



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V

1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

SEP 15 1982

MEMORANDUM FOR: H. R. Denton, Director, Office of Nuclear Reactor
Regulation

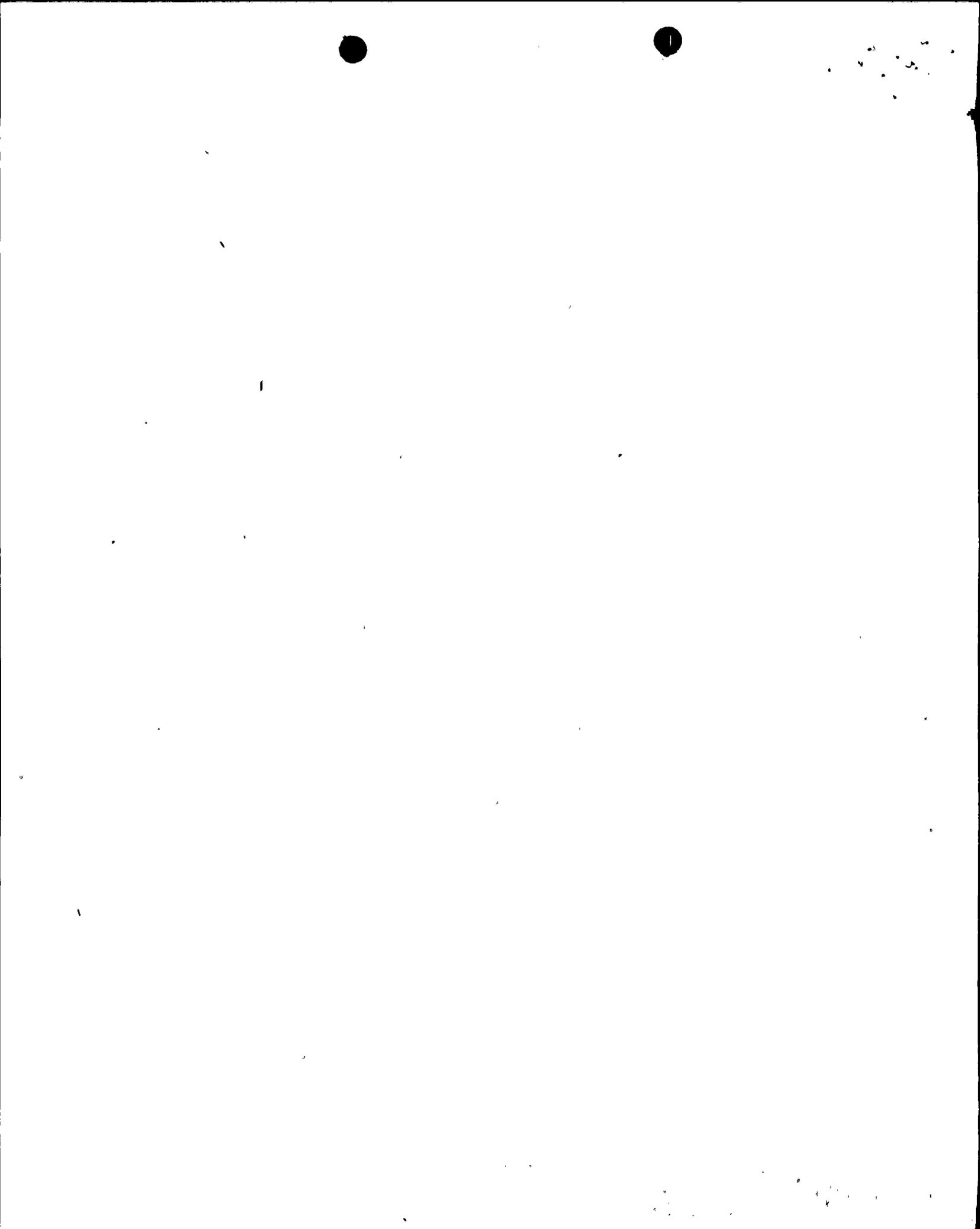
FROM: R. H. Engelken, Regional Administrator

SUBJECT: R. F. REEDY AND PG&E REVIEW OF
DIABLO CANYON DESIGN QUALITY ASSURANCE

On September 10, 1982, R. F. Reedy, Inc., (a Diablo Canyon Independent Design Verification, IDVP, contractor) conducted his audit exit meeting with representatives of the licensee. A member of our staff (T. W. Bishop) attended this meeting. Following the Reedy meeting Mr. Bishop met with licensee representatives to review their audits of PG&E in-house design activities and safety-related consultants. A summary of these audits and related comments are provided below.

R. F. Reedy IDVP Phase II Design QA Audit

R. F. Reedy, Inc., conducted design quality assurance audits of PG&E and some of their safety-related design contractor's who were not examined during the Phase I activities. Reedy audited five of the safety-related design organizations, these were: PG&E; EDS Nuclear; Radiation Research Associates (RRA); Quadrex/NSC; and Garretson-Elmendorf-Zinov (GEZ). The design activities audited were those related to the hardware samples discussed in the IDVP Phase II Program Plan. Reedy approached the audits in one of two ways. If the organization had developed and implemented a satisfactory design quality assurance program, then a "routine" design QA audit was performed (this approach was used for EDS and RRA). If a satisfactory design QA program was not evident, then Reedy conducted an audit of design quality assurance "practices", evaluating the organizations' practices against criteria identified in IDVP procedure No. DCNPP-IDVP-PP-002, Section 5.7. Due to a lack of adequately documented design QA programs Reedy chose to audit PG&E, Quadrex, and GEZ using this approach. Audits of design practices were subdivided into six categories: design inputs; design processes; design analyses; design outputs; change control; and interface control.



During the exit meeting Reedy provided the following "generic" comments based on his audits:

PG&E:

- Design Inputs - lack of evidence of documentation for design input data
- Design Processes - processes were generally adequate
- Design Analyses - lack of evidence of independent checking of calculation sheets and computer analyses
- Design Outputs - outputs were generally adequate
- Change Control - lack of evidence of control of changes to calculations; drawing change control was found to be adequate
- Interface Control - no generic problems were identified with internal interface control; there was lack of evidence of external interface control

EDS Nuclear:

EDS appeared to have established and adequately implemented a design QA program.

Radiation Research Associates (RRA):

RRA appeared to have established and adequately implemented a design QA program.

Quadrex/NSC:

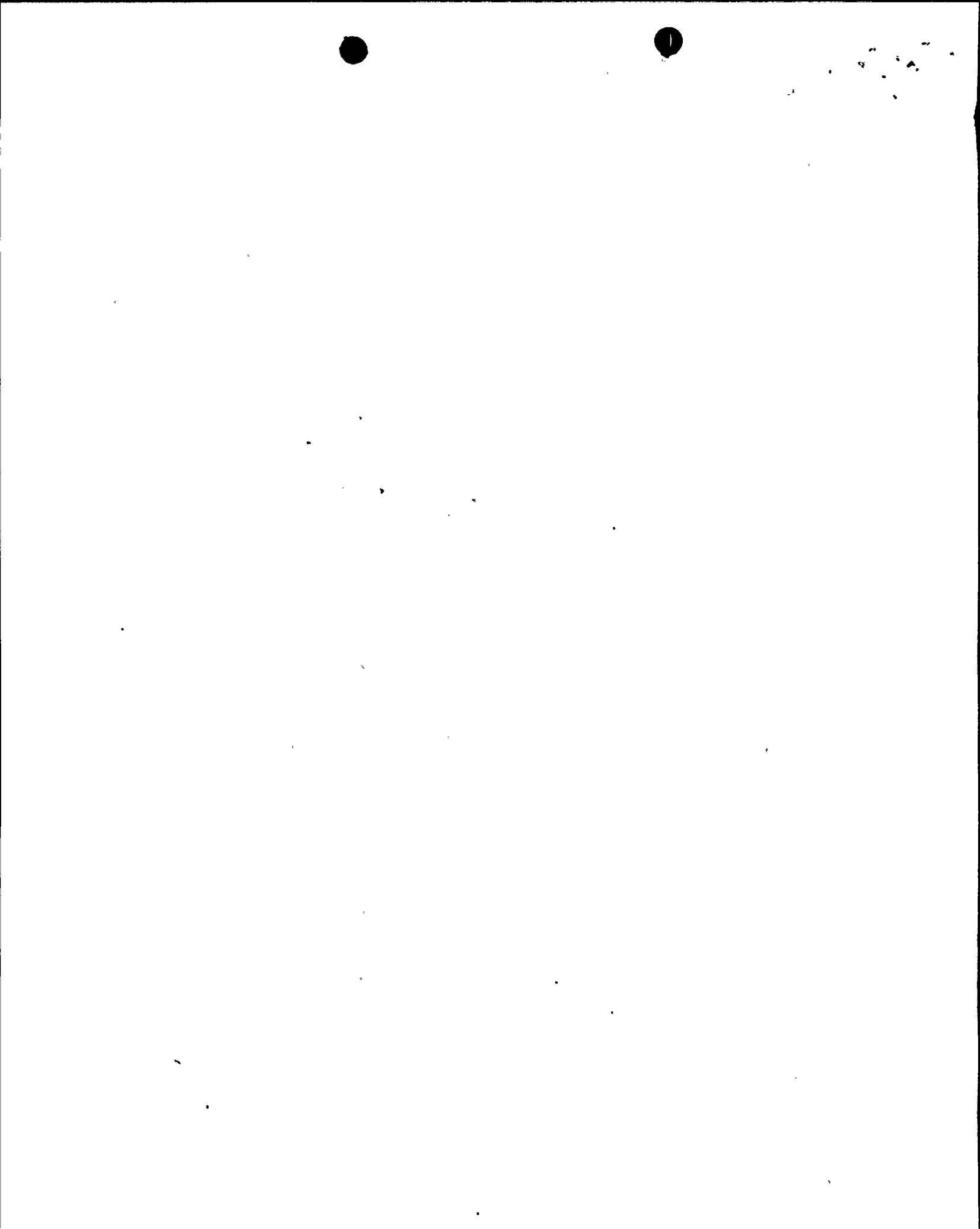
Quadrex/NSC had not established a design QA program for their PG&E work. In general, however, Quadrex was found to have adequate design control practices

Garretson-Elmendorf-Zinov (GEZ):

GEZ had not established a design QA program for their PG&E work. GEZ design practices exhibited three "generic" problems.

- lack of evidence of control of design inputs
- lack of evidence of independent checking of calculations
- lack of identification of changes in design calculations

Reedy stated that he had not yet categorized his findings (e.g. as errors or open items), nor fully assessed the implications of the findings. He anticipated these actions would be completed following discussion with other IDVP members (Teledyne and Stone & Webster). Reedy expects to issue his report at the end of October, 1982.



PG&E Look Back Reviews

In response to the original (September 1981) concerns regarding design interface control the licensee initiated audits of their in-house design activities and their safety-related consultant contracts (involving 18 contractors). The proposal to conduct these audits was discussed by the licensee in a transcribed meeting with the NRC staff on November 3, 1981. The licensee refers to these audits as "Look Back Reviews" since most of the activities examined involved closed contracts. The stated purpose of the reviews was to "verify all design activities comply with quality procedures and NRC regulations..." The licensee's QA organization was responsible for completion of the reviews and the Engineering Quality Control organization was responsible for resolution of the review of findings. The audits were initiated November 30, 1981 and were completed April 2, 1982. In June 1982 the licensee decided that an additional contractor (Garretson-Elmendorf-Zinov) should be audited since work performed by the contractor (HVAC) involved a safety function (the contract had been designated non-safety). This final audit was completed July 23, 1982.

All items which were found to be of "questionable status" were documented on "Look Back Deficiency Notices" (LBDN). 159 LBDN's were issued as a result of the reviews. 82 of the LBDN's pertained to licensee consultants, while 77 related to in-house design activities. In addition, a few Nonconformance, Deficiency, and Open Item Reports were issued to document the review findings. Many of the review items are similar to the R. F. Reedy findings. The Look Back Review items include:

In-House design - loads added to battery systems without effects analysis; design calculations/verifications not completed; uncontrolled changes to design; unapproved specification changes; inconsistencies with the FSAR; design change notice reviews not controlled by procedure; FSAR not maintained as a controlled document; instrument set points not controlled.

Contractor design - quality assurance program not specified as a requirement; quality assurance program not applied; drawing inconsistent with FSAR data; recommended "design assumption" tests not performed; calculations not controlled

The above examples are not representative of all the Look Back Review findings but do illustrate the similarity between the "generic" Reedy findings and the licensee's audit findings. This becomes significant since some of the licensee findings were identified in areas which were not specifically reviewed by Reedy (e.g. component cooling water system, 125V DC system).



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Region V Comments

In consideration of the above, we offer the following comments and questions.

1. Did R. F. Reedy, Inc., comply with the requirements of the NRR letter of November 19, 1981 regarding scope and approach?

The November 19, 1981 letter required quality assurance reviews of all service related contractors. R. F. Reedy, Inc., narrowed the scope of the reviews to contractors with significant safety-related design responsibilities, auditing only a portion of the safety-related service contractors. Service-related contractors such as Stafco, Inc. (responsible for quality "Q-list" and FSAR updating) and Western Canada Labs, Inc. (tank vortexing study) were not examined by R. F. Reedy. It appears that the omission of certain service-related contractors is inconsistent with the NRR letter.

During the conduct of the audits, once the lack of an effective QA program or implementation was identified, R. F. Reedy chose to initiate a review of "design practices". Further assessments of programmatic (procedural) controls were discontinued. The NRR letter requires a review to determine whether quality assurance procedures and controls were fully and effectively implemented. Without thoroughly examining the extent and implementation of the programmatic controls, an assessment of generic findings is inhibited (especially in the area of design control consistency). An evaluation of the need to complete the programmatic reviews may be appropriate.

2. How should the PG&E Look Back Review findings be used?

The IDVP Phase II Plan states that the primary IDVP purpose of the R. F. Reedy, Inc., audits is to obtain information which impacts the extent of design process verification. The plan further states that negative audit results reveal the potential for a low level of design control consistency and indicate the possible need for additional verification. We concur with IDVPs proposed use of the Reedy findings. Consistent with this, the PG&E Look Back Review findings provide further data which may be useful in assessing the need for additional verification. This is particularly valid since the sample of the Look Back Reviews was different from that of R. F. Reedy, Inc., in some cases. Accordingly, it is recommended that the detailed results of the Look Back Review be provided to the IDVP for their use in future decisions on additional verifications.

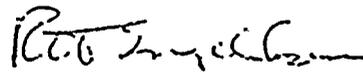


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3. Should the scope of the IDVP Phase II Program Plan be reexamined in light of the R. F. Reedy and PG&E findings?

The IDVP Phase II Plan currently provides for expansion of the verification program if warranted by design quality assurance audit findings. Although the R. F. Reedy findings are preliminary and may not accurately represent the final evaluation, their combination with the licensee audit findings suggests the possibility of broad programmatic deficiencies in the licensee's design program and certain of their contractors. Based on this condition, it may be appropriate to reexamine the scope of the initial verification sample defined in the Phase II Program Plan.

It is suggested that the above comments be provided to the IDVP for their timely use in completing the verification program. We would be pleased to discuss the above comments with you further (contact T. W. Bishop FTS 463-3751).



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Regional Administrator

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