



Consumers Power

QUALITY ASSURANCE PROGRAM POLICY

LIST OF DEFINITIONS

Page x
Revision 11
Date 11/18/81

Safety-Related - The term applied to:

Structures, systems, components, materials, services or Operational Safety Actions or Activities named on the Q-List as necessary to assure:

1. The integrity of the reactor coolant pressure boundary.
2. The capability to shut down the reactor and maintain it in a safe condition.
3. The capability to prevent or mitigate the consequences of an accident which could result in potential off-site exposures to individuals in excess of exposures specified in 10 CFR 100.
4. The operation of the facility within Technical Specifications limits and Nuclear Regulatory Requirements.

Secondary Standard - An item of measuring and test equipment (M&TE) used to calibrate other M&TE. They are periodically calibrated using Reference Standards and reserved for use in the calibration of working plant or field M&TE.

Section - A subdivision of a department, usually made along lines of a technical specialty; eg, Nuclear Licensing, Health Physics, Nuclear Fuel, etc.

Services - Work performed by an organization or department having no deliverable hardware type and item other than the results of construction, modifications, repairs, inspections, audits, reviews, etc.

Source Inspection - Inspection of an item at a Supplier's facility during its manufacture, or at completion of manufacture, to verify implementation of the procurement requirements.

Spare Part - An item available for replacement for an item in use.

Special Nuclear Material (SNM) -

1. Plutonium, Uranium 233; uranium enriched in the Isotope 233 or in the Isotope 235; and any other material which the NRC, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954 as amended, determines to be special nuclear material, but does not include source material; or
2. Any material artificially enriched by any of the foregoing, but does not include source material.

Special Process - Those metallurgical, chemical, or other processes where assurance of the process activity is dependent on the use of qualified procedures, personnel, or equipment; and where assurance of quality cannot be by direct inspection of the in-process activity or final product. These include, but are not limited to, welding, heat-treating, NDE and environments testing of the work process.

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regulations, guidelines, or other factors separate and distinct from the components of the system itself. The system is considered as a unit, with boundaries as defined by Regulatory Guide 1.70 and must meet specific requirements. The design bases describe all essential characteristics of the system with sufficient clarity so that an experienced engineer, using these design bases and material referenced in the design bases, can understand the functions of the system with respect to the rest of the plant. Items implicit to contemporary design (e.g., use of the English system of weights and measures or the exercise of good engineering practice) are not specified.

1.1.2.2.1 Safety Design Bases

Safety design bases directly establish or increase nuclear safety. Safety design bases provide for or assure the following:

- a. The integrity of the reactor coolant pressure boundary
- b. The capability to shut down the reactor and maintain it in a safe shutdown condition
- c. The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guideline exposures of 10 CFR 100
- d. The accomplishment of specific structure, system, or component requirements which are important to safety

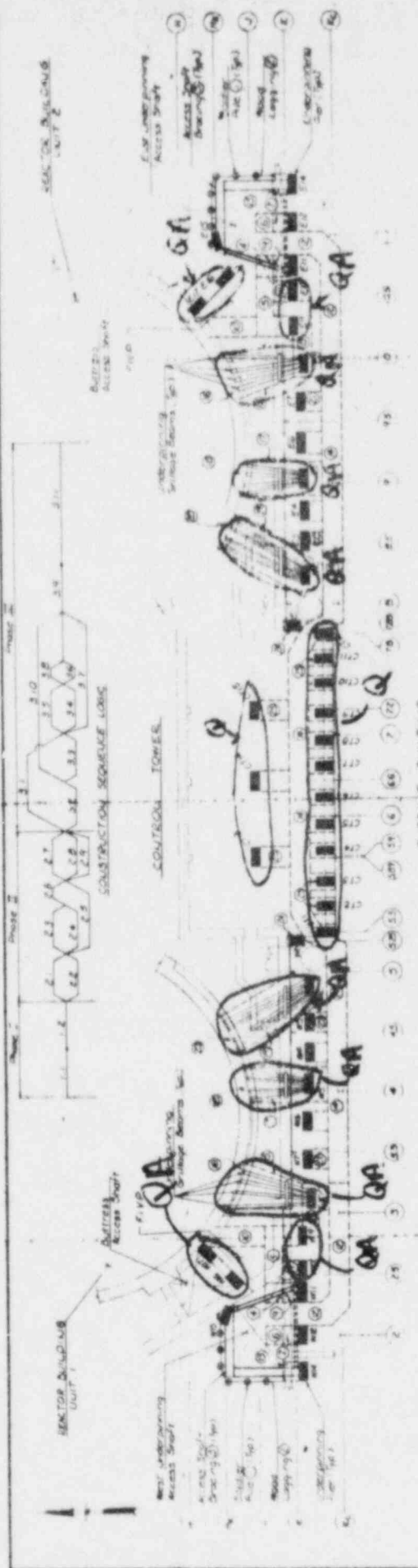
The control room operator action is considered as one of the fundamental means of achieving these criteria.

Safety-related structures, systems, and components important to safety are the portions of systems which are indispensable to nuclear safety. Items which are associated with safety-related equipment but which do not perform a nuclear safety function are not safety-related.

Redundancy requirements and system performance conditions are considered a feature of the equipment's capability to shut down the reactor safely or to prevent or mitigate accidents.

1.1.2.2.2 Power Generation Design Bases

Power generation design bases are those design bases which are not related to nuclear plant safety. They need not relate directly to the generation of power; however, they relate at least indirectly to power generation in the sense that all station requirements which are not imposed for safety reasons support the major function of the station as a whole; i.e., the generation of electrical power and process steam. An example of



1/2 1/2 3/10/11

RECORD OF TELEPHONE CONVERSATION

DATE: March 8, 1982, 3:30 pm

PROJECT: Midland

RECORDED BY: Joseph D. Kane

CLIENT: _____

TALKED WITH: Bechtel

CPC

GEI

NRC

J. Anderson
M. Das Gupta

T. Thruvengadam
K. Razdan

S. Poulos

J. Kane

ROUTE TO: INFORMATION

G. Lear
L. Heller
✓D. Hood
F. Rinaldi
S. Poulos
H. Singh
R. Landsman
J. Kane

MAIN SUBJECT OF CALL: ADOPTED SOIL SPRING STIFFNESSES USED IN DESIGN OF
AUXILIARY BUILDING UNDERPINNING AND START OF PHASE 2
CONSTRUCTION

ITEMS DISCUSSED:

1. Attachments 1 and 2 to this telephone record provide the design cases and soil spring stiffnesses adopted by Bechtel as soils input in their structural analysis of the Auxiliary Building. The values of stiffness also on Attachment 2 under the column labeled NRC are the results of extensive discussions between NRC Consultants, S. Poulos, GEI, H. Singh, COE and J. Kane, NRC and represent the staff and its Consultants determination of the range of reasonable stiffness values which should be considered in design. The NRC values had been provided to Bechtel via telephone on March 5, 1982 as committed to by the Staff in the meeting of February 26, 1982 in Bethesda.

The NRC recommended value of 70 KCF for the Main Auxiliary Building versus the Applicant's adopted 30 KCF for Case 2 is important because this difference has the potential to affect settlements which are to be tolerated during underpinning. Allowable settlements using the stiffness of 30 KCF had been provided on February 26, 1982 by M. DasGupta of Bechtel Corp.

2. Following considerable discussion on NRC recommended stiffness values (in both March 5 and March 8 telephone calls), Consumers expressed a willingness to use these values in their structural analysis but indicated the time needed to complete the required computer runs would impact their Phase 2 construction plans. As an alternative, J. Kane suggested that Phase 2 work be subdivided into two parts, the initial one beginning with work which would not affect the EPA and Control Tower area and the second part beginning after the analysis using the NRC recommended stiffness values had been completed by CPC and the results evaluated by the NRC staff. An acceptable line of demarcation between these two portions of Phase 2 work was tentatively identified as column lines 2.5 and 10.5 on the Construction Sequence drawing provided for the underpinning work at the February 3-5 design audit. These lines, respectively, are sufficiently west and east of the EPA and Control Tower to conclude that these structures would be unaffected by underpinning operations permitted by this initial portion of Phase 2 work.
3. Consumers agreed to provide a letter to NRC giving details which would permit the Staff to fully understand what work would be performed under this initial portion of Phase 2 work.
4. The following comments were given to Consumers concerning the monitoring plans during underpinning of the Auxiliary Building.
 - a. Drawing C-1493(Q), "Monitoring Matrix," should be updated and values provided in the tolerance criteria column for staff concurrence before any portion of Phase 2 work is started.
 - b. Sheet 8 of M. DasGupta's presentation on February 26, 1982 does not agree with previous drawings provided (Drwgs. C-1490 (Q) and C-1491 (Q)). Corrections in proper labeling of the deep seated bench mark locations on Sheet 8 and on Sheet 10 are needed and should be provided to the NRC.
 - c. NRC expressed a concern for measurement of horizontal movement between the EPA and the Turbine Building and between the Control Tower and the Turbine Building during underpinning operations and suggested three monitoring devices be installed. One device at the top of each wing of the EPA's and one at the top of the Control Tower was recommended. Consumers responded that they were now planning to place instruments at those locations in response to questions raised by ASLB but had not yet updated the monitoring locations on Drawings C-1490(Q), C-1491(Q) and C-1493(Q). The Staff indicated that criteria on tolerable relative horizontal movement for these instruments should be established and furnished on the Monitoring Matrix drawing along with the basis for these limits.
 - d. As previously discussed at the February 26, 1982 meeting in Bethesda, the Staff anticipates a submittal by Consumers identifying the acceptance criteria for the strain gages to be placed at El.659 on the Auxiliary Building.

5. Consumers indicated that the six deep seated bench mark instruments located on Sheet 8 of M. DasGupta's presentation will be in operation before beginning Phase 2 work. Installation of the additional instruments at top of the EPA's and Control Tower and the strain gages at El 659 and the results of the structural analysis using NRC recommended stiffness values are to be completed before the second portion of Phase 2 work is started.
6. J. Kane indicated that subdivision of Phase 2 underpinning work into two portions is subject to the approval of NRC Project Management and Structural Engineering Branch. It was also indicated that other conditions which could affect the start of Phase 2 work may be identified by the Staff. The original intent of this telephone conference call was to discuss soil spring stiffnesses but was not intended to address the start of Phase 2 work.

SOIL SPRING STIFFNESSESCases Considered

1. Normal Soil Springs - Springs used to represent subgrade for analysis of structure for FSAR loading conditions. (A subcase of this is the seismic condition).
2. Existing Condition - Springs used to represent subgrade for analysis of existing state of stress in the structure.
3. Long Term Settlement Condition - Springs which represent the behavior of the structure due to secondary consolidation of the structure after lock-off.

The springs for Case 1 are based on settlement data obtained since 1977 and the load increment added during that time. For the seismic subcase the springs are based on the stiffness used in the seismic model.

For the second case (existing condition) the springs are computed at the center of each area using elastic half space theory and assuming a flexible footing.

For the long term settlement case the springs are computed from the estimated settlement after lock-off and the estimated loads. There are two subcases which were considered: 3a) Where the undrained areas settle more than the main auxiliary building; and 1) where the main auxiliary building settles more than

Design Conditions	UNIT SPRING STIFFNESSES (KCF)					
	BECHTEL			NRC		
	E.P.A.	C.T.	M.A.	E.P.A.	C.T.	M.A.
Case 1						
Normal Soil Springs	180	180	80	Acceptable to NRC		
Case 2						
Existing Condition	17	18	30	Acceptable to NRC		70
Case 3(a)						
Long Term Settlement	410	350	1,160	180	240	580
Case 3(b)						
Long Term Settlement	160	350	230	Acceptable to NRC		

E.P.A. - Electrical Penetration Area
 C.T. - Control Tower
 M.A. - Main Auxiliary Building

Handed 3/14/82

ENCLOSURE 2
QUALITY PLAN AND
Q-LISTED ACTIVITIES FOR
SPECIFICATION C-194

QUALITY PLAN AND Q-LISTED ACTIVITIES

1.0 PURPOSE AND SCOPE

The purpose of this QA Plan is to provide the means by which to gain adequate confidence that the Service Water Pump Structure underpinning system is constructed according to design documents. This Plan describes the minimum procedural interfacing between the sub-contractor, contractor, consultant(s) and the Midland Project Quality Assurance Department. (MPQAD)

2.0 SUBMITTAL, REVIEW AND APPROVAL FOR Q-LISTED PROCEDURES

- 2.1 The procedures listed in Exhibit A will be submitted as a minimum by the subcontractor as specified in the contract documents.
- 2.2 The procedures will be routed for review, comment and approval according to the flow diagram in Exhibit B.
- 2.3 The groups responsible for review, comment and approval of procedures will be as specified in Exhibit A.

3.0 CALIBRATION OF SUBCONTRACTOR FURNISHED EQUIPMENT

- 3.1 All subcontractor-furnished jacks, gages, and construction equipment requiring calibration will be calibrated by an agency approved and audited by MPQAD.

4.0 QUALITY ACTIVITIES

- 4.1 Section 4.3 provides the Q-List. All Q-Listed hardware and installation will be performed in accordance with the Midland

ENCLOSURE 2
QUALITY PLAN AND
Q-LISTED ACTIVITIES FOR
SPECIFICATION C-194

Project Quality Assurance Program, and will be inspected by the Contractor's Quality Control organization and overinspected by the MPQAD. All other Q-Listed activities will also be performed in accordance with the Program and will be controlled by the Contractor's QC organization and the MPQAD.

- 4.2 Within thirty days prior to the scheduled start of but not limited to the following activities, meetings will be held between responsible personnel of Bechtel Construction Remedial Soils Group, MPQAD, Contractor QC and the Subcontractor. The adequacy and availability of technical criteria; Quality Control inspection plans; Subcontractor's procedures; schedule of Construction activities; the sequence and clarity of Q-List activities will be discussed.

1. Start excavation below 620'.
2. Start of final load transfer and lockoff.

- 4.3 For any work relating to the service water pump structure underpinning, the following activities will be Q-Listed. This is intended to be a complete Q-List for all activities unique to underpinning other than design activities. Not all of these activities, however, will be within the Subcontractor's scope of work.

1. Document submittal, interface and control.
2. Procuring Q-Listed items and materials.
3. Storage, handling and control of Q-Listed materials.

ENCLOSURE 2
QUALITY PLAN AND
Q-LISTED ACTIVITIES FOR
SPECIFICATION C-194

4. Furnishing and installation of lagging and bracing under "Q" structures.
5. Excavation limits, control and sequence under "Q" structures.
6. Crack mapping and evaluation.
7. Calibration, maintenance, control and installation of gages and settlement monitoring instrumentation.
8. Monitoring of building movement instrumentation and pier pressure gages.
9. Fines monitoring of dewatering wells in "Q" areas.
10. Location and protection "Q" utilities.
11. Geotechnical acceptance of subgrade.
12. Fabrication and installation of reinforcing steel.
13. Certification of personnel performing splices.
14. Threading of reinforcing steel and installation of mechanical splices.
15. Drilling in "Q" structures for the installation of anchor bolts, rock anchors and dewatering wells.
16. Installation and inspection of anchor bolts and rock anchors.
17. Compressible material configuration and installation.
18. Testing of reinforcing steel and mechanical splices.

ENCLOSURE 2
QUALITY PLAN AND
Q-LISTED ACTIVITIES FOR
SPECIFICATION C-194

19. Installation, inspection and testing of structural concrete,
lean concrete, grout and drypack.
20. Repair of concrete in "Q" structures.
21. Calibrating, maintaining, installing and controlling of
hydraulic jacks and pressure gages.
22. Load transfer activities.
23. Backfilling and acceptance testing for access shafts and
tunnels in "Q" areas.

Procedures To Be Submitted By The Subcontractor

Organization Responsible For Procedure Review & Approval

	Proj Eng	Resident Geotech	Bechtel Construction RSG	Bechtel Quality Control	MPQAD	Technical Consultant
Procedure for general underpinning - This procedure shall include the overall concept of the work involved, including the interface of all the operations listed below.	X	0	0	X	X	0
Procedure for load transfer.	X	0	0	X	X	0
Procedure for placement of lean concrete backfill in shafts and tunnel.	X		0	X	X	
Procedure for installation of (including mixing) and pressure grouting.	X		0	X	X	
Procedure for placement of pier concrete.	X		0	X	X	
Procedure for acquiring and maintaining calibration of jacks and gages.	X		0	X	X	
Procedure for mechanical splicing of reinforcement.	X		0	X	X	
Procedure for threading of reinforcing steel.	X		0	X	X	
Procedure for installation of anchor bolts and rock anchors.	X		0	X	X	
Procedure for installation of compressible material.	X		0	X	X	
Procedure for placing reinforcement including bending steel reinforcement (hot and cold).	X		0	X	X	
Procedure for core drilling.	X		0	X	X	

LEGEND

REVIEW & APPROVAL - X

REVIEW & COMMENT - 0
as applicable

Procedures To Be Submitted By The Subcontractor

Organization Responsible For Procedure Review & Approval

	X Proj Eng	Resident Geotech	Bechtel Construction RSG	Bechtel Quality Control	X MPQAD	Technical Consultant
Procedure for concrete repairs.	X		0	X	X	
Procedure for excavation "Q" structures and the installation of lagging.	X	0	0	X	X	
Procedure for protection of underground utilities	X		0	X	X	
Procedure for preparing, submitting, and revising Q procedures.	X		0	X	X	
Procedure for handling, storing, and controlling Contractor-furnished materials.	X		0	X	X	
Procedure for design document control.	X		0	0	X	
Procedures for interface and coordination between the Subcontractor and the Contractor for activities covered by the QA Program.	X	0	0	0	X	
Procedure for certifying Subcontractor Personnel specifically for AWS welding and mechanical splices.	X		0	X	X	
Procedure for Training Program of Subcontractor Personnel for the Q-Procedures covering the Subcontractors scope of work	X		0	X	X	

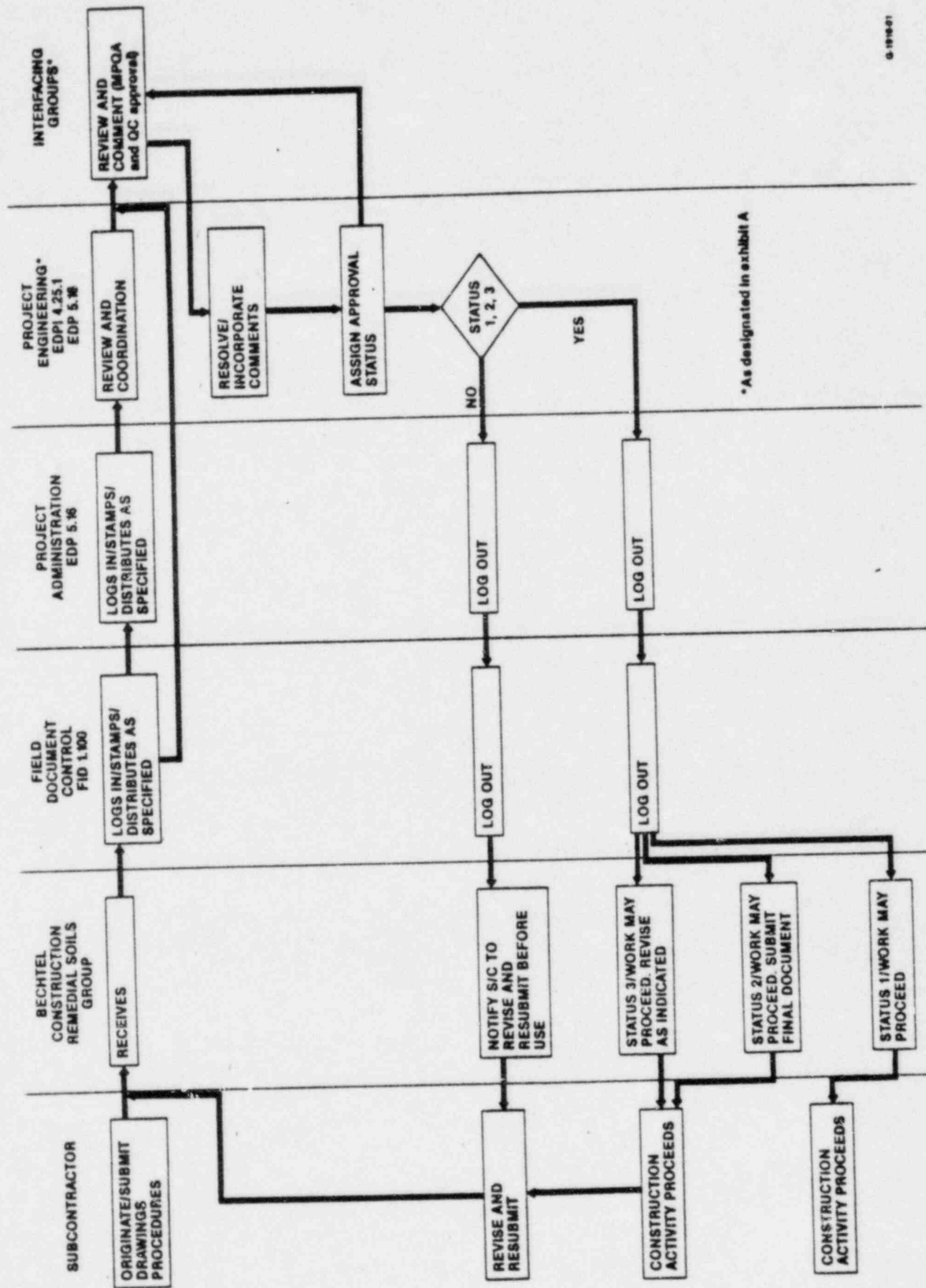
LEGEND

REVIEW & APPROVAL - X

REVIEW & COMMENT - 0
as applicableENCLOSURE 2
EXHIBIT A
PAGE 2 OF 2

PROCEDURE REVIEW/APPROVAL FLOWCHART

ENCLOSURE 2
EXHIBIT B



*As designated in exhibit A

0-1910-01

QUALITY PLAN AND Q-LISTED ACTIVITIES

1.0 PURPOSE AND SCOPE

The purpose of this QA Plan is to provide the means by which to gain adequate confidence that the Auxiliary Building (Electrical Penetration and control structure) underpinning system and Feedwater Isolation Valve Pit fill material replacement is constructed according to design documents. This Plan describes the minimum procedural interfacing between the sub-contractor, contractor, consultant(s) and the Midland Project Quality Assurance Department. (MPQAD)

2.0 SUBMITTAL, REVIEW AND APPROVAL FOR Q-LISTED PROCEDURES

- 2.1 The procedures listed in Exhibit A will be submitted as a minimum, by the subcontractor as specified in the contract documents.
- 2.2 The procedures will be routed for review, comment and approval according to the flow diagram in Exhibit B.
- 2.3 The groups responsible for review, comment and approval of procedures will be as specified in Exhibit A.

3.0 CALIBRATION OF SUBCONTRACTOR FURNISHED EQUIPMENT

- 3.1 All subcontractor-furnished jacks, gages, and construction equipment requiring calibration will be calibrated by an agency approved and audited by MPQAD.

4.0 QUALITY ACTIVITIES

- 4.1 Section 4.3 provides the Q-List. All Q-Listed hardware and installation will be performed in accordance with the Midland Project Quality Assurance Program, and will be inspected by the Contractor's Quality Control organization and overinspected by the MPQAD. All other Q-Listed activities will also be performed in accordance with the Program and will be controlled by the Contractor's QC organization and the MPQAD.
- 4.2 Within thirty days prior to the scheduled start of but not limited to the following activities, meetings will be held between responsible personnel of Bechtel Construction Remedial Soils Group, MPQAD, Contractor QC and the Subcontractor. The adequacy and availability of technical criteria; Quality Control inspection plans; Subcontractor's procedures; schedule of construction activities; the sequence and clarity of Q-List activities will be discussed.
1. Start construction of temporary underpinning.
 2. Start construction of permanent underpinning wall.
 3. Start of final load transfer and lockoff.
- 4.3 For any work relating to the auxiliary building underpinning, the following activities will be Q-Listed. This is intended to be a complete Q-List for all activities unique to underpinning other than design activities. Not all of these activities, however, will be within the Subcontractor's scope of work.

ENCLOSURE 3
QUALITY PLAN AND
Q-LISTED ACTIVITIES FOR
SPECIFICATION C-195

1. Document submittal, interface and control.
2. Procuring Q-Listed items and materials.
3. Storage, handling and control of Q-Listed materials.
4. Furnishing and installation of lagging and bracing under "Q" structures.
5. Excavation limits, control and sequence under "Q" structures.
6. Crack mapping and evaluation.
7. Calibration, maintenance, control and installation of gages and settlement monitoring instrumentation.
8. Monitoring of building movement instrumentation and pier pressure gages.
9. Fines monitoring of dewatering wells in "Q" areas.
10. Location and protection of "Q" utilities.
11. Geotechnical acceptance of subgrade.
12. Fabrication of steel grillage for temporary supports for "Q" structures.
13. Fabrications and installation of temporary supports for "Q" structures.
14. Welding of temporary and permanent supports for "Q" structures.
15. Fabrication and installation of reinforcing steel.

ENCLOSURE 3
QUALITY PLAN AND
Q-LISTED ACTIVITIES FOR
SPECIFICATION C-195

16. Certification of personnel performing splices.
17. Threading of reinforcing steel and installation of mechanical splices.
18. Drilling in "Q" structures for the installation of anchor bolts, rock anchors and dewatering wells.
19. Installation and inspection of anchor bolts and rock anchors.
20. Compressible material configuration and installation.
21. Testing of reinforcing steel and mechanical splices.
22. Installation, inspection and testing of structural concrete, lean concrete, grout and drypack.
23. Repair of concrete in "Q" structures.
24. Calibrating, maintaining, installing and controlling of hydraulic jacks and pressure gages.
25. Load transfer activities.
26. Backfilling and acceptance testing for access shafts and tunnels in "Q" areas.

Procedures To Be Submitted By The Subcontractor

Organization Responsible For Procedure Review & Approval

	Proj Eng	Resident Geotech	Bechtel Construction RSG	Bechtel Quality Control	MPQAD	Technical Consultant
Procedure for general underpinning - This procedure shall include the overall concept of the work involved, including the interface of all the operations listed below.	X	0	0	X	X	0
Procedure for load transfer.	X	0	0	X	X	0
Procedure for placement of lean concrete backfill in shafts and tunnel.	X		0	X	X	
Procedure for installation of (including mixing) and pressure grouting.	X		0	X	X	
Procedure for placement of pier concrete.	X		0	X	X	
Procedure for acquiring and maintaining calibration of jacks and gages.	X		0	X	X	
Procedure for mechanical splicing of reinforcement-	X		0	X	X	
Procedure for threading of reinforcing steel.	X		0	X	X	
Procedure for installation of anchor bolts and rock anchors.	X		0	X	X	
Procedure for installation of compressible material.	X		0	X	X	
Procedure for placing reinforcement including bending steel reinforcement (hot and cold).	X		0	X	X	
Procedure for core drilling.	X		0	X	X	

LEGEND

REVIEW & APPROVAL - X

REVIEW & COMMENT - 0
as applicable

	Proj Eng	Resident Geotech	Bechtel Construction RSC	Bechtel Quality Control	MPQAD	Technical Consultant
Procedure for concrete repairs.	X		0	X	X	
Procedure for excavation "Q" structures and the installation of lagging.	X	0	0	X	X	
Procedure for protection of underground utilities	X		0	X	X	
Procedure for preparing, submitting, and revising Q procedures.	X		0	X	X	
Procedure for handling, storing, and controlling Contractor-furnished materials.	X		0	X	X	
Procedure for design document control.	X		0	0	X	
Procedures for interface and coordination between the Subcontractor and the Contractor for activities covered by the QA Program.	X	0	0	0	X	
Procedure for construction of temporary supports including grillage.	X		0	X	X	0
Procedure for welding.	X		0	X	X	
Procedure for certifying subcontractor personnel specifically for AWS welding and mechanical splices.	X		0	X	X	
Procedure for Training Program of subcontractor personnel for the Q-Procedures covering the subcontractor scope of work.	X		0	X	X	

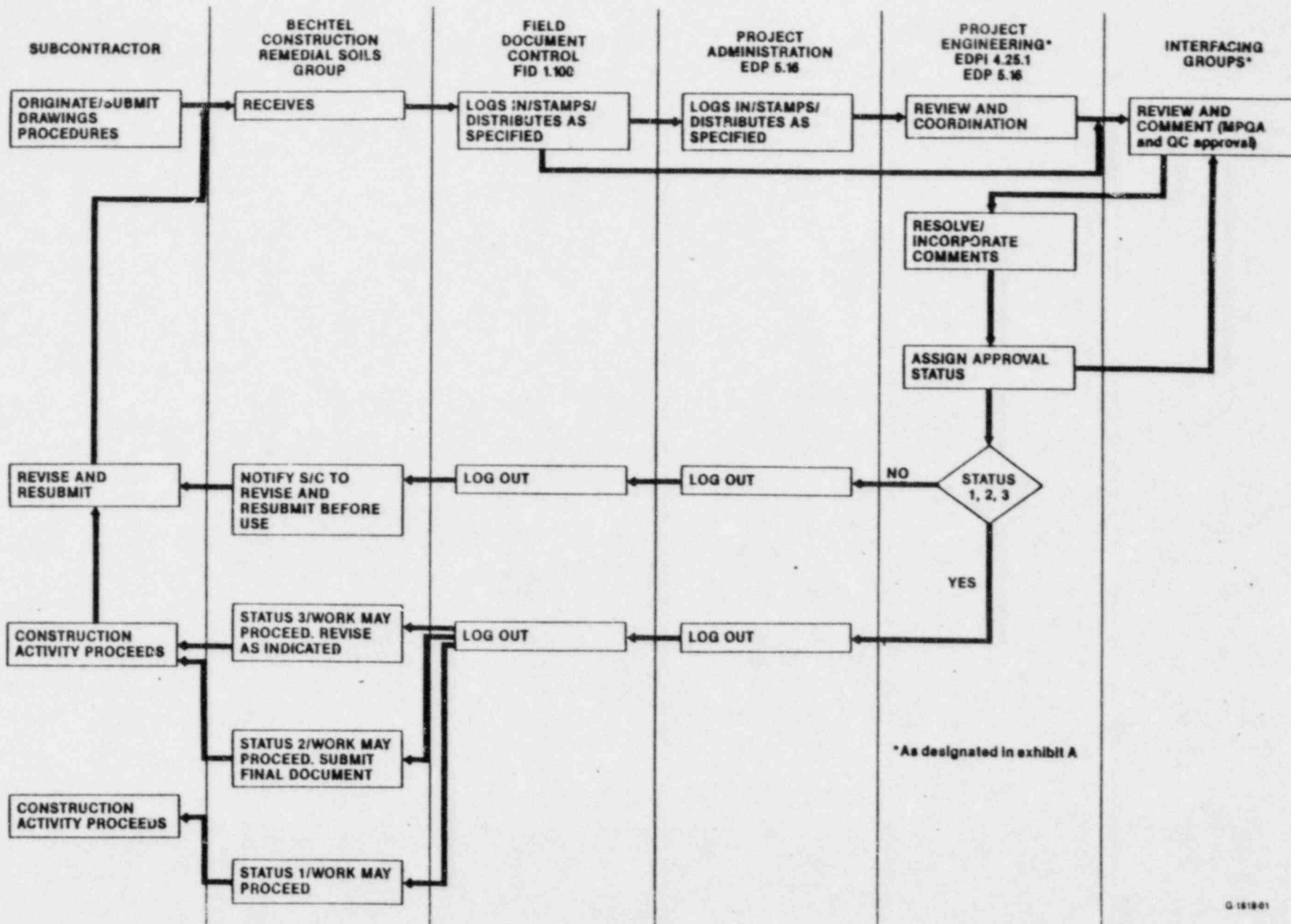
LEGEND

REVIEW & APPROVAL - X

REVIEW & COMMENT - 0
as applicable

PROCEDURE REVIEW/APPROVAL FLOWCHART

ENCLOSURE 3
EXHIBIT B



MEETING SUMMARY DISTRIBUTION

Docket File 50-329 OM, OL
NRC/PDR
Local PDR
TIC/NSIC/TERA
LB #4 r/f
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J. Kane
F. Rinaldi

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V. Benaroya
Z. Rosztoczy
W. Haass
D. Muller
R. Ballard
W. Regan
R. Mattson
P. Check
O. Parr
F. Rosa
W. Butler
W. Kreger
R. Houston
W. Gamill
L. Rubenstein
T. Speis
W. Johnston
S. Hanauer
C. Berlinger
F. Schroeder
D. Skovholt
M. Ernst
K. Kniel
G. Knighton
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J. Kramer
D. Vassallo
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D. Hood

M. Duncan

