



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V

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DEC 12 1983

MEMORANDUM FOR: G. Knighton, Chief, Reactor Licensing Branch
No. 3, NRR
H. Scherling, Diablo Canyon Project Manager, NRR
P. T. Kuo, Structural and Geotechnical
Engineering Branch, NRR

THRU: D. F. Kirsch, Chief, Reactor Projects Section No. 3 *DK*

FROM: P. J. Morrill, Reactor Inspector, RV

SUBJECT: DIABLO CANYON - ALLEGATIONS CONCERNING ERRORS IN
DESIGN/DOCUMENTATION OF SAFETY RELATED SYSTEMS,
STRUCTURES, AND COMPONENTS

The purpose of this memo is to forward my feeder report from the follow-up of items number two and seven of the subject allegations (enclosed). Should you have questions or comments please contact me at FTS 463-3740.

P. J. Morrill

P. J. Morrill
Reactor Inspector

Enclosure:
As stated

cc: (w/enclosure)
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ENCLOSURE

DIABLO CANYON - FOLLOW-UP OF ITEMS TWO AND SEVEN
REGARDING ALLEGATIONS CONCERNING ERRORS IN DESIGN/DOCUMENTATION
OF SAFETY RELATED SYSTEMS, STRUCTURES, AND COMPONENTS

Examinations conducted October 25 and November 3, 1983 at Pacific Gas and Electric Company offices in San Francisco, California

(A) ALLEGATION NUMBER TWO:

GENERAL: Allegation number two states, "Safety related equipment has inadequate/untraceable documentation". In general, safety related equipment requires documentation to (1) demonstrate that the equipment is qualified to meet its' intended purpose and (2) provide information for maintenance and operation. Consequently, the inspector decided to examine the licensee's systems used to document the qualifications of safety related equipment, examine the resolution of licensee identified documentation problem areas, question licensee personnel as to documentation problems which they were aware of, and examine a sample of licensee records which document equipment acceptance or qualifications to verify the adequacy of this documentation.

EXAMINATION: The inspector examined the licensee's project nonconformances identified in 1982 and 1983, the procedures the licensee uses to assure adequate qualifications of equipment are completed, and the engineering project files related to documentation and qualification records for safety related mechanical equipment. The inspector also discussed this issue with licensee engineers and management personnel in conjunction with the examination of documents. The inspector asked the licensee personnel contacted if they were aware of any circumstances which might cause such an allegation to be made.

The following personnel were contacted.

E. Kahler, Diablo Canyon Project, Engineering QC Supervisor
M. Williamson, Senior Licensing Engineer
F. Zerebinski, Assistant QC Engineer, Unit 1
M. Guzman, QA Engineer
J. McCracken, Senior Engineer, Engineering Mechanical Systems
R. Laverty, Deputy Engineering Group Supervisor, EMS
T. McIlraith, Mechanical Engineer, Engineering Department

The documents reviewed included the following.

Diablo Canyon Project Engineer's Instruction No. 5, "Design Interfaces", Rev. 3, effective October 10, 1983.

Diablo Canyon Project Engineer's Instruction No. 11, "Design Review Due to Response Spectra Revision", Rev. 2, effective March 11, 1983.

Diablo Canyon Project Non-Conformance Report Log 1982 and 1983

Non-Conformance Reports: DCO 82-EN-06, initiated April 28, 1982, "Class I equipment for ASWS qualified to Hosgri ground accelerations rather than floor response spectra": DCO 82-EN-14, initiated May 12, 1982, "Handling of Westinghouse NSSS Supplier Drawing Revisions": DCI 82-EN-20, initiated July 26, 1982, "HVAC seismic supports - generic support type does not satisfy Hosgri Criteria".

PG&E Engineering Department Procedure 7.2, Rev. 1, dated April 12, 1979, "Engineering Release".

Engineering Release Documents: ER 1654 "Reactor Coolant Subcooling Margin Monitor" (Combustion Engineering): ER 1653 "Reactor Head Vent Solenoid Valves" (Westinghouse): ER 1642 "LCV 106, 197, 198, 109 - Motor Operators" (Limtorque).

PG&E letter to Westinghouse, McCracken to Hobel, dated March 29, 1983, tabulation of all safety related Westinghouse equipment.

Westinghouse letter to PG&E, Hobel to Rocca, dated September 16, 1983, status report of Westinghouse equipment qualification.

Calculation, SQE 8.1 (D21.1-2, Rev. 1 and D21.1-3, Rev. 1), dated August 16, 1983, Qualification of Diesel Generator System

ANALYSIS: (Based on examination of the records and interviews of the personnel listed above) the engineering organization (Project) is responsible for obtaining and maintaining appropriate qualification and descriptive documentation of purchased equipment. Each discipline (Mechanical, Civil, Electric, etc.) Group Supervisor is responsible for obtaining appropriate descriptive documentation for each purchase order and for tabulating and maintaining a list of safety related equipment and qualification requirements for their discipline.

Descriptive documentaiton takes the form of drawings, technical manuals, and data reports. These items are obtained, coordinated, reviewed and approved by engineering prior to distribution to other potential users.

Qualification documentation of safety related equipment is either obtained from the vendor or produced by the Project. Vendor supplied qualification documentaiton is reviewed by responsible engineers who document their reviews on "Engineering Release" forms. Qualifications conducted by the Project are doucmented by controled calcuilations or reports. Licensee personnel stated that the Diablo Canyon Project was different from other Bechtel projects in that the large civil/structural scope of the project necessitated that many qualification analyses had to be assigned to support staff groups within Bechtel or PG&E rather than the civil/structural group. They went on to suggest that since the civil discipline was not completing many of the qualifications which they normally would, this might be preceived as a failure to do the qualifications by some people in the civil engineering group. When revisions to qualification requirements (such as seismic spectra) occur, the change is issued as a revision to a Design Criteria Memorandum (DCM) and distributed to the discipline groups. The engineers within each group are

responsible for reviewing these changes and verifying that equipment either meets the revised requirements or is requalified. With the exception of the NSSS supplier, safety related equipment lists are controlled documents and are in the form of calculations or indexes. In the case of the NSSS supplier (Westinghouse) the tabulation is in the form of a licensee letter addressed to Westinghouse. Revisions to DCMs are sent to Westinghouse by the responsible engineer who receives a monthly status report from Westinghouse as to the status of qualification for each revision of each DCM for each piece of safety related equipment. Project procedures provide guidance as to which group is responsible for which qualifications.

The inspector observed that the documentation associated with the qualification of the reactor vessel head vent solenoid, the reactor coolant subcooling meter, four auxiliary feedwater level control valves, and the seismic analysis of the diesel generators appeared satisfactory. The inspector also observed that documentation and qualification problems identified by the licensee had generally been identified in the licensee's or Independent Verification Program reports to the NRC. One NCR appeared to support the allegation in that licensee personnel had identified documentation problems related to Westinghouse vendor prints. Licensee personnel stated that when plant maintenance personnel attempted to repair a valve they found the vendor drawing for the valve was incorrect (a check valve was 3/4" taller than indicated on the drawing). A subsequent examination revealed that following each shipment of a valve or valves from Westinghouse a vendor print would be issued for that shipment. Subsequent valves (in some cases) were fabricated to a different revision of that drawing and shipped with that drawing revision following them. Engineering personnel, thinking the earlier revisions were no longer applicable, disposed of the older drawings. PG&E personnel went on to demonstrate to the inspector that the missing revisions had been recently purchased from Westinghouse and that this information was now available to plant personnel.

CONCLUSIONS: The inspector found that the allegation had merit, in that drawings of some Westinghouse valves had been inadvertently thrown away. The licensee subsequently identified this problem and obtained the missing documents. Current documentation of qualifications and analyses appeared satisfactory.

(B) ALLEGATION NUMBER SEVEN:

GENERAL: Allegation number seven states, "There are no complete sets of "As-Built" drawings for the containment and other areas. Even the ones existing have discrepancies with erection drawings and DC's issued". The inspector's understanding of the basic requirements related to this allegation are that drawings depicting the final "as-built" condition of the plant (1) should exist, (2) have been examined by the responsible engineers to verify the plant as constructed is consistent with their design and analyses, and (3) are available to personnel of the plant staff consistent with their need for this type of drawing for maintaining and operating the plant.

The inspector concentrated on the containment annulus structural steel connections, to determine (1) if "as-built" drawings exist, (2) whether or not the responsible engineers are receiving these drawings in a timely manner, (3) if the engineers are reviewing these drawings for consistency with their

design work, (4) if the subject drawings are available to the plant staff and other potential users in a timely manner, and (5) when will the relevant design drawings be finalized "as-built".

EXAMINATION: The inspector examined the licensee's procedures related to the control of DCNs and the "as-building" of drawings as well as relevant DCNs, shop drawings, field change transmittals, and working drawings. The inspector also discussed this issue and the associated work in progress with licensee employees to determine the status of "as-built" drawings and the nature of discrepancies in existing drawings.

The persons contacted are listed below.

G. Moore, Diablo Canyon Unit 1, Project Engineer
 J. McCall, Diablo Canyon Project, Civil Group Supervisor
 W. White, Special Assistant to the Civil Group Supervisor
 E. Kahler, Diablo Canyon Project, Engineering QC Supervisor
 N. Tuholski, Deputy Civil Group Supervisor
 J. Osborne, Drafting Group Supervisor
 R. Delrosario, Supervising Designer
 M. Williamson, Senior Licensing Engineer
 P. Kousharian, Senior Engineer
 K. Mandagi, Supervising Engineer

The documents examined included those listed below.

Engineering Procedure 3.6, dated June 25, 1982, "Design Changes".

Engineering Procedure 3.50N, dated August 15, 1983, "Operating Nuclear Plant Design Changes".

Engineering Procedure 3.7, dated September 1, 1983, "As-Built Documents".

Diablo Canyon Project Procedure CE-DC-5, dated November 1, 1982, "Procedure for Issue of Civil Structural Design Modifications".

PG&E Drawing 447245, Rev. 7, dated April 12, 1982, "Annulus Hanger Frames at Elevation 101 and 106, Containment Structure Area F & G".

PG&E Drawing 47281, Rev. 9, dated July 8, 1981, "Annulus Platform Framing Elevation 87".

PG&E Drawing 438282, Rev. 10, dated July 1, 1981, "Annulus Platform Framing Elevation 140".

PG&E Drawing 447254, Rev. 4, dated April 21, 1980, "Concrete Outline and Reinforcing Platform at Elevation 140".

PG&E Drawings 468984, Rev. 01B, dated March 7, 1983, 468985, Rev. 01B, dated March 7, 1983, 468986, Rev. 01A, dated December 1, 1982, "Civil Plans, Details and Sections, Column Additions & Column Braces, Annulus Frames - Containment Structure".

PG&E Drawing 468987, Rev. 01A, dated February 28, 1983, "Annulus Steel - Radial Frame Additions, Column 1".

PG&E Drawing 468988, Rev. 01A, dated February 28, 1983, "Annulus Steel - Radial Frame Additions, Column 2".

PG&E Drawing 468989, Rev. 01B, dated July 3, 1983, "Annulus Steel - Tangential Beam Modifications".

Design Change Notice DC1-EC-3601, Rev. 0, Generic DCN for annulus structural steel and platform modifications, including the DCN drawing index, Drawing Transmittal Forms, and DCN Drawings.

PG&E Drawings 468990 & 468991, Rev. 01A, dated February 28, 1983, "Annulus Steel Radial Frame Additions, Design Layout and Sections".

Plant Modification Follower, D1-3601-CRO, dated November 3, 1982.

Design Criteria Memorandum, C-27, Rev. 0, "Containment Annulus Structure".

Design Criteria Memorandum, C-49, Rev. 0, "Class I Architectural Platforms, Unit No. 1 Containment Structure".

Field Change Transmittals & Associated Foley Drawings, FCT 4473A through G corresponding to Foley drawings 6181-C1-13-40,41,44,46,47,43 & 42.

ANALYSIS: (based upon the examinations described above) At the time of this examination the licensee's Design Change Notice (DCN) for the containment annulus steel connections was incomplete. The DCN (DC1-EC-3601, Rev. 0) is a "generic" DCN which consists of many individual design changes. One or more changes is depicted on sketches prepared by engineering (the Project) and transmitted to Construction by Drawing Transmittal Forms. Each transmittal is uniquely numbered and includes an updated DCN Drawing Index. The On-Site Engineering Group (OSEG) can also issue design changes for this DCN in the same manner, with the condition that field initiated changes are within a predetermined scope and are coordinated with the Project. Construction reviews the changes from both the Project and the OSEG and turns them over to their contractor (H. P. Foley in this case) for construction. The change is engineered and completed by Foley with one or more "shop drawings". These drawings are "as-built" by Foley and checked by construction to document what was constructed for that particular change. The "shop drawing(s)" is then reviewed by construction and transmitted to the Project for review and approval by a Field Change Transmittal (FCT). At the completion of all Drawing Transmittals (which comprise the DCN), the licensee's "record drawings" are updated based on the FCTs which forwarded the "shop drawings" and the DCN is closed. The Nuclear Power Operations staff and Plant Operations staff have reviewed this "generic" DCN prior to work commencing and are required to review the complete DCN after it is finished. The Foley "shop drawings" are reviewed and approved by Construction and Project personnel. In the event a "shop drawing" is unsatisfactory the responsible engineers or construction personnel contact Foley personnel to correct the deficiency. The DCN, DCN sketches and drawing index, FCTs, and "shop drawings" are placed in the licensee's Records Management System (RMS) as these documents are processed through the system described above.

The inspector verified that the licensee personnel maintain a DCN Transmittal Log with copies of the DCN design sketches. The inspector also verified that the Foley "shop drawings" were also controlled, were being reviewed and approved by the responsible engineers, and were being placed in the licensee's RMS. As of November 3, 1983 approximately 380 Foley "shop drawings" had been received and over 90% had been approved by the Project. During interviews the inspector verified that responsible engineers had been to the field to examine the work and that they were satisfied with the quality of construction. The inspector observed that the "drawings of record" had not been "as-built" to reflect the subject DCN. Licensee personnel stated that (based on current procedures) these drawings would be reissued "as-built" within thirty days of completion of the DCN.

CONCLUSIONS: The inspector found that for the DCN covering the modifications to the annulus steel the allegation is correct, but the "as-built" information was available through the Foley "shop drawings". The transmittal of these drawings was controlled and they were being reviewed and approved by both Construction and Engineering. These "shop drawings" were available to potential users through the licensee's RMS system and were scheduled to be incorporated into final "as-built" drawings within 30 days of completion of the associated DCN.