jmd

ORIGINAL

Decision No. 79403

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the matter of the application of PACIFIC GAS AND ELECTRIC COMPANY for a certificate of public convenience and necessity to construct, install, operate, maintain and use Units 9 and 10 at The Geysers Power Plant and associated transmission facilities. (Electric)	Application No. 52325 (Filed November 24, 1970)

Fred T. Searls, John C. Morrissey, and Philip A. Crane, Jr., Attorneys at Law, for Pacific Gas and Electric Company, applicant.
Martin McDonough, Attorney at Law, for Northern California Power Agency, protestant.
Vincent V. MacKenzie, Attorney at Law, and Victor R. Cassman, for the Commission staff.

O P I N I O N

Applicant's Request

In this proceeding Pacific Gas and Electric Company (PG&E) seeks an order of the Commission issuing to it a certificate under Section 1001 of the Public Utilities Code of the State of California and the Commission's General Order No. 131 declaring that the safety, health, comfort, and convenience of the public and the present and future public convenience and necessity require or will require the construction, installation, operation, and maintenance of Units 9 and 10 at The Geysers Power Plant and associated transmission facilities.

Hearings were held on February 17 and 18, 1971, at San Francisco before Examiner Gillanders and the matter submitted on March 22, 1971, upon receipt of proposed findings of fact and conclusions of law submitted by the parties as requested by the examiner.

By Decision No. 79020, dated August 10, 1971, the submission of Application No. 52325 was set aside and the matter reopened for further hearing.

On September 2, 1971, PG&E and NCPA stipulated that it was their belief that further hearing was not necessary and requested that the matter be resubmitted on the existing record. The stipulating parties requested permission to submit their respective proposed findings of fact and conclusions of law. They suggested a schedule requiring proposed findings and conclusions be filed not later than September 15, 1971, and comments thereon be filed not later than September 30, 1971.

By Commission letter dated September 8, 1971, the above requests were granted.

Subsequently, proposed findings and conclusions were submitted by Thermal Power Company, Magma Power Company, PG&E and NCPA. Comments on the proposed findings and conclusions were submitted by PG&E, NCPA and the Commission staff.

The matter is now ready for decision.

PG&E's Proposal

In this proceeding PG&E seeks a certificate for a ninth and tenth unit at The Geysers Power Plant. These units, which will be substantially identical to Units 7 and 8, are each to consist of one 55,000 kw (nominal) capacity turbine designed for steam at 100 pounds per square inch gauge and 355 degrees Fahrenheit, one 66,000 kva, 13,800 volt, hydrogen-cooled generator, one direct contact condenser with gas ejectors and circulating water pumps, and one cooling tower, together with related facilities. Transformation will consist of one 132.0 mva, 13.8 - 115/230 kv, 3 phase transformer. Each unit will be provided with a steam supply of not less than 1,000,000 pounds of steam per hour at a pressure of 100 pounds per square inch gauge and a temperature of approximately 355 degrees Fahrenheit.

The general location of Units 9 and 10 is planned to be about two miles east of the site of Units 1 and 2 on land to be provided by Union Oil Company of California (Union), Magma Power Company (Magma), and Thermal Power Company (Thermal). The exact site of the two units will be selected by and be mutually agreeable to Union, Magma, Thermal, and PG&E.

With the completion of Units 9 and 10, the total gross normal operating capacity of The Geysers Power Plant will be 412,000 kilowatts.

Commercial operation of Units 9 and 10 is scheduled for August 1, 1973, and November 1, 1973, respectively, when the units will be required to assist PG&E in meeting the system loads estimated for that year and thereby promote the safety, health, comfort, and convenience of the public. Exhibits 6, 7, and 8 introduced at the hearing show PG&E load and resource data, actual and estimated, for the years 1965-1980. A condensed design and construction schedule for the units is as follows:

Item	Unit 9	Unit 10
CPUC Certificate Effective	July 1, 1971	July 1, 1971
Major Equipment Purchases Confirmed	July 1, 1971	July 1, 1971
Start Site Grading	August 1, 1971	August 1, 1971
Start Construction	October 1, 1971	October 1, 1971
Initial Turbine Operation	June 1, 1973	September 1, 1973
Commercial Operation	August 1, 1973	November 1, 1973

The estimated cost to install Units 9 and 10, including related substation and transmission facilities, is $13,520,000. Details of this estimate are shown in Exhibit 4.

The estimated average cost of power from the units, based on various capacity factors, is as follows:

Capacity Factor (%)	Cost-Mills per kwh
60	6.23
70	5.72
80	5.33
90	5.02

The details of this estimate are shown in Exhibit 5.

Site and Environmental Factors

Units 9 and 10 will be located at a site about two miles east of Units 1 and 2 in the remote, sparsely populated, mountainous

area of northeastern Sonoma County. The nearest towns are Cloverdale and Middletown located, respectively, about 14 miles westerly and 9 miles southeasterly of the proposed site.

The specific site for a unit at The Geysers Power Plant is determined principally by the location of producing wells which are to supply required steam. The units must be located centrally among the wells in order to minimize the length of the steam supply lines. The result is to minimize steam pressure losses, minimize steam piping costs, and maximize the power potential of the steam supply.

The facilities for Units 9 and 10 will be designed to be compatible with the environment of the mountainous terrain in which they will be located. With its application, PG&E submitted an artist's rendering of how Units 7 and 8 will appear. PG&E states that Units 9 and 10 will be similar in appearance.

Safety considerations are an integral part of plant design requirements. The design of Units 9 and 10 incorporates appropriate seismic requirements, and the units will have an adequate fire fighting water supply system. A geologic examination revealed no active earthquake faults. The units are designed to operate unattended and are provided with numerous control devices to shut down the plant in the event of emergency or abnormal operating conditions. Because these units will be connected to the integrated transmission system, system reserves will provide adequate power to loads served by the units during periods when they are on forced or scheduled outage.

Unlike conventional thermal units which return condensed steam to boilers to be recycled, condensed geothermal steam must be disposed of. Some of the condensate steam is evaporated in the cooling towers. The remainder will be returned to the steam suppliers (Union, Magma, and Thermal) for disposal. The steam suppliers contemplate that this returned water, which only amounts to about one-fifth of that delivered as steam, will be injected in deep wells back into the steam zone, as is their current practice. The quality of surface

water, therefore, will not be affected by operation of Units 9 and 10. There are no domestic water wells in the area. The steam suppliers have obtained a permit for this work from the State Division of Oil and Gas.

Since no fuel is burned, the units will produce no products of combustion. Some of the non-condensable natural gases in the geothermal steam will pass through the units and out to the atmosphere. Experience with the existing Geysers' units indicates that this will present no health problem. Air quality in Sonoma County was governed by regulations issued by the California Air Resources Board. Air quality within the plant is governed by regulations of the California Division of Industrial Safety. The Bay Area Air Pollution Control District was scheduled to assume local jurisdiction in Sonoma County July 1, 1971 (§24350 Health and Safety Code).

The noise level of The Geysers plants is about the same as that of a conventional fossil-fuel-fired generating plant. In addition, the site is remote and, therefore, there will be no noise abatement problems. The California Division of Industrial Safety has regulations governing noise levels within the plant.

Because of the nature of the geothermal steam resource, the desirability of developing the resource because of its small impact on the environment, and the relatively small size of the proposed units, there are no alternative sources of power to Units 9 and 10 the costs of which properly can be compared except other geothermal units in The Geysers area. With regard to alternate sites and justification for the site selected, location of the units depends upon the location of the wells drilled to furnish steam for the units.

Transmission Line

The transmission facilities will consist of about 4.2 miles of 230 kv double circuit tower line with one circuit strung initially from the plant site to Geysers Switching Station which is to be constructed in 1973. These circuits will be operated initially at 115 kv. The line will be required prior to the summer of 1973 when it will be needed to transmit power from Unit 9.

The line will traverse privately owned, unimproved lands consisting of remote, uninhabited, mountainous terrain. Some mining activities are conducted within the general area. The lands are not adaptable for development for any other purpose than mining, limited grazing, wildlife habitat, and watershed purposes. The lands are presently zoned unclassified with no change in zoning contemplated. The route of the proposed transmission line will not conflict with the provisions of any adopted general plan of the County of Sonoma. There are no parks, recreation areas, scenic areas, settled areas, nor are there any known areas or objects of historical or archaeological significance within one mile of the proposed route of the transmission line.

A description of the proposed transmission line is as follows:

Length	4.2 miles
Right of Way Width	100 feet
Type of Conductor	61 strand aluminum cable
Size of Conductor	1113 MCM
Capacity (MVA)	
A. Initial	159 Summer normal
	193 Summer emergency
B. Proposed	318 Summer normal
	387 Summer emergency
Type of Structures	Conventional square-base, self-supporting, double circuit steel towers
Height of Structures	120 feet (average)
Span Lengths	800 to 1,400 feet

Prior to ordering material for the line, PG&E will give consideration to what additional steps, if any, might be taken further to minimize the appearance of the line.

For a line as short as the line here under review, the principal influence on the route selected is the termini of the line, in this case Units 9 and 10 and Geysers Switching Station. Other factors

include topography and potential location of future units. Some minor deviations may have to be made in the route selected by PG&E because of ground conditions not apparent during initial route selection or as a result of right-of-way negotiations. The route selected, which is shown on Exhibit 1, will have minimal effect upon the environment and is economically feasible. Other alternate routes would lengthen the line without offering any environmental or economic advantages.

The Pine Flat county road and many existing roads built for access to mercury mines in the area or for development of steam wells are available for use in constructing the tower line. Spur roads to individual tower locations will be required. The design and location of roads to be constructed by PG&E will provide for a minimal effect on the terrain. Protective measures to provide proper drainage, erosion control, maintenance of existing ground cover, and reseeding of slope areas will be implemented, both during and after the construction phase. The access roads to be constructed will have minimal effects upon the environment in this remote, uninhabited area.

The schedule for right-of-way acquisition and construction of the transmission line is as follows:

Authorization for acquisition	February 1, 1971
Acquisition to be completed by	May 1, 1972
Construction authorized	December 1, 1972
Construction to be completed by	May 1, 1973

	Start	Complete
Construction schedule		
Foundations	2-1-73	3-15-73
Tower erection	3-1-73	4-15-73
Conductor stringing	4-1-73	5-1-73

Government Agencies

The only governmental agencies which require approvals for Units 9 and 10, including the transmission line, other than this Commission are the Sonoma County Planning Commission and the Sonoma County Department of Public Works. The Sonoma County Planning Commission approved the route and the proposed transmission line by resolution adopted October 15, 1970, a copy of which was filed with

the application as Exhibit J. A building permit for the facility will be sought from the Sonoma County Department of Public Works.

Steam Supply

By agreement of the parties, a portion of the record in the certificate proceedings for Units 7 and 8 was incorporated by reference into this proceeding.[1/] The portion of the record so incorporated dealt in general with the steam purchase contracts between Union and PG&E and Magma-Thermal and PG&E, the steam supply situation, the ownership of lands in The Geysers area, and the plans and proposals of NCPA. No new evidence on any of these matters was introduced at the hearing on Units 9 and 10, and those portions of the decision granting the certificate for Units 7 and 8 referring to those matters are pertinent here.

PG&E now purchases steam from Union and from Magma-Thermal under parallel contracts dated May 11, 1970. These contracts were introduced as Exhibits 8 and 9 in the Units 7 and 8 proceeding. PG&E's expert testified in that proceeding that in his opinion there is presently available steam to support an additional 200,000 to 300,000 kilowatts beyond Units 7 and 8 (Ramey, Units 7 and 8, Tr. 63). PG&E's operating experience with Units 1 through 4 has been, and is, satisfactory. The availability of these Units has been very good, averaging 90% or better. Exploratory wells have been drilled in the area in which it is planned to install Units 9 and 10. Additional wells to supply steam to these units will be completed fourteen months prior to their commercial operating dates. Magma-Thermal and Union will indemnify PG&E if there is insufficient steam to supply Units 9 and 10. (See paragraphs 8 (d) of the respective geothermal steam sale agreements.)

PG&E desires to proceed with the installation of Units 9 and 10 to comply with the terms of the geothermal steam sale agreements, to provide an additional economic source of power for its North Bay Division, and to promote the conservation of fossil fuels through utilization of geothermal steam.

1/ Tr. pp. 37 through 230; Exhibits 8 through 16.

The financial ability of PG&E to construct and operate the proposed units is shown in PG&E's Annual Report to the Commission for the year ended December 31, 1969, filed with the Commission on March 31, 1970. PG&E proposes to finance the construction of Units 9 and 10 by using to the extent available its working capital, moneys in reserve, funds not required for immediate use, and the proceeds of the issue and sale of such stocks, bonds, notes, or other evidences of indebtedness as the Commission shall hereafter, by proper application, authorize for that purpose.

Rates to be charged for service to be rendered by means of the construction proposed herein are the PG&E system electric rates now in effect or as may be authorized by the Commission in the future.

General Order No. 131

General Order No. 131 became effective July 1, 1970, which is one year before the date PG&E requires the Commission's certificate. PG&E states that it did not have adequate time to prepare and file by July 1, 1970, an application complying with General Order No. 131. In addition, this application is for a ninth and tenth unit at an existing plant. For all practical purposes, Units 9 and 10 are identical with Units 5 and 6, which have already been authorized by the Commission. PG&E has complied with the notification requirements of Section 6 of General Order No. 131.

Northern California Power Agency (NCPA)

At the commencement of the hearing NCPA moved that the proceedings be postponed 60 days to await the California Supreme Court's decision on the certificate granted for Units 7 and 8. This motion was denied, and NCPA thereafter took no active part in the proceeding.

No new evidence was introduced by either party at the hearing concerning the allegations advanced by NCPA at the Units 7 and 8 proceeding. In addition, as stated, a large portion of the Units 7 and 8 record was incorporated by reference in this proceeding. Accordingly, that part of the Units 7 and 8 decision dealing with the matters raised by NCPA is herein repeated in full.

"Northern California Power Agency (NCPA)

"Northern California Power Agency is a public agency created by agreement under the statute authorizing such action as an exercise of joint powers, under Section 6500 et seq. of the Government Code. The members of the Agency are the cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, Santa Clara and Ukiah, each of which owns and operates a municipal electric distribution system. The purposes of the agreement are stated in it, as follows:

> '...acquiring and disposing of ownership and use of revenue producing facilities, including electric generating and transmitting facilities, and making more efficient use of the common powers of individual member public agencies comprising the NCPA to acquire, purchase, generate, transmit, distribute, sell, interchange, and pool electric energy and capacity...'

"NCPA's powers include:

> '...any and all powers authorized by law to all of the parties hereto, and separately to the agency herein created, relating to the acquisition, construction, disposition, use, operation and maintenance of works for the generation and transmission of electric power and energy to such area by contract with owners of such facilities including federal and state agencies and public utilities.'

"Issues Raised in the Proceeding by NCPA

"In the view of NCPA, the following issues are presented in this proceeding:

"(1) Do the contracts for geothermal steam supply on which PG&E relies give PG&E exclusive control over the entire steam supply covered by the contracts?

"(2) Do those contracts give PG&E the right to prevent geothermal steam supplies from being developed at all during the lifetime of those contracts?

"(3) Are the steam supplies so controlled by PG&E a significant and important part of the steam supplies available to Northern California?

"(4) Is the effect of the contracts substantially to lessen competition in the development of geothermal steam, and to tend or attempt to create a monopoly, and to restrain trade in electric power generated from such steam, which electric power is a part of trade or commerce among the several states?

"(5) Is the public interest, as represented by NCPA, adversely affected by those contracts?

"Position of NCPA

"NCPA contends in its brief that the answer to each of the above issues is affirmative, and that the Commission should refuse to issue the certificate requested herein until PG&E renegotiates the contracts to eliminate the objectionable exclusive features.

"NCPA states that it will be happy to participate in the negotiations to revise the present contracts, in order that PG&E may be able to construct its units under a proper contract in the public interest at the earliest date.

"Position of PG&E

"PG&E, in its brief, declares that objection raised by NCPA is neither in the general interest of the public nor is it basically fair.[2/]

"Position of Magma-Thermal

"According to Magma-Thermal,

> 'If Pacific Gas and Electric Company be prevented from installing the facilities necessary to carry out the terms of said contract, it would result in the following:

"2/ To this statement PG&E in the Units 9 and 10 proceeding would add that the steam supply contracts are designed to give PG&E reasonable assurance that an adequate supply of steam is available, the provisions in the contracts of which NCPA complains are reasonably necessary to secure the development and use of the resource, and that in any event an adequate supply of steam is available to NCPA at The Geysers from lands not controlled by PG&E's steam suppliers.

'(a) Magma-Thermal would suffer irreparable injury in the permanent and complete loss of geothermal steam sales and the proceeds therefrom, none of which could ever be recovered.

'(b) Magma-Thermal would be deprived of its market for geothermal steam and still have the continuing obligation under the existing leases without a source of income for the sale of geothermal steam, to its irreparable loss and damage.

'(c) The public would be forever deprived of the electric energy which would be produced from the current steam supplies produced on Magma-Thermal land.

'(d) The property and contract rights of Magma-Thermal would be impaired immeasurably to its irreparable damage without due or any process of law and without any compensation.'"

Findings of Fact

Based upon a consideration of the record herein, the Commission finds as follows:

1. Undisputed evidence demonstrates the need for the new electric generation to be provided by Geysers' Units 9 and 10.

2. PG&E is a publicly regulated utility engaged, inter alia, in the generation, transmission and distribution of electric power in Northern and Central California. PG&E generates electric power in hydroelectric plants, nuclear plants, fossil fuel plants, and geothermal plants.

3. NCPA, a joint powers organization of 11 California cities owning and operating their own electric distribution system, desires to construct a geothermal generation plant in the same area as PG&E, using the same kind of steam, as a part of an overall program of providing additional power supplies for its members.

4. It is in the best interests of the State to develop available supplies of geothermal steam known to be of practical value for the generation of electric power and energy to meet the growing needs of such power and energy, in preference to fossil fuel and nuclear fired generation.

5. It is in the best interests of the State to permit competition, rather than allow monopoly, in the development of these geothermal sources of power; and it is in the public interest to permit cities having their own distribution systems to generate their own power, if they desire to do so, rather than to require them against their will to purchase such supplemental power from a public utility.

6. In 1958 PG&E entered into its first contract to purchase geothermal steam from Magma and from Thermal.

7. In 1967 Magma and Thermal entered into a joint venture with Earth Energy, Inc., a subsidiary of Union Oil Company, whereby each assigned to the other an undivided one-half interest in its holdings within a specified area at The Geysers, and Earth Energy became the operator of those holdings. Earth Energy later merged into Union. When the 1970 steam sale contracts were negotiated, at Union's suggestion, the area of the joint venture was adopted by the parties as the area within which PG&E obtained initial exclusive rights to purchase geothermal steam produced by the joint venture. This area was referred to in the hearing as the "red line area." The 1970 steam sale contracts replaced the 1958 PG&E, Magma-Thermal steam sale contract as amended.

8. The geothermal steam field owned by Magma, Thermal and Union, with Union as the operator, is the subject of the contract, and is only one of various sources of hot water and steam, either separately or combined, available for use in the production of electric energy, the availability of which has already been demonstrated in some instances and in others are in the process of exploration and development.

9. Included in available sources of geothermal steam are fields which are not subject to the contract and include those leased and held by Signal Oil Company and GRI, with established production, in relatively close proximity to The Geysers to which the contract relates, and all of which are presently available for the production and sale of electric energy. In addition, there are other areas within the State with hot water and steam energy now

subject to exploration and development, including Lake County, Imperial County and Plumas County.

10. The development of geothermal steam resources in the area subject to the contract is made feasible by the contract between Magma, Thermal, Union and PG&E.

11. The geothermal steam resources at The Geysers are themselves relatively small and unimportant compared to the total available sources for generating electricity in the relevant market, which includes nuclear and fossil fuels, hydro and geothermal steam available in the geographical area lying north of the Tehachapi Mountains.

12. Geothermal steam has some advantages as a power source for electric generation over other forms of energy:

a. Its use produces a minimal adverse effect on the environment, as no combustion exists by which combustion by-products may be released into the atmosphere.

b. The power plants are proving to be highly reliable since need for a boiler system is eliminated.

c. Its use conserves other forms of natural resource energy.

13. Geothermal steam has some disadvantages as a power source for electric generation in comparison with other forms of energy:

a. The technology for use of the steam and for estimation of steam reserves is still in the pioneering stage, and thus risks associated with making large capital expenditures in order to use the steam are greater than those associated with constructing more conventional power plants.

b. Shutting down steam wells can damage the wells, thus it is best not to use geothermal plants for peaking (low load factor) operation, and such plants are better used for base load (high load factor) operation.

c. Since geothermal steam can only be transmitted economically for a maximum of about one to one and one-half miles, and the generating plants have no boilers which can be converted to other energy fuels, the plants are especially vulnerable in the event a local steam supply fails.

14. The Geysers' steam field was discovered as early as 1847. Since the early 1920s it has been known that steam could be produced from a well drilled a few hundred feet below the earth's surface.

15. Magma drilled its first steam well at The Geysers in 1955.

16. Production of geothermal steam is still a developing technology. After years of actual production at The Geysers, it is still not known whether such production is from one field or more than one field. There are conflicting data on this point.

17. The red line area shown on Exhibit A, attached to Exhibits 8 and 9 of Application No. 51892, encompasses approximately 113,000 acres.

18. As of the time of the hearing, Union and Magma-Thermal held leases to about 15,000 acres within that area.

19. Union and Magma-Thermal are under no obligation to PG&E to obtain additional leases to lands within the red line area.

20. Union, the operator at The Geysers' steam field for the Union-Magma-Thermal joint venture, does not contemplate, under the PG&E steam sale contracts, acquiring any additional lands.

21. The presently known geothermal steam field at The Geysers includes about 19,100 acres within which steam may reasonably be expected to be found. About 54 percent of this area is not subject to the Union and Magma-Thermal contracts with PG&E.

22. Most of the existing wells at The Geysers have been drilled expressly for PG&E under the contracts with it. The effect of these wells on the capacity and productivity of The Geysers' field is unknown, although geothermal steam is believed to be a depletable resource.

23. Signal Oil Company and Geothermal Resources International each has drilled several active steam wells in the vicinity of The Geysers. The present steam sale contracts do not apply to those wells.

24. Union has drilled at least one productive steam well in the Clear Lake vicinity but at a location which is outside of the red line area. The 1970 steam sale contracts do not apply to steam from that well.

25. Union and others are actively exploring for geothermal steam throughout California.

26. PG&E's installations at The Geysers have been and are expected to be as follows through 1973:

Unit	Size	Year Installed or to be Installed
1	12-1/2 MW	1960
2	12-1/2 MW	1963
3	27-1/2 MW	1968
4	27-1/2 MW	1968
5	55 MW	1971
6	55 MW	1971
7	55 MW	1972
8	55 MW	1972
9	55 MW	1973
10	55 MW	1973

27. Under the contracts with PG&E, The Geysers' field has been steadily developed at a pace set by the gradually developing technology of geothermal steam production.

28. The long-term and the exclusive dealing provisions of the steam sale contracts are reasonable and in the public interest. They are necessary to assure a reliable supply of steam for the full life of the generation and transmission equipment installed to utilize it, and thus give PG&E an opportunity to recover the investment made in pioneering the development and use of geothermal steam as a source of energy for electric power generation.

29. The provision of the steam sale contracts that, in the event PG&E does not exercise its right to purchase steam within a specified length of time, the steam supplier can sell the steam to others or use it itself for "process, chemical or manufacturing purposes", does not preclude sale or use of the steam for generating electricity.

30. Since geothermal steam appears to be a depletable resource, if there is but one pool of steam at The Geysers, use of that steam by anyone other than PG&E might affect availability of steam for PG&E's plants.

31. The long-term nature of the contracts is not unreasonable in view of the large investment required to construct the generating plants and necessary transmission lines and the continuing need of the public for electric power.

32. The provision of the steam sale contracts that the suppliers compensate PG&E, if they sell steam to others and thereafter steam supplies for PG&E plants are reduced, is not unreasonable in view of the large investment required to construct the generating plants and necessary transmission lines, the need of the public for a reliable, long-term source of electric power, and the newness of the technology of production of geothermal steam.

33. The steam sale contracts assure the continued long-term availability of geothermal steam at a reasonable price for generating electric power.

34. Development of the ability to use geothermal steam for electric power production at The Geysers might not have been possible if PG&E had not participated in the pioneering by constructing generating plants.

35. If PG&E had not entered into the present contracts with Union and Magma-Thermal, those developers would have had no market for their steam, and no funds with which to continue their development of the new resource, until some speculative time in the future.

36. PG&E's obligations under the steam sale contracts to construct generating plants and purchase steam are conditioned upon its obtaining certificates of public convenience and necessity from this Commission. This Commission has the jurisdiction and authority to consider any possible anticompetitive effects of these contracts each time a certificate is sought and can protect the public interest in free trade, as circumstances in the future may warrant.

37. The steam sale contracts commit PG&E to operate the geothermal steam plants at a high load factor (i.e., base load operation).

38. The cost of electric energy produced at The Geysers under the contracts is approximately equal to the cost of electric energy now produced by PG&E at its other modern generating plants.

39. PG&E load forecasts demonstrate that PG&E will have a retail and wholesale market for the electric power which will be produced at The Geysers' Units 9 and 10.

40. NCPA's plans for using geothermal steam are vague and speculative. It made no showing that it is capable of carrying out its plans to build geothermal electric generating plants.

41. PG&E's steam supplier, Union Oil Co., attempted unsuccessfully to contract with NCPA, but determined NCPA had no present or foreseeable ability to use steam thereafter "dedicated" by contract to PG&E.

42. NCPA could not utilize to capacity the steam from wells controlled by Union if it had purchased this steam, thus requiring the shutting down of wells with consequent stress and economic loss.

43. NCPA did not show that any party to the steam contract refused to sell steam to it.

44. Union and Magma-Thermal contracted with PG&E in 1970 only after Union, acting for the three suppliers, negotiated with NCPA and concluded that a timely sale contract with NCPA could not be obtained.

45. One of the major reasons NCPA's negotiations with Union failed was NCPA's unwillingness to accept risk involved with developing geothermal steam.

46. NCPA made no showing that it could use geothermal steam practicably. NCPA may be unable to use geothermal steam for generating electricity because prudent operation of the steam wells requires continuous, high load factor operation and a minimum of shutdowns, whereas NCPA's needs would be for peaking generation and thus would require low load factor operation.

47. NCPA failed to pursue other geothermal sources readily available to it. Its sole expert witness at the hearing did not even know that developers other than Union and Magma-Thermal had geothermal steam holdings at The Geysers prior to learning of them at the hearing in that proceeding.

48. Any impact of the steam sale contracts on freedom of trade is remote and speculative.

49. It is in the public interest to encourage the development of the technology for the use of geothermal steam for the production of electric power.

50. The 1970 steam sale contracts promote the development of the technology for such use of geothermal steam.

51. PG&E does not have the power to exclude other potential users of geothermal steam from obtaining such steam from wells at The Geysers which are not under contract to PG&E.

52. NCPA desires to be able to contract with Union and Magma-Thermal because Union and Magma-Thermal have special knowledge and experience with geothermal steam development.

53. PG&E is obligated to sell wholesale power to NCPA's member cities at reasonable rates which are subject to Federal Power Commission regulation.

54. PG&E is presently supplying all or part of the wholesale electric power needed by several of NCPA's member cities. The balance of the power needed by those cities is supplied by the Bureau of Reclamation.

55. NCPA has not contended that any of its member cities has experienced a power shortage or that PG&E will be unable to meet their future needs for wholesale electric power.

56. The purpose of the 1970 steam sale contracts is not anticompetitive. The restrictive provisions and lengthy terms of contracts were and are necessitated by the unique characteristics of geothermal steam, the present state of knowledge of geothermal steam production, and the need of PG&E as a public utility to obtain reliable power sources for its generators.

57. The 1970 steam sale contracts have had no anticompetitive effect in the relevant market. The contracts do not foreclose competition in any measurable share of the relevant market. More than sufficient energy sources, including geothermal steam, remain available to NCPA and others to allow such entities to generate electricity if they choose to do so.

58. The 1970 steam sale contracts do not unreasonably foreclose competitors from The Geysers' steam field. PG&E presently has under contract about 46 percent of the land under which steam may reasonably be expected to be found. PG&E's contractual rights over this portion of The Geysers' field do not constitute monopoly power in the relevant market.

59. Considering all the evidence introduced concerning the 1970 steam sale contracts and their competitive effects, it is clear that they are consistent with the public convenience and necessity.

60. NCPA cities and all other wholesale and retail customers of PG&E will benefit from electric power generated by geothermal steam at The Geysers pursuant to PG&E contracts with Union and Magma-Thermal and sold at reasonable, nondiscriminatory rates established by this Commission and by the Federal Power Commission.

61. Exceptional circumstances exist making appropriate this Commission's authorization of less than a twelve-month period between the filing of the certificate application and the required date of decision as provided for in Section 4 of General Order No. 131.

Conclusions of Law

Based on the foregoing findings, the Commission concludes that:

1. The public safety, health, comfort, convenience and necessity require the installation, maintenance, operation, and use of Units 9 and 10, and associated transmission facilities, at The Geysers Power Plant, and that the requested certificate be issued.

2. The features of the contracts referred to in the findings of fact which give PG&E exclusive control over the areas described in those contracts are not against the public interest, necessity,

convenience and welfare; in such respects such contracts are not in restraint of trade or commerce among the several states; they do not monopolize or attempt to monopolize a part of the trade among the several states; they do not propose a combination of acts to create and carry out restrictions in trade or commerce within this state, and do not prevent competition in manufacturing, making, transportation, sale or purchase of electric energy in this state, and thus are not in violation of the Cartwright Act.

3. Due to the unique area in which the proposed transmission line will be constructed, we can visualize that at present the 30 year old design on towers applicant intends to use will fit more unobtrusively into the landscape than would more modern designs. We expect that in future hearings PG&E will not ask us to approve such towers unless it is prepared to show that such design is more aesthetically pleasing than its new designs (not just less costly) and we would point out that no one knows what type of development may take place within The Geysers area and vicinity within the next 50 years.

The certificate of public convenience and necessity which will issue herein is 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 proceedings for the purpose of determining just and reasonable rates.

O R D E R

IT IS ORDERED that:

1. A certificate of public convenience and necessity is granted to Pacific Gas and Electric Company to construct, operate, maintain and use geothermal steam-electric generating Units 9 and 10 of The Geysers Power Plant and associated transmission facilities as described in the application and the evidence adduced thereon.

2. Pacific Gas and Electric Company shall file with this Commission a detailed statement of the capital cost of The Geysers Power Plant Units 9 and 10 and related facilities within one year following the date Unit 10 is placed in commercial operation.

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

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

Dated at San Francisco, California, this 23rd day of NOVEMBER, 1971.

Chairman

Commissioners

Commissioner J. P. Vukasin, Jr., being necessarily absent, did not participate in the disposition of this proceeding.