

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of

PACIFIC GAS AND ELECTRIC COMPANY

(Diablo Canyon Nuclear Power
Plant, Unit Nos. 1 and 2)

)
)
) Docket Nos. 50-275 O.L.
) 50-323 O.L.
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)
)

AFFIDAVIT OF DALE G. BRIDENBAUGH
AND RICHARD B. HUBBARD

DALE G. BRIDENBAUGH and RICHARD B. HUBBARD, being first
duly sworn, state under oath as follows:

1. In preparing this affidavit, affiant Richard B. Hubbard reviewed PG&E's proposed special low power test program as set forth in the low power license application and as further described in PG&E's safety analysis report provided to the NRC Staff on February 6, 1981. He also attended, as a consultant to Governor Brown's counsel, all sessions of the recent low power test proceedings which were held in San Luis Obispo from May 19 to May 22, 1981. Thus, he is familiar with the duration of the low power tests as postulated by PG&E and Staff witnesses. Further, he has reviewed the actual schedule for fuel loading, initial criticality and zero power testing, and low power testing of large PWR's which have occurred in the

post-TMI period, particularly North Anna-2, Salem-2, and Sequoyah-1. In addition, on July 10, 1981, Hubbard accompanied Commissioner Gilinsky on his tour of the Diablo Canyon facility. A recent statement of Hubbard's professional qualifications and experience is set forth in Exhibit 16 of "Opposition of Governor Edmund G. Brown, Jr. to the NRC Staff and Pacific Gas and Electric Company Motions for Reconsideration and Summary Disposition," dated April 24, 1981.

2. Affiant Dale G. Bridenbaugh is a Professional Nuclear Engineer, technical consultant, co-founder and president of MHB Technical Associates, technical consultants on energy and environment, with offices at 1723 Hamilton Avenue, Suite K, San Jose, California. He has participated as an expert witness in licensing proceedings before the U.S. Nuclear Regulatory Commission (NRC); has served as a consultant to the NRC; has testified at the request of the Advisory Committee on Reactor Safeguards; has appeared before various committees of the U.S. Congress and testified in various state licensing and regulatory proceedings. Additional details of Bridenbaugh's experience and qualifications are set forth in Attachment A, which is attached hereto.

3. The purpose of this affidavit is twofold: First, to estimate the elapsed time which is likely to be required after issuance of a low power operating license to load fuel and to

complete the special low power tests at or below 5% of Rated Thermal Power as Pacific Gas and Electric Company has proposed for Diablo Canyon Unit 1; second, to identify the technical difficulties and increased costs associated with modifying the structures, systems, and components of the plant should further modifications be required after fuel has been loaded and operation commenced. The results of our review are summarized in the following paragraphs.

4. During Commissioner Gilinsky's tour of the Diablo Canyon facility, both NRC and PB&E personnel emphasized PG&E's readiness to load fuel. The necessary fuel is presently onsite in a building immediately adjacent to the Containment Building. Further, due to the duration of the licensing process, PG&E has had sufficient time to conduct, and in some cases reconduct, its pre-operational tests as set forth in Section 14.1 of the Final Safety Analysis Report. Thus, we conclude that Diablo Canyon Unit 1 equipment is in an advanced state of readiness to load fuel, and that virtually all preliminary testing (see FSAR Table 14.1-1) possible prior to fuel loading has been completed.^{*/} Further, we conclude that PG&E should be able to promptly load fuel once such authorization is received from the NRC.

5. We estimate that the fuel loading task should be completed in less than one week elapsed time. For example, at

^{*/} A recent Nucleonics Week article indicates that all steps prior to fuel load will be completed by approximately August 12, 1981 (p. 4, Nucleonics Week, July 23, 1981). In general, all pre-operational testing will be completed before fuel loading (FSAR, p. 14.1-8).

Salem-2, a Westinghouse-designed PWR similar in design and rating to Diablo Canyon, fuel loading began on May 23, 1980 and was completed on May 27, 1980. More specifically, a PG&E spokesman recently estimated that preparation and fuel loading of Diablo Canyon Unit 1 could be completed in about one month after issuance of a low power license (see July 18, 1981 article from the San Francisco Chronicle, which is attached hereto as Attachment B). Therefore, we conclude that it is reasonable to expect that fuel loading of Diablo Canyon could be completed in one to two weeks and certainly no more than 30 days after the issuance of a low power test license.*

6. The next phase of startup and testing includes initial criticality and low power testing. FSAR Table 14.1-2 summarizes the normal tests which will be performed. In addition, the scope and duration of the special low power tests were described in detail during the recent low power proceedings in San Luis Obispo. The Board, in the partial Initial Decision dated July 17, 1981, noted at page 24, paragraph 61, that PG&E has proposed a series of eight special low power tests. The proposed tests would probably last for no more than one month and in actuality, as cited by the Board, would perhaps take only about eighteen days (Tr. 10,726-10,728). Other references to the "relatively few days" encompassed by the proposed low power test

*/ It has been reported that PG&E expects fuel loading to take no longer than two weeks (p. 4, Nucleonics Week, July 23, 1981).

program are set forth in the recent decision by the Board at page 25 (paragraph 65), page 32 (paragraph 82), and page 33 (paragraph 83). Therefore, we believe that it is reasonable to expect that, absent major problems, initial criticality and low power testing can be conducted in an elapsed time of less than 30 days. Thus, assuming a 30-day period to complete fuel loading (which we believe to be very conservative), the entire fuel load and testing program can easily be completed in no more than 60 days.

7. The reasonableness of a 60-day cycle from license issuance to completion of the special low power tests was further confirmed during Commissioner Gilinsky's tour of the Diablo Canyon facility. In response to a question, the Diablo Canyon Plant Manager, Robert C. Thornberry, stated in Hubbard's presence that PG&E's current schedules forecast that fuel loading, zero power testing, and the special low power test program will be completed approximately 58 days after receipt of a low power license. Mr. Thornberry added that the schedule might need to be increased if major unanticipated problems were encountered during the test program.

8. In order to be conservative, we believe it may be appropriate to add 15 to 30 days to the fuel loading and low power testing schedule to allow time for resolution of any routine unanticipated events. In reaching the preceding conclusions,

we have assumed a routine startup during which no major accident, such as a seismically induced LOCA, occurs. Thus, we are not stating any conclusion on either the risk potential during low power testing or the probability of accidents occurring during such testing. Our sole purpose is to express the view that absent unforeseen events, the PG&E startup and low power testing program should require no more than 30 days to complete after fuel is loaded.

9. The post-TMI experience and the current schedules for startup testing lend further support to the preceding conclusions. The first plant granted an operating license in the post-TMI period was Sequoyah-1, which received a low power license on February 29, 1980. Fuel loading commenced on March 2, 1980 and was completed on March 8, 1980. Two major problems thereafter seriously delayed the initial criticality of Sequoyah-1. First, in response to I&E Bull. 79-14, TVA required approximately 60 days to inspect and rework pipe hangers and supports. Second, in parallel with the hanger reinspection, TVA conducted a base line inspection of the turbine blades. The turbine reinspection required 4-5 weeks of elapsed time. Routine maintenance problems and pre-operational testing resulted in further delays. Initial criticality was achieved on July 5, 1980. Following zero power testing, the special low power testing program began on July 12 and was completed on

July 18, 1980.

10. The second plant to receive a post-TMI license to load fuel and conduct special low power tests was North Anna-2. The authorization to load fuel was issued on April 11, 1980 and the low power testing was completed by July 1, 1980, an elapsed time of less than 80 days. The Salem-2 low power license was issued on April 18, 1980. As set forth in paragraph 5, fuel loading was completed on May 27, 1980. Initial criticality was achieved on August 2, 1980 and the special low power test program was completed on August 29, 1980. The two months delay between fuel loading and initial criticality was largely due to the need to conduct routine pre-operational maintenance testing and surveillance testing (such as valve operability) which could have been accomplished prior to fuel load. As presented in paragraph 4, we believe that these pre-operational tests will be accomplished at Diablo Canyon prior to mid-August, 1981. Thus, we conclude that the actual duration of the Salem-2, North Anna-2, and Sequoyah-1 fuel loading and low power testing programs is not inconsistent with our conclusions for Diablo Canyon as set forth herein.

11. Table I of the testimony of Applicant's witness, Dr. Brunot, in the low power test proceedings sets forth the fission product inventories which will be produced in the core during the proposed Diablo Canyon low power test program. For

example, the inventory of iodine-131, one of the radionuclides which is a significant contributor to the dominant exposure modes for accidents requiring off-site emergency preparedness, is estimated by Dr. Brunot as 4,500,000 curies (approximately 1/20th the full power value as set forth in FSAR Table 11.1-4). In contrast, for the design basis LOCA addressed by the Applicant in the FSAR for full power operation, only 192 curies of iodine-131 were postulated to be released to the environment in the first two hours (FSAR Table 15.5-12). Therefore, because of the relatively rapid buildup (half-life of hours to days) of the radioactive isotopes listed in Table 3 of NUREG-0654^{*/} which dominate prompt health consequences resulting from postulated accidental releases, we conclude that even at 5% power the fission products available for release pose a significant potential hazard.

12. Operation at low power will not only cause a buildup of fission products within the reactor core, making it inaccessible for contact repair and/or modification but will also cause a spread of radioactive contaminants throughout the primary portion of the steam supply system. It will also contaminate certain auxiliary systems such as the Chemical and Volume Control System, Equipment and Floor Drainage Systems, and the Liquid Radioactive Waste System. If fuel failures and/or steam generator tube failures or leaks are experienced, a large number

^{*/} NUREG-0654, Rev. 1 (FEMA-REP-1), "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November, 1980.

of other systems, including the turbine, condensate, and other components within the Steam and Power Conversion System could become contaminated. Contamination and irradiation of such equipment greatly increases the care required and the time and cost of future modifications that could be required at the plant. It is, therefore, important that power operation, including low power testing, not be permitted until reviews and evaluations that could lead to required plant modifications have been completed.

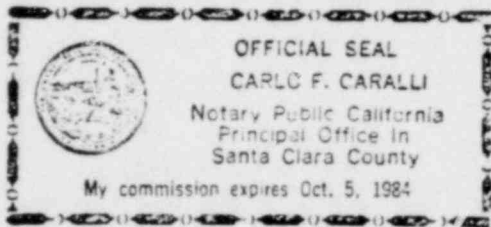
13. Based on the foregoing, we conclude that fuel loading, initial criticality, and low power testing, including the special low power tests, can be accomplished at Diablo Canyon Unit 1 within approximately 60 days, with an outside maximum elapsed time of approximately 90 days, after issuance of the low power operating license. We further conclude that the fuel loading portion of the startup schedule should be completed within less than 30 days following issuance of the low power license. Finally, we conclude that operation at low power will contaminate some of the facility's components and systems. This unnecessary commitment of resources creates technical difficulties and increased costs associated with modifying the reactor, should further modification be required after fuel has been loaded and power operation commenced.

I have read the foregoing and swear that it is true and accurate to the best of my knowledge.

Dale G. Bridenbaugh
DALE G. BRIDENBAUGH

Richard B. Hubbard
RICHARD B. HUBBARD

Subscribed and sworn to before me this 11th day of August, 1981.



Carl F. Caralli
Notary Public

My commission expires: 10/5/84

PROFESSIONAL QUALIFICATIONS OF DALE G. BRIDENBAUGH

DALE G. BRIDENBAUGH
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Suite K
San Jose, CA 95125
(408) 266-2716

EXPERIENCE:

1976 - PRESENT

President - MHB Technical Associates, San Jose, California.

Co-founder and partner of technical consulting firm. Specialists in energy consulting to governmental and other groups interested in evaluation of nuclear plant safety and licensing. Consultant in this capacity to state agencies in California, New York, Illinois, New Jersey, Pennsylvania, Oklahoma and Minnesota and to the Norwegian Nuclear Power Committee, Swedish Nuclear Inspectorate, and various other organizations and environmental groups. Performed extensive safety analysis for Swedish Energy Commission and contributed to the Union of Concerned Scientist's Review of WASH-1400. Consultant to the U.S. NRC - LWR Safety Improvement Program, performed Cost Analysis of Spent Fuel Disposal for the Natural Resources Defense Council, and contributed to the Department of Energy LWR Safety Improvement Program for Sandia Laboratories. Served as expert witness in NRC and state utility commission hearings.

1976 - (FEBRUARY - AUGUST)

Consultant, Project Survival, Palo Alto, California.

Volunteer work on Nuclear Safeguards Initiative campaigns in California, Oregon, Washington, Arizona, and Colorado. Numerous presentations on nuclear power and alternative energy options to civic, government, and college groups. Also resource person for public service presentations on radio and television.

1973 - 1976

Manager, Performance Evaluation and Improvement, General Electric Company - Nuclear Energy Division, San Jose, California.

Managed seventeen technical and seven clerical personnel with responsibility for establishment and management of systems to monitor and measure Boiling Water Reactor equipment and system operational performance. Integrated General Electric resources in customer plant modifications, coordinated correction of causes of forced outages and of efforts to improve reliability and performance of BWR systems.

1973 - 1976 (Contd)

Responsible for development of Division Master Performance Improvement Plan as well as for numerous Staff special assignments on long-range studies. Was on special assignment for the management of two different ad hoc projects formed to resolve unique technical problems.

1972 - 1973

Manager, Product Service, General Electric Company - Nuclear Energy Division, San Jose, California.

Managed group of twenty-one technical and four clerical personnel. Prime responsibility was to direct interface and liaison personnel involved in corrective actions required under contract warranties. Also in charge of refueling and service planning, performance analysis, and service communication functions supporting all completed commercial nuclear power reactors supplied by General Electric, both domestic and overseas (Spain, Germany, Italy, Japan, India, and Switzerland).

1968 - 1972

Manager, Product Service, General Electric Company - Nuclear Energy Division, San Jose, California.

Managed sixteen technical and six clerical personnel with the responsibility for all customer contact, planning and execution of work required after the customer acceptance of department-supplied plants and/or equipment. This included quotation, sale and delivery of spare and renewal parts. Sales volume of parts increased from \$1,000,000 in 1968 to over \$3,000,000 in 1972.

1966 - 1968

Manager, Complaint and Warranty Service, General Electric Company - Nuclear Energy Division, San Jose, California.

Managed group of six persons with the responsibility for customer contacts, planning and execution of work required after customer acceptance of department-supplied plants and/or equipment--both domestic and overseas.

1963 - 1966

Field Engineering Supervisor, General Electric Company, Installation and Service Engineering Department, Los Angeles, California.

Supervised approximately eight field representatives with responsibility for General Electric steam and gas turbine installation and maintenance work in Southern California, Arizona, and Southern Nevada. During this period was responsible for the installation of eight different central station steam turbine generator units, plus much maintenance activity. Work included customer contact, preparation of quotations, and contract negotiations.

1956 - 1963

Field Engineer, General Electric Company, Installation and Service Engineering Department, Chicago, Illinois.

Supervised installation and maintenance of steam turbines of all sizes. Supervised crews of from ten to more than one hundred men, depending on the job. Worked primarily with large utilities but had significant work with steel, petroleum and other process industries. Had four years of experience at construction, startup, trouble-shooting and refueling of the first large-scale commercial nuclear power unit.

1955 - 1956

Engineering Training Program, General Electric Company, Erie, Pennsylvania, and Schenectady, New York.

Training assignments in plant facilities design and in steam turbine testing at two General Electric Factory locations.

1953 - 1955

United States Army - Ordnance School, Aberdeen, Maryland.

Instructor - Heavy Artillery Repair. Taught classroom and shop disassembly of artillery pieces.

1953

Engineering Training Program, General Electric Company, Evendale, Ohio.

Training assignment with Aircraft Gas Turbine Department.

EDUCATION & AFFILIATIONS:

BSME - 1953, South Dakota School of Mines and Technology, Rapid City, South Dakota, Upper $\frac{1}{2}$ of class.

Professional Nuclear Engineer - California. Certificate No. 0973.

Member - American Nuclear Society.

Various Company Training Courses during career including Professional Business Management, Kepner Tregoe Decision Making, Effective Presentation, and numerous technical seminars.

HONORS & AWARDS:

Sigma Tau - Honorary Engineering Fraternity.

General Managers Award, General Electric Company.

PERSONAL DATA:

Born November 20, 1931, Miller, South Dakota.

Married, three children

6'2", 190 lbs., health - excellent

Honorable discharge from United States Army

Hobbies: Skiing, hiking, work with Cub and Boy Scout Groups.

PUBLICATIONS & TESTIMONY:

1. Operating and Maintenance Experience, presented at Twelfth Annual Seminar for Electric Utility Executives, Pebble Beach, California, October 1972, published in General Electric NEDC-10697, December 1972.
2. Maintenance and In-Service Inspection, presented at IAEA Symposium on Experience From Operating and Fueling of Nuclear Power Plants, Bridenbaugh, Lloyd & Turner, Vienna, Austria, October, 1973.
3. Operating and Maintenance Experience, presented at Thirteenth Annual Seminar for Electric Utility Executives, Pebble Beach, California, November, 1973, published in General Electric NEDO-20222, January, 1974.
4. Improving Plant Availability, presented at Thirteenth Annual Seminar for Electric Utility Executives, Pebble Beach, California, November 1973, published in General Electric NEDO-20222, January, 1974.
5. Application of Plant Outage Experience to Improve Plant Performance, Bridenbaugh and Burdsall, American Power Conference, Chicago, Illinois, April 14, 1974.
6. Nuclear Valve Testing Cuts Cost, Time, Electrical World, October, 15, 1974.
7. The Risks of Nuclear Power Reactors: A Review of the NRC Reactor Safety Study WASH-1400, Kendall, Hubbard, Minor & Bridenbaugh, et al, for the Union of Concerned Scientists, August, 1977.

8. Swedish Reactor Safety Study: Barsebäck Risk Assessment, MHB Technical Associates, January, 1978. (Published by the Swedish Department of Industry as Document DsI 1978:1)
9. Testimony of D.G. Bridenbaugh, R.B. Hubbard, G.C. Minor to the California State Assembly Committee on Resources, Land Use, and Energy, March 8, 1976.
10. Testimony of D.G. Bridenbaugh, R.B. Hubbard, and G.C. Minor before the United States Congress, Joint Committee on Atomic Energy, February 18, 1976, Washington, DC (Published by the Union of Concerned Scientists, Cambridge, Massachusetts.)
11. Testimony by D.G. Bridenbaugh before the California Energy Commission, entitled, Initiation of Catastrophic Accidents at Diablo Canyon, Hearings on Emergency Planning, Avila Beach, California, November 4, 1976.
12. Testimony by D.G. Bridenbaugh before the U.S. Nuclear Regulatory Commission, subject: Diablo Canyon Nuclear Plant Performance, Atomic Safety and Licensing Board Hearings, December, 1976.
13. Testimony by D.G. Bridenbaugh before the California Energy Commission, subject: Interim Spent Fuel Storage Considerations, March 10, 1977.
14. Testimony by D.G. Bridenbaugh before the New York State Public Service Commission Siting Board Hearings concerning the Jamesport Nuclear Power Station, subject: Effect of Technical and Safety Deficiencies on Nuclear Plant Cost and Reliability, April, 1977.
15. Testimony by D.G. Bridenbaugh before the California State Energy Commission, subject: Decommissioning of Pressurized Water Reactors, Sundersert Nuclear Plant Hearings, June 9, 1977.
16. Testimony by D.G. Bridenbaugh before the California State Energy Commission, subject: Economic Relationships of Decommissioning, Sundersert Nuclear Plant, for the Natural Resources Defense Council, July 15, 1977.
17. Testimony by D.G. Bridenbaugh before the Vermont State Board of Health, subject: Operation of Vermont Yankee Nuclear Plant and Its Impact on Public Health and Safety, October 6, 1977.
18. Testimony by D.G. Bridenbaugh before the U.S. Nuclear Regulatory Commission, Atomic Safety and Licensing Board, subject: Deficiencies in Safety Evaluation of Non-Seismic Issues, Lack of a Definitive Finding of Safety, Diablo Canyon Nuclear Units October 18, 1977, Avila Beach, California.

19. Testimony by D.G. Bridenbaugh before the Norwegian Commission on Nuclear Power, subject: Reactor Safety/Risk, October 26, 1977.
20. Testimony by D.G. Bridenbaugh before the Louisiana State Legislature Committee on Natural Resources, subject: Nuclear Power Plant Deficiencies Impacting on Safety & Reliability, Baton Rouge, Louisiana, February 13, 1978.
21. Spent Fuel Disposal Costs, report prepared by D.G. Bridenbaugh for the Natural Resources Defense Council (NRDC), August 31, 1978.
22. Testimony by D.G. Bridenbaugh, G.C. Minor, and R.B. Hubbard before the Atomic Safety and Licensing Board, in the matter of the Black Fox Nuclear Power Station Construction Permit Hearings, September 25, 1978, Tulsa, Oklahoma.
23. Testimony of D.G. Bridenbaugh and R.B. Hubbard before the Louisiana Public Service Commission, Nuclear Plant and Power Generation Costs, November 19, 1978, Baton Rouge, Louisiana.
24. Testimony by D.G. Bridenbaugh before the City Council and Electric Utility Commission of Austin, Texas, Design, Construction, and Operating Experience of Nuclear Generating Facilities, December 5, 1978, Austin, Texas.
25. Testimony by D.G. Bridenbaugh for the Commonwealth of Massachusetts, Department of Public Utilities, Impact of Unresolved Safety Issues, Generic Deficiencies, and Three Mile Island-Initiated Modifications on Power Generation Cost at the Proposed Pilgrim-2 Nuclear Plant, June 8, 1979.
26. Improving the Safety of LWR Power Plants, MHB Technical Associates, prepared for U.S. Dept. of Energy, Sandia Laboratories, September 28, 1979.
27. BWR Pipe and Nozzle Cracks, MHB Technical Associates, for the Swedish Nuclear Power Inspectorate (SKI), October, 1979.
28. Testimony of D.G. Bridenbaugh and G.C. Minor before the Atomic Safety and Licensing Board, in the matter of Sacramento Municipal Utility District, Rancho Seco Nuclear Generating Station following TMI-2 accident, subject: Operator Training and Human Factors Engineering, for the California Energy Commission, February 11, 1980.
29. Italian Reactor Safety Study: Caorso Risk Assessment, MHB Technical Associates, for Friends of the Earth, Italy, March, 1980.
30. Decontamination of Krypton-85 from Three Mile Island Nuclear Plant, H. Kendall, R. Pollard, & D.G. Bridenbaugh, et al, The Union of Concerned Scientists, delivered to the Governor of Pennsylvania, May 15, 1980.

31. Testimony by D.G. Bridenbaugh before the New Jersey Board of Public Utilities, on behalf of New Jersey Public Advocate's Office, Division of Rate Counsel, Analysis of 1979 Salem-1 Refueling Outage, August, 1980.
32. Position Statement, Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Joint Cross-Statement of Position of the New England Coalition on Nuclear Pollution and the Natural Resources Defense Council, September, 1980.
33. Testimony by D.G. Bridenbaugh and Gregory C. Minor, before the New York State Public Service Commission, In the Matter of Long Island Lighting Company Temporary Rate Case, prepared for the Shoreham Opponents Coalition, September 22, 1980, Shoreham Nuclear Plant Construction Schedule.
34. Supplemental Testimony by D.G. Bridenbaugh before the New Jersey Board of Public Utilities, on behalf of New Jersey Public Advocate's Office, Division of Rate Counsel, Analysis of 1979 Salem-1 Refueling Outage, December, 1980.

New Flap Over Security

SF *Journal*
7/18/81 (p. 2)

Diablo Licensing Go-Ahead

Washington

The Nuclear Regulatory Commission's atomic safety and licensing board yesterday recommended that a low-power testing license be issued to Pacific Gas and Electric Co.'s new Diablo Canyon nuclear plant.

The action, which must be reviewed by the Nuclear Regulatory Commission before any license can be issued, came as fresh controversy erupted in the plant's long battle for a license.

Clare Miles, a commission representative, confirmed that NRC officials conducting a test

of the plant's physical security this week were able to sneak a simulated weapon, packed in Lucite, past plant detection equipment.

"We consider that to be just another significant impediment in the licensing of that ill-fated plant," said Harvey Rosenfield of Ralph Nader's Congress Watch group.

Miles said the commission could review the licensing recommendation within 10 days, but that it would not begin until a licensing appeals board reached a decision on the plant's physical security plan. Rosenfield said the breach of security detected on Thursday would

probably be ignored because the appeals board has already closed its record.

A PG&E spokesman, Dick Davin, played down the ability of NRC inspectors to get the simulated weapon inside the plant perimeter. "It was just a toy gun," he said. "It was a training exercise. It was a guard's first day at work, and he didn't recognize it. He will now." Davin said PG&E security managers were aware of the test while it was under way.

If the low power license is approved quickly, Davin said, loading of the 93 tons of fuel could be finished in about one month. A full-power license, which PG&E hopes for in November, might permit the plant to operate a full capacity early next year, he said.

A low-power license allows loading of nuclear fuel in the reactor and its operation at 5 percent of full capacity. This allows testing of the facility in advance of issuance of a full-power license.

Nuclear opponents have fought long and hard to block the licensing of Diablo Canyon, partly because they think it is too close to an earthquake fault.

The \$2 billion Diablo Canyon plant, near San Luis Obispo, has sat unused as the battle raged over the past several years. The utility first received a construction permit for one of the twin reactors at the plant in 1978.

A.P. & U.P.