17.1A.1.2.4.

During site preparation, records of completed procedures, reports, test equipment calibration records, test deviation,a nd inspection and examination records shall be prepared. These shall be placed with other project records as required by code, standard, specification, or project procedrues.

17.1A.2.1.1 Quality Assurance Program Documentation. The TVA Quality Assurance Program for design and construction is documented by written policies and procedures. OEDC will follow the guidance of NRC Regulatory Guides as described in Table 17.1A-4.

The structures, systems, and components to which this program

applies are identified in Table 17.1A-3 of the SAR. The program provides control over activities affecting quality to an extent consistent with importance to safety.

Table 17.1A-1 provides a cross index which lists each TVA Quality Assurance Procedure and the related Quality Assurance Criteria of Appendix B to 10 CFR 50. Table 17.1A-2 provides a brief description of the purpose and scope of key TVA quality assurance procedures.

TVA will review and formally concur with the NSSS vendor's QA Program and will conduct audits as described in Section 17.1A.18.

17.1A.2.1.2 Indoctrination and Training. An indoctrination and training program for OEDC personnel performing QA and quality-affecting activities provides for:

(1) Instruction of personnel performing QA and quality-affecting activities as to the purpose, scope, and implementation of manuals, instructions, and procedures related to the activities they perform. 5

(2) Training and qualification of personnel performing QA and quality-affecting activities in the principles and techniques of the activities they perform.

(3) Documenting the scope, objective, and method of implementing the specific parts of the indoctrination and training program.

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 1)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
I	EN DES-EP 1.30	Qualification Requirements for Personnel Assigned Quality Assurance Activities	This procedure defines the minimum acceptable requirements for personnel assigned QA activities such as checking, auditing, or otherwise verifying to ensure that specified quality requirements are sufficient, will be achieved, and are verified. This EP also defines a minimum baseline standard for the qualifications of personnel engaged in quality assurance activities within the EN DES branches/staffs/projects. This EP does not apply to nondestructive examination and inspection activities.	
II	EN DES-EP 1.16	Quality Assurance Training Program	This procedure describes how EN DES ensures adequate in-house QA training for employees doing QA-related work.	5
	EN DES-EP 1.31	Nondestructive Examination (NDE) Personnel-Qualification and Certification	This procedure describes how EN DES fulfills its requirements and the requirements of applicable codes and specifications for qualifying and certifying personnel associated with nondestructive testing and examination.	
III	EN DES-EP 3.10	Design Verification Methods and Performance of Design Verifications.	This procedure defines responsibilities of EN DES branches/staffs/ projects for the selection of design verification requirements for performance of design verification within EN DES.	

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 2)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
	EN DES-EP 4.02	Engineering Change Notices-Handling	This procedure outlines how the Engineering Change Notice is initiated and assigns responsibilities for their handling. The ECN is intended to provide EN DES, CONST, and NUC PR with a concise scope of a design change in a timely manner. It is not intended to be used as a substitute for routine communication and/or coordination within EN DES or with CONST and NUC PR.
III	EN DES-EP 4.03	Field Change Requests	This procedure covers the processing of Field Change Requests (FCR's) that affect EN DES-approved TVA and/or vendor drawings or documents for TVA nuclear power plants. 5
	EN DES-EP 4.04	Handling of Squad Checks	This procedure describes the EN DES squadcheck process for EN DES documents, such as design drawings, design criteria documents, design criteria diagrams, purchase requisitions, and specifications, and for technical drawings and documents submitted by a vendor. The squadcheck process as used to submit drawings or other documents from one EN DES organization to another for design interface review is covered in this EP.
	EN DES-EP 4.18	Design Change Requests (DCR's)-Processing, Reviewing, and Approving	This procedure delineates the handling of Design Change Requests (DCR's) in EN DES received from NUC PR.

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 3)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
	EN DES-EP 4.25	Design Review and Interface Coordination of Detailed Construction and Procurement Drawings.	This procedure defines the responsibilities of EN DES personnel who are involved in the process of performing design verification by the design review process, which is applicable to EN DES nuclear power plant detailed construction and procurement drawings.	
IV	EN DES-EP 5.01	Purchase Requisitions Evaluation of Bids and Recommendation/Rejection of Contract Award - Revisions to Contracts	This procedure describes how EN DES prepares and processes purchase requisitions, conducts bid evaluations, prepares the recommendation of award or rejection of bid memos, and modifies contract requirements for all contracts used for the procurement of permanent equipment, materials, and components for TVA projects.	
	EN DES-EP 5.33	Procurement Quality Assurance	This procedure covers the methods for controlling the procurement of structures, systems, components, parts, appurtenances, and materials that are important to safety and are to be permanently installed at TVA nuclear plants.	5
	QAB-EP 26.31	Review of Recommendations/ Rejections of Contract Award	This EP describes how the Quality Assurance Branch (QAB) reviews recommendation/rejection of awards for nuclear plant quality-related procurement.	
	QAB-EP 26.34	Review of Purchase Requisitions	This EP describes Quality Assurance Branch (QAB), Quality Assurance Audit Section (QAAS) duties for the review of nuclear power plant purchase requisitions to ensure the inclusion of, or reference to, adequate QA program requirements.	

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 4)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
V	EN DES-EP 1.01	Preparation and Processing of Division-Level Engineering Procedures	This procedure describes how to prepare and issue a division-level engineering procedure (EP).
VI	EN DES-EP 1.28	Control of Documents Affecting Quality	This procedure defines the general methods for controlling design documents issued formally by EN DES to define the requirements used in the design, procurement, fabrication, installation, erection, construction, quality assurance, operation, and maintenance of those structures, systems, and components that must meet the requirements of the Quality Assurance Program.
	EN DES-EP 5.43	Release of QA Items from Suppliers' Shops to Construction Site.	This procedure describes how EN DES releases items from the shop of a supplier or his subtier supplier to the construction site to ensure that the requirements of the drawings, specifications, and other contract documents have been fulfilled. The EP applies to items that must meet the requirements of the Quality Assurance (QA) Program for TVA Nuclear Plants. 5
	QEB-EP 24.50	Surveillance of NSSS Vendor Inspection and Test Activities	This procedure defines the general methods and requirements for shop surveillance by TVA Inspectors of primary system components which are procured by the Nuclear Steam Supply System (NSSS) vendor for a TVA nuclear plant. Components which are procured to ASME Boiler and Pressure Vessel Code requirements also require inspection by an

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 5)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
			authorized Code inspector as defined by the Code. This procedure only covers surveillance requirements for primary system components furnished by the NSSS vendor; however, it is used as a guide for establishing the level of surveillance for other type components, commensurate with their importance to safety. QEB performs this surveillance as required.	
	QEB-EP 24.51	Shop Surveillance for Pressure Containing Systems and Components (TVA Procured)	This procedure describes how TVA inspectors maintain shop surveillance during fabrication of safety-related components such as pressure vessels and tanks, pumps, piping, and valves.	
	QEB-EP 24.52	Shop Surveillance of Reactor Pressure Vessels	This procedure defines general requirements to be observed by TVA inspectors in the shop surveillance of reactor pressure vessels procured by the NSSS vendor. It describes minimum requirements necessary to ensure TVA that the NSSS vendor and third party inspection agency are performing shop surveillance as required by the ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components.	5
VII	QEB-EP 24.53	Shop Surveillance for Steel Containment vessels	This procedure defines the methods and requirements for shop surveillance of the structural steel containment vessels that are within the scope of the Quality Assurance (QA) Program for all nuclear plants.	

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 6)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
			This procedure is used as a guide by QEB for surveillance at vendor plants where any component of each vessel is being manufactured.
	QEB-EP 24.54	Shop Surveillance for Heavy Equipement Items	This procedure assists the TVA Inspector in his surveillance of heavy equipment items at the contractor's plant.
	QEB-EP 24.55	Shop Surveillance for Instrumentation and Control Components for TVA Procured Items	This procedure defines the general methods and requirements for shop surveillance of instruments and control components or systems for nuclear plants which are within the scope of the TVA Quality Assurance Program. This procedure is a guide for the TVA Inspector for his surveillance of vendor plants where applicable components or systems are being manufactured or assembled. Applicable standards of quality and specific vendor requirements are defined in the contract for the component or systems. 5
	QAB-EP 26.32	Preparation, Performance, and Reporting of QA Preaward Surveys	This EP describes responsibilities for the planning, preparation, performance, reporting, and followup activities associated with QA preaward surveys conducted by the Quality Assurance Branch (QAB) Quality Assurance Audit Section (QAAS).
	QAB-EP 26.33	Evaluation of Bidder's QA Qualifications and	This EP describes the methods used by the Quality Assurance Branch (QAB), Quality Assurance Audit

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 7)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
		Supplier's Revised QA Program.	Section (QAAS) for the review of bidder and supplier QA manuals/program descriptions for all nuclear plant quality-related procurements.
	QAB-EP 26.36	Vendor QA Program Evaluation Index-Maintenance and Handling	This EP defines how the QA Audit Section (QAAS) identifies vendors of safety-related equipment as candidates for QA audits. It applies to OEDC vendors that furnish nuclear safety-related equipment, materials, items, and services.
X	QEB-EP 24.56	Inspection Reports Preparation, Review, and Distribution	This procedure describes how the Quality Engineering Branch (QEB) of EN DES prepares, reviews, and distributes inspection reports for nuclear plant materials and equipment requiring quality assurance documentation. The procedure supplements the requirements of particular contracts and specifications. 5

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 8)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
XI	EN DES-EP 6.01	Preoperational Testing	This procedure covers the specific Documents-Processing responsibilities of EN DES and the general responsibili ties of CONST, NUC PR, and the Division of Occupational Health and Safety (OC H&S) in processing preoperational testing documents. The EP applies to the Sequoyah, Watts Bar, Bellefonte, and Yellow Creek nuclear steam generation plants. The Hartsville and Phipps Bend Plants will be covered in a later revision to this EP.	
	EN DES-EP 6.05	Documentation of System	This procedure describes how EN DES works with Configuration for NUC PR and Preoperational Testing CONST in processing test record drawings to make sure the configuation of a system or subsystem (or a part of one) is acceptable for preoperational testing. The EP applies to the identification, review, marking, approval, and recording of test record drawings to show the "as tested" system configuration.	5
	EN DES-EP 6.06	Review of Startup Test Instructions and Startup Test Results	This procedure defines the responsibilities of EN DES and the coordination process for the review of startup test instructions, and the review and approval of startup test results.	
	EN DES-EP 6.08	Test Reports-Recording	This procedure describes requirements for	

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 9)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
		Specification Requirements	recording specification acceptability limits on test results in reports of tests performed for EN DES.
XV	EN DES-EP 1.26	Nonconformances-Reporting and Handling by EN DES	This procedure provides a system for recording and controlling characteristics of hardware and/or information which are found to be not in conformance with prescribed requirements. It describes the EN DES system of nonconformance reporting and processing.
	QEB-EP 24.57	Supplier Nonconformances Handling	This procedure outlines how the Quality Engineering Branch (QEB) handles supplier nonconformances. The procedure applies to quality assurance (QA) items designated for inspection by QEB as required by procurement documents. Nuclear Steam Supply System (NSSS) vendors and subcontractors report nonconformances according to the NSSS contract specifications. 5
XVII	EN DES-EP 1.14	Engineering Records Retention and Storage	This procedure covers the retention and storage of engineering records produced and acquired by EN DES.
	QEB-EP 24.58	Handling of Supplier Records	This procedure outlines the methods that QEB handles supplier records for TVA contracts requiring inspection by QEB. This procedure applies to supplier records submitted to QEB to furnish proof of compliance with the requirements of the contract specification.

TABLE 17.1A-1 ENGINEERING DESIGN QUALITY ASSURANCE PROCEDURES
(Sheet 10)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
XVIII	EN DES-EP 1.29	Internal EN DES Quality Assurance Audit Program	This procedure establishes the EN DES program of internal audits , including policy, objectives, and responsibilities for their planning, conduct, reporting, and followup actions. The program verifies compliance with all aspects of the Quality Assurance (QA) Program.	5
	EN DES-EP 5.34	Vendor Quality Assurance Audit Program	This procedure establishes an EN DES program for quality assurance (QA) audits of vendors.	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 1)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
I	CONST-QAPP-1	Organization	This policy states that the Manager, Division of Construction, has the overall responsibility for establishing and maintaining sufficient organizations to accomplish all construction activities including quality assurance and quality control.	
	CONST-QAP-1.1	Division of Construction Organization	This procedure delineates organizational structure, duties, responsibilities and communication channels for the Division of Construction organization management.	5
	CONST-QAP-1.2	Stop Work	This procedure assigns the responsibilities and defines the requirements for stop work of further fabrication, installation, or use of nonconforming items, or other identified conditions adverse to quality which if allowed to continue would affect the end use of the item or safe operation of the nuclear facility.	
II	CONST-QAPP-2	Quality Assurance Program	This policy states that a formal Quality Assurance Program, including quality control, shall be planned, documented, and executed within the Division of Construction.	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 2)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
	CONST-QAP-2.2	Qualification/Certification of Inspection, Examination, and Testing Personnel	This procedure describes the sequence of actions necessary for the selection, qualification, and certification of personnel who perform inspection, examination, testing activities that assure the quality of safety-related parts of a nuclear plant during the construction phase other than nondestructive
	CONST-QAP-2.3	Qualification, Training, and Certification Requirements for Nondistructive Examination Personnel	This procedure defines the qualification and training requirements for and methods involved in accomplishing nondestructive examination (NDE) personnel certification.
	CONST-QAP-2.4	Communications with NRC	This procedure describes CONST requirements applicable to the release of information or work samples to the NRC in accordance with OEDC-QPM-7-77.
III	CONST-QAPP-3	Design Control	This policy states that a program shall be established, documented, and executed to provide assurance that changes from specified design requirements or quality standards initiated by CONST are identified, documented, and controlled.
	CONST-QAP-3.1	Field Change Requests	This procedure defines the requirements for preparation, control, and documentation of Field Change Requests

5

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 3)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
			(FCR's) to be transmitted to the Design Project Organization (DPO). This procedure is applicable to both TVA's and contractor's documents (which includes any drawing, sketch, specification, aperture card, etc.) which have been approved/accepted by EN DES for use in the construction of a nuclear power plant.	
	CONST-QAP-3.2	Design Information Request	This procedure defines the Design Information Requires (DIR) system by which CONST requests additional information or interpretation of design drawings or specifications from the Design Project Organization (DPO).	
IV	CONST-QAP-4	Procurement Document Control	This policy states that a program shall be established, documented, and executed to provide assurance that applicable requirements, including quality assurance program requirements, are included or referenced in documents for procurement of material, equipment, and services.	5
	CONST-QAP-4.1	Procurement Document Control	This procedure establishes the method and assigns responsibilities for the Division of Construction in the request for an procurement of permanent and nonpermanent plant safety-related items or services.	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 4)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
V	CONST-QAPP-5	Instructions, Procedures, and Drawings	This policy states that a program shall be established, documented, and executed to provide assurance that activities affecting quality are prescribed in a preestablished document network.	
	CONST-QAP-5.1	CONST Quality Assurance Program Policies and Quality Assurance Procedures	This procedure identifies the requirements for the development and maintenance of the CONST Quality Assurance Program Policies (QAPP's) and Quality Assurance Procedures (QAP's).	
VI	CONST-QAPP-6	Document Control	This policy states that a program shall be established, documented, and executed to provide assurance that documents including revisions thereto which prescribe activities affecting quality are controlled.	5
VII	CONST-QAPP-7	Control of Purchased Material, Equipment, and Services	This policy states that a program shall be established, documented, and executed to provide assurance that purchased material, equipment, and services conform to the procurement documents.	
	CONST-QAP-7.1	Transfer of Items for Construction use	This procedure assigns the responsibility and defines the requirements when transferring quality assurance items between nuclear construction projects	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 5)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
			(inter-project transfer) or from another TVA organization (inter-organization transfer) for construction use.	
	CONST-QAP-7.2	Surveillance of Site Contractors	This procedure assigns the responsibilities and identifies the program requirements for surveillance of those contractors performing quality control activities on quality assurance items at the construction sites.	
	CONST-QAP-7.3	Evaluation and Selection of Suppliers	This procedure assigns the responsibility and defines the sequence of actions to be accomplished for the evaluation and selection of suppliers furnishing CONST generated procurements.	5
VIII	CONST-QAPP-8	Identification and Control of Materials, Parts, and Components	This policy states that a program shall be established, documented, and executed to provide assurance that materials, parts, and components including partially fabricated assemblies are identified and controlled.	
IX	CONST-QAPP-9	Control of Special Processes	This policy states that a program shall be established, documented, and executed to provide assurance that special processes including welding, heat treating, nondestructive testing, cleaning, and protective coating are controlled and	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 6)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
			accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.
	CONST-QAP-9.1	Release for Drilling, Chipping, Cutting of, or Welding to Permanent Structures or Components	This procedure assigns responsibility and defines the sequence of actions to be accomplished for obtaining a release and for documenting satisfactory work completion for drilling, chipping, cutting of, or welding to permanent structures or components when such operations are not shown on Division of Engineering Design (EN DES) or contractor drawings. 5
X	CONST-QAPP-10	Inspection	This policy states that a program shall be established, documented, and executed to provide verification that items/activities affecting quality are in conformance with the documented instructions, procedures, and drawings for accomplishing the activity.
XI	CONST-QAPP-11	Test Control	This policy states that a program shall be established, documented, and executed to assure and demonstrate that structures, systems, and components (items) will perform satisfactorily in service.

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 7)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
			Prerequisites shall be provided in written test procedures for the test program and provisions for documenting and evaluating test results shall be identified.
XII	CONST-QAPP-12	Control of Measuring and Test Equipment	This policy states that a program shall be established, documented, and executed to provide assurance that tools, gauges, instruments, and other inspection, measuring, and testing equipment and devices used in activities affecting or evaluating quality are of proper range and type with accuracy necessary to verify conformance to established requirements. Control measures shall not be employed for rulers, tape measures, levels, and other such devices if commercial quality equipment provides adequate accuracy.
XIII	CONST-QAPP-13	Handling, Storage, and Shipping	This policy states that a program shall be established, documented, and executed to control the handling, storage, and shipping of material and equipment to prevent damage and deterioration.
XIV	CONST-QAPP-14	Inspection, Test, and Operating Status	This policy states that a program shall be established, documented, and executed to identify the status of inspections and tests performed on items and the operating

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 8)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
			status of structures, systems, and components during construction.	
XV	CONST-QAPP-15	Nonconforming Materials, Parts, or Components	This policy states that a program shall be established, documented, and executed to control materials, parts, or components (items) which do not conform to requirements in order to prevent their inadvertent use or installation. The method for identification, documentation, segregation, and disposition of nonconforming items and notification to affected organizations shall be documented and controlled.	5
	CONST-QAP-15.1	Control of Non-Conformances	This procedure assigns the responsibility and defines the sequence of actions for the systematic control (identification, segregation, and disposition) of nonconformances and verification of corrective action to resolve nonconformances. This procedure applies to all activities, services, and items within the scope of the CONST Quality Assurance Program.	
XVI	CONST-QAPP-16	Corrective Action	This policy states that a program shall be established, documented, and executed to provide measures to assure that conditions adverse to quality are promptly identified	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 9)

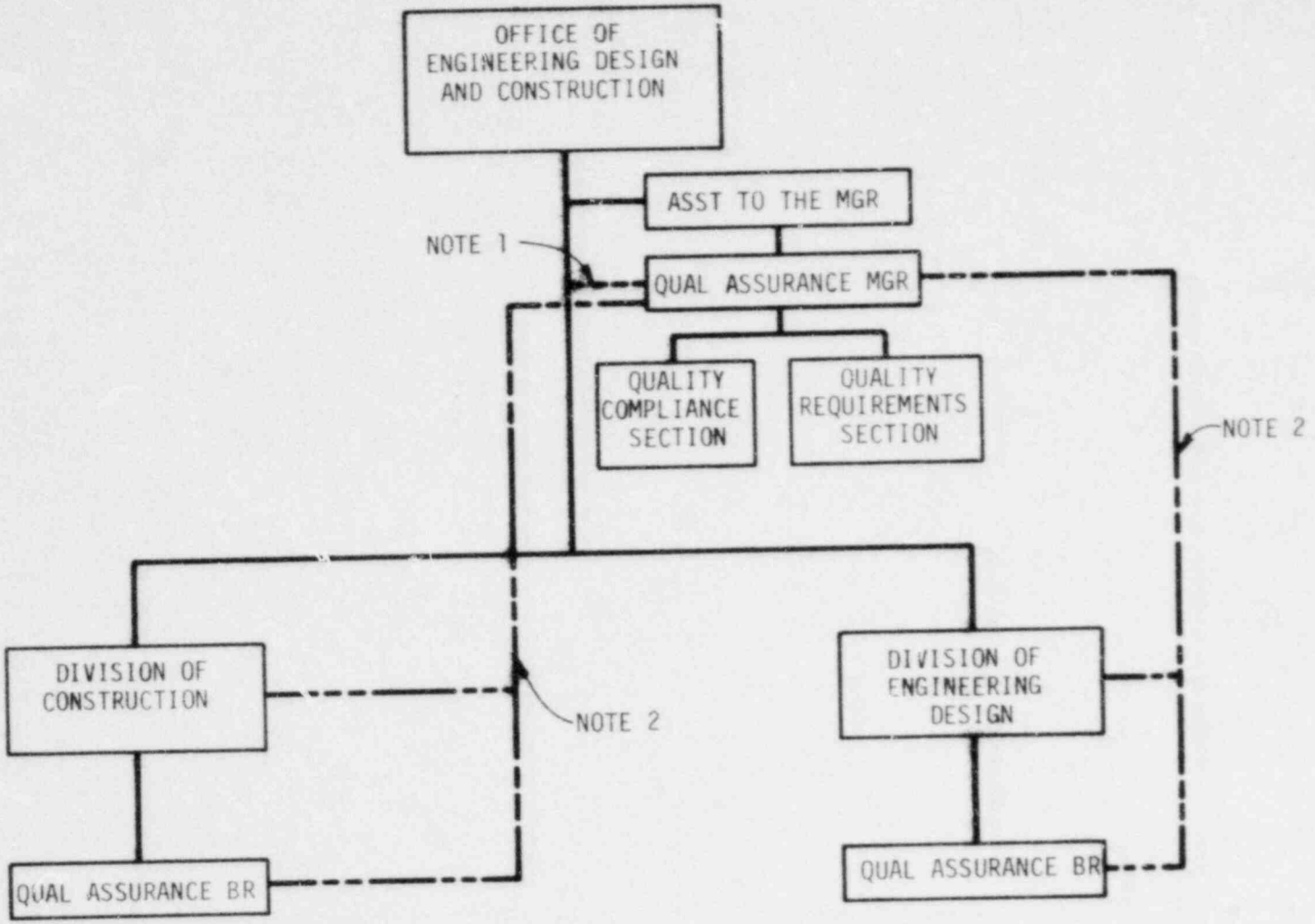
10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
			and corrected.
	CONST-QAP-16.1	Corrective Action	CONST-QAP-15.1 satisfies the "Direction" and "Delegation" of CONST-QAPP-16 with regard to CONST activities.
	CONST-QAP-16.2	Handling Allegations	This procedure assigns the responsibility and states the sequence of actions for identification, investigation, documentation, and closure of an allegation. This procedure applies to allegations from any source transmitted to TVA personnel encompassing safety-related situations which can contribute to a substantial safety hazard, i.e., moderate exposure to or release of licensed material; or major degradation of essential safety-related equipment; and to non-safety related situations which could contribute to damage or harm to personnel, equipment, or plant. 5
	CONST-QAP-16.3	Formal Responses to NRC	This procedure assigns responsibility for preparing formal responses by the Division of Construction (CONST) to the Division of Engineering Design (EN DES) in answer to Nuclear Regulatory Commission Inspection Reports (IR's) involving violations,

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 10)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT	
			infractions, and/or deficiencies; Construction Deficiency Reports (CDR's) involving 10CFR50.55(e)/10CFR21 items and NRC Bulletins/Circulars. It also provides for Project QA Unit review and follow up of responses.	
	CONST-QAP-16.4	Employee Concerns and Differing Opinions	This procedure assigns the responsibility and states the sequence of actions for documentation and resolving CONST employee concerns/differing opinions (hereafter referred to as concerns) related to the quality of work or safety in design, construction, and operation of a nuclear plant.	
XVII	CONST-QAPP-17	Quality Assurance Records	This policy states that a program shall be established, documented, and executed to provide for the maintenance of sufficient records that furnish objective evidence to assure that activities affecting quality have been properly completed and the quality assurance requirements have been met. Measures shall be provided for identification, retrieval, and retention of records.	5
	CONST-QAP-17.1	Quality Assurance Records	This procedure assigns the responsibility and defines the program for the identification, collection, retention,	

TABLE 17.1A-2 CONSTRUCTION QUALITY ASSURANCE PROCEDURES
(Sheet 11)

10CFR50 APPENDIX B CRITERION NO.	PROCEDURE NO.	TITLE	SCOPE STATEMENT
			correction, processing, storage, and disposition of quality assurance records. 1. This procedure applies to quality assurance records generated by or in the possession of the Division of Construction and specifies the program for the collection, filing, storage, maintenance, and disposition of quality assurance records during the construction phase of nuclear plants. 2. This procedure shall be supplemented at each nuclear plant site by the Project Manager, CONST, or designated representative who will prepare and attach a file index identifying the quality assurance records maintained. 5
	CONST-QAPP-18	Audits	This policy states that a program shall be established, documented, and executed to provide an audit system to verify compliance with applicable aspects of the Quality Assurance Program.
	CONST-QAP-18.1	Audits	The purpose of this procedure is to establish the actions required by CONST project supervision in support of audits of construction activities.



NOTE 1 - REPORTS DIRECT TO MANAGER OF OEDC
ON SIGNIFICANT MATTERS RELATED TO QUALITY.

NOTE 2 - COMMUNICATION AND AUDIT.

FIG. 17.1A-1 ORGANIZATION FOR DESIGN AND CONSTRUCTION (OFFICE OF ENGINEERING DESIGN AND CONSTRUCTION)

REV. 5

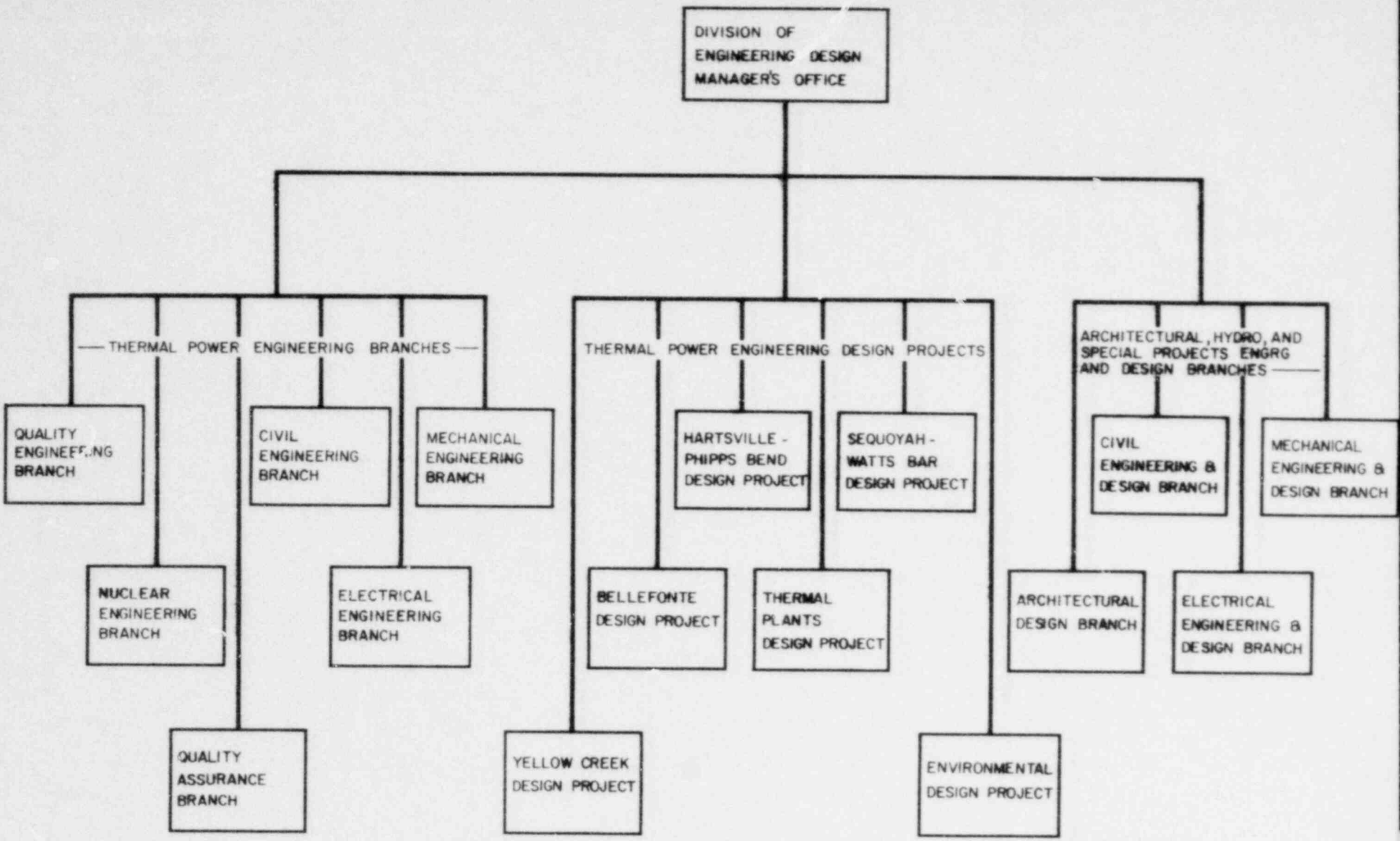


FIGURE 17.1A-2 - ORGANIZATION CHART FOR DIVISION OF ENGINEERING DESIGN

REV. 5

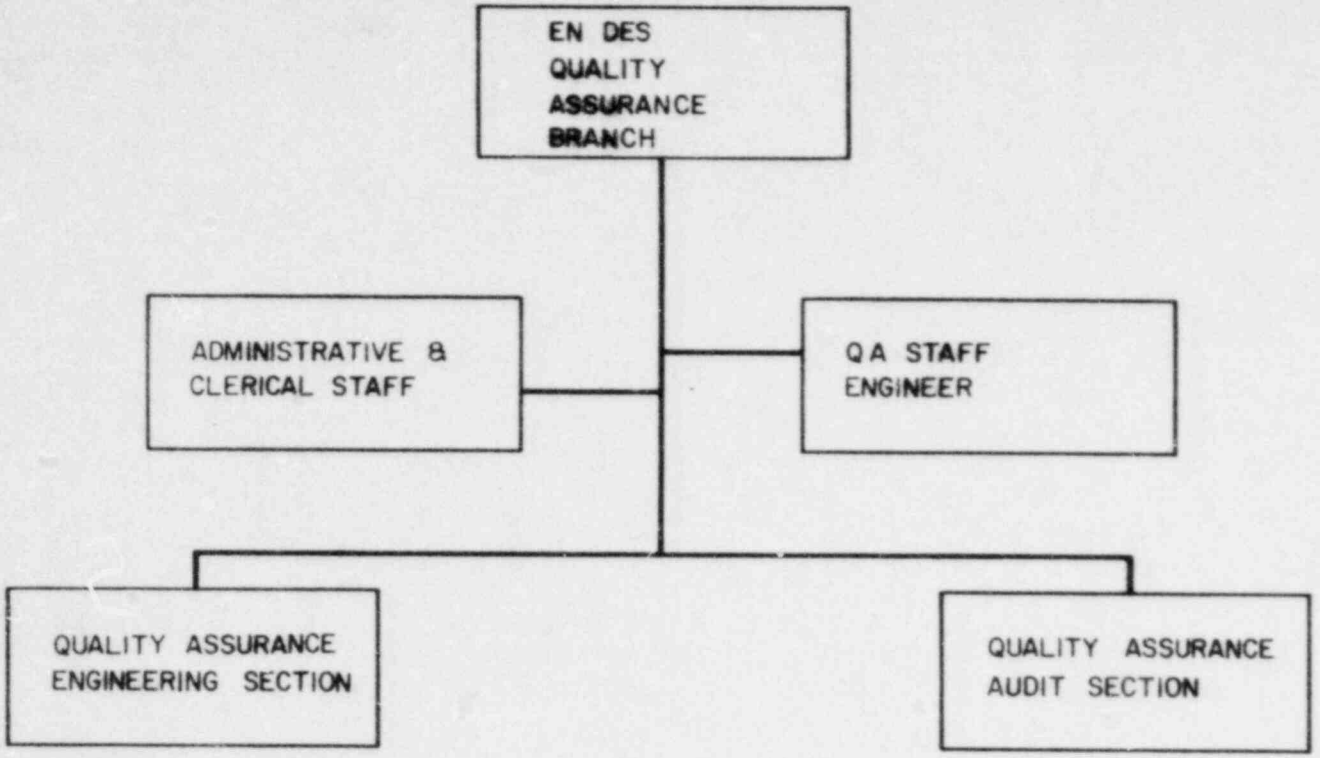


FIGURE 17-1A-3 ORGANIZATION CHART FOR EN DES QUALITY ASSURANCE BRANCH

REV. 5

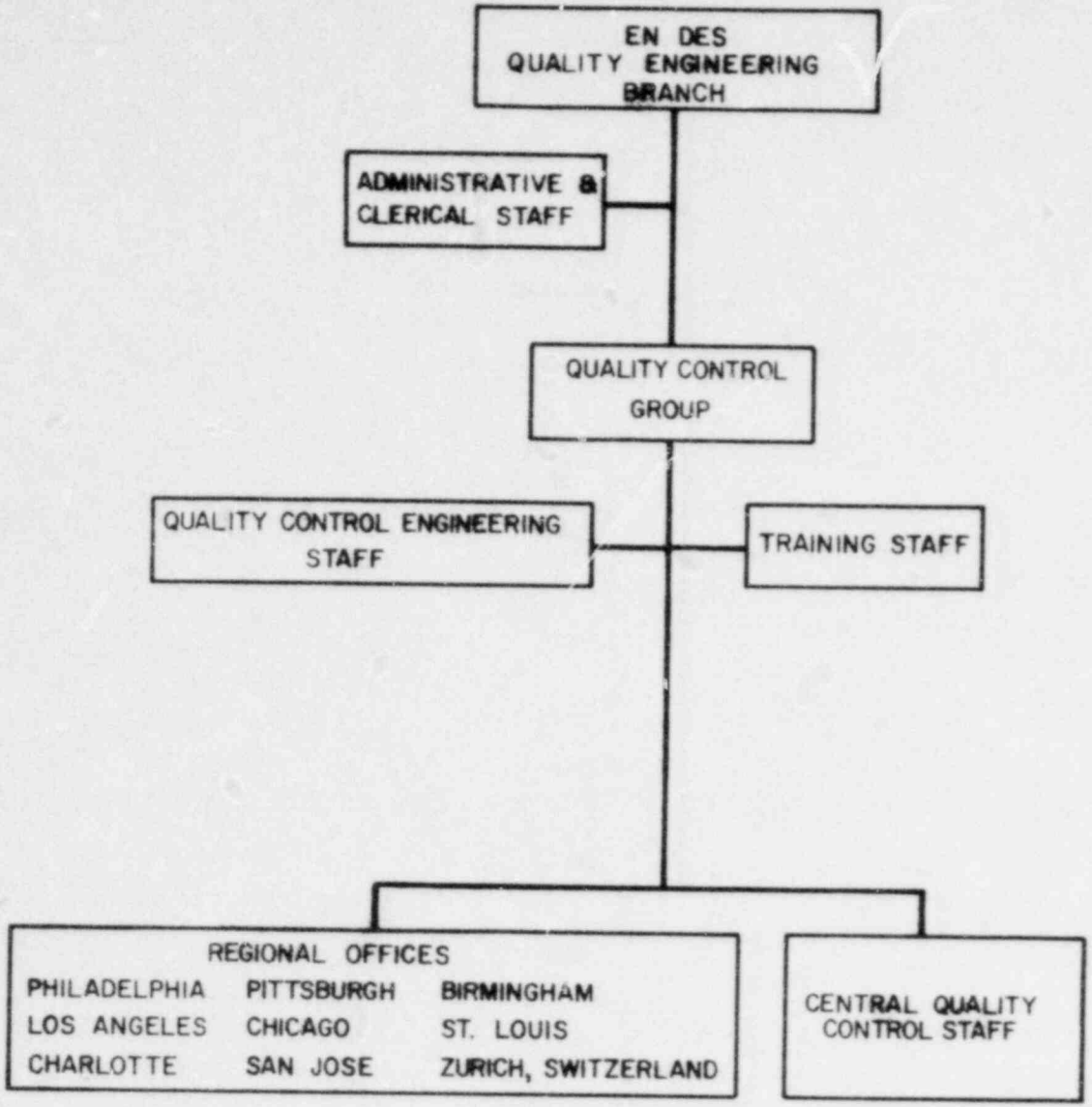


FIGURE 17.1A-4 - ORGANIZATION CHART FOR EN DES QUALITY ENGINEERING BRANCH

REV. 5

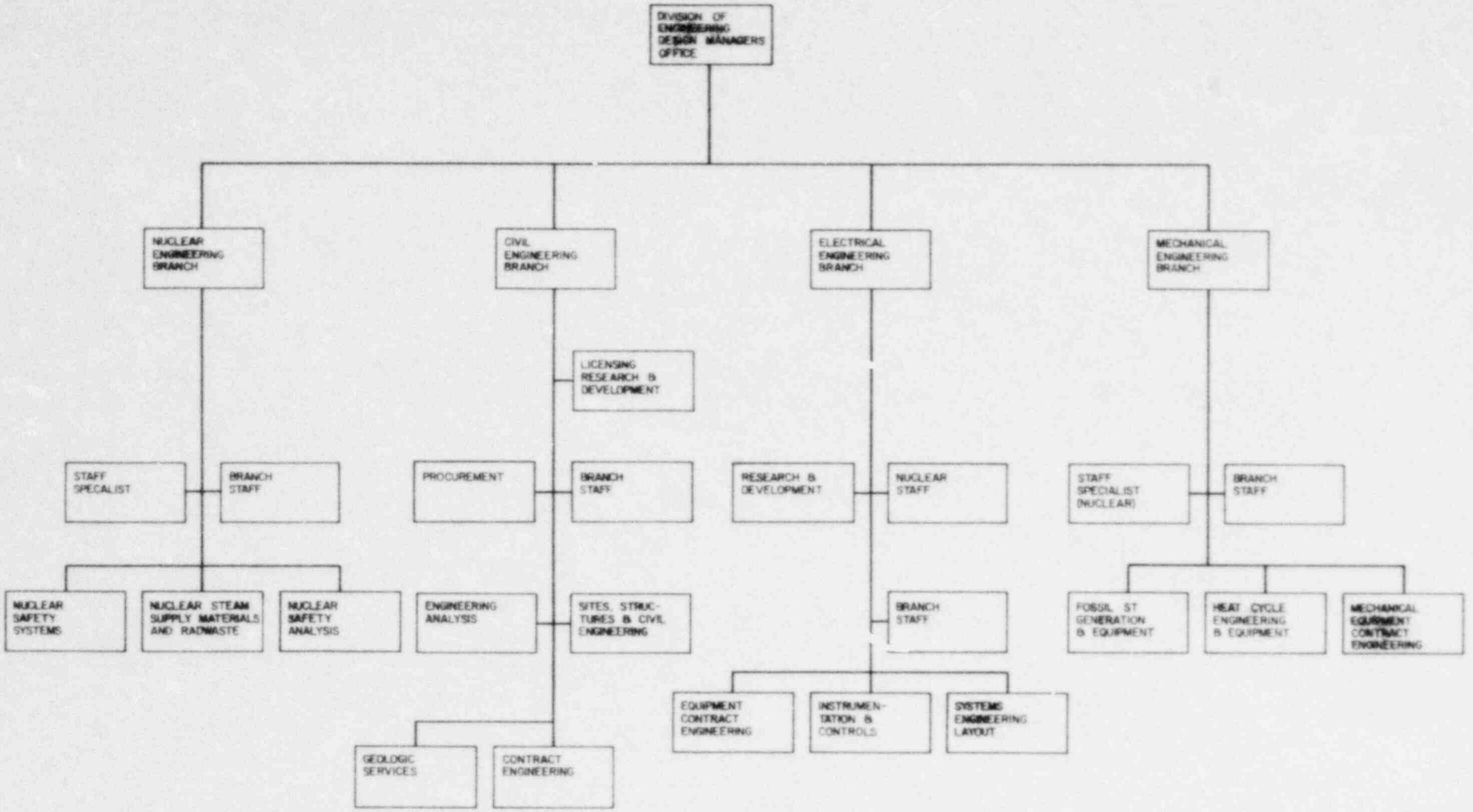


FIGURE 17.1A-5 THERMAL POWER ENGINEERING BRANCHES

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REV. 5

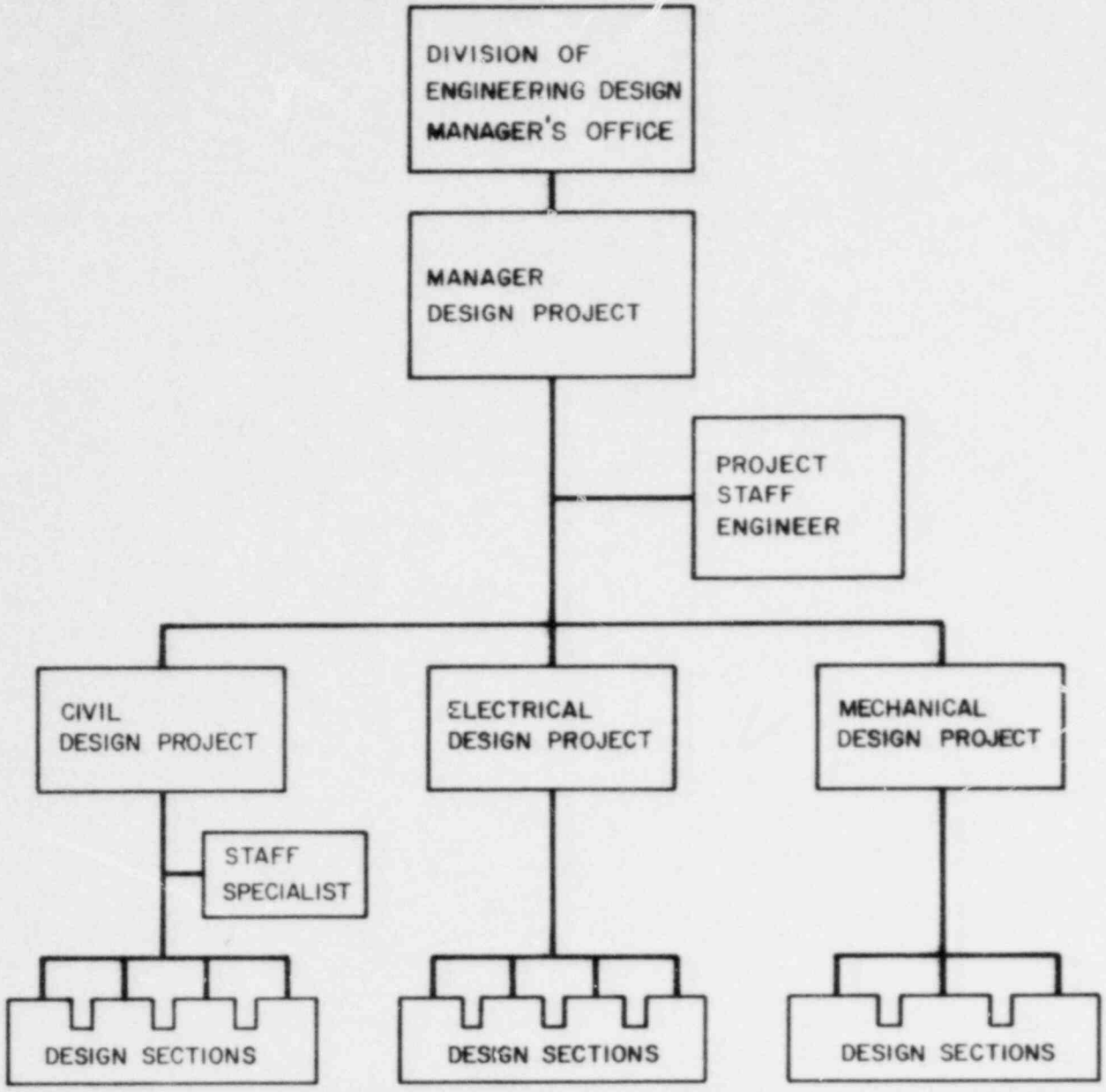

FIG. 17.1A-6-TYPICAL THERMAL POWER ENGINEERING DESIGN PROJECT

REV. 5

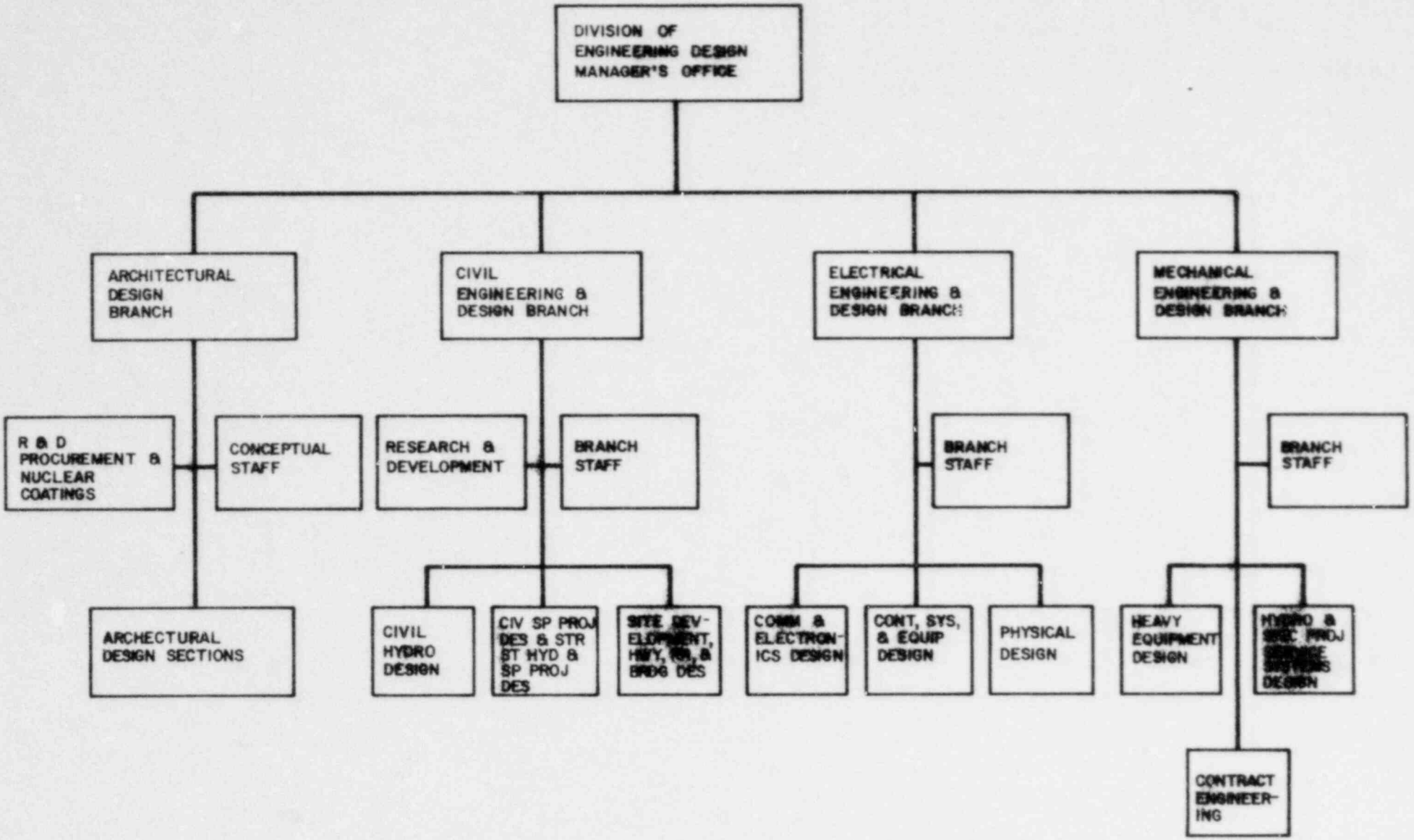

FIGURE 17.1A-7 ARCHITECTURAL, HYDRO, AND SPECIAL PROJECTS ENGINEERING AND DESIGN BRANCHES

REV. 5

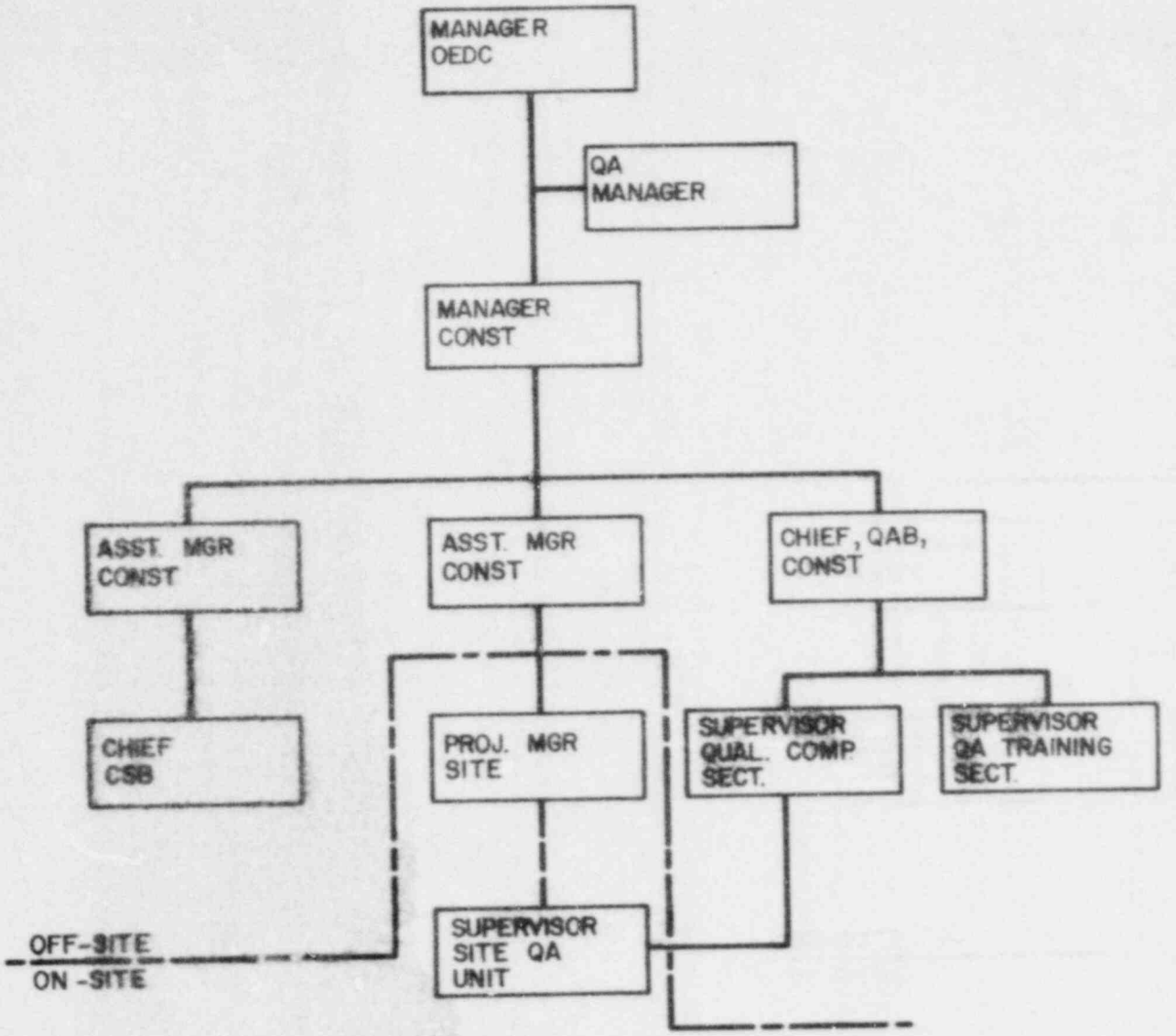

FIGURE 17.A-8 DIVISION OF CONSTRUCTION ORGANIZATION

REV. 5