4.2.3 Case Study C

The Licensee of the Case C study had established its own in-house engineering and construction management capability in the 1930s. During the late 1940s and early 1950s, outside architect-engineer (A-E) firms were utilized because of unusually large (post-WWII) system expansion requirements. In the mid-1950s, the Licensee's earlier practice of doing its own engineering and construction management was resumed.

During the late 1950s and early 1960s, the Licensee planned an ambitious program to construct several nuclear power stations. Nuclear power was recognized as a new technology and the Licensee took actions to prepare itself for entry into this field, including having observers at the construction sites of some early nuclear power plants, participating in the design of a test reactor, and studying A-E's designs of proposed nuclear plants. The Licensee decided to build its first nuclear plant -- a small (<100MWe) power reactor -- through a "turn-key" contract for design and construction. The plant was completed in the early 1960s, and the Licensee operated it successfully for about 15 years until it was retired. The Licensee capitalized on the turn-key design and construction activity to familiarize its staff with nuclear activities to enable it to engineer and construct subsequent nuclear plants. The Licensee had been successful in engineering and construction activities on a variety of generating technologies and related electrical transmission systems.

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During the early and mid-1960s, the Licensee announced plans for several nuclear plants. Environmental and/or seismic problems, coupled with intense intervention, political factors, load growth changes, and other considerations, resulted in all but the Case C nuclear station being cancelled. Many of these factors were also present in the Case C project, resulting in significant delays and cost increases.

The Case C nuclear station is comprised of two large (>1000MWe) units. The Licensee announced Units 1 and 2 in the mid-to-late 1960s. Construction permits were issued in the late 1960s and early 1970s. Unit 1 of the nuclear station was largely completed by the mid-1970s and fuel was received onsite for both units in 1975 and 1976.

Then occurred a series of required modifications to the nuclear station which delayed its completion. Included in these were NRC regulations related to pipe-break-outside-containment which necessitated, among other things, relocation of a number of conduits (1973-75); identification and/or reconsideration of a seismic fault which required such modifications as column stiffening, tank bracing, revising piping hangers and equipment supports, diaphragm stiffening, buttressing and foundation changes (1978-79); the Brown's Ferry incident which required modifications related to cable spreading, inerting atmosphere, new decking, and extensive concrete anchor bolt installation (1980); the TMI accident which required

installation of extensive additional wiring, sub-cooled monitors, hydrogen recombiners, and other modifications (1981).

It is important to note that, over the time span of about eight years, at least one of the two units had been within a few months of being completed on a number of occasions. Thus far, Unit 1 has undergone three hot functional tests and three containment leak tests. Unit 2 has undergone one containment leak test.

In 1981 the Licensee received operating licenses for its two units. These were suspended two months later following notification by the Licensee to NRC that the diagrams used to locate the vertical seismic floor response spectra in the Unit 1 containment annulus area were in error. Briefly, the error occurred as follows: the Licensee had transmitted to its seismic consultant a sketch of the vertical loadings from which the consultant was to determine the seismic response spectra. There was no indication on the sketch which unit the loadings applied to, though the consultant understood (correctly) that they were for Unit 2. The consultant thought that Unit 1 was a slidealong unit (instead of a mirror-image unit) and performed the analysis on Unit 1 based on that assumption. The information returned to the Licensee was marked as "Unit 1" (in fact, the analysis applied to Unit 2, not Unit 1). The Licensee accepted the data at face value as being for Unit 1 and, because it knew the plants to be mirror-image plants, flipped the data so as to be applicable to Unit 2 (in fact, the data in the flipped condition were correct for Unit 1, not Unit 2). The seismic response spectra were now incorrect for both Units 1 and 2.

Upon confirmation that wrong diagrams were used in the development of Unit 1 design requirements, the Licensee reanalyzed the design requirements for Unit 1 using the appropriate containment annulus frame orientation diagrams and determined that, as a result of the error, modifications were required to be made on 31 Unit 1 pipe supports. These modifications involved such actions as adding snubbers, changing the snubber size, adding braces, replacing structural members, and stiffening base plates.

In an inspection report of seismic-related errors, the Nuclear Regulatory Commission stated that the basic cause of this problem appeared to be the informal manner in which the subject data were developed by the Licensee and transmitted to its seismic consultant, and the lack of independent review of the data within the Licensee's organization prior to submittal to that consultant.

The Licensee had been the architect-engineer/construction manager for the Case C nuclear power station. One of the major actions that the Licensee took as a result of the aforementioned error was the formation of a Project Completion Team comprised of the Licensee's engineering/construction personnel and personnel from a newly hired architect-engineering firm.

An extensive Independent Design Verification Program (IDVP) was initiated in early 1982 in response to the seismic errors discovered in 1981. The Project Completion Team is also conducting a concurrent design verification program.

As of January 1983, it was reported that an estimated 90% of the design and 40% of the construction required for modifications as a result of a wide range of reviews spawned by discovery of the seismic diagram error had been completed. The Licensee has applied for reinstatement of the operating licenses.

At the time of the case study visit, neither the Independent Design Verification Program nor the Licensee's design verification program had revealed significant further deficiencies in the design or construction of the nuclear station. The design errors which were identified were not considered to have prevented the affected systems from performing their functions satisfactorily.

The Case C Study Team identified the following factors which it considered significant in contributing to the quality problem experienced by the Licensee:

1. The primary root cause of the design-related quality problem was the Licensee's failure to plan, establish, and effectively implement a management system which provided adequate control and oversight over all aspects of the project. The Licensee failed to fully control the flow of information across all the interfaces inherent in the engineering/design process and to provide a appropriate reviews of the information transmitted.

There appear to be several factors which contributed to this failure. Using the experience gained from their earlier turn-key plant and participation of the staff in other nuclear projects, the Licensee, after considerable evaluation, assumed the role of architect-engineer for this nuclear project. As previously stated, the Licensee had good success with various types of generating projects it had engineered and managed over the years. The nuclear project was fitted into a design, engineering, and management system that may not have been adequately modified to handle all aspects of nuclear work, including the control of quality at design interfaces. As a general rule, it has been more difficult to apply QA to the engineering process than to the construction process, and the Licensee found this to be the case. Even though QA was apparently rigorously applied to the construction of the project in question (and growing in strength as NRC requirements and guidance evolved) the Licensee did not implement NRC quality requirements for engineering as intensely as they did for construction. Their attitude seemed to be that the engineering organization was comprised of professionals capable of doing what is right without overlaying a stringent formal quality assurance program beyond the normal controls considered part of good engineering practice.

Another factor in the problem of assuring quality in engineering related to changes in NRC requirements that occurred between the late 1960s and the late 1970s. It appears that the Licensee did not completely understand the implications of the changes as they occurred; hence, a QA program for engineering that the AEC might have found acceptable early in the project might not pass NRC scrutiny in the late 1970s.

Secondary root causes included the following:

a. Failure to understand and appreciate the potential merit of a formal institutioanlized QA program. This is suggested by the fact that the Project Completion Team adopted the A-E's quality assurance program, even though they were concerned about imposing a new system on the project at a late date (the Licensee's engineering procedures were maintained, however). Examples of program deficiencies (drawn from various reports on the project and discussions with NRC inspectors) which had occurred during the project and the key indications of these deficiencies were as follows:

- Design control
  - The Licensee's engineering staff did not always document important data transmitted to subcontractors
  - Verbal transfer of design information to subcontractors occurred
  - Assigned cognizant engineers were sometimes bypassed in the information or approval process

- Adequate internal communications among the disciplines did not always exist within the Licensee's organization

- Requirements for independent reviews were not always followed

- Control of Instructions, Procedures, and Drawings/Document Control

  - The Licensee's engineering did not develop and/or implement formalized procedures to comply with early QA program requirements

  - In some cases, outdated drawings were used to establish seismic criteria

  - In some cases, diagrams in lieu of release drawings were used -- a contributing factor to the seismic problem

- Control of Service Contracts

  - Proceduralized activities for services contracts were lacking to control all interfaces with some subcontractors

  - Informal "letter-type" contracts and documents were used

- Service contracts were not treated as formally as hardware contracts

- Formal quality requirements were not placed on some subcontractors until the late 1970s

b. NRC's failure to sell QA as a management tool. The NRC requirement for quality assurance seemed to come across as just another requirement. The emphasis from NRC seemed to be on externals -- the trappings of a QA program, rather than its substance. Develop a QA manual, set up a QA organization, make the QA manager report high in the organization, etc. NRC tended to lose sight of what it was trying to achieve and failed to provide adequate guidance on what a quality assurance program should be. NRC failed to inspect against QA requirements in the engineering area to the extent they inspected against QA requirements for construction.

c. Long period of time between inception of the project and operation. As previously stated, the period of time between the issuance of a construction permit and the present has been about 15 years. This long period of time greatly increased the exposure to changes in technology, to changing regulatory requirements, and to changing state of the art in technical matters with the attendant opportunities for quality failure. During this period, there was considerable turnover of personnel on the project, thereby losing continuity in engineering understanding of project practices and assumptions.

BACKGROUND INFORMATION FOR CONGRESSIONAL AMENDMENT STUDY

Requirements of Act

1. In conducting study, NRC shall obtain comments of public, licensees, ACRS, associations of professionals.

2. Study shall include an analysis of the following five alternatives:

   - More prescriptive A/E criteria.
   - Condition CP on demonstration of ability to independently manage a QA/QC program.
   - Evaluation/Audits by associations of professionals.
   - Improvement of NRC's organization, methods and programs for QA development, review and inspection.
   - Condition CP on commitment to use third party audits.

3. Study shall include an analysis of QA and QC programs at representative sites at which such programs are operating satisfactorily and an assessment of the reasons therefor.

4. NRC shall undertake a pilot program to review and evaluate programs that include one or more of the five alternatives, including the fifth one. The purposes of the pilot program are (1) to determine the best means of assuring that commercial nuclear power plants are constructed in accordance with applicable safety requirements of AEA, and (2) to assess the feasibility and benefits of the five alternatives.

5. Report shall include:

   - Brief summary of the information received from public and other three groups and Commission's response to significant comments received.
   - Report shall set forth an analysis of the results of the "pilot program".
   - Report shall be accompanied by recommendations of Commission, including legislative recommendations and a description of administrative actions that the Commission has undertaken or intends to undertake.

Comments of Senator Ford in Sponsoring the Amendment

The amendment is directed toward the growing problem of construction of nuclear facilities in the U.S. today, a problem caused by poor QA/QC programs on the part of the licensee and the contractors and by poor safety inspection by NRC. The amendment attempts to establish for the first time procedures and mechanisms to correct this intolerable state of affairs.

Only after the insistence of myself and others did NRC finally issue a stop-work injunction and initiate an investigation of Marble Hill.

In every one of these cases there is a clearly established pattern of fault. The utilities of this country simply must accept the serious responsibility of building safe nuclear facilities and must recognize the significant difference between building a coal-fired plant and a nuclear powered generator. Neither they nor their contractors can ignore the unique problem involved. Shortcuts cannot be taken, mistakes must be thoroughly corrected, not covered up. Management and workers on the site must realize that quality assurance/quality control programs are not established to harass them and impede their work. Finally, the NRC must inspect more closely the construction of nuclear plants. They must, in fact, be relentless in their oversight duties.

In addition to tightening QA/QC programs and upgrading the safety oversight role of the NRC, a direction in which, I am pleased to note, the agency is already moving, this amendment emphasizes a dimension I have long advocated -- the participation of third parties. As I mentioned earlier, my efforts were successful in having independent engineers placed at Marble Hill to insure that previously unnoticed flawed concrete was properly repaired.

Increased inspections by independent industry and institutional organizations, and the use of independent, inspectors for auditing all QA/QC verification responsibilities not only offer a system of checks and balances by providing a third layer of safety monitoring, they also perform another function -- that of bolstering the public's confidence in nuclear energy. Problems such as those that have occurred at Diablo Canyon, Zimmer, and Marble Hill have further eroded whatever trust in nuclear industry and its regulators the public had left after Three Mile Island. If we are going to have nuclear energy in this country, it must be safe -- safely constructed, safely operated, and its waste must be safely disposed. Nothing less is acceptable. It is not too much to ask that the public health and welfare be protected to the maximum extent possible.

Comments of Senator Simpson in Cosponsoring the Amendment

I believe that this amendment provides an important step toward addressing these problems by strengthening NRC's resident inspector program and by exploring a number of alternatives to improve quality assurance performance.

Second, the amendment requires a study of existing programs and alternate concepts for improving quality assurance and quality control performance in the construction of nuclear powerplants.

Third, the amendment calls for a pilot program consisting of programs now underway to gain actual experience with one or more of these concepts at at least three construction sites.

The concepts that are required to be studied under the amendment include the development of a more precise approach to defining criteria for plant construction, similar to the technical specifications that are now developed for plant operation.

...and the requirement that a licensee demonstrate the ability to independently perform quality assurance and quality control responsibilities for the plant. Under the latter concept, the Commission would determine the point at which a licensee would be required to demonstrate this capability and the means by which this capability would be demonstrated. One such means, for example, that would fit this concept is owner certification by the American Society of Mechanical Engineers, which can now be granted after the plant is 15% completed.

A third concept to be studied is the more effective use of inspections and audits by independent industry and institutional organizations. Such organizations might include he Institute of Electrical and Electronic Engineers, the American Society of Mechanical Engineers and the Institute for Nuclear Power Operations. In fact, Mr. President, the Institute for Nuclear Power Operations has recently begun a program that provides for the establishment of criteria for evaluating nuclear powerplant construction quality assurance and quality control, and for audits to verify compliance with these criteria.

This industrywide program is a promising step toward improving quality control and quality assurance in the construction of nuclear powerplants, and may well be the best option for bringing much needed improvement to this area. I believe the industry is to be commended for this initiative, and I believe the Commission should pay particular attention to this concept in developing its requirements and recommendations in the area of quality assurance and quality control.

Programs now underway at several sites that involve the use of third party inspectors for auditing quality assurance performance would be included as part of the pilot program.

As I understand it, this requirement is intended to provide information on a range of sites, for the purpose of assessing past quality assurance peformance, corrective measures that have been undertaken where deficiencies have been found, and the effectiveness and appropriateness of ongoing programs for third party auditing, and other alternate concepts, at these sites.

This requirement is not intended to characterize sites as good or bad in terms of their present quality assurance programs. Thus, mere selection for the pilot program in either category should not be interpreted as an acceptable or unacceptable quality assurance program. In addition, I believe it is the intent of the sponsors of the amendment that the amendment be implemented so as to avoid delays or disruptions in plant construction particularly with respect to the pilot program.

Comments of Senator Mitchell in Cosponsoring the Amendment

The amendment also requires the NRC to conduct a comprehensive study of alternate concepts and existing programs for improving quality assurance and quality control performance in the construction of commercial powerplants.

Two of the alternate concepts which the NRC would be required to study are, one, obtaining more effective evaluations, inspections or audits of powerplant construction by independent organizations; and two, requiring, as a condition of the issuance of construction permits, that the licensee contract or make other arrangements with an independent inspector to verify quality assurance performance.

The pilot program must include the alternate concepts under study. It must also include projects underway that use independent inspectors for auditing the quality assurance responsibilities of the utility.

The amendment is a forceful response to the continuing disclosures of design errors and construction mishaps at plant construction sites around the country.

The example of a lapse in quality assurance and quality control most often referred to is the discovery in November 1981 of numerous errors in the design and calculations for the Diablo Canyon project. But there have been others, as well, less publicized but equally important.

It is in the best interests of utilities, as Chairman Palladino stated, to meet the high quality assurance standards required of them. It pays to meet these standards because it costs if they are not met. But there is an inherent conflict of interest in this area that one cannot ignore. That is the conflict caused by the fact that the utility building the plant is also responsible for the plant's quality assurance. Cutting corners to save money on construction can often mean cutting corners on safety regulations.

The Ford amendment attempts to minimize this conflict of interest by upgrading and increasing NRC efforts in this critical area. The amendment provides a meaningful alternative to the string of disclosures and the string of fines.

The amendment also provides quality assurance before the fact, in effect before the utility has spent a prodigious amount to build the plant. In the process, it may save the utilities a lot of headaches, expensive delays in construction time, and costly fines. More importantly, it will place safety before development, and thereby better protect the public health and safety.

Comments of Senator Levin in Cosponsoring the Amendment

One of the major problems facing the nuclear power industry is the increasing lack of public confidence in the safety of nuclear power. For years we were told that no accidents were possible -- until accidents started occurring. Regulators told us their guidelines were foolproof -- until it was discovered that major errors had occurred.

I believe the amendment offered by Senator Ford could help both prevent mistakes and assure the public that quality control will be required. Under such a program, the utility building a nuclear plant, the NRC, which must license and regulate nuclear powerplants, and the public paying for and living next door to the plant can see if it meets all quality requirements.

In my State of Michigan there has been a certain amount of mistrust concerning the quality control of nuclear plants. Those building plants have assured us that they will be safe. What better way to verify quality control than to have such a plant participate in a new system of independent inspectors?

Comments of Senator Hart in Cosponsoring the Amendment

The amendment will begin the much needed task of upgrading the quality control and quality assurance programs at nuclear powerplants under construction.

Construction deficiencies, and inadequacies in licensees' quality assurance/ quality control programs, have long plagued the U.S. commercial nuclear power program. The recent disclosure of serious construction errors at the Diablo Canyon powerplant, and the $200,000 fine levied by NRC against Cincinnati Gas & Electric for having an inadequate QA/QC program at its Zimmer powerplant, indicate these problems have not disappeared and, in fact, may have gotten worse.

NRC Chairman Palladino strongly criticized the nuclear industry for construction deficiencies and inadequacies in its QA/QC programs. He said:

> "A number of deficiencies at some plants have come to my attention which show a surprising lack of professionalism in the construction and preparation for operation of nuclear facilities. The responsibility for such deficiencies rests squarely on the shoulders of management..."

In addition to the lack of professionalism in some cases, noted by Chairman Palladino, the quality control efforts by utilities also will suffer from a flawed regulatory philosophy: An inherent conflict of interest arises because the utility constructing the powerplant, which naturally seeks to minimize construction costs, also has the responsibility for assuring and controlling the quality of construction -- efforts that could increase the total cost of the project.

I support the Ford amendment because it seeks to minimize the inherent conflict of interest that results when the utility building the powerplant bears responsibility for assuring the quality of construction.

Perhaps more important, the Ford amendment would establish a pilot program for at least three sites where powerplants are under construction to assess the benefits of using independent third party inspectors to perform the utility's quality assurance and quality control verification responsibilities. The assessment under this pilot program is one that the Congress should have required the NRC to make long ago.

Language from the July 21, 1983, Conference Committee Markup of the Bill

In conducting the study, the Commission shall obtain the comments of the public, licensees of nuclear powerplants, the Advisory Committee on Reactor Safeguards, and organizations comprised of professionals having expertise in appropriate fields ~~(including the National Board of Boiler and Pressure Vessel Inspectors, the American Society of Mechanical Engineers, and the American Welding Society)~~.

(3) ~~more effective~~ evaluations, inspections, or audits of commercial nuclear powerplant construction by representatives of independent associations of professionals having expertise in appropriate fields (~~including the associations referred to in the preceding sentence~~) which evaluations, inspections, or audits are more effective than those under current practice.

The study shall also include an analysis of quality assurance and quality control programs at representative sites at which such programs are operating satisfactorily and an assessment of the reasons therefor ~~(including Diablo Canyon, Zimmer, Marble Hill, Midland, and South Texas). The analysis shall include a determination by the Commission as to whether such programs are operating satisfactorily and an assessment of the reasons for the satisfactory or unsatisfactory operation of such programs~~.

Language from the September 28, 1983 Conference Committee Report

The conference agreement instructs the Commission, where it deems appropriate, to provide NRC "inspection personnel" at any such site following issuance of a construction permit for the facility in question. The conferees do not intend that such "inspection personnel" must be a resident inspector, although the Commission has discretion to assign a resident inspector to a site where construction is less than 15% complete. Like the Senate amendment, the conference agreement requires that once construction of a given nuclear powerplant reaches the 15% completion threshold, a resident inspector must be assigned to the project. The conferees do not intend to imply the NRC's responsibility to regulate nuclear powerplant construction is any less during the early stages of reactor construction (i.e., when construction is less than 15% complete), than it is once a project is 15% complete.

In fulfilling this requirement, the Commission is instructed by the conference agreement to obtain comments from the public, licensees, the Advisory Committee on Reactor Safeguards, and "organizations comprised of professionals having expertise in appropriate fields." The conferees intend that these latter "organizations" include, but not be limited to, the following: the National Board of Boiler and Pressure Vessel Inspectors, the American Society on Mechanical Engineers, the American Welding Society, the Institute for Nuclear Power Operations, and private nuclear insurance pools.

Subsection 13(b) of the conference agreement sets forth specific proposals for improving quality assurance and quality control in the construction of nuclear powerplants, and requires the Commission to conduct a study and detailed analysis of those proposals. Subsection 13(d) of the agreement directs the Commission to report to Congress on the results of the study conducted pursuant to subsection (b).

The purpose of the pilot program is twofold: (1) to determine the best means of assuring that commercial nuclear powerplants are constructed in accordance with all applicable safety requirements; and (2) to assess the feasibility, advantages, and disadvantages of the proposals listed in subsection 13(b). In undertaking the pilot program, the Commission must include the use of "independent inspectors" as described under paragraph (5) of subsection (b).

By imposing the requirement that the pilot program shall include programs that use an "independent inspector", the conferees do not mean that the Commission, in undertaking the pilot program, should place lesser emphasis on the review and evaluation of programs incorporating the concepts in paragraphs (1) through (4) of subsection 13(b).

The conference agreement stipulates that the pilot program shall include at least one site at which quality assurance and quality control programs have operated satisfactorily, and shall include at least two sites "at which major construction, quality assurance and quality control deficiencies... have been identified in the past." The conferees recommend that the Commission, in selecting these latter two sites, refer for guidance to the testimony of the NRC Executive Director for Operations before the House Committee on Interior and Insular Affairs on November 19, 1981.

license shall take effect upon the promulgation by the Commission of the regulations required in such provisions.

QUALITY ASSURANCE

SEC. 13. (a) The Nuclear Regulatory Commission is authorized and directed to implement and accelerate the resident inspector program so as to assure the assignment of at least one resident inspector by the end of fiscal year 1982 at each site at which a commercial nuclear powerplant is under construction and construction is more than 15 percent complete. At each such site at which construction is not more than 15 percent complete, the Commission shall provide that such inspection personnel as the Commission deems appropriate shall be physically present at the site at such times following issuance of the construction permit as may be necessary in the judgment of the Commission.

(b) The Commission shall conduct a study of existing and alternative programs for improving quality assurance and quality control in the construction of commercial nuclear powerplants. In conducting the study, the Commission shall obtain the comments of the public, licensees of nuclear powerplants, the Advisory Committee on Reactor Safeguards, and organizations comprised of professionals having expertise in appropriate fields. The study shall include an analysis of the following:

(1) providing a basis for quality assurance and quality control, inspection, and enforcement actions through the adoption of an approach which is more prescriptive than that currently in practice for defining principal architectural and engineering criteria for the construction of commercial nuclear powerplants;

(2) conditioning the issuance of construction permits for commercial nuclear powerplants on a demonstration by the licensee that the licensee is capable of independently managing the effective performance of all quality assurance and quality control responsibilities for the powerplant;

(3) evaluations, inspections, or audits of commercial nuclear powerplant construction by organizations comprised of professionals having expertise in appropriate fields which evaluations, inspections, or audits are more effective than those under current practice;

(4) improvement of the Commission's organization, methods, and programs for quality assurance development, review, and inspection; and

(5) conditioning the issuance of construction permits for commercial nuclear powerplants on the permittee entering into contracts or other arrangements with an independent inspector to audit the quality assurance program to verify quality assurance performance.

For purposes of paragraph (5), the term "independent inspector" means a person or other entity having no responsibility for the design or construction of the plant involved. The study shall also include an analysis of quality assurance and quality control programs at representative sites at which such programs are operating satisfactorily and an assessment of the reasons therefor.

(c) For purposes of—

(1) determining the best means of assuring that commercial nuclear powerplants are constructed in accordance with the

applicable safety requirements in effect pursuant to the Atomic Energy Act of 1954; and

(2) assessing the feasibility and benefits of the various means listed in subsection (b);

the Commission shall undertake a pilot program to review and evaluate programs that include one or more of the alternative concepts identified in subsection (b) for the purposes of assessing the feasibility and benefits of their implementation. The pilot program shall include programs that use independent inspectors for auditing quality assurance responsibilities of the licensee for the construction of commercial nuclear powerplants, as described in paragraph (5) of subsection (b). The pilot program shall include at least three sites at which commercial nuclear powerplants are under construction. The Commission shall select at least one site at which quality assurance and quality control programs have operated satisfactorily, and at least two sites with remedial programs underway at which major construction, quality assurance, or quality control deficiencies (or any combination thereof) have been identified in the past. The Commission may require any changes in existing quality assurance and quality control organizations and relationships that may be necessary at the selected sites to implement the pilot program.

(d) Not later than fifteen months after the date of the enactment of this Act, the Commission shall complete the study required under subsection (b) and submit to the United States Senate and House of Representatives a report setting forth the results of the study. The report shall include a brief summary of the information received from the public and from other persons referred to in subsection (b) and a statement of the Commission's response to the significant comments received. The report shall also set forth an analysis of the results of the pilot program required under subsection (c). The report shall be accompanied by the recommendations of the Commission, including any legislative recommendations, and a description of any administrative actions that the Commission has undertaken or intends to undertake, for improving quality assurance and quality control programs that are applicable during the construction of nuclear powerplants.

LIMITATION ON USE OF SPECIAL NUCLEAR MATERIAL

SEC. 14. Section 57 of the Atomic Energy Act of 1954 (42 U.S.C. 2077) is amended by adding at the end thereof the following new subsection:

"e. Special nuclear material, as defined in section 11, produced in facilities licensed under section 103 or 104 may not be transferred, reprocessed, used, or otherwise made available by any instrumentality of the United States or any other person for nuclear explosive purposes.".

RESIDENT INSPECTORS

SEC. 15. Of the amounts authorized to be appropriated under section 1, the Nuclear Regulatory Commission shall use such sums as may be necessary to conduct a study of the financial hardships incurred by resident inspectors as a result of (1) regulations of the Commission requiring resident inspectors to relocate periodically from one duty station to another; and (2) the requirements of the Commission respecting the domicile of resident inspectors and

ADDRESS ALL COMMUNICATIONS
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CALIFORNIA STATE BUILDING
SAN FRANCISCO, CALIFORNIA 94102
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Public Utilities Commission

STATE OF CALIFORNIA

June 19, 1984

FILE No.

U.S. Nuclear Regulatory Commission
Division of Rules and Records
Freedom of Information and Privacy Office
Washington, D.C. 20555

FREEDOM OF INFORMATION ACT REQUEST
FOIA-84-516
Rec'd 6-25-84

To Whom It May Concern:

The California Public Utilities Commission is currently engaged in a review of the costs incurred in constructing the Diablo Canyon Nuclear Power Plant. One of the areas under study is the utility's quality assurance program.

A recent NRC study entitled "Assurance of Quality In Nuclear Construction Projects", published as NUREG 1055, contains a useful discussion of quality assurance programs at seven different nuclear plants under construction. The study contains relatively little documentary support, however, for the conclusions reached. I understand that the study was based largely upon separate "case studies" of the seven plants which may contain somewhat more detailed documentation and analysis.

We have obtained copies of case studies A, B, and C, but have not been able to obtain any of the remaining case studies. Neither have we been able to obtain any of the documentation or analysis supporting the conclusions reached in the "case studies". This information would be of definite assistance to us in thoroughly and fairly evaluating the Diablo Canyon Project. Accordingly, we request that the following information be provided to us under the Freedom Of Information Act, 5 U.S.C. §552:

a) All "case studies", or analyses of quality assurance at nuclear power plant construction projects by whatever designation, used, reviewed, or relied upon in preparing the study "Assurance of Quality In Nuclear Construction Projects".

b) All statements, comments, interview notes, minutes, transcripts or tapes used, reviewed, or relied upon in preparing either the "case studies" or the study "Assurance of Quality In Nuclear Construction Projects".

c) All documents, data, studies, reports, analyses, audits, records, publications, decisions, letters, orders, photographs, drawings, agreements, contracts, notes, memoranda, and drafts used, reviewed, or relied upon in preparing either the "case studies" or the study "Assurance of Quality In Nuclear Construction Projects".

If for any reason you are unable to promptly comply with some part of this request, please comply to the extent possible and indicate which item or items you are unable to promptly comply with. If you are unable to comply with any part of this request due to an alleged exclusion from the provisions of the Freedom Of Information Act, please identify the alleged exclusion, and the item to which the exclusion is alleged to apply. Please identify the item by providing, where applicable, its date, author, originator, general subject matter, title, present location, custodian, recipients, and the use to which it was put in preparing either the "case studies" or the study, "Assurance of Quality In Nuclear Construction Projects".

Thank you very much for your cooperation. Should you have any questions regarding this request please call either myself at (415) 557-2381 or Mr. Mark Fogelman at (415) 557-2563.

Very truly yours,

Edward W. O'Neill

EWO:lz

cc: M. Fogelman