GOVERNMENT ACCOUNTABILITY PROJECT
Institute for Policy Studies
1901 Que Street N.W., Washington, D.C. 20009
(202) 234-9382

January 24, 1983

PRINCIPAL STAFF			
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D/RA		ENF	
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Mr. James J. Keppler
Regional Administrator
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

It has come to my attention that an affidavit submitted to your office with my January 20, 1983 letter inadvertantly had signatures on the bottom of several pages that were not whited-out. Although the affiant does not object in any case to his/her identity being revealed to the NRC Office of Investigations, (s)he does not consent to extending that knowledge to Kaiser and/or CG&E officials. The witness is concerned with attempts at industry blacklisting, fears recognized as legitimate last July by the Atomic Safety and Licensing Board through its order granting MVPP's Motion for a Protective Order with respect to affidavits for witnesses in the then-scheduled licensing hearings. Therefore, I am submitting this fully-deleted copy of the affidavit and request that you substitute it for the copy currently in use.

Today Mr. Warnick informed me that you already have refused to provide CG&E with a copy of the statement but that it could possibly be obtained under the Freedom of Information Act. The affidavit should be exempt under the Act's provisions for ongoing law enforcement proceedings, as well as the NRC's own confidentiality guidelines.

If you are unable to comply with this request, please notify me so that we can consider whether it would be appropriate to seek an injunction against release under the FOIA of the originally-submitted affidavit. Thank you for your cooperation in this sensitive matter.

Sincerely,

Thomas Devine

Thomas Devine
Legal Director

cc: John Sinclair

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THE CINCINNATI GAS & ELECTRIC COMPANY

CINCINNATI, OHIO 45201

W. H. DICKHONER
PRESIDENT

January 3, 1983

PRINCIPAL STAFF

U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Attention: Mr. James G. Keppler
Regional Administrator

Gentlemen:

Re: Wm. H. Zimmer Nuclear Power Station, Unit 1
Order to Show Cause and Order Immediately
Suspending Construction, Docket No. 50-358,
Construction Permit No. CPPR-88, W.O. 57300,
Job E-5590 - Supplemental Information
Requested By Your Letter of December 28, 1982

This is in response to your letter of December 28, 1982 requesting supplemental information to my letter of November 26, 1982, in which we requested the approval of the Bechtel Power Corporation (Bechtel) to conduct the independent review of the management of the Zimmer Project. We would like to provide the requested information in the same general order and format, as follows:

A.1. The only document we have related to our plans to utilize Bechtel as outlined in my letter of November 10, 1982 to the NRC Commissioners, is a proposal submitted by Bechtel with a transmittal letter dated November 8, 1982. A copy of this original submittal, less contract terms and conditions which we and Bechtel deem proprietary, as well as a copy of the transmittal letter is enclosed. You will note that the original proposal is essentially the one submitted with my letter to you dated November 26, 1982. Also enclosed is a tabulation of the meetings held between CG&E and Bechtel as well as a tabulation of the site visits by Bechtel employees to date.

Your request under this particular item also included some discussion of any oral understandings that we might have relative to utilizing Bechtel as outlined in my November 10, 1982 letter to the Commissioners. As I indicated in my letter of November 26, 1982 to you, we had concluded prior to the issuance of the Show Cause Order that additional project management expertise should be brought to the

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Zimmer Project. On November 2, 1982 we contacted, by telephone, three firms, one being Bechtel, relative to making a presentation as to their capabilities to conduct an assessment of the Zimmer Project management. A fourth company was considered but not contacted since they had just recently done work for us. Bechtel made an initial presentation to us on November 5, 1982 and submitted a formal proposal to us outlining a proposed program on November 8, 1982. As indicated above, a copy of this initial proposal is enclosed. This proposal was subsequently revised by letter dated November 23, 1982 which was attached to my letter to you dated November 26, 1982.

By November 10, 1982, we had concluded that Bechtel was the most qualified of the companies interviewed to fulfill our needs. We indicated verbally to Bechtel that we were going to submit a letter to the Commission indicating a proposed program utilizing their services.

In the interim, the Commission issued the Show Cause Order on November 12, 1982, shutting down safety-related construction at the site. Since the assessment portion of the program outlined in my November 10, 1982 letter to the Commission was essentially the same independent review of management requirement outlined in the Show Cause Order, the decision was made to allow Bechtel to proceed with preliminary work. It was indicated by us to Bechtel that they would now be proceeding on the basis that approval from the NRC would have to be forthcoming before any definitive contract was signed and a total scope of work defined.

This situation was discussed with you at our meeting on November 17, 1982. At that time it was understood that any work done by Bechtel prior to NRC approval was being done at risk.

It should be emphasized that there is no signed agreement nor formal purchase order issued to the Bechtel Power Corporation for their efforts to date. Our verbal understanding with them is that if they receive approval to do the management assessment from the NRC, a formal agreement will be signed covering those services and commercial terms negotiated for any additional scope of work beyond the initial assessment phase. In the event that for some unknown reason Bechtel would be disapproved, we have verbally agreed that at that point in time Bechtel would be reimbursed for work completed on the basis of their standard consulting rates for comparable services.

We believe that this should clarify our relationship with Bechtel and should indicate that any work done by Bechtel to date has not in any way compromised the NRC's approval process.

B.1. Refer to the attached letter dated December 29, 1982 from Bechtel for their response to this item.

Note: For clarification, refer to Appendix A of Bechtel's proposal for Paragraphs E and C.1 which they have now revised.

C.1. CG&E's Response to Item C.1:

In this question you asked why any Bechtel continuing role on the project beyond IV B (1)(a) of the Order would not affect their objectivity in performing the management assessment. We would first like to indicate that the objective of the program proposed in my letter of November 10, 1982 and the steps outlined in the Commission's Show Cause Order of November 12, 1982, are essentially the same; namely, to complete the Zimmer Project in full compliance with all applicable requirements to ensure a safe operating plant. The cornerstone of my November 10 letter and the Show Cause Order is to bring sufficient management, quality assurance, and construction expertise to the project to implement the Quality Confirmation Program and the project completion program. The first step in both programs was to determine what must be done to the management of the project to ensure that the project can be completed in conformance with applicable regulations and the Construction Permit.

As indicated in my letter of November 26, 1982, CG&E believes that Bechtel has expertise in all required areas and firmly believes that Bechtel has the professional integrity and character to recommend a management structure that would be the best possible one to meet the unique requirements of the Zimmer Project, regardless of the organization utilized for its implementation. We further believe that Bechtel is the best qualified through its experience and depth of personnel to be the implementing organization, independent of any assignment to assess project management.

Our objective is to complete this plant in such a manner that it meets all applicable requirements. With this in mind, we believe the best course of action is to have the party implementing a program be the same party proposing the courses of action to be taken. Undivided responsibility would be placed on one party, focusing accountability, thereby best ensuring the integrity of the completed plant. This would have the best chance of success by not placing a second entity in the role of trying to implement a program that they had no responsibility for formulating.

To summarize, we believe that Bechtel has superior qualifications in all the required areas involved in completing Zimmer. We believe that their professional integrity, as well as their vested interest in the nuclear industry, would not allow them to compromise a management assessment of what they might perceive their downstream role on the project to be. Finally, it is the logical decision to have the same party accept the responsibility of implementing a program they created, particularly when they have the total expertise of the Bechtel Power Corporation.

You also requested a discussion as to whether Bechtel's activities at the site to date affected their objectivity in making the management assessment. As indicated in several places, Bechtel's assignment relative to my letter of November 10, 1982 and the Show Cause Order is the same relative to the management assessment. Bechtel has not been compromised in any respect in their activities to date nor have they been given any preconceived ideas or direction. They have been directed by myself to make a management assessment of the project with no reservations and to make an honest, unbiased, and comprehensive report based on the facts as they exist. I want the facts as much as the NRC and I can state categorically that CG&E has taken no actions that would affect the independence relative to Bechtel's activities to date that should have any affect on Bechtel's objectivity. Furthermore, at no time has anyone from CG&E discussed with any member of the Bechtel organization any of their findings or made any attempt to influence such findings.

C.1. Refer to the attached letter dated December 29, 1982 from Bechtel for their response to this item.

I believe the above has satisfactorily answered your supplemental request and should allow the NRC to formally approve Bechtel to conduct an independent management assessment of the Zimmer Project. Whether Bechtel was selected just prior to the Show Cause Order or immediately following the Order does not place the test of independence in jeopardy as defined in Chairman Palladino's letter to Congressmen Dingell and Ottinger.

Yours very truly,

THE CINCINNATI GAS & ELECTRIC COMPANY

By W H Dickhoner
W. H. Dickhoner

WHD:vm

Enclosures
Bechtel proposal dated November 8, 1982
List of CG&E - Bechtel Off-Site Meetings
List of Site Visits by Bechtel Personnel
Bechtel's Response to Questions B and C dated December 29, 1982

Bechtel Power Corporation
Engineers – Constructors

Fifty Beale Street
San Francisco, California
Mail Address: P.O. Box 3965, San Francisco, CA 94119

November 8, 1982

Mr. W.H. Dickhoner, President
Cincinnati Gas and Electric Company
139 East Fourth Street
Cincinnati, Ohio 45202

Dear Mr. Dickhoner:

We appreciated the opportunity, the frankness, and the cooperation of your personnel in discussing the status of your project last Friday. We agree that this is a critical time in the schedule for the completion of the W.H. Zimmer plant. The completion of your project is vital to your company as well as the future of the U.S. nuclear utility industry. Bechtel is prepared to mobilize our full capability and experience to help Cincinnati Gas and Electric complete the project.

We believe that our management experience at Fermi, WPPSS, South Texas, and Diablo Canyon can provide you with the assistance your project organization needs to resolve the current problem areas and complete the Quality Confirmation Program.

Appendix A describes the immediate steps we would take to identify organizational, procedural, and actions that are needed. This Phase I of the initial work is expected to take three weeks, in which time our senior people would further design the approach and a staffing plan for the completion of the project. Generally, those same people, upon completion of this phase, would be available to carry out the implementation of the plan.

Appendix B includes the resumes of the Phase I team members. You'll find them very experienced in nuclear power plant, and particularly BWR, projects. In selecting these candidates, we have emphasized the need for experience in:

1. Project management and construction management

2. Integrated project control

3. QA/QC programs

4. Construction completion, systems turnover, and startup.

Appendix C includes summaries of Bechtel's nuclear experience, which, as you know, is approached by no other company.

Some of Bechtel's in-depth capabilities that we think are important to this job are:

1. Construction management and direct-hire construction

2. Quality control programs

3. Project control systems for integration of quality, schedule and cost priorities

4. Reactor containment expertise

5. Welding expertise and national code relationships

6. Nuclear regulatory licensing expertise

7. Labor relations

8. Operating power plant services

In Appendix D, for your convenience we have included copies of two contract forms. The first is a technical services agreement which is our normal contract for studies similar to the Phase I effort. The second is the form we normally use for more broad-based support of nuclear plant project completions. This Phase II contract allows assignment of the activities that we can foresee for successful completion of the project and allows Cincinnati Gas and Electric, at their discretion to utilize any of Bechtel's capabilities that may be required.

In the event that additional support services are needed after project completion, commercial terms are included that allow Cincinnati Gas and Electric to use our Operating Plant Services organization after commercial operation for whatever help may be needed.

I have found it useful to personally intensively review our performance and overall project progress in periodic executive review meetings with your counterparts in other utilities. I recommend a similar program on the Zimmer project.

Bechtel is prepared to provide expertise and resources to assist Cincinnati Gas and Electric in the successful completion of the W.H. Zimmer Nuclear Station project. We do have sufficient experienced personnel to accomplish it in conjunction with the project's existing capable personnel. We look forward to working with you towards that end.

Sincerely,

H.O. Reinsch
President

HOR/lsw

Enclosures

cc: E.A. Borgmann

PHASE I PROJECT SURVEY

Based on our experience in providing project completion assistance on similar projects we recommend the following sequence and scope of survey activities in preparation for the overall management of the W.H. Zimmer Nuclear Power Station.

A. Management review of project organization and status of job - Has been completed for the purpose of selecting the review team.

B. Assemble survey team - Complete, on standby, and immediately available for Zimmer.

Combined team will be backed up by senior management support and will provide proven capability in the following areas:

- Project Management/Construction Management experience
- Recent nuclear expertise
- Project controls
- Current Quality Control programs
- Managerial capability

C. Survey Tasks

1. Review Project Controls

   a. Overall integration of project schedules:

      1. Milestone Summary Schedule

      2. Engineering, Procurement, Construction & System Turnover Schedule

      3. On going QC inspection planning

      4. QCP inspection/re-work schedule

      5. Detailed work plans for designers, craftsmen

   b. System Completion & Turnover Process

   c. Design change control (Use of design "Freeze" and Design Change Package approach)

   d. Field change control

   e. System & Facility configuration control

   f. Cost control

   g. Administrative control

2. Quality Control

   a. Review program for compatibility of representative specification, drawings, quality control instructions and construction work plans

b. Review adequacy of organization, program, and staffing.

c. Quality Control for remaining work

1. Review of vendor and contractor certification and documentation

2. Action plan for closeout of NCRs

d. Quality Confirmation Program

1. Completeness and adequacy

2. Action plan for closeout of NCRs

e. Review interfaces between QA, QC, craft supervision, field engineering and resident engineering

f. Review program for training and certification of QC inspectors

3. Review Construction Organization

a. Responsibilities and reporting relationships of field engineers. How do they interface with resident engineers, superintendents - systems or area basis?

b. Who assembles quality documentation for field work.

c. Cost and Schedule controls; who develops and maintains?

d. Craft training and indoctrination for nuclear work.

e. Procurement and Warehousing controls

4. Review Nuclear Regulatory Commission Interfaces and Communication

a. Does official contact point exist at appropriate level of CG&E organization for:

1. Licensing

2. Region III

b. Is staffing level and authority adequate to provide timely response of best information with minimum impact on project operation?

c. Are appropriate people involved in NRC communication process? (e.g. Exit Interviews)

d. Who is responsible for managing timely resolution of 50.55 (e) open issues, Title 21 issues?

e. How are impacts of open issues recognized or reflected in project schedule?

5. Review Status of Engineering for:

a. Outstanding design issues not yet issued for construction, if any.

b. Dispositioning of NCRs from QCP.

c. Open issues with NRC licensing group (NRR).

d. Status of Operating License SSER, ACRS Letter, and Public Hearing.

D. Survey Process

1. Interview key people regarding:

a. Scope of responsibility

b. Scope of authority

c. Background and experience

d. Problem areas

2. Obtain and review project procedures and reports for:

a. Monthly progress reports for Engineering, Procurement, Construction and Start-up

b. Schedule and Cost forecast

c. Project Procedure Manuals for CG&E and Kaiser

d. QA & QC Manuals (CG&E and Kaiser)

E. Key People to be interviewed

Cincinnati Gas & Electric

E.A. Borgmann	-	Senior Vice-President & Project Manager
B.R. Sylvia	-	Vice-President, Startup & Nuclear Operation
H.R. Sager	-	Quality Assurance Manager
J.F. Shaffer	-	Quality Confirmation Program Manager
B.K. Culver	-	Construction Manager
H.C. Brinkmann	-	Nuclear Engineering Manager
J.R. Schott	-	Nuclear Production Manager
J.D. Flynn	-	Nuclear Licensing Manager
K.K. Chitkara	-	Nuclear Service Manager

H.J. Kaiser

M. Albertin	-	Project Manager
W. Hedzik	-	Site QA Manager
C. Stanfield	-	Construction Manager
B. Scott	-	Estimating & Cost Control Manager
D. Davis	-	QC Manager
H. Vitale	-	Quality Engineer Manager
G. Power	-	Records Manager

NUCLEAR REGULATORY COMMISSION

- Resident Inspector

SARGENT & LUNDY

- Resident Project Engineer

HARTFORD INSURANCE

- Authorized Inspector

STATE OF OHIO

- Boiler & Pressure Vessel Licensing Agency.

Appendix B - Survey Team and Resumes

Survey Team

Project Operations	- George Jones*
Construction	- Claude Turbow Don Stover* (Alt.)
Project Controls	- Dick Soderholm
QA/QC	- Bob Scott* Gary Stanley*
Code - Welding Inspection	- Larry Campbell Tom Fallon* (Alt.)
Startup Turnovers	- John Walker (part-time)

The survey team will be headed up by George Jones and will report to Bill Henry, Vice-President and Deputy General Manager of the Ann Arbor Power Division.

* Available for permanent Zimmer Project Team.

GEORGE B. JONES

POSITION	Project Manager
EDUCATION	BS, Electrical Engineering, University of California MS, Mechanical Engineering, Naval Post-graduate School
PROFESSIONAL DATA	Registered Professional Engineer in California Member, American Society of Mechanical Engineers Member, American Society of Naval Engineers Member, Project Management Institute

SUMMARY

6 years:	Project manager
2-1/2 years:	Engineering manager
9 months:	Deputy engineering manager
3-1/2 years:	Shipyard commander
1 year:	Deputy, fleet maintenance
5 years:	Planning/production officer
4 years:	Head of Piping, Valves, and Machinery Arrangement Branch

EXPERIENCE

Mr. Jones was Project manager of Hope Creek Unit 1 & 2, 1,100 MW BWRs for Public Service Electric & Gas Company. He is currently managing the close out operation on Unit 2.

Earlier, Mr. Jones was engineering manager for the following projects: Pilgrim 1 and 2 for Boston Edison Company; Jim Bridger 1, 2, 3, and 4 for Idaho Power & Light Company; Hope Creek for Public Service Electric & Gas Company; and Humboldt Bay for Pacific Gas & Electric Company. He also served as coordinator for Bechtel Power Corporation with respect to the use of automatic pipe welding equipment.

Mr. Jones joined Bechtel in January 1971 as deputy engineering manager for the Hope Creek Project.

GEORGE B. JONES (Cont'd)

Prior to joining Bechtel, Mr. Jones was shipyard commander with the U.S. Department of the Navy where he was responsible for all aspects of industrial operations of shipyard activity and the supervision of 6,500 people. Mr. Jones's thirty years of naval experience includes positions as deputy in charge of fleet maintenance, planning production officer, and head of the Piping, Valves and Machinery Arrangement Branch.

REFERENCE

[redacted]

Claude Turbow
Resume to follow

DONALD M. STOVER

POSITION	Project Superintendent
EDUCATION	BS, Civil Engineering, University of Maine
PROFESSIONAL DATA	Professional Structural Engineer, Massachusetts Licensed to Practice, Province of Newfoundland
SUMMARY	5 years: Project superintendent 1 year: Project superintendent 3 years: Field superintendent 3 years: Staff assistant to construction manager 2 years: Assistant manager of construction 2 years: Construction manager 1 year: Project manager 4 years: Resident field manager 6 years: Structural designer and group leader
EXPERIENCE	Mr. Stover is currently project superintendent on 1100 MW BWR Hope Creek project responsible for field supervision of services which includes field subcontract administration. Act for field construction manager in his absence. Mr. Stover was project superintendent of services in Bechtel's San Francisco Power Division assigned to the Nuclear Fast Flux Test Facility. As field superintendent, Mr. Stover was responsible for all construction activities. Mr. Stover was staff assistant to construction manager responsible for coordinating construction department activities on four thermal power stations. Mr. Stover was assistant manager of construction for Acres Canadian Bechtel of Churchill Falls and he was responsible for field activities including inspection, administration, scheduling and cost reporting. As construction manager of Acres Canadian Bechtel of Churchill Falls, Mr. Stover was responsible for initial construction activities, definition and scope of major field construction contracts and administration of active field contracts. Mr. Stover was project manager of ammonia fertilizer complex for Bechtel Corporation.

DONALD M. STOVER (Cont'd)

Mr. Stover was resident field manager of Twin Falls Power Corporation on [illegible] unit hydro plant. He prepared scope of contracts; participated in bid reviews and awards; administered all site construction contracts; prepared cost and progress reports; commissioned and turned over plant to operating personnel.

REFERENCE

RICHARD W. SODERHOLM

POSITION	Technical Services Manager
EDUCATION	BS, Mechanical Engineering, University of California at Berkeley Management Program, Bechtel

SUMMARY

2 months:	Technical services manager
1-1/2 years:	Project superintendent
1 year:	Field cost and scheduling supervisor
4-1/2 years:	Cost and scheduling supervisor
7 months:	Assistant cost and scheduling supervisor
1 year:	Staff assistant
2 years:	Corporate budget coordinator
1 year:	Senior cost engineer
1-1/2 years:	Cost engineer
3 years:	Field cost engineer

EXPERIENCE

Mr. Soderholm is currently technical services manager responsible for technical guidance and personnel administration of division technical services personnel on the Midland nuclear project.

Previously, Mr. Soderholm was project superintendent of construction services for the Midland nuclear project responsible for managing the following groups onsite: subcontracts, cost and scheduling, office services, document control, finance and accounting, procurement, safety, and personnel.

Mr. Soderholm transferred to the Ann Arbor Power Division in March 1980 as field cost scheduling supervisor assigned to Midland Units 1 and 2. He was responsible for all planning, scheduling, and cost control programs, which included productivity monitoring and control, field trending, and preparing all construction schedules.

While serving as cost and scheduling supervisor at the San Francisco Power Division, Mr. Soderholm was assigned to the Pebble Springs and Pilgrim 2 nuclear projects. He was responsible for implementing all planning and scheduling,

RICHARD W. SODERHOLM (Cont'd)

cost control, and quantity tracking programs in the office, and for the initial development of similar programs for the field.

Previously, Mr. Soderholm was staff assistant to the general manager of the Thermal Power Organization (TPO). He reviewed correspondence and procurement authorizations and prepared and coordinated presentations.

Mr. Soderholm was corporate budget coordinator for two years. He was responsible for coordinating overhead budgeting activities for Bechtel Group, Inc.

During his tenure with Bechtel, Mr. Soderholm has also served as senior cost engineer, cost engineer, and field cost engineer.

REFERENCE

[redacted]

ROBERT L. SCOTT

POSITION	Assistant to Manager of Quality.
EDUCATION	Business Management General Studies, Southern Illinois University; various company-sponsored courses such as Fundamentals of Computer Systems. Basic Radiographic Interpretation, Effective Writing, Nondestructive Testing, and Auditor Training.
PROFESSIONAL DATA	Registered Professional Quality Engineer in State of California; Member, American Society Quality Control
EXPERIENCE	Presently assigned as assistant to the Bechtel Manager of Quality at the Washington Nuclear Power Station (WNP-2) for Washington Public Power Supply System. Responsible for technical direction of the construction Quality Control program.

Manager, Documentation Engineering - Bechtel Power Corp. Assigned as consulting Documentation Engineering Manager to a major mechanical contractor at the Washington Nuclear Power Station, Unit Number 2 for Washington Public Power Supply System. Responsible for direction and management of a quality documentation review and correction program, to enable certification of records necessary for nuclear plant licensing. (1 year)

Project Quality Assurance Manager - Bechtel Power Corp. Assigned as project Quality Assurance Manager to the Grand Gulf Nuclear Power Station, two 1300 MW BWR units for Mississippi Power and Light Company. Responsible for direction and control of the project quality assurance program, as well as direction and management of project quality assurance activities. (4 years)

Project Quality Assurance Engineer - Bechtel Power Corp. Served as project Quality Assurance Engineer on the 950 MW PWR Arkansas Nuclear One - Unit 2 for Arkansas Power and Light Company. Responsible for direction and control of the quality assurance program, representing the project on project related quality assurance matters. (4 years)

ROBERT L. SCOTT (Cont'd)

Manager of Quality Assurance - Westinghouse Nuclear Energy Systems Division. Before joining Bechtel, was an equal partner/owner of a steel fabrication and design company. Prior to this, was Manager of Quality Assurance in the Heat Transfer Division of Westinghouse Electric Corporation. Formerly was the West Coast Quality Assurance Representative and Senior Quality Engineer for Westinghouse Nuclear Energy Systems Division. Responsible for source surveillance/auditing of Westinghouse suppliers of NSSS components in California, Washington, Arizona and Colorado. Previously was responsible for quality assurance program and records planning for Westinghouse NES quality assurance consulting efforts for a utility, nuclear projects balance-of-plant equipment. (3 years)

Product Assurance Coordinator - Quality Engineering - Lockheed Propulsion Company; Unidynamics and Other. While with Lockheed Propulsion Company, was a Product Assurance Coordinator involved in quality engineering activities related to manufacturing planning of Navy nuclear reactor internal (core) components. Previous positions included Production/Quality Engineer initiating quality control inspection procedures for Unidynamics, St. Louis, and Manager of Quality Assurance for Scott Engineering and Welding Service responsible for development and implementation of a program to meet the requirements of MIL-Q-9858A. (3 years)

REFERENCE

[redacted]

G.W. STANLEY

POSITION — Senior Construction Engineer

EDUCATION — Courses at Kansas State University and Wichita State University

SUMMARY

2 years:	Project field engineer
1-1/2 years:	Systems superintendent and and assistant project field engineer
3-1/2 years:	Project construction quality control engineer
1 year:	Staff quality control supervisor
3-1/2 years:	Project quality control engineer and lead mechanical piping quality control engineer
5 years:	Lead quality control planner

EXPERIENCE

Mr. Stanley is presently assigned as project field engineer on the BWR Grand Gulf Power Station Units 1 and 2, 1,300 MW each, for Mississippi Power & Light Company, responsible for supervising and directing all field engineering activities. He has also served as the project systems superintendent responsible for construction completion and release of systems for startup testing. In addition, he was assistant project field engineer on this project, responsible for supervising Unit 1 field engineering activities.

Mr. Stanley was previously assigned as project construction quality control engineer for the PWR SNUPPS 1,150 MW Sterling Unit 1 nuclear project for Rochester Gas & Electric Corporation. He was responsible for staffing and supervising the field construction quality control organization and implementing the quality control program.

Mr. Stanley formerly served as quality control staff supervisor in Bechtel's Gaithersburg office, where he supervised the quality control technical staff and

was responsible for the preparation of instructions and procedures, and providing technical guidance to field quality control engineers.

Prior to this, Mr. Stanley served as project construction quality control engineer on the PWR Calvert Cliffs Nuclear Power Station Units 1 and 2, 880 MW each, for Baltimore Gas & Electric Company. He was also assistant project construction quality control engineer and simultaneously acted as lead quality control engineer for construction testing operations. Earlier, he served as lead mechanical/piping quality control engineer, responsible for quality activities for the verification of safety-related mechanical and piping system installation. He also served on this project as mechanical quality control engineer for inspecting the installation of piping and mechanical activities.

Before joining Bechtel, Mr. Stanley was associated with The Boeing Company as lead quality control planner. He planned and developed quality control procedures, evaluated test plans and specifications for facilities installation as well as ground and flight test operations on the Apollo/Saturn program, and dealt extensively with the quality records system.

REFERENCE

LARRY L. CAMPBELL

POSITION	Quality Control Coordinator
EDUCATION	BS, Mechanical Engineering, Virginia Polytechnic Institute and State University
PROFESSIONAL DATA	Certified Level III Mechanical Quality Control Engineer Certified Level III Welding Quality Control Engineer

SUMMARY

1-1/2 years:	Lead quality control engineer
4 years:	Assistant lead field weld engineer
1 year:	Senior construction engineer
1 year:	Construction engineer
5 years:	Pipefitter

EXPERIENCE

Mr. Campbell is currently the quality control coordinator in the Ann Arbor Power Division primarily responsible for the coordination of activities at the Palisades and Fermi nuclear jobsites. He provides assistance to the chief construction quality control engineer for the remaining nuclear and non-nuclear construction quality control activities within the Ann Arbor Power Division.

Previously, Mr. Campbell was the lead quality control engineer at the Detroit Edison Fermi 2 Generating Station, assigned to the client's construction and maintenance quality assurance organization. He supervised the client's quality control staff in the performance of inspection activities and the preparation of program procedures, which included quality control instructions for construction and maintenance activities performed by contractors or the client's maintenance organization. Mr. Campbell is also a consultant for the client on American Society of Mechanical Engineers Sections III, IX, and XI, and on American Welding Society Code matters.

Prior to this assignment, Mr. Campbell was the assistant lead field weld engineer at the Limerick jobsite. He acted as the lead field weld engineer during his absence, directing and coordinating the activities of 28 personnel. He was responsible for preparing and writing technical reports to support jobsite welding activities.

LARRY L. CAMPBELL (Cont'd)

Before joining Bechtel, Mr. Campbell held various construction engineering assignments and was promoted to senior construction engineer at several nuclear power plants. He also completed a 4-year pipefitter apprentice program while working at a nuclear shipbuilding company.

REFERENCE

[redacted]

Tom Fallon
Resume to follow

JOHN G. WALKER

POSITION	Project Manager
EDUCATION	BS, Mechanical Engineering, Texas A&M University
PROFESSIONAL DATA	Registered Professional Mechanical Engineer in Texas Registered Professional Nuclear Engineer in California Member, American Nuclear Society
SUMMARY	3 years: Project manager 1 year: Manager of startup and operating services 6 years: Chief startup engineer 2 years: Project startup engineer 3 years: Senior startup engineer 2 years: Senior results engineer 3 years: Results engineer
EXPERIENCE	Mr. Walker is currently project manager for Bechtel's work on Detroit Edison's Fermi 2 project. Mr. Walker was manager of startup and operating services in Bechtel's San Francisco Power Division. Previously, as chief startup engineer he had overall responsibilities for division startup operations. As a project startup engineer on a number of projects, Mr. Walker was responsible for total plant startup activities. Previously, as a startup engineer, he was responsible for plant cleaning and flushing and power testing. Mr. Walker was previously a startup engineer on the Great Canadian Oil Sands project where he provided technical direction and coordination of power plant and utilities startup.

JOHN G. WALKER (Cont'd)

Prior to joining Bechtel, Mr. Walker was a senior results engineer with the Texas Electric Service Company where, as a plant operations supervisor, he was in charge of operating personnel; he also directed startup of a 550 MWe fossil plant addition. As a results engineer, he prepared and conducted plant performance tests and worked as a shift operations supervisor.

REFERENCE—

[redacted]

WILLIAM (BILL) GERALD HENRY

POSITION	Vice-President and Deputy General Manager
EDUCATION	BS, Civil Engineering, University of Washington BMC, Business Law, University of Washington
PROFESSIONAL DATA	Registered Professional Engineer in Alabama Contractor's License (BPG), Nevada

SUMMARY

6 months:	Vice-president and deputy general manager
1 year:	Vice-president and manager of division construction
4-1/2 years:	Manager of division construction
6 months:	Deputy manager of division construction
1-1/2 years:	Manager of construction
5 years:	Construction manager
1-1/2 years:	General superintendent
2-1/2 years:	Project superintendent
6 months:	Assistant superintendent
2 years:	Senior field engineer
3 years:	Field engineer
1 year:	Design engineer
2 years:	Heavy equipment supervisor
4 years:	Equipment operator

EXPERIENCE

Currently, Mr. Henry is vice-president and deputy general manager of the Ann Arbor Power Division.

Prior to his present assignment, Mr. Henry was vice-president and manager of division construction for Bechtel's Los Angeles Power Division where he was responsible for foreign and domestic construction activities. Previously, Mr. Henry was manager of construction for projects in the southwestern United States and Southern California and, later, deputy manager of division construction. As a construction manager in the Los Angeles Power Division, Mr. Henry was responsible for work on the Mohave, Rancho Seco, and San Onofre units.

WILLIAM (BILL) GERALD HENRY (Cont'd)

Mr. Henry has had considerable field experience since joining Bechtel in 1957 as a design engineer. Beginning in 1958, he worked as a field engineer on the Mammoth Pool hydropower plant in the Sierra and the Alamitos Steam Station gas turbine units. In 1963, he became assistant superintendent on the Etiwanda power plant project. From 1964 to 1967 Mr. Henry was project superintendent for Redondo Units 7 and 8, and in 1967 he was named general superintendent on the Mohave Generating Station. For the next three years Mr. Henry served as construction manager responsible for Mohave 1 and 2 and Four Corners 4 and 5.

Prior to joining Bechtel in 1957, Mr. Henry was a heavy equipment supervisor for the Army Corps of Engineers and an equipment operator for Henry Brothers Construction Company and the State Highway Department.

Appendix C - Nuclear Experience

BECHTEL NUCLEAR EXPERIENCE

This section describes Bechtel's capabilities and experience as the leader in providing engineering and construction services to the nuclear industry.

BECHTEL QUALIFICATIONS AND RECORD IN NUCLEAR POWER

- 30 YEARS OF NUCLEAR POWER EXPERIENCE
- 91 NUCLEAR PLANTS DESIGNED OR CONSTRUCTED
- 73 NUCLEAR PLANTS WITH BECHTEL AS CONSTRUCTION MANAGER/ CONSTRUCTOR
- TOTAL CAPACITY EXCEEDS 78,000 MEGAWATTS
- RESPONSIBLE FOR CONSTRUCTION MANAGEMENT/CONSTRUCTION OF 25% OF CURRENTLY OPERATING NUCLEAR UNITS
- SELECTED FOR THREE MILE ISLAND RESTORATION WORK
- SELECTED FOR PROJECT COMPLETION OF 7 UNITS CURRENTLY IN PROGRESS
- LEADER IN DEVELOPING AND APPLYING EFFECTIVE PROJECT CONTROL TOOLS FOR NUCLEAR PROJECTS

General Nuclear Experience

Bechtel has been a pioneer in the nuclear power field: first was the nuclear accelerator at Los Alamos, New Mexico, then came Arco, proving that power-generating atomic heat could be produced, controlled, and used. In the following year, the company performed the engineering for the Mark I and Mark II Materials Testing Accelerator Project in Livermore, California. Next, it constructed the $20 million AEC Chemical Fuel Processing Plant in Idaho.

Bechtel provided construction management and engineering for the installation of a turbine generator at General Electric Company's Knolls Atomic Laboratory in West Milton, New York. This installation, utilizing byproduct energy from the prototype reactor for the U.S. Navy submarine Sea Wolf, supplied the first nuclear-fueled power for commercial use in 1955.

Also for General Electric, near Pleasanton, California, Bechtel had complete responsibilities from engineering through construction of the Vallecitos Atomic Laboratory. Vallecitos, as an experimental facility, made its greatest contribution by demonstrating increasing efficiency and output, and thus reducing cost of nuclear power.

A milestone in Bechtel's growth with the nuclear industry came in 1959 with completion of the Commonwealth Edison Company's Dresden Nuclear Power Station in Morris, Illinois. This was the country's first large, privately financed nuclear power plant. Bechtel was engineer-constructor, responsible for all construction and design, except for the nuclear package.

Through these, and other projects, Bechtel has maintained its position within this rapidly evolving industry with participation in many advanced projects involving studies, evaluations, engineering, and construction milestones. Some highlights of these activities are:

- Comprehensive design and construction services for first nuclear addition to a conventional steam plant, Humboldt Bay 3.
- Engineering services for the first nuclear power unit with a pressure suppression containment - APPR-1A.
- Development and construction of the first fully prestressed, post-tensioned concrete containment vessel - Palisades 1.
- Comprehensive design and construction services for the first nuclear power plant with a field fabricated reactor vessel - Monticello 1.
- Engineering, procurement and construction of Tarapur, India's first commercial nuclear power plant. This required extensive training of workers and close supervision of local subcontractor

- High Temperature Gas Cooled Reactor Plant Studies and Designs.
- Standardized Nuclear Unit Power Plant System.
- Liquid Metal Fast Breeder Reactor Program, Fast Flux Test Facility Engineering and Construction.
- Engineering and Construction of San Onofre Units 2 and 3 with seismic design criteria of 0.66G, one of the world's highest.

Bechtel has experience with nearly all types of reactor design and power concepts. Bechtel is not associated permanently with any manufacturer or agency but works with all major worldwide suppliers of nuclear steam supply systems and turbine generators.

Today, in its third decade of service to the nuclear industry, Bechtel has participated in the design engineering and/or construction of 91 major nuclear plants in the United States and worldwide. The total capacity of these projects is in excess of 78,000 megawatts.

Many technical and economic studies, safety analyses, licensing preparations and presentations for state of the art and advanced fission and fusion nuclear power plants, and the nuclear fuel cycle from mining to waste storage have been performed and completed. For example, a study was completed concerning the licensability in the United States of the French Phenix, fast breeder reactor. Other studies have covered spent fuel pool expansions, temporary and permanent waste storage, and recovery of Three Mile Island Unit 2.

Nuclear Plant Construction
Management/Construction Experience

Bechtel's nuclear plant construction experience dates back to 1950. Since then Bechtel has been responsible for the construction of 73 nuclear units. Our involvement has ranged from projects when we were the construction manager only with all work being performed by contractors to assignments where virtually all of the work was performed directly by Bechtel.

Most projects included a combination of the above. Substantial work is performed by Bechtel forces (± 60%). The remaining work is performed by specialty contractors with Bechtel providing construction management services. This combination of experience makes Bechtel uniquely qualified in that our field engineers and supervisors have acquired a breadth of understanding of both managing as well as directly performing the work.

The following table taken from Kidder, Peabody & Company's March 30, 1982 "Status Report on Engineers and Construction Managers for Electric Utility Nuclear Reactors and Fossil Boilers (as of 12/31/81)", depicts Bechtel's preeminence as a Construction Manager for domestic nuclear power plants.

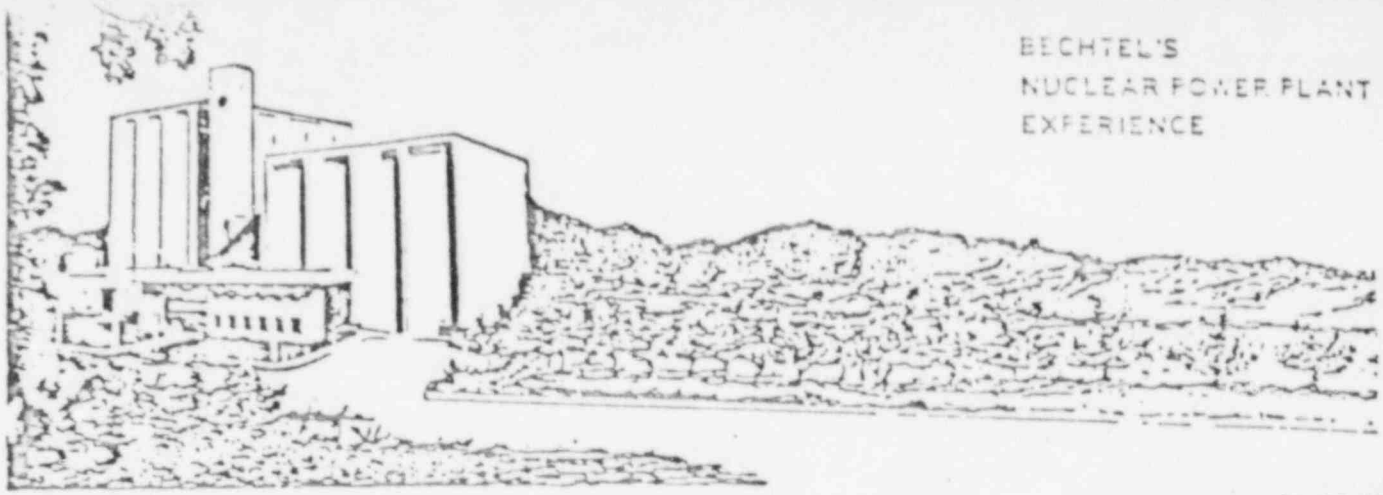
Engineers and Construction Managers
Summary - Construction Managers, Nuclear Reactors, Domestic

Manager	Operating #	Operating MWE	Operating %	To Be Operated #	To Be Operated MWE	To Be Operated %	Total #	Total MWE	Total %
American El Pr Service Co	2	2,120	3				2	2,120	1
Baldwin				2	1,866	2	2	1,866	1
Bechtel	25	18,813	27	20	22,429	26	45	41,242	26
Brown & Root	2	1,642	2	2	2,300	3	4	3,942	3
Burns & Roe	3	1,508	2				3	1,508	1
C.F. Braun	1	644	1				1	644	
Commonwealth Edison	2	2,100	3	8	8,936	10	10	11,036	7
Consolidated Ed NY	1	265					1	265	
Daniel	5	4,608	7	6	6,093	7	11	10,701	7
Duke Power	7	7,678	11	6	7,310	8	13	14,988	10
Ebasco	6	4,238	6	6	6,796	8	12	11,034	7
Georgia Power	2	1,581	2	2	2,220	3	4	3,801	2
Gibbs & Hill	1	457	1				1	457	
J.A. Jones	1	825	1				1	825	1
Kaiser Engineers	1	850	1	1	810	1	2	1,660	1
Miscellaneous	1	52					1	52	
Northern States Pr	2	1,060	2				2	1,060	1
Pacific Gas & El				2	2,190	3	2	2,190	1
Pub Serv Indiana				2	2,260	3	2	2,260	1
Pub Serv Oklahoma	2	2,300	3				2	2,300	1
Stone & Webster	7	4,854	7	5	4,458	5	12	9,312	6
Tenn Valley Auth	4	4,345	6	13	15,896	18	17	20,241	13
United Engineers & Const	8	7,148	10	2	2,300	3	10	9,448	6
Virginia El & Pr				1	938		1	938	1
Westinghouse	2	1,838	3				2	1,838	3
Wisconsin Pub Serv	1	541	2				1	541	
Total	86	69,467	100	78	86,802	100	164	156,269	100

Nuclear Plant Project Completion
Services Experience

Owner	Unit	Services
Washington Public Power Supply System	WNP - 1	Project management Construction management
	WNP - 2	Project management Construction management
	WNP - 4*	Project management Construction management
South Texas Project	South Texas-1	Project management Engineering Procurement Construction management
	South Texas-2	Project management Engineering Procurement Construction management
Pacific Gas & Electric	Diablo Canyon 1	Project management Engineering Construction management
	Diablo Canyon 2	Project management Engineering Construction management
Detroit Edison Company	Fermi 2	Construction (punch listing) Startup Maintenance

* Unit later cancelled.

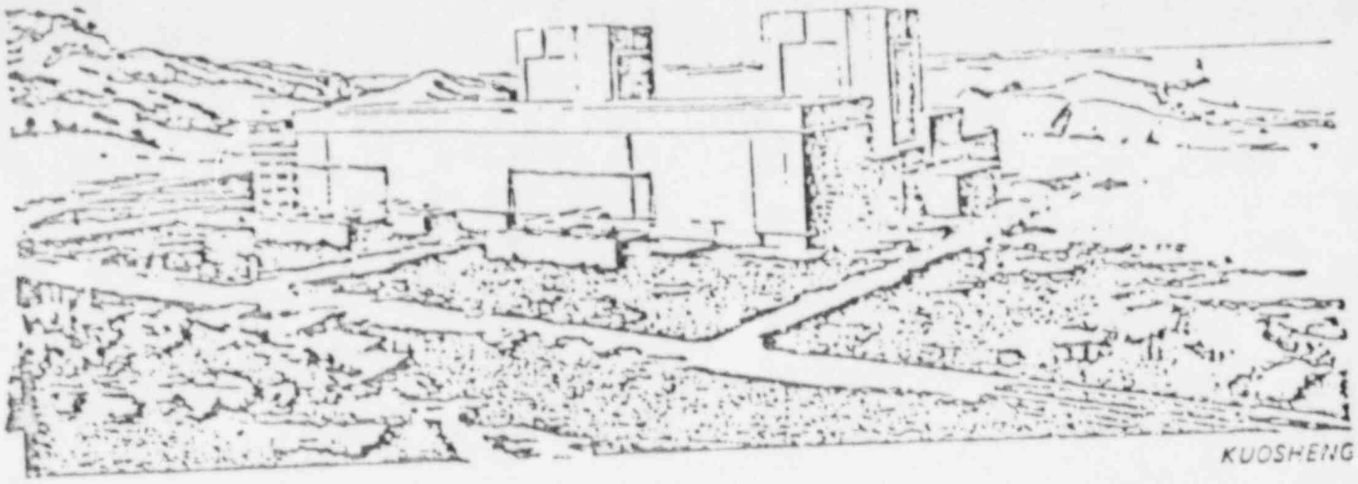


BECHTEL'S
NUCLEAR POWER PLANT
EXPERIENCE

PILGRIM

Commercial Operation Date-Unit	Client	Location	Reactor Supplier & Type	Gross MW	Bechtel Scope	Start Engineering	Start Construction
1988							
Sayago	Iberduero, S. A.	Spain	Westinghouse PWR	1100	ME	1975	1977
1987							
Korea Nuclear 8	Korea Electric Co.	Korea	Westinghouse PWR	950	EPMC	1979	1980
Taiwan 7	Taipower	Taiwan	–	–	Prelim E	1979	–
Taiwan 8	Taipower	Taiwan	–	–	Prelim E	1979	–
Hope Creek 2	New Jersey Public Service E & G	New Jersey	GE – BWR	1100	EPC	1974	1974
Callaway 2	Union Electric	Missouri	Westinghouse PWR	1150	EP	1973	1976
Pilgrim 2	Boston Edison	Mass.	CE – PWR	1223	EPC	1972	1980
Vogtle 2	Georgia Power Southern Services	Georgia	Westinghouse PWR	1100	EP	1971	1974
1986							
Korea Nuclear 7	Korea Electric Co.	Korea	Westinghouse PWR	950	EPMC	1979	1980
Tsuruga	Mitsubishi	Japan	Mitsubishi/ Westinghouse PWR	1100	E	1977	1980
Vandellos II	ENHER	Spain	Westinghouse PWR	1100	ME	1976	1977
Palo Verde 3	Arizona Public Service	Arizona	CE – PWR	1300	EPC	1975	1976
Washington Nuclear Power 4	WPPSS	Washington	B & W/W PWR	1218	MC	1972	1973
1985							
Korea Nuclear 6	Korea Electric Co.	Korea	Westinghouse PWR	950	EPMC	1978	1980
Hope Creek 1	New Jersey Public Service E & G	New Jersey	GE – BWR	1100	EPC	1974	1974
Enel V	Electronucleare Italiana	Italy	Westinghouse PWR	950	MEC	1974	Delayed
Washington Nuclear Power	Washington Public Power Supply System	Washington	B & W/W PWR	1218	MC	1972	1973
Grand Gulf Nuclear 2	Mississippi Power and Light	Mississippi	GE – BWR	1301	EPC	1971	1974
Limerick 2	Philadelphia Electric	Pennsylvania	GE – BWR	1065	EPC	1969	1974

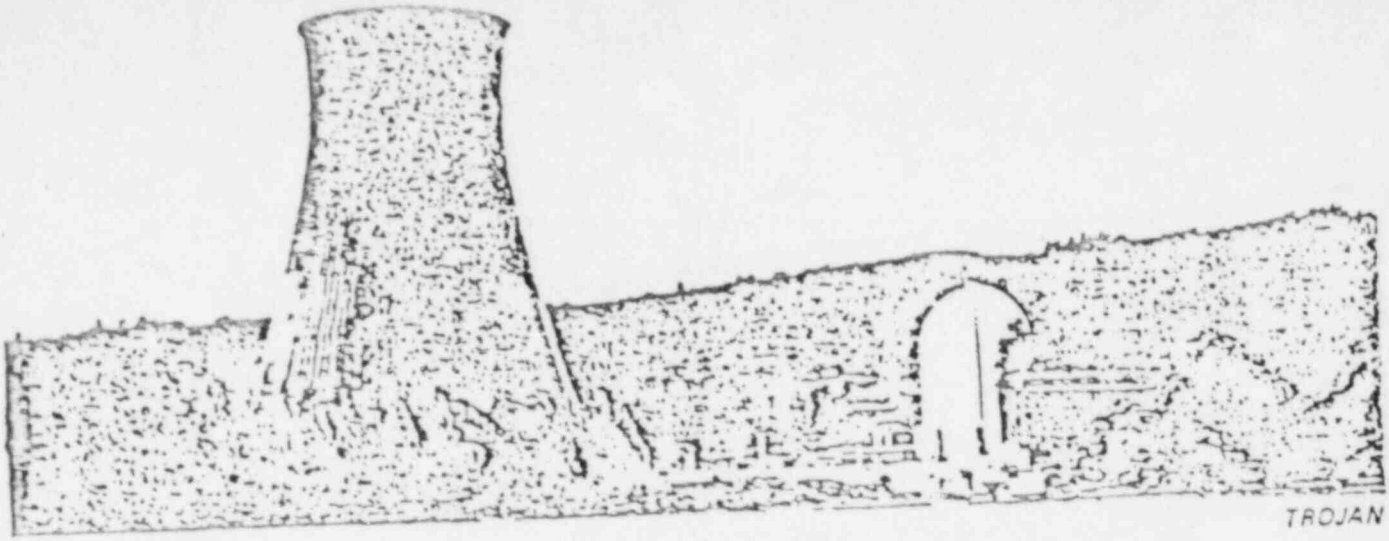
E – ENGINEERING P – PROCUREMENT C – CONSTRUCTION M – MANAGEMENT



KUOSHENG

Commercial Operation Date-Unit	Client	Location	Reactor Supplier & Type	Gross MW	Bechtel Scope	Start Engineering	Start Construction
1984							
Korea Nuclear 5	Korea Electric Co.	Korea	Westinghouse PWR	950	EPMC	1978	1980
Maanshan 2	Taiwan Power	Taiwan	Westinghouse PWR	950	EPMC	1976	1978
Palo Verde 2	Arizona Public Service	Arizona	CE – PWR	1300	EPC	1973	1976
Skagit Nuclear 1	Puget Sound Power and Light	Washington	GE – BWR	1300	EPMC	1973	Delayed
Vogtle 1	Georgia Power Southern Services	Georgia	Westinghouse PWR	1100	EP	1971	1974
Midland 1	Consumers Power	Michigan	B & W PWR	460	EPC	1968	1972
1983							
Maanshan 1	Taiwan Power	Taiwan	Westinghouse PWR	950	EPMC	1976	1978
Wolf Creek	Kansas City P & L	Missouri	Westinghouse PWR	1150	EP	1973	1977
ASCO 2	FECSA	Spain	Westinghouse PWR	930	ECM	1973	1974
Palo Verde 1	Arizona Public Service	Arizona	CE – PWR	1300	EP[illegible]	1973	1976
Pebble Springs 1	Portland General Electric	Oregon	B & W PWR	1260	EMC	1972	Delayed
Lemoniz 2	Iberduero	Spain	Westinghouse PWR	930	E	1972	1974
Susquehanna 2	Pennsylvania Power & Light	Pennsylvania	GE – BWR	1095	EPC	1970	1974
Limerick 1	Philadelphia Electric	Pennsylvania	GE – BWR	1068	EPC	1969	1974
Midland 2	Consumers Power	Michigan	B & W PWR	812	EPC	1968	1972
1982							
Callaway 1	Union Electric	Missouri	Westinghouse PWR	1150	EP	1973	1976
Kuosheng 2	Taiwan Power	Taiwan	GE – BWR	1000	EPMC	1972	1975
Grand Gulf Nuclear 1	Mississippi Power and Light	Mississippi	GE – BWR	1301	EPC	1971	1974
Susquehanna 1	Pennsylvania Power & Light	Pennsylvania	GE – BWR	1095	EPC	1970	1974

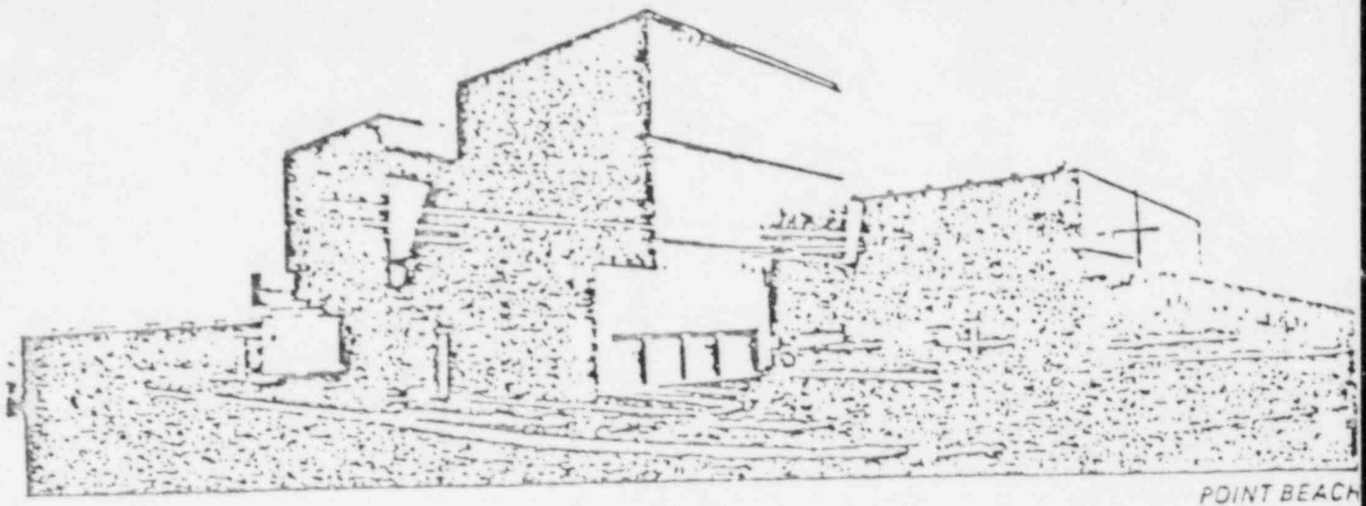
E – ENGINEERING P – PROCUREMENT C – CONSTRUCTION M – MANAGEMENT



TROJAN

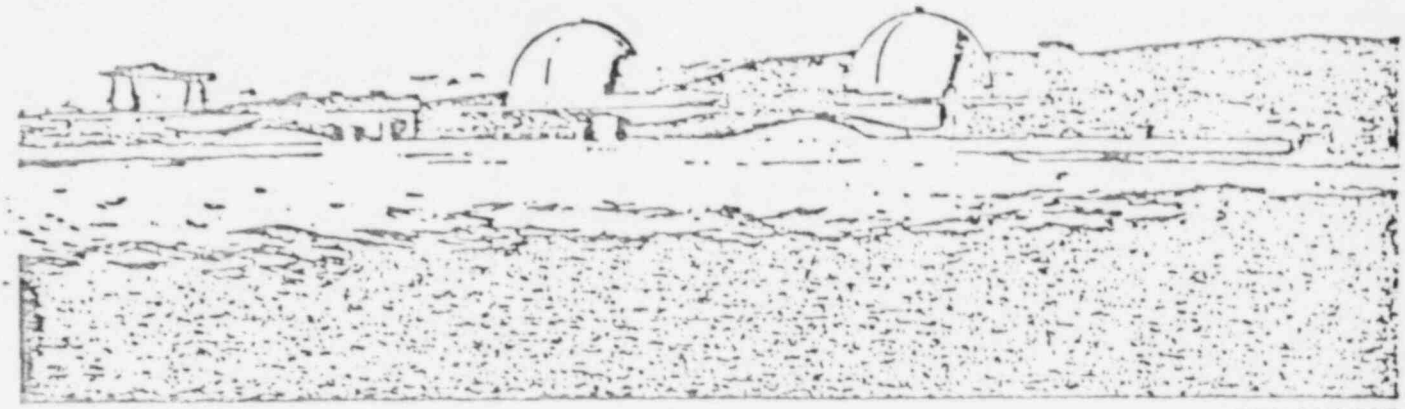
Commercial Operation Date-Unit	Client	Location	Reactor Supplier & Type	Gross MW	Bechtel Scope	Start Engineering	Start Construction
1981							
Kuosheng 1	Taiwan Power	Taiwan	GE – BWR	1000	EPMC	1972	1975
Lemoniz 1	Iberduero	Spain	Westinghouse PWR	930	E	1972	1974
ASCO 1	FECSA	Spain	Westinghouse PWR	930	ECM	1972	1974
San Onofre 2	Southern California Edison	California	Comb. Eng. PWR	1100	EPC	1970	1974
1980							
Arkansas Nuclear 1 Unit 2	Arkansas Power & Light	Arkansas	Comb. Eng. PWR	930	EPC	1970	1972
Joseph M. Farley 2	Alabama Power & Southern Service	Alabama	Westinghouse PWR	847	E	1970	1972
FFTF	WADCO for USAEC	Washington	Westinghouse LMFBR	400	EPC	1968	1970
1979							
E. I. Hatch 2	Georgia Power & Southern Service	Georgia	GE – BWR	822	E	1970	1971
Forsmark	ASEA-ATOM	Sweden	ASEA-ATOM BWR	900	Advisory	1970	1973
1977							
Joseph M. Farley 1	Alabama Power & Southern Service	Alabama	Westinghouse PWR	847	E	1969	1972
Davis-Besse 1	Toledo-Edison Cleveland Electric	Ohio	B & W PWR	906	EMC	1965	1971
Calvert Cliffs 2	Baltimore Gas & Electric	Maryland	Comb. Eng PWR	881	EPC	1967	1969
1975							
Trojan 1	Portland Gen. Electric	Oregon	Westinghouse PWR	1150	EMC	1965	1971
Milestone Nuclear 2	Connecticut Light & Power Co. Hartford Electric Light Company West Massachusetts Electric Company	Connecticut	Comb. Eng. PWR	857	EPC	1966	1970

E – ENGINEERING P – PROCUREMENT C – CONSTRUCTION M – MANAGEMENT



POINT BEACH

Commercial Operation Date-Unit	Client	Location	Reactor Supplier & Type	Gross MW	Bechtel Scope	Start Engineering	Start Construction
1975							
E. I. Hatch 1	Georgia Power & Southern Service	Georgia	GE – BWR	813	E	1967	1969
Calvert Cliffs 1	Baltimore Gas & Electric	Maryland	Comb. Eng. PWR	864	EPC	1967	1969
Rancho Seco	Sacramento Municipal Utility District	California	B & W PWR	950	EPMC	1967	1969
1974							
Duane Arnold	Iowa Light & Power Co.	Iowa	GE – BWR	588	EPC	1969	1970
Arkansas Nuclear 1 Unit 1	Arkansas Power & Light	Arkansas	B & W PWR	904	EPC	1967	1968
Oconee 2	Duke Power Co.	So. Carolina	B & W PWR	900	E	1966	1967
Oconee 3	Duke Power Co.	So. Carolina	B & W PWR	900	E	1966	1967
Peach Bottom 2	Philadelphia Electric	Pennsylvania	GE – BWR	1108	EPC	1966	1967
Peach Bottom 3	Philadelphia Electric	Pennsylvania	GE – BWR	1108	EPC	1966	1967
1973							
Point Beach 2	Westinghouse for Wis.-Mich. Power Co.	Wisconsin	Westinghouse PWR	490	EPC	1967	1968
Oconee 1	Duke Power Co.	So. Carolina	B & W PWR	900	E	1966	1966
Turkey Point 4	Flordia Power & Light	Florida	Westinghouse PWR	724	EPC	1965	1967
1972							
Pilgrim 1	Boston Edison	Mass.	GE – BWR	658	EPC	1967	1968
Turkey Point 3	Florida Power & Light	Florida	Westinghouse PWR	724	EPC	1965	1967
1971							
Monticello	General Electric for No. State Power Co.	Minnesota	GE – BWR	545	EPC	1966	1967
Palisades 1	Consumers Power	Michigan	Comb. Eng. PWR	815	EPC	1966	1967



SAN ONOFRE

Commercial Operation Date-Unit	Client	Location	Reactor Supplier & Type	Gross MW	Bechtel Scope	Start Engineering	Start Construction
1970							
Point Beach 1	Westinghouse for Wis.-Mich. Power Co.	Wisconsin	Westinghouse PWR	490	EPC	1966	1967
Ginna 1	Westinghouse for Roch. Gas & Electric	New York	Westinghouse PWR	470	PC	1965	1966
1969							
Tarapur 1	IGE for Indian AEC	India	GE – BWR	190	EPC	1964	1964
Tarapur 2	IGE for Indian AEC	India	GE – BWR	190	EPC	1964	1964
1968							
San Onofre 1	Southern California Edison San Diego Gas & Electric	California	Westinghouse PWR	450	EPC	1963	1964
1967							
Peach Bottom 1	Philadelphia Electric	Pennsylvania	GA – HTR	46	EPC	1958	1962
1963							
Humboldt Bay 3	Pacific Gas & Electric	California	GE – BWR	69	EPC	1958	1960
VESR	General Electric – ESADA	California	GE – Steam Superheater	0	C	–	1961
1962							
Big Rock Point	Consumers Power	Michigan	GE – BWR	75	EPC	1959	1960
NPD	Canadian General Electric for AECL	Canada	CGE – PHWR	20	PC	–	1959
Hallam	Atomic Energy Commission	Nebraska	AI – SGR	76	EC	1958	1959
1960							
Dresden 1	General Electric for Commonwealth Edison	Illinois	GE – BWR	210	EPC	1955	1957
1957							
VBWR	General Electric	California	GE – BWR	5	EPC	1955	1956
APPR-1A	ALCO	Alaska	ALCO – PWR	2	E	1954	1955
1955							
West Milton	General Electric	New York	GE – SIR	10	EC	1952	1953
1952							
EBR-1	Atomic Energy Commission	Idaho	ANL-LMFBR	0.2	M	–	1949

E – ENGINEERING P – PROCUREMENT C – CONSTRUCTION M – MANAGEMENT

Experienced Power Plant Engineering and Construction Personnel

Bechtel's ability to provide clients with specific services and expertise is made possible by the number and diversity of experienced personnel available within the organization.

More than 43,000 professional, technical, and support personnel are employed by Bechtel on projects throughout the world. More than 50 percent of these are graduate engineers. As manloading requirements change on various projects, Bechtel has the flexibility to meet the needs of all the divisions of the Bechtel group of companies. Within Bechtel Power Corporation, there are more than 20,000 personnel. These include:

- 55 nuclear power plant project managers
- 65 nuclear power plant construction managers
- 1,060 nuclear power plant planning, scheduling, and estimating personnel
- 1,000 quality control personnel*
- 2,000 power plant field engineers
- 600 power plant construction supervisors
- 170 quality assurance personnel
- 200 nuclear and environmental engineers
- 2,900 procurement personnel worldwide
- 3,000 project support personnel including personnel qualified in
  - labor relations
  - safety
  - rigging
  - welding/metallurgy
  - nuclear licensing
  - containment design
  - health physics
  - security

*Quality Control department established in 1970

Participation in Codes and Standards Committees

In recognition of the important role that the National Codes and Standards program occupies in the development and application of commercial nuclear power, Bechtel participates extensively through the commitment of experienced engineers on national codes and standards committees. A review shows that Bechtel Power Corporation had 105 engineers serving on 234 committees. A breakdown of this service is shown below. An additional 40 to 50 engineers from other Bechtel organizations also participate in the national codes and standards program.

Bechtel participation in codes and standards work benefits a client's project in two ways. The most direct benefit is that the latest issues, some of which may not be published yet, can be considered. Probably the most important benefit is the feedback from actual engineering and construction work to the various code committees. This enables consideration of special requirements in the development of the industry standards required for commercialization.

Bechtel Power Corporation
Participation in Code and Standards Committees

Activity	Number of Engineers	Number of Committees
ANS	24	34
ANSI	20	35
ASME	28	55
ASTM	6	24
IEEE	28	51
Others	22	35
	128*	234.

* 23 engineers participate in committees from more than one Society

PROJECT MANAGEMENT

Bechtel's project team concept requires that projects be carried out under the direction of a project manager who will manage, schedule, and integrate the many project activities. The project manager is the Bechtel team leader and is responsible to the client and Bechtel management for the successful completion of the project in accordance with agreed-upon objectives. He has direct and continuing access to the division general manager. He is Bechtel's prime point of contact with the owner, acting through whatever organizational approach the owner designates.

At the onset of a project, the Bechtel team leader, working with the owner, establishes project objectives and directs the formulation of the project plan to meet them. He ensures that the project team is appropriately staffed with qualified personnel. He and his team establish the procedures and project controls to be used, tailoring them to the specific project and obtaining the owner's concurrence where the procedures interface with the owner's organization, procedures, and desires. He establishes strong formal and informal communications channels, not only between himself and his owner counterpart but also between Bechtel-owner channels at appropriate key team levels. Supporting and complementing these, he arranges reporting means to give the project visibility desired by the owner and Bechtel management. He arranges documentation of objectives, plans, and procedures and ensures that the project technical scope and the detailed Bechtel scope of services are documented to the owner's satisfaction.

The Bechtel team leader, acting through his key team members, monitors all project activities from inception through completion, adjusting the project plan as necessary to meet changing objectives or circumstances, always in concert with and to the detail required by the owner. He and his team identify departures from the plan and take appropriate corrective action. He is also the administrator of the Bechtel-owner contract and is responsible for execution and close out to the owner's and Bechtel management's satisfaction. In summary, the Bechtel team leader makes sure that the project members are working in the close rapport required and that they are appropriately supported by the strength of the Bechtel division and corporate resources.

The project manager acts for the owner using the project management concept. He receives directions, develops instructions, receives reports, and prepares recommendations to be submitted to the owner.

Engineers, contractors, and suppliers receive their instructions from the project manager, perform their assigned tasks, and report results to the project manager.

In summary, the project management team functions as an extension of the owner's organization and acts on behalf of and in the interest of the owner to:

- Establish budgets, control costs, and ensure adherence to schedules
- Manage and integrate planning and engineering work by design firms
- Procure major plant equipment, services, and supplies
- Coordinate and manage the activities of construction supplies
- Supervise preoperational testing

PROJECT CONTROLS

INTRODUCTION

In the execution and management of large, complex projects, numerous organizations become involved in the process of design and construction. Careful coordination of these organizations is needed to provide the proper flow of drawings and materials to a site, and the proper sequencing of construction and startup activities.

Fundamental to this coordination is a wide range of activities that include the development of a project plan, operating policies and procedures, organization charts and responsibility assignments, and the scoping of work segments. Equally essential is the implementation of a project control system that provides consistent and accurate project status for client and Bechtel management visibility and decision making.

Bechtel, with its broad experience in major engineering and construction projects, maintains a comprehensive library of state-of-the-art cost, schedule, and material control programs that can be modified for project uniqueness and for client internal and external reporting and control requirements. After project and client requirements are specified and program selections made, the programs are assembled into an integrated project control system.

Bechtel's project control programs are viable programs that can be used on projects without the need for change. They can, however, be modified as necessary to meet specific client or project requirements.

SYSTEM DESCRIPTION

The project control system is based on existing programs, but is tailored to meet specific client requirements. In general, the control system consists of:

a. A mutually agreed-upon project plan that incorporates resultant schedules and cost and quantity budgets

b. A monitoring plan that continually measures actual performance against the plan

c. A reporting program that identifies deviations from that plan

d. An action program to anticipate and correct project-related problems, and to take advantage of project-related opportunities.

The project plan defines the scope of work, identifies services to be provided, assigns responsibilities, and identifies controls, methods, and procedures for meeting agreed-upon objectives.

The plan is modified as necessary to accommodate client requirements and, when mutually approved by client and Bechtel management, becomes the basis for measurement of project performance. Reports to client management indicate the status and progress of the project and project performance.

The plan is expanded, refined, and updated as required as the project passes through the phases of design, procurement, construction, and startup. Visibility of the plan ensures that control can be accomplished by responsible individuals at each organizational level for all project phases. To accommodate this visibility, control programs are designed on a modular concept so that each can stand alone as a control tool yet be fully integrated into the project control system.

Integration of the program modules is accomplished through the use of standardized codes for activities, quantities, and cost. This coding system is an interrelated series of structured numbers which provide a set relationship of the detailed elements in each module to each other, to all other modules in the system, and to the project as a whole. Individual modules can be manual or automated depending on project requirements without affecting module approach or methodology; this provides significant flexibility in arranging the tools to support client and Bechtel management requirements while still maintaining system integrity.

The project control system consists of three primary programs: schedule control, cost control, and material control.

Bechtel's standardized approach to schedule control utilizes an integrated system of computerized and noncomputerized planning and scheduling techniques and procedures that assist the client and Bechtel management in developing a valid plan, monitoring performance, and producing reports that permit redirection of plan objectives to the best interest of the project.

Bechtel's cost control system is supported by a code of accounts which provides an overall project structure to the various estimates and budgets used to accomplish cost control. Forecasting is performed periodically along with a continuous monitoring system consisting of trending, home office cost control, and procurement cost control.

Bechtel provides an overview of the project scope of defining materials from conceptual quantities through detail design takeoff with a sophisticated and comprehensive material control system. Material control encompasses the identification, quantification, and status updating to provide visibility of equipment and material scope during all phases of a project. Quantification of basic materials enables the project scope to be measured in terms common to engineering, construction, and the support services.

PROGRAM SELECTION

The project control system is administered by Bechtel's project manager; he is responsible for module coordination, implementation, and updating. The modules that make up specific programs are identified in policy manuals. The client and Bechtel may select the most appropriate tools from these manuals, and decide if operation of the system should be fully automated, partially automated, or manual. The project's cost/schedule supervisor, engineer, field construction manager, and startup engineer have the responsibility of supporting the project manager in this activity. Functional departments are responsible for providing guidance and input.

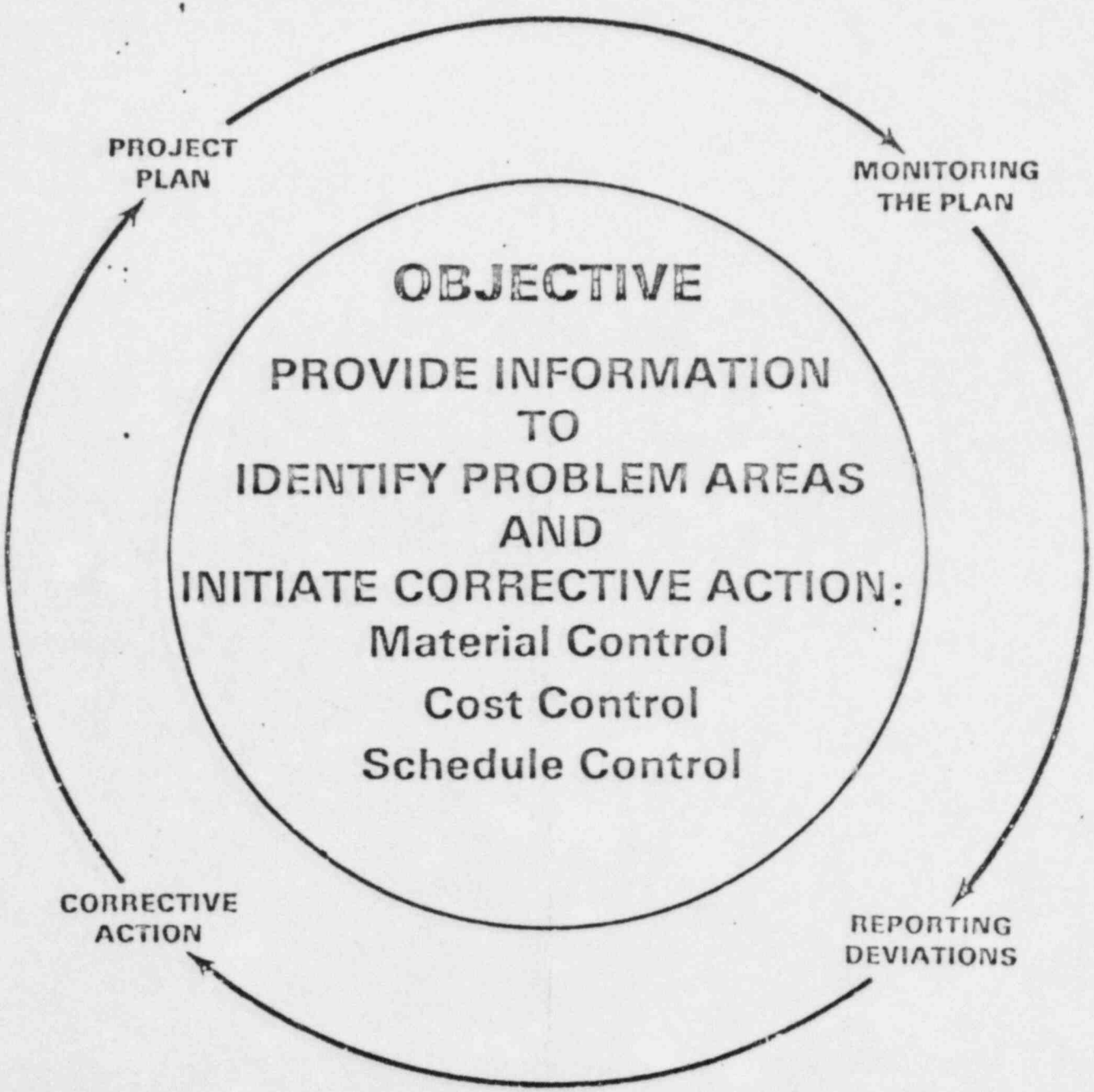
FEATURES OF THE CONTROL SYSTEM

Bechtel's fully integrated project control system is designed to facilitate rapid solution of problems on large projects. Program modules using standardized codes are linked to indicate project actions and their impact on cost/schedule and resources. Automation may be provided by a state-of-the-art management software system for the material, scheduling, and cost processing. Visibility may be provided graphically to display project objectives in tabular or plotted form or on a CRT terminal. The scheduling system has the capability to distribute resources (quantity/manhours) over the work activities and to redistribute remaining resources (using Bechtel's historical experience) over these activities as progress is reported. This feature provides quick assessment of time and resource status and the depicting of "what-if" scenarios as rapidly as possible. Data for historical comparison can be utilized to provide management with quick access to historical reference points so that they can more rapidly evaluate the condition of the project from a non-project perspective.

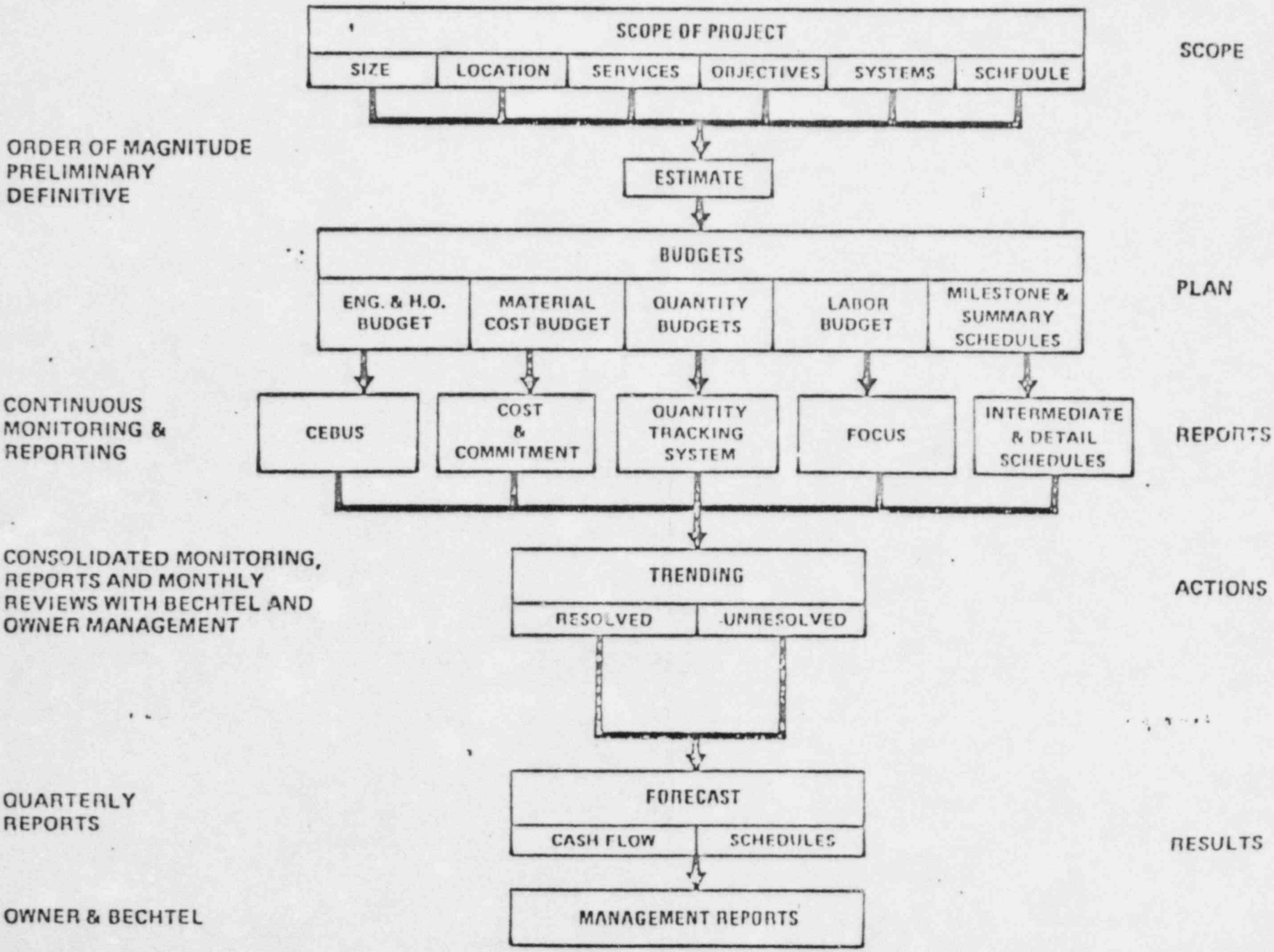
Another part of the project control system is an integrated cost system that can provide quantity, manhour, and cost status, measure this status against the project plan, and report at any level of detail a comprehensive comparison to the plan and/or historical data.

This system provides the client with access to project data in essentially the same manner that it is provided to Bechtel project and division management, enabling mutual participation in project decisions with complete awareness of project status.

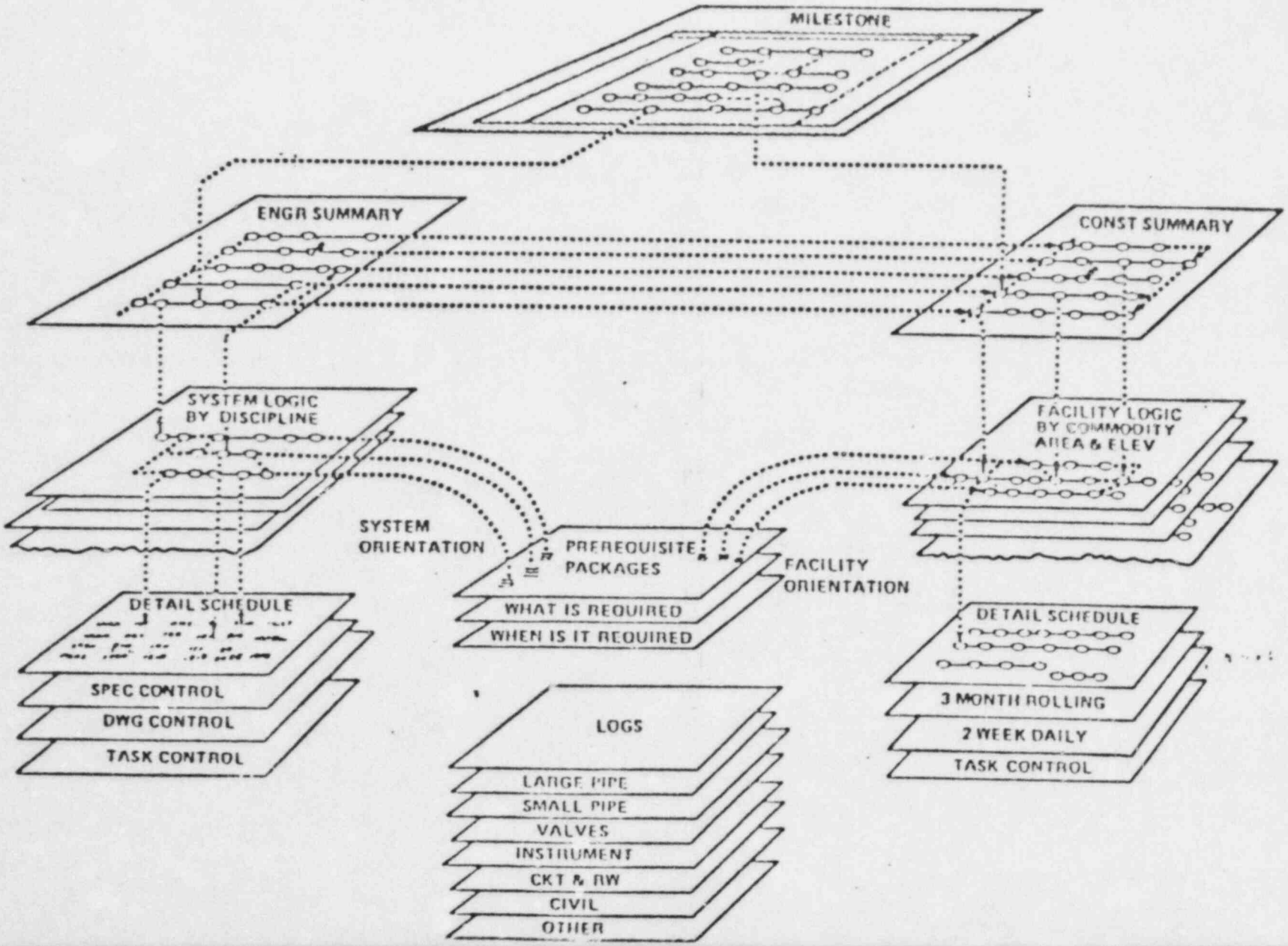
ELEMENTS OF PROJECT CONTROL



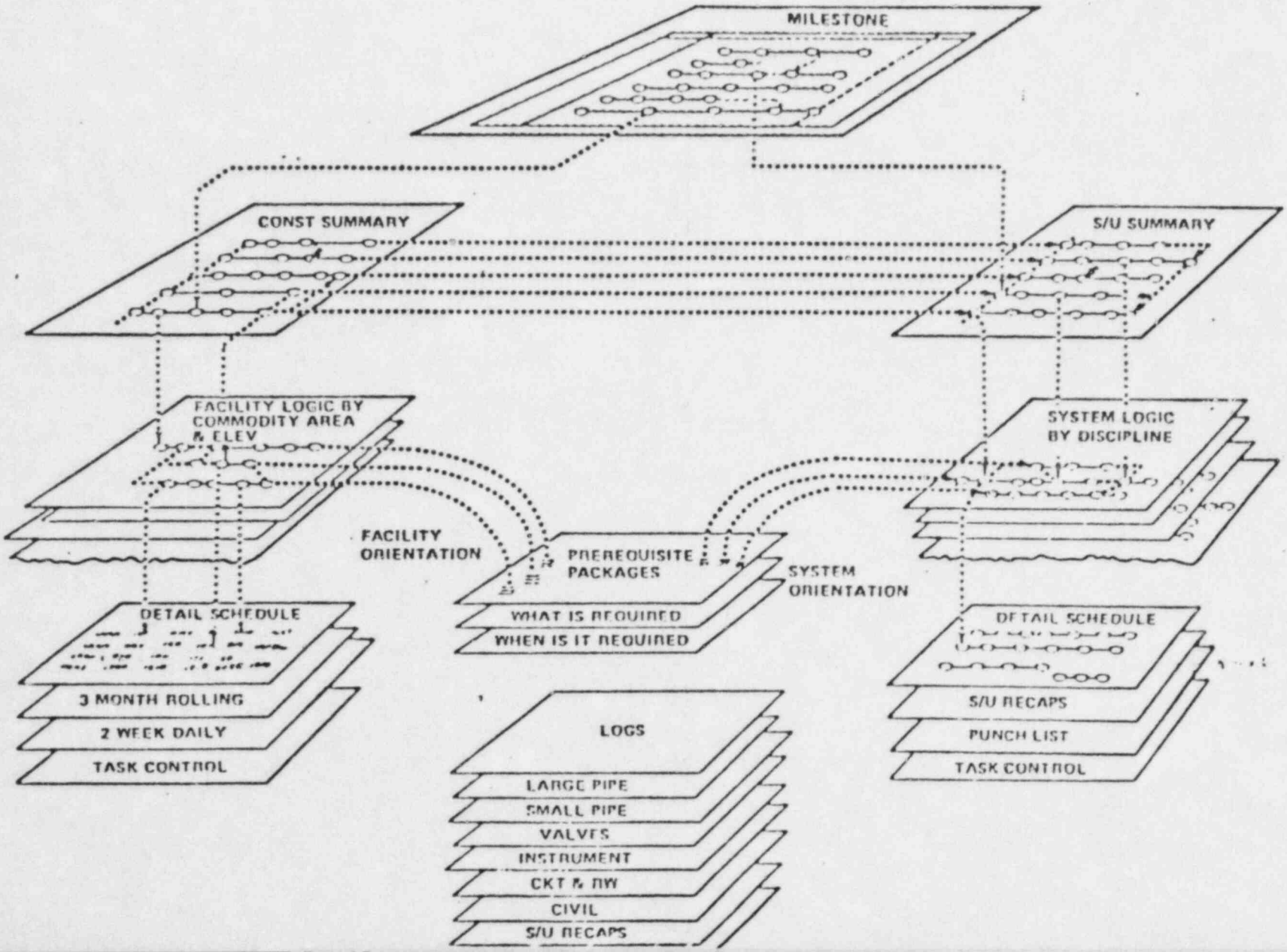
THE CONTROL CYCLE


SCOPE OF PROJECT
SIZE
LOCATION
SERVICES
OBJECTIVES
SYSTEMS
SCHEDULE
SCOPE
ORDER OF MAGNITUDE
PRELIMINARY
DEFINITIVE
ESTIMATE
BUDGETS
ENG. & H.O. BUDGET
MATERIAL COST BUDGET
QUANTITY BUDGETS
LABOR BUDGET
MILESTONE & SUMMARY SCHEDULES
PLAN
CONTINUOUS MONITORING & REPORTING
CEBUS
COST & COMMITMENT
QUANTITY TRACKING SYSTEM
FOCUS
INTERMEDIATE & DETAIL SCHEDULES
REPORTS
CONSOLIDATED MONITORING, REPORTS AND MONTHLY REVIEWS WITH BECHTEL AND OWNER MANAGEMENT
TRENDING
RESOLVED
UNRESOLVED
ACTIONS
QUARTERLY REPORTS
FORECAST
CASH FLOW
SCHEDULES
RESULTS
OWNER & BECHTEL
MANAGEMENT REPORTS

CONSTRUCTION-ENGINEERING INTERFACE



CONSTRUCTION-STARTUP INTERFACE



Operating Plant Services

Bechtel's Operating Plant Services Organization provides a complete range of services for operating nuclear plants.

Typical services which have recently been provided at more than 25 operating nuclear units include the following:

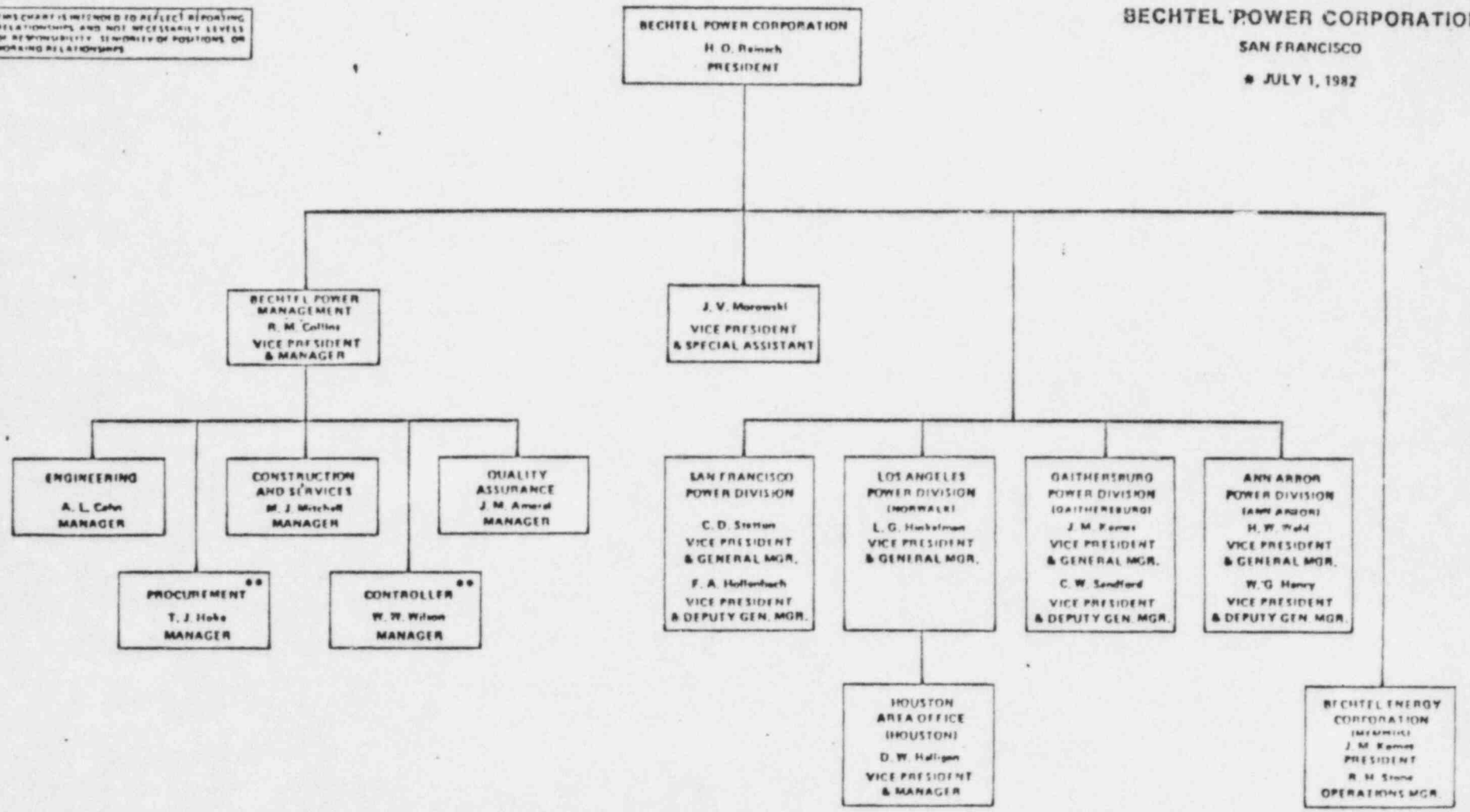
- Plant Inspections and Walkdowns
- Support for NRC Bulletins
- Engineering Studies and Consultation
- Capital Improvements and Expansions
- Licensing Support
- Emergency Response Services
- Outage Management
- Plant Maintenance
- Instrument Calibrations
- Circuit Verification
- Performance Testing
- Preventive Maintenance
- Spare Parts Program
- Operating Procedures and Training
- System As-Builts
- Records Management
- Craft Labor Services
- Vendor Shop Quality Surveillance

BECHTEL POWER CORPORATION

SAN FRANCISCO

* JULY 1, 1982

THIS CHART IS INTENDED TO REFLECT REPORTING RELATIONSHIPS AND NOT NECESSARILY LEVELS OF RESPONSIBILITY, SENIORITY OF POSITIONS, OR WORKING RELATIONSHIPS



NOTE:
ALL PERSONNEL BASED IN HOME OFFICE UNLESS OTHERWISE INDICATED

** RECEIVES FUNCTIONAL GUIDANCE FROM THE APPLICABLE SAN FRANCISCO SERVICE ORGANIZATION

* REPLACES CHART DATED FEBRUARY 22, 1982

Appendix D - Contract Forms

TECHNICAL SERVICES AGREEMENT

AGREEMENT FOR PROJECT COMPLETION SERVICES

(These Contract Forms are Considered Proprietary By The Bechtel Power Corporation)

CG&E - BECHTEL OFF-SITE MEETINGS

DATE	ATTENDEES
November 5, 1982	CG&E - Messrs. Dickhoner, Borgmann, & Sylvia Bechtel - Messrs. Murowski, Wahl, & Henry
November 8, 1982	CG&E - Mr. Borgmann Bechtel - Messrs. Wahl, Henry, & Trommerhaus
November 19, 1982	CG&E - Mr. Dickhoner Bechtel - Messrs. Henry and Jones
November 24, 1982	CG&E - Mr. Borgmann Bechtel - Mr. Trommerhauser
December 17, 1982	CG&E - Mr. Dickhoner Bechtel - Mr. Jones
November 17, 1982	Joint Meeting - NRC Region III Bechtel CG&E

SITE VISITS BY BECHTEL PERSONNEL
AT THE WM. H. ZIMMER NUCLEAR POWER STATION
(Continued)

December 15, 1982

D. Stover
R. Scott
M. White
R. Soderholm
G. Jones
M. Krupa
G. Stanley

December 16, 1982

G. Jones
M. Krupa
R. Scott
R. Soderholm
G. Stanley
D. Stover
M. White
P. Dallas

December 17, 1982

R. Scott
G. Stanley
D. Stover
M. Krupa
R. Soderholm
M. White
P. Dallas

December 20, 1982

G. Stanley
J. Baramyi

December 21, 1982

G. Stanley
J. Baramyi

December 22, 1982

G. Stanley

Bechtel Power Corporation

777 East Eisenhower Parkway
Ann Arbor, Michigan

Mail Address P.O. Box 1000, Ann Arbor, Michigan 48106

ATTN | RECEIVED | NOTED
W. H. DICKHONER
JAN 3 1983
FILE
RETURN TO:

December 29, 1982

Mr. William H. Dickhoner, President
Cincinnati Gas & Electric Company
139 East Fourth Street
Cincinnati, Ohio 45202

Dear Mr. Dickhoner:

Bechtel wishes to provide the following supplement to our letter proposal of November 23, 1982 in response to the request of James G. Keppler, Regional Administrator U.S. NRC Region III, by his letter of December 28, 1982, directed to Cincinnati Gas and Electric Company. Our responses are numbered to match questions directed to Bechtel within the NRC letter.

Item B Questions Directed to Bechtel Power Corporation.

Item B.1 Paragraph E of the Bechtel November 23, 1982 Revised Proposal listed key people to be interviewed. This list was intended to be a minimal listing or starting point regarding the personnel to be interviewed. Therefore, amend paragraph to add, "In the conduct of a review of the Zimmer project to determine measures needed to ensure that construction of the Zimmer plant can be completed in conformance with the Commission's regulations and construction permits, it is Bechtel's intent to interview NRC personnel directly involved in the Zimmer project. We will also interview National Board of Boiler and Pressure Vessel Inspectors to identify existing procedural or construction deficiencies which must be resolved by management. Other competent individuals who may have direct knowledge or insight into management, organizational, quality assurance, or construction activities, will be sought out to provide background information for assessing recommended corrective actions".

Paragraph C.1 of the Bechtel Revised Proposal dated November 23, 1982 revised to include item (h) "wherein the review team will review identified construction and quality assurance deficiencies to determine if they are attributable to or related to management".

Item B.2 The team's "management review" report will be first critiqued by the functional management located in the Bechtel Ann Arbor office. In the Bechtel method of operation, the management

review team works independently of the functional management in Ann Arbor and therefore, this would be an objective review bringing to bear a wide range of nuclear engineering, construction and quality assurance experience.

In addition, the report would be reviewed by the Bechtel Power Management (BPM). This group is independent of the various divisions and reports directly to the President of Bechtel Power Corporation. This is a very significant review in that the reviewers are experienced, senior people and will have the background of similar work being done by all the Bechtel Power divisions. This final review should indicate any areas of the report needing additional emphasis and support, its general applicability and validity.

Item B.3 Affidavits are being assembled - personnel have been contacted and will sign.

Item B.4 The following is provided as further information on the role of Mr. Soderholm during his direct involvement with the Midland Project:

a) March 1980 to February 1981 - Mr. Soderholm joined the Ann Arbor Power Division as field cost scheduling supervisor. As stated in his resume, he was responsible for all planning, scheduling and cost control programs at the Midland site. He held no responsibilities in activities covered by 10CFR50 Appendix B. In this capacity there were no construction or quality assurance related deficiencies identified in his area of responsibility.

b) February 1981 to September 1982 - Mr. Soderholm was promoted in February 1981 to the position of project superintendent - services. In this position he managed such non-safety related activities as cost and scheduling, office services, finance and accounting, construction safety, and personnel. He also managed three safety related areas covered by quality assurance programs:

1) Subcontract Administration - This area included administration of the contractual bonds between the Midland Project and such subcontractors as B&W, Zack, and U.S. Testing.

a. In this time frame, B&W, and U.S. Testing have had a minimum of quality assurance related deficiencies, none of which were attributable to Mr. Soderholm's subcontract administration. QA controls of these subcontractors are provided by the utility (CPCo).

b. Zack had had problems in the past which eventually resulted in a Civil Penalty assessed against CPCo. Mr. Soderholm was given his assignment approximately one month after the Civil Penalty and was instrumental in establishing more effective control of HVAC activities which included the licensee taking responsibility for all QA/QC activities about mid-1981. This area has since been related as a Category I in the NRC Region SALP Report issued in April 1982.

2) Field Procurement - This area included routine field procurements of materials not controlled through the normal Midland Project procurement operation in Ann Arbor, performance of receipt inspections for count and damage (not quality control inspection) and management of storage areas. No major problems were identified in areas under Mr. Soderholm's responsibility. NRC Region III Reports 50--329 and 330/81-08 describe several storage conditions but these areas were under control of construction maintenance engineers rather than field procurement. A July 1982 special memo from Resident Inspector R. J. Cook to R. F. Warnick again described storage condition problems but without identification of examples. It is believed that the 1981 report was the primary reference.

3) Document Control - Mr. Soderholm was also responsible for administrative services which included control and issuance of design documents from a central document control center. This area was established with a continual self-auditing function to monitor its activities which resulted in excellent control and identification of only minor deficiencies during his tenure. An NRC inspection performed in the last several months is expected to note one deficiency but the report has yet to be received.

c) September 1982 to date - Mr. Soderholm was transferred from the Midland Site to Ann Arbor where he assumed responsibilities as the Technical Services Manager - Projects, a division position providing technical guidance and salary administration for Midland Project Cost and Schedule Engineers. No Construction or Quality Assurance functions are related to this position.

Item C.1 Bechtel was contacted by CG&E prior to the Order to Show Cause to perform an assessment of the project and to subsequently assume a management role to assist the licensee in the management of the Zimmer project. As a result of this contact, an agreement was reached and Bechtel assembled an experienced team from throughout the Bechtel organization. The purpose of this team was to establish the conditions that exist in the various discipline areas, i.e., QA, engineering, construction, at this stage of the construction. Specific emphasis would be placed on the identified quality problem areas, programs in place to resolve these areas and their impact on planning for the completion of the project. In addition, the relationships between the various subcontractors was to be looked into. This degree of involvement was considered vital before Bechtel could commit to a course of action either as the independent reviewer or to assume the follow-on role in assisting in managing the project. This was explained in some detail in W. H. Dickhoner's (CG&E) letter of November 10, 1982.

The Bechtel team arrived to perform this function on the first working day after the Order was effective. It was a mutual CG&E/Bechtel decision at that time that the proposed Bechtel review included all of the essential elements contained in the Order and should continue. The Bechtel site presence was diminished when it was considered that they had sufficient information to complete the initial assessment of the project and to recommend a course of action. In as much as CG&E and Bechtel had independently and voluntarily agreed to a review similar to that set forth in the Order, we do not believe that Bechtel's objectivity has or will be affected. W. H. Dickhoner's (CG&E) letter of November 26, 1982 to Region III supports this position in greater detail.

Bechtel's independence and objectivity is further ensured by the fact that we are a national engineer/constructor involved in all phases of nuclear power plant design and construction. The extent of our involvement is shown in Appendix C of Bechtel's submittal of November 23, 1982 and represents 90 plants. Bechtel's corporate QA program and supporting work procedures have been subject to the scrutiny of the NRC, many utility organizations and applicable national and state code boards. Of equal importance is our established reputation for maintaining high ethical standards. Bechtel's recommendations will be based on the facts discovered and on our professional integrity and experience in the nuclear industry. In addition, the approved action plan will be subject to continuing review and approval of the NRC. The matter of independence was also covered in detail in the Bechtel proposal of November 23, 1982 submitted to CG&E.

Sincerely yours,

H. W. Wahl

Howard W. Wahl
Vice President & General Manager

HWW/cf

GEORGE B. JONES (Cont'd)

Prior to joining Bechtel, Mr. Jones was shipyard commander with the U.S. Department of the Navy where he was responsible for all aspects of industrial operations of shipyard activity and the supervision of 6,500 people. Mr. Jones's thirty years of naval experience includes positions as deputy in charge of fleet maintenance, planning production officer, and head of the Piping, Valves and Machinery Arrangement Branch.

REFERENCE

DONALD M. STOVER (Cont'd)

Mr. Stover was resident field manager of Twin Falls Power Corporation on 4-unit hydro plant. He prepared scope of contracts; participated in bid reviews and awards; administered all site construction contracts; prepared cost and progress reports; commissioned and turned over plant to operating personnel.

REFERENCE

ROBERT L. SCOTT (Cont'd)

Manager of Quality Assurance - Westinghouse Nuclear Energy Systems Division. Before joining Bechtel, was an equal partner/owner of a steel fabrication and design company. Prior to this, was Manager of Quality Assurance in the Heat Transfer Division of Westinghouse Electric Corporation. Formerly was the West Coast Quality Assurance Representative and Senior Quality Engineer for Westinghouse Nuclear Energy Systems Division. Responsible for source surveillance/auditing of Westinghouse suppliers of NSSS components in California, Washington, Arizona and Colorado. Previously was responsible for quality assurance program and records planning for Westinghouse NES quality assurance consulting efforts for a utility, nuclear projects balance-of-plant equipment. (3 years)

Product Assurance Coordinator - Quality Engineering - Lockheed Propulsion Company; Unidynamics and Other. While with Lockheed Propulsion Company, was a Product Assurance Coordinator involved in quality engineering activities related to manufacturing planning of Navy nuclear reactor internal (core) components. Previous positions included Production/Quality Engineer initiating quality control inspection procedures for Unidynamics, St. Louis, and Manager of Quality Assurance for Scott Engineering and Welding Service responsible for development and implementation of a program to meet the requirements of MIL-Q-9858A. (3 years)

REFERENCE

G.W. STANLEY (Cont'd)

was responsible for the preparation of instructions and procedures, and providing technical guidance to field quality control engineers.

Prior to this, Mr. Stanley served as project construction quality control engineer on the PWR Calvert Cliffs Nuclear Power Station Units 1 and 2, 880 MW each, for Baltimore Gas & Electric Company. He was also assistant project construction quality control engineer and simultaneously acted as lead quality control engineer for construction testing operations. Earlier, he served as lead mechanical/piping quality control engineer, responsible for quality activities for the verification of safety-related mechanical and piping system installation. He also served on this project as mechanical quality control engineer for inspecting the installation of piping and mechanical activities.

Before joining Bechtel, Mr. Stanley was associated with The Boeing Company as lead quality control planner. He planned and developed quality control procedures, evaluated test plans and specifications for facilities installation as well as ground and flight test operations on the Apollo/Saturn program, and dealt extensively with the quality records system.

REFERENCE

analyzed field cost reporting and recommended labor and cost savings to field construction management. In addition, he was responsible for day-to-day cost control of construction labor and materials and subcontractors, forecasting job costs, and job historical reports.

As lead field cost engineer, he was supervisor of the field department responsible for analysing and reporting job productivity, evaluating construction techniques for cost effectiveness, and devising graphic presentations for construction control, in addition to directing all jobsite computer operations. He also assisted in field construction planning for construction of a 400 MW e fossil fuel power plant and conversion of four existing power plants from coal fired to oil fired.

In his first assignment for Bechtel, Mr. Dallis was a cost engineer, with responsibility for definitive and conceptual electrical estimating, including electrical design as required to supplement incomplete engineering for various nuclear and fossil fuel power plants. Project responsibilities included preparation of cash flows, cost forecasts, cost benefit analysis of alternate designs, and bid evaluation for power plant equipment. He also developed computer programs for job productivity analysis.