

ORIGINALDecision No. 67180

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of)
 SOUTHERN CALIFORNIA EDISON COMPANY)
 and SAN DIEGO GAS & ELECTRIC COMPANY)
 for a Certificate that Present and)
 Future Public Convenience and Necessity)
 require or will require the construction)
 and operation by Applicants of a new)
 nuclear electric generating station at)
 Camp Pendleton, California, together)
 with the transmission lines and other)
 appurtenances to be used in connection)
 with said station.)

Application No. 45231
 (Filed March 11, 1963)

Rollin E. Woodbury, Harry W. Sturges, Jr., and David N. Barry, III, for Southern California Edison Company, applicant.
Chickering & Gregory by Sherman Chickering and C. Hayden Ames, and Stanley Jewell, for San Diego Gas & Electric Company, applicant.
William W. Evers, for California Manufacturers Association; M. B. Andrew and K. J. Hedstrom for William E. Warne, Director, California Department of Water Resources; Alan M. Firestone, by Robert S. Teaze, for City of San Diego; Robert B. Hatch, for California Department of Parks and Recreation; Harold Bissell, for California Department of Fish and Game; Alexander Grendon, for California Office of Atomic Energy Development and Radiation Protection; and William L. Knecht, for California Farm Bureau Federation, interested parties.
A. E. Gaede, for association being formed and Margaret B. Porter, in propria persona, protestants.
Franklin G. Campbell and Melvin E. Mezek, for the Commission staff.

INTERIM OPINIONApplicant's Request

Southern California Edison Company and San Diego Gas & Electric Company jointly request a certificate of public convenience and necessity to construct

and operate a nuclear electric generating station at Camp Pendleton in San Diego County together with transmission lines and other appurtenances. The plant is to be known as the San Onofre Nuclear Generating Station.

Public Hearing

Public hearing was held before Commissioner Bennett and Examiner Patterson, at San Clemente on June 12 and 13, 1963, and at Los Angeles on July 17 and 18, and August 28, 1963, and the matter was submitted on August 28, 1963.

Applicants presented evidence through 12 witnesses and 24 exhibits in support of their application. Three witnesses representing civic and trade council groups testified in favor of the application. Opposition to the proposal was presented by statements made by a housewife residing in San Diego, and by a resident of San Clemente who purported to represent an organization which was being formed. The latter individual also sponsored the testimony of two scientists who expressed concern as to radiation hazards which would ensue in the unlikely event of a major nuclear accident at the plant. The Commission staff presented five exhibits and testimony of one witness.

Proposed Generating Station

The plant, as proposed, would be located on the ocean front on an 84-acre site in the northern portion of the Camp Joseph H. Pendleton Naval Reservation in San Diego County, about 2-1/2 miles south of the San Clemente city limits.

Public Law 88-82 (77 Stat. 115) was enacted by the United States Congress on July 30, 1963, enabling the Secretary of the Navy to grant easements in Camp Pendleton to the applicants necessary for construction, operation, maintenance, and use of the generating station and appurtenances.

The plant is expected to have a gross electrical output of 395,000 kilowatts with a net output to the utility systems of 375,000 kilowatts. The reactor system will be of the pressurized water, closed cycle, forced circulation type, fueled with slightly enriched uranium dioxide contained in a metallic cladding. Light water will be circulated in the reactor to function as a coolant and moderator. Steam from the boiler at approximately 500° Fahrenheit, and 650 pounds per square inch pressure will be introduced to the turbine at a flow rate of 4,750,000 pounds per hour. The turbine will be a tandem compound unit rotating at 1800 rpm and directly connected to a hydrogen cooled generator. Ocean water will be circulated in the condenser cooling system.

The unit is designed as an outdoor type except for the portions of the nuclear steam supply system which will be located within a steel containment sphere. Supervision and control of the reactor will be centered in a single control room.

Electric energy produced in the plant will be transmitted to the Southern California Edison Company system over two new 220 kv transmission lines, one terminating at the Villa Park substation in Orange County, and the other at the Chino substation in San Bernardino County. Energy for the San Diego Gas & Electric Company system will be transmitted over the existing 138 kv circuit to the Capistrano substation, or over a new twin-circuit 138 kv transmission line terminating at the San Luis Rey substation.

The size of the site is stated to be adequate for expansion of the plant, through installation of additional units, to a total rating of about 2,000,000 kilowatts.

Edison-San Diego Agreement

The basis upon which Southern California Edison Company (Edison) and San Diego Gas & Electric Company (San Diego) will participate in the procurement and operation of the plant is covered by the Edison-San Diego Agreement dated March 8, 1963, Exhibit 21. Under this agreement, Edison will own an undivided 80 percent interest, and San Diego will own an undivided 20 percent interest in the plant except that Edison and San Diego will own their respective transmission line easements, transmission lines, and switchyard and substation facilities. The agreement provides that on or before June 30, 1965, Edison and San Diego shall enter into an operating agreement which will contain the terms and conditions upon which the station will be operated, used, and maintained, and the method of sharing the costs thereof. It is specified that said operating agreement will provide that Edison will be fully responsible for the operation and maintenance of the station and will furnish all manpower required for the operation and maintenance of the station, and that Edison and San Diego will receive 80 percent and 20 percent, respectively, of the benefits of operation of the station, and will bear 80 percent and 20 percent, respectively, of the costs and other burdens and responsibilities arising out of the ownership and operation of the station. Under the agreement, Edison is appointed San Diego's agent to perform all the obligations specified thereunder.

Contractors

The principal contractors for design and construction are Westinghouse Electric Corporation which will supply the reactor plant equipment and the conventional steam electric apparatus, and be responsible for nuclear design; and Bechtel

Corporation which will serve as the engineer-constructor of the plant. The agreement between Edison and these contractors is covered by a contract dated January 11, 1963, Exhibit 22.

The plant is to be constructed under the Atomic Energy Commission (AEC) Power Demonstration Program, which provides certain inducements to utilities and manufacturers. The basic arrangements and commitments which will exist between AEC, the applicants, and the contractors on the San Onofre plant are set forth in Exhibit 19.

Safety

In the opinions of the experts who testified for applicants, the proposed plant will be safely and reliably constructed and operated from the standpoint of health and safety of the public. These opinions were based essentially on testimony that the station is being designed in accordance with proven reactor technology and represents a continuation of the experience, skills, and technology of similar existing power reactors the safety record of which has been outstanding. The pressurized water type of reactor is presently used in 28 of the United States Navy's commissioned submarines, in 4 surface vessels, and in one merchant ship. In regard to land-based nuclear plants, there are 3 pressurized water reactors of large commercial size now in operation, which are the Shippingport 60 megawatt reactor which went into operation in Pennsylvania in 1957, and which is now being modified for an output of 150 megawatts; the Yankee Electric Plant in New England which first operated in 1960, and which is now licensed for an output of 170 megawatts; and the Indian Point Plant in New York which went into service in August, 1962, and which has an output of 163 megawatts.

The design of the San Onofre plant was described as having five barriers that will serve to prevent the escape of radioactive fission products. First, the fuel pellets are densely compacted units that will retain an estimated 99 percent of the fission products. Second, the fuel will be contained in sealed metal tubes that will hold fission products that appear on the surface of the fuel. Third, the entire fuel assembly comprising the reactor core will be contained in a steel reactor vessel with a wall thickness in the order of 9-1/2 inches and the associated closed system piping and vessels will be fabricated with correspondingly thick walls. Fourth, there will be approximately 5 feet of concrete surrounding the reactor vessel and an additional 5 feet of concrete surrounding the steam generator, pumps, and piping, making a total thickness of approximately 10 feet of concrete shielding. Fifth, the entire nuclear steam supply system will be housed in a steel containment sphere, approximately 140 feet in diameter with a minimum wall thickness of approximately 1 inch, which will be capable of withstanding the pressure resulting from the release of steam from the primary coolant system in the unlikely event of a rupture of that system.

Witnesses for applicants testified that radioactive materials will be disposed of with great care and in conformity with the requirements of the AEC, the State Department of Public Health, and any other agencies which have lawful jurisdiction.

Monitoring of radiation levels will be provided in two stages. First, an internal system on the plant site, intended to detect any leak or unusual condition which might occur, and second, an environmental monitoring system which will be developed and coordinated with the various governmental agencies having jurisdiction.

It will be the objective of the second plan to insure that operation of the plant and discharge of radioactive wastes is not adversely affecting the surrounding environment.

Site Selection

According to the record, Edison made preliminary investigation of some 20 possible sites ranging from the Colorado River to the Salton Sea, and from Point Conception to Camp Pendleton. In all cases, except Camp Pendleton, transmission costs, availability of cooling water, or proximity of populated areas, excluded the sites from further detailed consideration. Applicants' witnesses testified that the San Onofre site meets the necessary criteria of size for future units, abundance of cooling water, good foundation soil conditions, adequate protective distance from populated areas, and transmission costs which are economically feasible for both utility systems.

It was stated that there are no persons residing within a one-mile radius of the reactor site and that there are approximately 50 permanent residents within a one- to two-mile radius.

Estimated Plant Costs

Based upon present price levels, cost of the generating plant to be jointly owned by applicants is estimated to be \$80,869,000, including interest during construction and all other overhead expenses chargeable to plant costs. Almost \$70,000,000 of this amount is a firm figure not subject to escalation, under Edison's aforesaid agreement with the contractors, except in the event of undue delay in obtaining an initial construction permit from the AEC. In addition to the generating plant cost, Edison estimates its switchyard facilities at the plant site, 80 miles of 220 kv transmission line, and terminal facilities will total

\$11,947,000. San Diego estimates its switchyard substation, 18 miles of 138 kv transmission line, and terminal facilities will total \$2,900,000.

The price applicants are paying the contractors under the agreement reflects government participation to the extent that the AEC has allocated up to approximately \$9,100,000 to the contractors for research and development on this type of reactor.

Estimated Operating Costs

Applicants estimate that the cost of energy produced at the nuclear plant will be 6.565 mills per kwhr over the operating life, which is assumed to be 30 years. This compares with an estimate of 6.899 mills per kwhr for energy produced from a fossil fuel unit of the same size if constructed at a similar site. Estimates were also presented of 6.289 mills per kwhr for the fossil fuel unit now under construction on Edison's system known as El Segundo Unit No. 3. Also, an estimate of 6.026 mills per kwhr was presented for energy to be produced from Edison's proposed Alamos Unit No. 5, also a fossil fuel unit. The lower cost of estimated energy for these latter two fossil fuel units was explained partly by the fact that these would be additional units at existing sites which would benefit through the sharing of common facilities used by the other units at those sites.

The calculation for the nuclear unit includes an estimated lifetime average fuel price of 2.0 mills per kwhr, under the contract by which Westinghouse will supply nuclear fuel for the plant, and reflects a waiver by the AEC of the rental charge on nuclear fuel for the first 5 years of operation. In exchange for the waiver of fuel charge and for the allocation for research

and development, applicants and the contractors involved are obligated to supply the AEC with all the technical data to be obtained during design of the plant and during the first 5 years of operation.

Load Growth and Resources

Exhibit 1 shows that Edison's peak load has increased at a rate of 9.5 percent compounded annually over the last 16 years. An estimate for the future 5-year period of a growth rate of 8.3 percent compounded annually indicates that if adequate margins between load and resources are to be maintained, Edison will need 475 megawatts of new capacity by April 1, 1966, and another 300 megawatts by December 31, 1966. Edison proposes to satisfy the 475-megawatt requirement by the addition of Unit No. 5 at its Alamitos Steam Generating Station, authority for which was granted by Decision No. 66473 dated December 17, 1963, in Application No. 45620, and the 300 megawatt requirement by Edison's portion of the nuclear plant which is being considered herein.

Exhibit 3 shows that San Diego's peak demand has increased at a rate of 9.4 percent compounded annually over the past 19 years. Increase in the future period at a rate somewhat less than 9.4 percent annually would require that to preserve adequate margins on the San Diego system at least 75 megawatts of new capacity, such as can be supplied by the nuclear plant, will be necessary to meet San Diego's estimated 1967 cold winter peak. San Diego's representative testified that prior to participating in the joint venture with Edison, San Diego was planning the addition of a 200-megawatt unit in 1966 to meet the 1966-1967 peak load. Participation in the joint project will permit San Diego to delay the 200-megawatt unit for at least a year.

In order to meet an operating date of December 31, 1966, applicants presented a construction schedule under which it is indicated that site grading and excavation should have started on October 1, 1963, and construction of the station proper should have started by April 1, 1964.

Licenses and Permits

The record shows that before applicants can commence major construction on the project they would have to secure not only the authority being sought herein but also authority to construct from the AEC. We take official notice that on February 29, 1964, the order issued by the Atomic Safety and Licensing Board^{1/} authorizing applicants, together with Westinghouse Electric Corporation and Bechtel Corporation, to construct the nuclear facility became the order of the AEC. We note that the authority issued by the AEC is in the form of a provisional construction permit which, in essence, provides that a license authorizing operation of the facility will not be issued until applicants have submitted additional information and until the AEC has found that the final design provides reasonable assurance that the health and safety of the public will not be endangered by operation of the facility.

In addition, statutory requirements of various other Federal, State, and local governmental agencies must be met.

Staff Position

The staff studies were devoted primarily to a comparison of estimated costs of constructing a similar nuclear unit at other possible locations. The most likely alternate sites selected for

^{1/} Appointed pursuant to Sec. 2.721 of the AEC rules of practice and procedure.

study by the staff were on the coast in the vicinity of the common boundary between the counties of Los Angeles and Ventura and a location adjacent to the San Diego Company's present Encina plant in San Diego County. The staff's estimates clearly show the San Onofre location to be the most favorable from the standpoint of economics, and the staff witness also testified that, based on all the parameters which should be considered in site selection, it represents the optimum choice.

California Resources Agency

The California Resources Agency participated in the hearing through witnesses for both the Department of Fish and Game and the Department of Parks and Recreation. The Department of Fish and Game is desirous of insuring that the location and operation of the proposed plant will conform to conditions which would retain or improve the public access for fishing and recreational purposes, and which would preserve fish and wild-life resources from adverse effects of construction and operation. The spokesman for that department stated that general agreement had been reached with representatives of applicants, and he expected that a final signed agreement would be soon consummated and would be supplied to the Commission for its information. He recommended that any certificate to be issued be conditioned upon execution of such an agreement.

Five specific recommendations were made on behalf of the Department of Parks and Recreation directed at preserving the natural appearance of the beach and its approaches and insuring that the public will have access to the beach to the extent that it is reasonable, under the circumstances.

Opposing Testimony

Testimony in opposition to the proposed plant was presented by an expert trained in atmospheric physics. He expressed concern as to the contamination hazard which could result from a major catastrophe such as a core melt-down of the reactor. He admitted, however, that he had made no study of the proposed San Onofre reactor nor of the safety features incorporated in the design of that unit. A professor of zoology testified in a very general way as to biological hazards of radiation but did not relate his testimony in any specific way to the particular proposed nuclear installation which is being considered herein. One of the protestants, in her closing statement, opposed the application on the basis of possible nuclear hazard and also on the basis that it would utilize a portion of the sea coast.

Findings

The record in this proceeding has demonstrated that if electric loads in Southern California continue to increase as they have in the past, applicants will not only have to develop their existing plants to the fullest capabilities, but will also have to seek new plant locations. With the larger size units which are now being installed and particularly with nuclear units, the quantities of cooling water required are so enormous that it is almost mandatory to locate new plants so that they may have easy access to ocean water for cooling purposes. Another aspect which is peculiar to nuclear units is the necessity of satisfying the siting criteria of the AEC with respect to distance of a nuclear plant from large population centers and the control of population located in the proximity of the plant. It is clear,

from the studies made by applicants and by the staff, that the San Onofre site possesses a remarkable combination of favorable circumstances. Although we are mindful of the vanishing California coast line and the desirability of preserving the beaches for public use, it is clear from the evidence and we find that the proposed San Onofre nuclear site occupies a unique position in satisfying site criteria requirements and, being located on military property, in an area which is now not generally accessible to the public.

With respect to safety, applicants presented considerable testimony as to the design features and the steps that will be taken to insure that there will be no undue hazard to the public. Under Section 768 of the Public Utilities Code, we have a grave responsibility to pass upon the safety aspects of any utility project. That is equally true with respect to nuclear reactors. The California Supreme Court stated in Northern California Association to Preserve Bodega Bay and Harbor v. Public Utilities Commission (61 A.C. 107).

"In view of subdivision (k) of [42 U.S.C.,] section 2021, respondent commission unquestionably has authority to inquire into safety questions apart from radiation hazards. Accordingly, * * * it is clear that the federal government has not pre-empted the field, at least with respect to the phase of protecting the public from hazards other than radiation hazards, and that the states' powers in determining the locations of atomic reactors are not limited to matters of zoning or similar local interests other than safety."

We find there is no evidence concerning safety in this record which would cause us to reject the proposed project as being unsafe. The testimony has revealed, however, that certain details involving nuclear design and control of radiation hazards are still under development, and will be developed in coordination with the governmental agencies having jurisdiction. In recognition of the incomplete status of these particular safety details, and of the fact that the construction permit issued by the AEC is provisional in nature, the certificate which will issue herein, will be conditioned upon applicants' securing final authority for construction and operation of the proposed project from the AEC and from all other governmental agencies as required by law.

With respect to the impact the plant will have on the environment from the standpoint of aesthetics and ecology, we take notice of the fact that the Commission has been supplied with a copy of an agreement executed on March 10, 1964 between applicants and the State of California acting through its Resources Agency on behalf of the Departments of Conservation, Water Resources, Parks and Recreation, and Fish and Game. This document reveals that general agreement has been reached between the respective parties with reference to spoil disposal, physical appearance, environmental monitoring, and oceanographic survey and surveillance programs. We find that the proposed plan will not create irreconcilable conflicts with aesthetics and ecology.

After carefully considering the entire record in this proceeding, and setting aside the matter of radiation hazards which are under AEC jurisdiction, we find that subject to the conditions contained in the following order, the construction as proposed at the San Onofre site will not result in undue hazards to the public nor will it create irreconcilable conflicts with conservation, aesthetics and ecology. We find further that the present and future public convenience and necessity will require the construction and operation by applicants of a nuclear power unit rated at approximately 395,000 kilowatts at the San Onofre site, together with transmission lines and other appurtenances, generally as described by applicants in this proceeding but subject to the limitation that the grant will be interim in form until such time as applicants establish by evidence of record that final authority for construction and operation has been secured from all governmental agencies as required by law.

The certificate hereinafter granted shall be subject to the following provision of law:

The Commission shall have no power to authorize the capitalization of this certificate of public convenience and necessity or the right to own, operate, or enjoy such certificate of public convenience and necessity in excess of the amount (exclusive of any tax or annual charge) actually paid to the State as the consideration for the issuance of such certificate of public convenience and necessity or right.

The action taken herein is for the issuance of a certificate of public convenience and necessity only and is not to be considered as indicative of amounts to be included in future proceedings for the purpose of determining just and reasonable rates.

On September 27, 1963, Margaret B. Porter filed a petition to reopen the hearing for the purpose of having the Commission secure information relative to (1) the San Diego Gas & Electric Company's proposal to link salt water conversion with the production of electric power, and (2) the proposal of the United States Department of Interior to establish a long range Pacific Southwest water plan. The San Diego Gas & Electric Company's salt water conversion proposal as described in a newspaper article attached to the petition relates only to the company's South Bay power plant and would, therefore, have no bearing on the plant being considered herein. The Department of Interior's long range water plan as described in a newspaper article attached to the petition is directed mainly towards alleviation of the Pacific Southwest area's water problems and the hydroelectric power facilities mentioned in connection therewith are either not new or are of such an indeterminate nature that they would not be of benefit to applicants in meeting the load requirements expected by December 31, 1966. The petition fails to describe any additional evidence which would be material to any of the issues in this proceeding and it will be denied.

INTERIM ORDER

IT IS ORDERED that:

1. A certificate of public convenience and necessity is granted to Southern California Edison Company and San Diego Gas & Electric Company to construct and operate a nuclear power unit rated at approximately 395,000 kilowatts at the San Onofre site together with transmission lines and other appurtenances generally as described by applicants in this proceeding, but subject to the condition that the certificate is interim in form and may be made final by further order of the Commission on the establishment by evidence in the record that final authority has been secured from the Atomic Energy Commission to construct and operate the nuclear energy plant, and that all other franchises, licenses, or permits have been secured as required by law.

2. Applicants shall file with this Commission a detailed statement of the capital costs of the project including transmission lines and other appurtenances within one year following the date on which the unit is placed in commercial operation.

3. The authorization herein granted shall expire if not exercised within four years from the date hereof.

4. The petition to reopen the proceeding is denied.

The effective date of this order shall be twenty days after the date hereof.

Dated at San Francisco, California, this 5th day of May, 1964.

Richard E. Mitchell President

George L. Thayer
Frederick B. Hiloboff
Commissioners

A-45231 mm

McKEAGE, Commissioner, specially concurring:

I concur in the decision of the Commission, but believe that language should be embodied therein which would put the applicants on notice that any deficiency of revenues resulting from the operation of the facilities, therein authorized, shall not be charged against the ratepayers of applicants. While I am aware that regulatory law authorizes this Commission to take such action, whenever the facts so justify, nevertheless, I do believe that it would be in the public interest for such an admonition to be included in the herein decision.


McKEAGE
Commissioner

May 5, 1964

BENNETT, William M., Commissioner, concurring opinion:

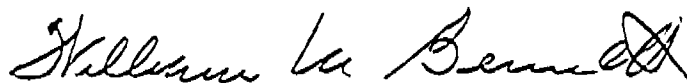
Having personally listened to all of the testimony herein and having carefully reviewed the record, I wish to spell out clearly that while I concur in the order granting the certificate herein requested, I do so with certain reservations. It is only fair to applicants that the phrase appearing on page 15 of this opinion, wherein applicants are advised that the certificate issued is not to be considered as indicative of amounts to be included in future proceedings for the purpose of determining just and reasonable rates, should be spelled out. So far as I am concerned the opinion is telling applicants that in regard to the economic feasibility of the project, applicants' estimates indicate that energy will be produced by the nuclear facility at a cost about 5 percent less than that for energy from a fossil fuel unit of the same size if constructed at a similar site, but at a somewhat higher cost than energy from fossil fuel units which are presently being installed at existing sites. Thus I may conclude that the nuclear project compares favorably with alternative production resources available to applicants at new sites. Despite this optimistic outlook, I am concerned with the fact that costs in the nuclear field are subject to many uncertainties not only because of the rapidly advancing technology but also because of the extreme care which must be exercised to insure that the public safety is not impaired. Although applicants enjoy a large measure of cost increase protection by virtue of the firm nature of the price provisions in Edison's contract with the prime contractors, I do not believe that risks beyond those contemplated by applicants' cost estimates should be thrust upon the utilities' ratepayers. I,

therefore, am putting applicants on notice that any deficiency of revenues resulting from the operation of the facilities, herein authorized, shall not be charged against applicants' ratepayers.

One body of responsible opinion maintains that nuclear plants, absent government subsidies, are not and cannot become competitive with plants fired by fossil fuels. Whether this contention proves erroneous by future economies is subject to argument. In any event it is a fact that plants such as this do operate competitively only by aid of various federal subsidies. The possibility that such subsidies may one day be withdrawn, should be protected against by the limitation I have herein imposed as to future ratemaking.

These are the reasons for placing these applicants upon notice that this is a certificate proceeding only and not a rate-making proceeding.

In my judgment it is only consistent with fairness and frankness to apprise applicants of the doubts which I have expressed herein but which I trust are the children of pessimism and will be so demonstrated in the future.


WILLIAM M. BENNETT, Commissioner

May 5, 1964