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Decision No. 81931

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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| Investigation on the Commission's Own Motion into the Adequacy and Reliability of the Energy and Fuel Requirements and Supply of the Electric Public Utilities in the State of California. | Case No. 9581 |

(Appearances are listed in Appendix B)

INTERIM OPINION

The Public Utilities Code gives this Commission a mandate to take the requisite action to ensure that every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public, without discrimination. (See Sections 451, 453, 457, 701, 702, 761, and 762, Public Utilities Code.) In view of indications of a deteriorating fuel supply situation with respect to electric utilities in California, this investigation was instituted to determine on a record as accurately as possible the amount of fuel electric utilities in California must obtain in order to meet foreseeable electricity generating requirements between now and 1976. It also was intended to obtain from fuel suppliers factual information as to the expected availability of fuel to meet such electric utility requirements. The Commission therefore on July 3, 1973 issued an order instituting investigation on its own motion so that appropriate action may be taken or recommended without further delay.

In addition to the electric generation and fuel supply information to be obtained, the desirability and feasibility of the following specific actions to alleviate any impending fuel supply problem were to be explored:

(a) Obtaining additional fuel supplies from present sources;

(b) Obtaining additional supplies by making Federal reserves available;

(c) Initiation of action with appropriate Federal agencies or authorities seeking an upgrading of regulatory or other priorities assigned to fuel requirements of electric utilities;

(d) Temporary relaxation of regulations limiting emmissions from electric generating plants and the sulfur content of fuels used in electric generation;

(e) New or expanded energy conservation measures;

(f) Establishment or strengthening of agreements among utilities providing for mutual assistance during shortage periods; and

(g) Development or modification of new or existing energy-curtailment plans.

The foregoing actions were indicated to be suggestive and not necessarily exclusive.

In view of the focus on electric generation requirements and fuel supply at this stage of the hearings, copies of the Order Instituting Investigation were distributed principally to electric utility companies, municipal utility districts, governmental agencies concerned with fuel supply and electric generation, and fuel suppliers with refinery facilities located in California. News of the hearings also received wide publicity in the press and news media.

Hearings were held on alternative weeks in Los Angeles and San Francisco from July 11 to August 3, 1973, before the President of the Commission, Vernon L. Sturgeon, Commissioner Symons, and Examiner Burt Banks. After eleven days of hearings, 1336 pages of transcript, 42 exhibits and the testimony of 28 witnesses, including testimony by witnesses from the United States Department of the Interior Division of Oil and Gas, Los Angeles Air Pollution Control District and the United States Environmental Protection Agency, the record was closed upon motion of the staff for the purpose of evaluating

the record, to issue an interim opinion, and to order that further hearings be held with respect to specific elements of the electric energy-fuel supply relationship.

## HISTORICAL BACKGROUND

This Commission has been called upon to deal with electrical energy shortages affecting broad areas of California on at least two earlier occasions. During 1947 and 1948 when there was a drought and consequently a substantial shortage of hydroelectric power, this Commission, following public hearings, appointed an emergency power director and authorized the issuance of emergency curtailment regulations which were constantly monitored and modified as the situation warranted during the period of the hydroelectric shortage. (Decision No. 41256, Case No. 4939, 47 CPUC 769 (1948); Decision No. 41309, Case No. 4939, 47 CPUC 801 (1948).) Those measures were based upon similar actions in earlier power emergencies in California in 1918 and 1924 when electricity conservation measures also were adopted during those critical periods.

In these earlier cases the pervasive role of electric power and the dependence on electricity for the irrigation, storing and processing of agricultural products and by manufacturers in the industrial processes was manifest. Also the general effect on employment of stoppage or reduction of either agricultural or factory production and the resulting disruption in payroll, income and buying power which in turn would affect nearly every person in California also was evident. The dependence upon electricity and its significance in the economy of the State appears to be no less today. While falling water was the source of energy for hydroelectric generation, energy obtained from the combustion of hydrocarbons (and to some degree nuclear energy) is the energy source for steam electric generation, in far greater amounts than that obtained from hydro resources. Since the predominant supply of hydrocarbons comes from locations outside of California, either

in other states or from overseas sources, the consequences of a fuel supply shortage can be far more complex and longlasting than the consequences of drought which historically have been infrequent and of relatively short duration.

Accordingly, it appears that the energy curtailment and conservation measures proposed to alleviate the effects of a prolonged fuel shortage, should be subjected to a searching analysis before implementation if they are to have the broad public support necessary to minimize the social and economic impact which may be experienced.

Therefore, the following opinion will discuss not only the immediate findings and conclusions with respect to the fuel requirements of electric utilities as found in this record, but also will touch upon a range of conservation measures and policies to which interested parties may provide a factual response. Interested parties also may wish to present to the Commission for consideration in the forthcoming hearings to be ordered herein other measures and policies supported by factual data.

## CALIFORNIA ELECTRIC UTILITY FUEL REQUIREMENTS, 1973-1976

The inquiry into electric generating requirements and fuel supply in this case has been limited to the period between the present and 1976 because it does not appear that the parameters affecting the supply-demand relationships can change significantly during that period. It would take several years for production from new oil field discoveries, either on-shore or off-shore, to reach the market, additional capacity from recently announced refinery construction plans would not be available for two or three years, nor would additional energy from nuclear or hydroelectric facilities soon be available since construction would take several years.

Pursuant to Appendix B of the Order Instituting Investigation herein, data on electric utility area loads and requirements was submitted by the utilities specifically requested to testify and

also by the Los Angeles Department of Water and Power which appeared in this proceeding in order to assist in developing a complete record on this matter of mutual concern.1/

The information requested as to gas and oil requirements, and requirements remaining uncovered through 1976, are summarized in Appendix A attached hereto. It can be seen in Appendix A that the estimated decline in gas fuel supply from 65.8 million barrels, oil equivalent, in 1973 to 25.5 million barrels in 1974, result in as yet uncovered requirements for residual fuel oil of 57.7 million barrels in 1974. Similarly, uncovered fuel oil requirements for 1975 are 76.2 million barrels and 56.1 million barrels for 1976.

While it is possible that continued diligent efforts by these utilities to obtain additional supplies of fuel oil may be successful, testimony by representatives of affected utilities as summarized below, indicates that they may not be successful in obtaining all of the fuel they foresee they will need.

## AVAILABILITY OF FUEL AND ALTERNATIVES

To understand the significance of the uncovered fuel requirements for 1974 through 1976 shown in Appendix A, it is helpful to review the history of the availability of fuel and energy resources traditionally used by California electric utilities, alternative energy sources and the efforts being made by California utilities to obtain sufficient fuel to meet foreseeable electric generating requirements.

Historical Background. When it became clear in 1969-1970 that El Paso Natural Gas Company would have difficulty in fulfilling all of its future natural gas delivery commitments and that curtailment

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1/ Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company were expressly ordered to appear and present information on the subject areas set forth in Appendix B to the order instituting investigation.

proceedings would be held by the Federal Power Commission (FPC) in Docket RP72-6, contingency planning began to take place by California electric utilities to find alternative fuel and energy sources. Collaterally, the Canadian National Energy Board decided not to approve additional exports of natural gas, beyond those amounts already approved, thus limiting an alternaive source of supply of natural gas for delivery to California. While natural gas also is produced in some amounts in northern California, gas producing interests state additional production could be obtained from this source by increased exploration and development. Utility interests assert doubts as to the amount of additional volumes of gas that could be obtained from this source and indicate accelerated production of existing fields could result in recovering less than the maximum realizable potential.

Upon the tightening of air quality standards for stack emissions between 1970 and 1972, under the Clean Air Act of 1970, 42 USCA 1857 et seq., it appeared that there were sufficient supplies of conventional residual fuel oil available to meet fuel oil contingencies for generating needs. As air quality controls tightened, the spectrum of eligible fuel oil that could be used was reduced to that of fuel oil having a sulphur content of 1/2 percent by weight, or less. During this same time most mid-West and East coast electric utility generating facilities were being converted from coal to less polluting fuel oil, resulting in an estimated equivalent increased demand of 240 million barrels annually.

It appears that most refineries supplying California fuel oil consumers are not equipped with sufficient desulphurizing equipment to provide fuel oil that would meet low sulfur specifications. Accordingly, it was necessary to obtain low sulfur crude oil that could be refined in sufficient amounts to meet low sulfur fuel requirements. The two principal low sulfur crude oil sources supplying the west coast are the Cook Inlet in Alaska and Indonesia.

Also, at about the same time, other countries were instituting air quality quality control standards similar to those being instituted in the United States. Consequently, fuel oil consumers in such countries as Japan were searching for low sulfur crude oil, which put added demands upon the few known producing areas. This demand could be further intensified by large industrial consumers of natural gas also having to make contingency plans to find alternative low polluting fuels.2/

To the extent fuel oil users increase in number and volume faster than fuel oil can be supplied, it is reasonable to expect the fuel oil shortage to increase. The competition for fuel oil can be expected to be particularly critical for California utility companies. The fuel use characteristics of California electric utilities is different from that of electric utilities east of California in which coal is used in volumes greater than in California. The role of coal in the fuel supply and demand relationship in California is minimal. (Exh. 35, p.9.) In California, utility generating facilities are designed to use either fuel oil or gas.3/ Since coal is not an alternative fuel for California facilities, the dependence on fuel oil as an alternative to gas is even greater than that of utilities east of California where coal is or may be used.

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2/ See the testimony of John C. Abrams, Southern California Gas Company, for a summary of the effects of the El Paso Gas Company curtailment. (Tr. 481 et seq., particularly pages 501-503 and Exhibit 9.)

3/ The two exceptions where coal is used are the Mojave Generating facilities in Nevada and the Four Corners Generating facilities in Arizona in which Southern California Edison Company has a partial interest.

The record shows that during the last year invitations to bid sent to American refiners by major California Utilities, inviting bids to supply fuel oil sufficient to meet requirements, received little or no response. Consequently, California utilities have been attempting to deal directly with foreign national producers. The record shows that even with firm commitments from foreign producers, it is uncertain whether such commitments will be completely fulfilled due to changing national policies by the producing countries. Collapse of negotiations between Southern California Edison Company and Union Oil Company when the foreign commitment to Union Oil failed to materialize and announcements of partial nationalization of American producing properties in Lybia were cited as examples.

Moreover, it appears that at present there is insufficient refinery capacity, both in California and internationally to meet the surging demand for fuel oil and particularly fuel oil with low sulphur content. Consequently, it appears that PG&E, Southern California Edison Company and San Diego Gas & Electric are in various stages of planning and implementing conversion of certain boiler facilities from the burning of natural gas to the burning of residual fuel oil and crude oil. Also, plans are underway for the construction of expanded storage facilities in order to extend the ability to meet generating requirements from fuel or crude oil that can be obtained from whatever sources.

It appears that this dependence upon oil was increased through delays in bringing planned nuclear generating facilities and other plants on line.[4/]

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4/ See generally testimony by witnesses from Southern California Edison Company, San Diego Gas & Electric, PG&E and the Los Angeles Department of Water and Power, particularly that of Mr. W. H. Seaman, Mr. C. M. Laffoon, Mr. Paul Matthew and Mr. William Sells.

Attempts to Develop New Supplies and Alternatives. On more than one occasion during the course of the proceeding it was stated that low sulphur fuel oil or crude oil cannot presently be obtained without reducing the planned use of such commodity by someone else. In short, it does not appear that there are any known quantities of low sulphur fuel oil or crude oil that are not already committed for use. Moreover, although the United States is a major producer of low sulphur crude oil, it appears that the production of crude oil in the United States cannot be expected to continue to increase at the same rate as in prior years. On the contrary, it appears that based on known reserves, production of crude oil in the United States is tending to level off and will gradually decline, while the ever-growing demand for energy in the United States will be fueled by obtaining oil from foreign oil producing sources, primarily the Middle East. (See Exh. 21, pp. 16, 18, 26, 28 and 30; Exh. 22, pp. 6 and 8.) Based on existing known world crude reserves and refinery capacity it appears that not only California but the United States will become increasingly dependent upon foreign imports of petroleum supplies to satisfy what appears to be an ever-growing demand. (See Exh. 35, pp. 31, 33, 46 and 47.) The United States' appetite for overseas oil is estimated to be growing at the rate of 16% per year according to one witness.5/ (Tr. 1282)

As a result of this condition it was foreseen by another witness that customary utility company fuel supply contracts of five-year duration would be replaced with agreements of fifteen to twenty or twenty-five years supply, providing for construction by the fuel supplier of refineries especially designed to provide desulphurization equipment sufficient to manufacture low sulphur

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5/ At the same time it appears that income to Near East producing countries is at such high levels that there is not much incentive to increase production but instead to stretch production out thereby creating leverage in a market of ever rising demand and dependence.

fuel oil. (Tr. 187.) It also appears that utility companies themselves will attempt to participate in worldwide exploration and development activities in the search for secure supplies of fuel.

While shareholder owned utility companies have a somewhat greater degree of flexibility and a broader range of alternatives in their search for fuel supplies and generating sources, it appears that municipally owned and operated electric utility companies are more limited in the range of the alternatives available, due to their governmental rules and regulations governing purchasing and their scope of operations. Testimony by the witness for the Los Angeles Department of Water and Power illustrates the difficulties experienced in following mandatory bidding requirements followed by emergency authority to enter into direct negotiations. As a result, it appears that the Department of Water and Power will have used up fuel oil in storage by the end of February 1974 and will be faced with the necessity of substantial curtailments in electric generation.6/

Longer term actions that could be taken to alleviate the apparent pinch in fuel supply and generating resources that appear on the record are: Expedite construction of the Trans-Alaska Pipeline, expedite exploration and development of the outer continental shelf on the East and West Coasts of the United States, expedite research and development of nuclear generation, geothermal development, development of coal resources including gasification and liquefication, development of shale oil resources, and for the very long term development of magneto hydrodynamics (MHD), solar energy and the fast breeder reacter.

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6/ 35% curtailment starting in February 1974, 60% curtailment in 1975, and 65% curtailment in 1976. (Tr. 215.) Curtailment could come earlier for some Los Angeles communities. City of Pasadena, October 1973; City of Glendale, November 1973; City of Burbank, January 1973. (Exh. No. 5.)

The more immediate actions that could be taken to help alleviate the energy shortage situation appearing on the record are: Expedite applications for the construction of additional fuel storage tanks and terminal facilities, expedite authorization of geothermal plants and nuclear plants, relax air quality control standards sufficiently to allow the burning of whatever fuel the utility companies are able to acquire, and allow development of Federal petroleum reserves, such as the Elk Hills Naval Reserve in California.

From the foregoing it appears that a program of mandatory fuel allocation to meet current generating needs would be more desirable than substantial curtailments of electric generation by utilities. If a mandatory fuel allocation program were implemented, electric utilities should be given the highest priority in the allocation of oils usable in electric generating plants in order to reduce as much as possible the social and economic hardship that would result from the curtailment of the pervasive use of electricity in our society. The testimony indicates that curtailment of electric power would be in the form of "rolling blackouts". This would mean the cutting off of power by geographic areas within a utility's service area seriatim. All other reasonable measures to conserve the use of electricity should be exercised before reaching this last most undesirable step.

Refinery Capacity and Fuel Supply. Testimony was received from Standard Oil Company of California, Union Oil Company of California, Southern California Gas Company, Atlantic Richfield Company, Getty Oil Company, Shell Oil Company, Phillips Petroleum Company, Exxon Corporation, Texaco, Inc. (appearing under subpoena), California Gas Producers' Association, and Magma Power Company and Dr. Lisle Reed of the Office of Oil and Gas, United States Department of the Interior.

Dr. Reed, the lead off witness covering oil production and fuel supply, characterized the world fuel supply situation and its relation to California. (Exhibits Nos. 11, 12 and 13.) His testimony indicated that each year between now and 1976 the conditions of supply and demand for fuel oil, both on the world market and as it may relate to District V (California, Oregon, Washington, Alaska and Hawaii) will probably get a little tighter. The complex situation that has brought us to the point we are in today was summarized as follows.

Over the past few years there have been variables that worked adversely against the supply of fuels while at the same time there have been variables that have accelerated demand for energy, thereby creating an energy gap. On the supply side there have been delays in constructing new refinery capacity due in part to uncertainty over the final setting of sulfur content standards following enactment of the Clean Air Act of 1970, it being necessary to construct refinery capacity designed to manufacture products in compliance with those standards. Another problem was the Oil Import Program which operated on a quota system tied to domestic production. In 1971-72 the United States ran out of surplus domestic crude production with the result that additional supplies of oil to be refined in this country had to come from foreign sources. Consequently, construction of new refinery capacity had to depend almost entirely on the availability of foreign oil. This factor resulted in uncertainty surrounding financing the economic life of the proposed plant when it was questionable whether there would be sufficient firm commitments of foreign crude to fulfill the operating life of a proposed facility. Moreover, the importation of unlimited quantities of residual oil on the East Coast and a prohibition to domestic refiners to manufacture residual from foreign crude, resulted in construction of "high conversion plants". With the pick up of demand in residuals in the late 60's it became efficient to build refineries that could manufacture a wide range of products

for essentially the same amount of money as the older high conversion plants. Accordingly, new plant construction did not add significantly to residual oil capacity.

Moreover, the phenomena of price depression was an inhibiting factor to the adding of capacity. The cost of crude oil from foreign sources was rapidly escalating but there was substantial resistance to raising domestic product prices that would recoup the extra costs and maintain profits. Finally, the mere fact of dependence upon foreign crude oil with the uncertainties of obtaining secure supplies for the life of a proposed facility was in itself an inhibiting factor.

While the foregoing factors were working against building refineries, the following factors were working to increase the demand for oil drastically.

Curtailment of natural gas and the resulting switch to oil occurred at about the time the switch was being made from coal to oil due to more stringent air quality standards. This put rapidly increasing demands on oil that were sudden and large. Disqualification of environmentally unacceptable fuel such as coal and high sulfur oil concentrated demand on low sulfur oil. Delays in nuclear plant construction intensified the dependence upon low sulfur oil. These shifts to oil were occurring as the result of decisions reached independently by many operators across the country. Since these decisions were made independently, the magnitude of the shift to oil was not susceptible to accurate prediction. Consequently, the exact quantities of fuel oil needed were elusive and difficult to calculate accurately.

There followed the President's message regarding energy policy on April 18 of this year followed by his further announcement on June 29 which established an energy office in the White House, the proposal for a department of energy and natural resources, and an energy research and development administration. While these steps will help to alleviate the energy gap in the long term, it

was concluded that energy conservation will be our primary salvation particularly for the short term (the next 3-5 years). This will necessitate cooperation at all levels of the State and Federal governments and a large voluntary effort by the citizens of the country to cut back on their use of energy. (Tr 546-556.)

It was stated that the backing down of the refining of gasoline in order to make more fuel oil would be about a barrel for barrel tradeoff, although the feasibility of such an operation was doubtful. It was stated that diligent pursuit of conservation measures and refraining from using energy where not absolutely necessary, would be a better course of action to take. It was also pointed out that any savings of energy would be of great benefit to the trade balance of payments due to the outflow of American dollars necessary to purchase foreign oil.

Testimony from the various refiners tended to corroborate the foregoing. Some refiners indicated troubles in obtaining commitments for all of the crude oil supplies they would need to continue running at the present full capacity. While the refiners uniformly indicated concern regarding the fuel oil shortfall predicted by California electric utilities, it was indicated there was little or no fuel oil available whether low sulfur or high sulfur for which contractual commitments had not already been made. While the record shows that many of the California refiners are major suppliers of fuel oil to California electric utilities, it appears there is not sufficient refinery capacity to provide the additional amounts of fuel oil needed by the utilities.

Accordingly, unless California utilities are able to obtain fuel oil supplies from other sources sufficient to satisfy projected uncovered requirements, there will not be sufficient fuel oil available to meet projected electric generating requirements. While the question of mandatory allocation of fuel oil was discussed, it was pointed out that allocations merely distribute the shortage and that oil would be taken away from non-priority users in order to supply priority users.

Obtaining Additional Supplies by Making Federal Reserves Available. The question of obtaining crude oil from the Elk Hills, California, Naval Petroleum Reserve was raised at various times during the proceeding. Testimony by witnesses from Southern California Edison Company, San Diego Gas & Electric Company, and Standard Oil Company of California, indicated that action by the United States Congress would be necessary before emergency supplies could be withdrawn from Elk Hills Reserve.

It appears that if all other attempts by electric utilities to obtain crude oil for combustion in their converted boilers are unsuccessful and the only possibility remaining is the curtailment of electrical generation, then emergency legislation to make crude oil available to electric utility companies in California for direct use in their boilers or for the purpose of trading crude oil for fuel oil, preferably low sulfur, would be appropriate.

Upgrading of Regulatory or Other Priorities Assigned to Fuel Requirements of Electric Utilities. At present the use of natural gas in boilers for the purpose of generating electricity and for other industrial purposes has a low-use priority under FPC rules. The most efficient use of natural gas is in direct use by the end user for such purposes as space heating and cooking.

Conversion of the energy in natural gas to electric energy for transmission to the end user is inherently less efficient than the direct uses by the end user stated above. Accordingly, because of the pervasive use of electricity throughout our economy, every effort should be made to secure alternative fuels to meet generating requirements, thereby preventing a slowdown of economic growth and the broad social and economic impact that foreseeably would be experienced from curtailment of electric generation.

Therefore, should a mandatory fuel allocation program be established, electric utility companies should receive the highest priority classification for allocation of fuel oils necessary to meet reasonable electric generation requirements.

Temporary Relaxation of Regulations Limiting Emissions from Electric Generating Plants and the Sulfur Content of Fuels Used in Electric Generation.

It was in this context that the clash between the opposing philosophies of maintaining high environmental standards versus unfettered economic progress arose. The issue was presented whether to have power outages because of insufficient availability of low sulfur fuel oil or to permit the burning of higher sulfur oil with the resulting higher concentrations of sulfur oxides and consequent deterioration of air quality.

Testimony by witnesses from the United States Environmental Protection Agency (EPA) and the Los Angeles Air Pollution Control District (LAAPCD) indicate the following: On May 31, 1972 7/ the Environmental Protection Agency approved in part dates and regulations of the California plan pertaining to sulfur dioxide emission limitations and fuel sulfur content which would reach national standards prescribed by the Federal Clean Air Act of 1970. This Act set forth primary standards to protect the health of the population and secondary standards to protect the general welfare. Crop damage, visibility and property damage are among the items protected by continued maintenance of the secondary national ambient air quality standards. According to the Clean Air Act the primary standards must be attained and maintained by 1975 or, if necessary, by 1977 with the approval of EPA. The secondary standards must be attained and maintained within a reasonable time.

Federal primary standards for sulfur oxides, measured as sulfur dioxide, are 0.03 parts per million (ppm) calculated as an annual arithmetic mean from 24-hour concentrations, and 0.14 ppm calculated as a 24-hour maximum concentration not to be exceeded more than one time per year.

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7/ 40 CFR 52 Code of Federal Regulations.

The secondary standards for sulfur oxides are: 0.01 ppm, calculated as a 24-hour maximum concentration not to be exceeded more than one time per year and 0.5 ppm, calculated as a three-hour maximum concentration not to be exceeded more than once per year. (Tr 1243-1246.)[8/]

The authority of the Los Angeles County Air Pollution Control Board is given in Chapter 2, Division 20 of the California Health and Safety Code. There are two state sulfur dioxide standards, a 0.04 ppm average for 24 hours and a 0.5 ppm average for one hour.

Los Angeles Air Pollution Control District rules governing sulfur content of fuel oil are Rule 50 embodied in California Health and Safety Code Section H & S 24242 limiting opacity of plumes discharged into the atmosphere; Rule 51 embodied in H & S Section 24243 designed to protect public health and comfort and to prevent a public nuisance or damage to business or property; Rules 62, 62.1 and 6.2 in combination, which require that only natural gas with less than 50 grains of hydrogen sulfide per 100 cubic feet or fuel oil containing 0.5 percent sulfur or less be burned; Rule 68 which limits the concentration of nitrogen oxides for large fuel burning equipment. Rule 50 of the district is more stringent than H and S Code Section 24242. Amendment of Rule 62 is under consideration which would allow power plants to burn higher sulfur content fuel oils if the stack effluent can be adequately treated. It is unknown whether the proposed amendment would be approved by EPA. (Tr 749-755.)

In the South Coast Air Basin (Los Angeles Area) the State air quality standards of 0.04 ppm, sulphur dioxide, a 24-hour maximum concentration, and 0.5 ppm, sulfur dioxide, a one-hour maximum concentration, were exceeded in 1972 on 115 days for the 24-hour standard and only once for the one-hour standard. These counts

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8/ The standard of 0.02 ppm calculated as the annual arithmetic mean from 24-hour concentrations was withdrawn on September 6, 1973. (BNA, Environmental Reporter Current Developments Vol. 4, No. 19. September 7, 1973, p. 770.)

compare with average counts of 117 for the 24-hour standard and 3 for the one hour standard during the last 17 years. The Federal primary standards were not exceeded in 1972 and the secondary for 3 hours was not exceeded. The secondary standard for annual average was exceeded by 35 percent at the monitoring station with the highest value within the Los Angeles Basin. (Tr 752.)

According to the witness for the LAAPCD, since 1970, when the natural gas shortage began to develop in Southern California, fuel oil usage in Southern California power plants has more than doubled.[9/] For the rest of the decade it now appears that power plants in the South Coast Air Basin will burn an average of about 50 million barrels of fuel oil per year. It appears that even if all of the alternative fuel oil used is of the premium low sulfur type, it is questionable whether Federal air quality standards for sulfur dioxide can be achieved. (Tr. 753.) The increase in the ambient concentrations will be approximately proportional to the increases in the sulfur dioxide emitted in the atmosphere. When inversion conditions persist over the South Coast Air Basin, the sulfur dioxide level may become dangerous, especially when coupled with high particulate levels. (Tr. 1247, 1248.)

In 1966-67, the last year in which conventional fuel was burned, the average daily winter emission of sulfur dioxide from power plants in Los Angeles County was about 400 tons per day, based on 1.6 percent sulfur fuel oil. Power plant stack plumes were extensively and

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9/ For 15 years prior to 1970 power plants in Los Angeles County burned an average of about 10 million barrels of fuel oil each year. In the latter part of this period fuel oil represented about 20 percent of their total fuel requirements. The other 80 percent was natural gas. (Tr. 753.)

persistently visible, there was deterioration in visibility, residents near power plants complained of damage to their houses, cars and shrubbery while similar complaints were received from boat owners moored near power plants. To burn high sulfur oil, with 1.6 percent sulfur in winter months now could result in sulfur dioxide emissions of 600 to 700 tons per day due to increased fuel usage with the consequent intensification of the manifestations experienced in 1966-67. While burning oil with 1 percent sulfur would tend to compensate for intensification of effects, the daily emission tonnage of sulfur dioxide would probably cause the state 24-hour standard to be exceeded virtually every day and the Federal primary standard, annual average, to be exceeded by as much as 50 percent. (Tr. 756, 757.)

From the foregoing it can be seen that every possible realistic action to obtain clean burning fuels must be attempted. It is noted that in the 1972-73 winter season variances of between 1 and 3 months, depending upon location, were granted certain East Coast utility companies, where there was a limitation on low sulfur fuel oil and sufficient supplies of such fuel could not be obtained. While ordinarily such variances would have to be approved by EPA, in those cases the decision was left up to the individual regional administrators of EPA where action against those variances was not taken because it was felt they were justified. (Tr. 1250, 1253.)

Finally, testimony by various witnesses invites the conclusion that because refinery facilities are now operating at full capacity and output of fuel oil whether low sulfur or high sulfur has been contractually committed, additional supplies of fuel oil to meet generating requirements are simply not available from traditional sources, especially during the 1974 season and to a slightly lesser degree in 1975 and 1976.

Therefore it may be concluded that every effort should be made to obtain high priority allocations for low sulfur fuels for use by electric utilities in California. If higher sulfur fuels are obtained it appears that such fuel will be in the form of crude oil or fuel oil obtained from sources outside of California and probably from foreign sources. Finally, if relaxation of air quality standards are sought such applications should be based upon reasonable expectations of secured supplies of fuel.

ADDITIONAL HEARINGS - SUBJECT MATTER

While the following subjects were included in the order instituting investigation, it was requested by the staff in its Motion on the 9th day of hearings that these matters be the focus of subsequent hearings to be held herein following an interim closing and analysis of the record. Accordingly, the following subjects will be the focus of additional hearings as discussed in more detail below:

1. New or expanded energy conservation measures.

2. Establishment or strengthening of agreements among utilities providing for mutual assistance during energy shortage periods.

3. Development or modification of new or existing energy curtailment plans.

As previously discussed, the record indicates the strong probability that the major electric utilities in California will be faced with the decision to curtail generation of electricity sometime between now and 1976. Because of the far-reaching and complex effects of such an occurence the electric utilities in California, subject to the jurisdiction of this Commission, are ordered, as set out in the ordering paragraphs below, to file with this Commission plans for the actions to be taken both individually and collectively in the event of curtailment.

Effects of Curtailment - Need for Energy Sharing Agreements.

The witness for the Los Angeles Department of Water and Power proposed certain curtailment measures for legislation. Staff counsel also made reference to the proposed curtailment measures in its motion on the 9th day of hearings herein. The far-reaching and potentially drastic consequences of the proposed electricity curtailments and fuel oil shortages, were forcibly stated by counsel for the California Manufacturers' Association. (Tr. 1136-1149.) The extreme interdependence of utilities and industry is manifest as is the interdependence of the various branches of manufacturing upon each other and their relationship to the food industry. The food processors need electricity to operate their facilities, but unless the processor has a container in which to put his product, it would do their mutual operations little good to have a priority system for oil or electricity if the supplier of the packaging into which the food is put does not have priorities comparable to those of the food processor. Similarly, the question of whether to reduce the use of electricity at home or at one's place of employment has great cogency.

It is the policy of this Commission to take every step possible within its power and to urge upon all agencies and levels of government, both federal and state and upon the public, actions to conserve the use of energy and to make the best use of available supply in order to forestall and hopefully prevent the undesirable broad and social economic effects of the curtailment of the generation of electric power.

Accordingly, all alternatives to curtailment should be explored in a search to develop the most feasible alternatives possible. In this context the electric utilities are especially urged to present for consideration as ordered below, plans for providing mutual assistance during periods of energy shortages among the respective utilities. While mutual assistance agreements are now in existence

such agreements appear to be directed more towards sudden capacity shortages resulting from equipment outages. That situation is far different from energy shortages which may extend over a period of weeks or months.

For the protection of public health and safety and the operation of essential industry in California necessary to prevent deterioration of employment and the wellbeing of Californians, it is necessary and essential that plans for mutual assistance during periods of energy shortages be developed and ready for use.

Conservation Measures to Forestall or Prevent Curtailment.

While the foregoing touches upon the ultimate alternatives to be considered in the approaching energy crunch, there is much that can be done by the end users, consumers of energy, to forestall or prevent those final events.

Although conservation of energy deals both with supply and demand the primary emphasis is necessarily on the demand side. In this context there are two broad categories of energy conservation. The first is simply to reduce consumption of energy over all. The second is to increase the efficiency with respect to the energy that is used, such as improved insulation in buildings or the use of emergy efficient appliances or machinery in lieu of less efficient counterparts.

Energy consumption can be divided into two broad economic components. The first is final demand which consists primarily of use by ultimate consumers. The other is intermediate demand which represents primarily consumption by industry in order to produce the products subsequently purchased by final consumers. It is possible that use of energy by intermediate consumers may be more susceptible to improvement in efficiency of consumption than that by final users. As long as energy, in its historical role, was a relatively low-cost element in the industrial process there was little economic incentive to use energy efficient

equipment or machinery. It is believed that through financial or regulatory incentives, manufacturers could be encouraged to use more energy efficient machinery and equipment by investing in new plant and equipment and retiring older, inefficient plant and low efficiency machinery.

Finally, over the near to intermediate term, it can be expected that due to the installation of anti-pollution devices, to control emissions either from automobiles or stationary facilities, a fuel consumption penalty will be experienced in the form of increased fuel consumption as a consequence of the use of the emission control devices. Accordingly, until technology can develop over the intermediate to longer term to improve fuel consumption efficiency together with the use of anti-emission devices, it appears that vigorous fuel and energy conservation measures will have to be practiced by final and intermediate users alike.

While the hearings herein are concerned with proposed curtailment and conservation plans to be instituted by electric utility companies together with energy sharing mutual assistance agreements, the effectiveness of conservation measures will depend to a great degree on the practice of conservation in broad areas of the economy. For the purpose of the discussion herein these broad areas are divided into the following fuel and energy consuming components: Transportation, residential/commercial, industry and electric utilities. It appears that for all of the foregoing components, energy efficiency standards should be developed together with a congruent system of rewards and penalties. Incentives also should be provided to encourage replacement of inefficient equipment in favor of more efficient equipment including the construction of energy efficient new structures.

In the field of transportation, attention should be given to encouraging those modes of transportation which use energy or fuel most efficiently. This would include an analysis of the interrelationships of rail, truck, bus, mass transit and air transportation

to determine the most efficient combination. Where appropriate, a greater use of communications facilities should be encouraged in lieu of transportation.

In the residential/commercial field, it is believed that one of the most effective near term conservation measures would be use of improved insulation in all structures, together with the use of more efficient appliances and an overall adoption of good conservation practices. Ultimately these strategies should carry into a system of incentives and regulations to promote design and construction of energy efficient dwellings and commercial structures.

With respect to industry, incentives should be adopted by the Legislature and governmental agencies which would encourage investment in replacement of inefficient equipment and to promote research for more efficient conservation technologies including development of non hydrocarbon alternative energy sources.

With respect to electric utilities, strategies that would tend to smooth out the daily demand cycle and to encourage a shift in the use of electricity from peak periods to off-peak periods, should be encouraged.

Finally, it is the intention of this Commission to inject the energy conservation issue into all appropriate proceedings before this Commission. In order to assure that scarce fuel and energy supplies are conserved for their most efficient use, it will be the policy of this Commission in its future proceedings to require utilities subject to regulation by this Commission to adopt policies and procedures dedicated to the conservation and nonwasteful use of scarce fuel supplies and electric energy.

While specific and finely tuned controls can be implemented with respect to the end use of petroleum products, electric utilities do not appear to have sufficient ability to control the end use of the energy they generate. The method for curtailing generation as developed in this record appears to be limited to "rolling blackouts". By this method transmission of power to geographical

locations would be cut off for periods of time on a sequential basis rotating throughout an electrical distribution system. It does not appear that electric utilities in California can selectively cut off deliveries of power to a given user. This is not to say that certain large manufacturing installations could not be cut off on a selective basis.

The burden of conserving available energy falls in great part upon each of us individually as discussed above. Ways of conserving energy have been published by various entities.10/ In addition to research and development of a more long-term nature developing alternative sources of energy and improvements in building and construction design including legislation for mandatory insulation in buildings of all types, the developing of petroleum reserves in the Western hemisphere and construction of deep water ports or the implementation of strategies to conserve fuel used in transportation such as encouragement of the use of mass transit or peak period pricing schedules for bridge tolls and highway travel such as descending block toll schedules for automobiles with one or more passengers, or greater use of communications devices in lieu of travel, every individual should take stock of the many ways in which he uses energy in his daily life in order to determine priorities for his personal conservation efforts.

While electric utilities in this proceeding have given testimony as to their conservation education programs, all electric utilities

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10/ For examples see 87 Suggestions for Household Energy Conservation, (CCH Energy Management 9983.) Guidelines for Gas Savings. (CCH Energy Management 9987.) Labeling of Major Household Appliances. (CCH Energy Management 9990.) 19 Ways for Business to Cut Energy Consumption. (CCH Energy Management 9991.) See also "Potential for Energy Conservation, a Staff Study, October 1972, Executive Office of the President, Office of Emergency Preparedness".

in California, as ordered below, will file with this Commission specific steps to be taken to conserve the use of energy both within their respective organizations and with respect to informing their consumers and the public what steps may be taken similar to those steps cited in footnote 11.

Finally, it is believed that factual data with respect to the subject matter listed below from informed, interested parties, would be helpful to the record in the hearings to be ordered herein.

CONSERVATION AND CURTAILMENT MEASURES TO BE CONSIDERED IN SUBSEQUENT HEARINGS HEREIN.

In order that all parties may know of the character and extent of the conservation and curtailment measures this Commission may put into effect should the situation require, the following orders were implemented during the energy shortage of the 1947/48 winter season. Similar orders may be prepared for use as the outcome of the hearings to be ordered herein.

Conservation and curtailment measures of the kind appearing below would be filed by each electric utility subject to regulation by this Commission and would be implemented by order of the Commission or an Emergency Power Director, should one be appointed, upon the determination that an emergency of sufficient magnitude existed. Such determination would be based upon reports received periodically from regulated utilities. It is emphasized that the following measures are intended to be suggestive and not exclusive. Moreover, because a substantial conservation burden will be borne by the final and intermediate users of electrical energy, comments on the proposed rules are invited from all interested parties. Finally, industry associations such as the California Manufacturers Association, the California Farm Bureau and the California Trucking Association together with any other such organization whose members are

substantial consumers of fuel and electrical energy, or are substantially concerned with the conservation thereof, are encouraged to present to this Commission the details of any curtailment and conservation of energy plans they are encouraging their members to undertake.

## CONSERVATION AND CURTAILMENT EMERGENCY REGULATIONS ISSUED 1947

Pursuant to authority granted by Decision No. _____ dated _____, the Emergency Power Director of the Public Utilities Commission of the State of California establishes the following emergency rules and regulations. Any rule or regulation, rate or contract of a utility subject to the above-mentioned order on file with the Commission or in force or effect, inconsistent herewith, is suspended or modified to the extent necessary to remove such inconsistency.

### I GENERAL

1. No special agreement for the conservation or curtailment of electricity except such as are hereinafter so specified may be carried out until first authorized by the Emergency Power Director.

2. No utility may inaugurate any plan for allocating available supplies of electricity or of establishing a method of priorities for the distribution thereof except as hereinafter directed without first having obtained authority to do so from the Emergency Power Director.

### II CONSERVATION

The use of electric power and energy for the following lighting purposes is prohibited and the utility shall not supply, or continue to supply, electric service for said purposes during the period of this emergency:

1. For advertisements, announcements, billboard notices or signs advertising a product or service or designating the location or nature of an office, store or other place of business, either indoors or outdoors, except that

a. Commercial establishments other than theatres open to the public during evening hours shall be permitted entrance lights or signs not to exceed 75 watts per entrance from sunset to closing.

b. Theatres and other establishments with marquees shall be permitted entrance area lighting and attraction boards not to exceed 25% of normal from sunset to closing.

2. For the lighting of show windows and promotional displays.

3. For the illumination of the interior of stores, offices and other places of business, except minimum requirements for protection, maintenance and operation. All-night protection lighting shall not exceed five watts per 100 square feet of interior area but may be 25 watts per store or entrance.

4. For the ornamentation or exterior illumination of any commercial or public building or structure.

5. For lighting of outdoor areas such as service stations, used car lots, parking lots, and other outdoor activities, except when open for business in evening hours, in which event lighting shall be permitted from sunset to midnight, in an amount not to exceed 25% of normal or 250 watts whichever is greater.

6. For floodlighting of outdoor sporting events in excess of 50% of the energy used during the corresponding month of the previous year or by special agreement authorized by the Emergency Power Director during a corresponding period of the previous year. Sports floodlighting shall not be turned on prior to 8 p.m.

7. For street lights now operating on other than an all-night basis.

8. This order shall not be construed as prohibiting minimum lights or lighting required by law or public safety.

III NEW BUSINESS

Electric service may be supplied to new customers, or for increased facilities of existing customers, in accordance with the following provisions:

1. The utility may serve without further approval

   a. Minimum requirements for agencies or instrumentalities essential for the maintenance of public health and safety.

   b. Residential service for lighting and lamp socket devices and domestic water supply. Ranges and water heaters may not be served under this section.

2. All other new loads may be served only upon authorization by the Emergency Power Director upon showing and recommendation by the applicant and the utility that such new load is essential.

3. Application received subsequent to the effective date hereof will not be accepted for the following types of service:

   a. Replacement of other fuels or types of power which have previously performed a given service or function.

   b. Space heating and air conditioning of living or working areas.

   c. Lighting for outdoor sports, illuminated signs and exterior flood or ornamental lighting of commercial or public buildings or structures, except as specifically exempted herein.

   d. Street lighting where existing all-night lights are adequate for safety.

   e. Heating in industrial processes where other fuels can be utilized.

IV CURTAILMENT

The use of electric power and energy shall be curtailed as specified below and the utility shall not supply or continue to supply electric service in excess thereof.

1. RESIDENTIAL OR DOMESTIC SERVICE

   a. Use of electric energy for household purposes by residential customers shall not exceed 90% of their use of electricity during the corresponding month of ____ with proportionate adjustment for load changes which may have been made in the intervening period.

2. AGRICULTURAL SERVICE

Use of electric power and energy for agricultural purposes shall not exceed the amounts specified in the following paragraphs.

a. Total kilowatt hour use in pumping plants not operated during any PEAK PERIOD shall not exceed, for the period March to December, inclusive, ____, 90% of the total use during the corresponding period in ____. The maximum kilowatt hour use during any 30-day period shall not exceed 100% of the greatest use in any 30-day period from March to December, inclusive, ____.

b. Total kilowatt hour use in pumping plants operated during any PEAK PERIOD shall not exceed, for the period March to December, inclusive, ____, 90% of the total use during the corresponding period in ____. The maximum kilowatt hour use during any 30-day period shall not exceed 100% of the greatest use in any 30-day period from March to December, inclusive, ____.

c. On individual farms, irrigation or reclamation districts where two or more pumping plants are operated, curtailment may be accomplished by discontinuing use of electricity supplied by the utility for the remainder of the emergency at one or more plants. The remaining plants may be operated without restriction provided the total kilowatt hour use of all the remaining plants operated during the months March to December, inclusive, ____, is not more than 90% of the total kilowatt hours used by all plants operated during the corresponding period of time in ____. Plans involving other methods of curtailing by combining or rearranging plant operation may be accomplished by special agreement subject to the approval of Emergency Power Director.

d. Pumping plants used for the purpose of supplementing natural or gravity irrigation shall be permitted to use a greater number of kilowatt hours during the months March to December, inclusive, ____, than was used during the corresponding period of time in ____. Such excess shall not be more than the kilowatt hours per horsepower of rated motor size, established by authority of the Emergency Power Director. Such additional amount of energy shall be determined by the minimum needs to preserve the life of trees, vines, or other permanent plantings.

e. The use of electricity for agriculture other than pumping shall not exceed 90% of the use in the corresponding period of ____.

f. In each case of Section 2, 3, 4 and 5 where the quota for a given month is exceeded in accordance with above rules in expectation that curtailment will be made later in the season, the customer will be required to sign a memorandum of understanding to that effect.

g. Plants connected subsequent to January 1, ____, and not having a prior use record for ____ will be curtailed, as above, based upon the use of like plants within the area.

Note: The PEAK PERIOD is the time during the day when the greatest use of electric power occurs. Agricultural customers will be advised monthly of the time of the PEAK PERIOD by the utility at the direction of the Emergency Power Director.

3. ALL OTHER SERVICE

The demand for (rate of use) and the use of electric energy by all except domestic and agricultural users for heating, lighting, manufacturing, processing purposes, or for any other power requirement, shall not exceed a percentage of the demand and use during corresponding periods of ____, with proportionate adjustment for load changes which may have been made in the intervening period, and provided further that:

a. Individual plants which reduce their demand for and use of electricity without curtailing duration of operations shall restrict their ____ monthly demand for and use of electricity to 90% of the demand and use in the corresponding month of ____. Such plants may use substitute sources of power. If such substitute sources are electrical, they may be run in parallel with the utility's facilities by agreement with the utility or upon authorization by the Emergency Power Director.

b. Plants which reduce their use of electricity by curtailing their periods of operation shall restrict their ____ monthly maximum demand to 100% and their monthly use of electricity to 90% of the use in the corresponding month of ____. The period of curtailment shall be agreed upon by the customer and the utility or authorized by the Emergency Power Director.

c. Plants, industries, or associations having seasonal use characteristics because of requirements to service agricultural products shall curtail their use of electricity to 90% of the use in the corresponding ____ season. Such curtailment shall be in accordance with a pre-determined plan agreed to by the customer and the utility and authorized by the Emergency Power Director.

d. Plants, industries or associations which can curtail the use of electricity by combining operations or substituting other forms of power shall restrict the aggregate demand and aggregate use for each month of ____ to 90% of the demand and use in the corresponding month of ____. Such curtailment shall be in accordance with a pre-determined plan agreed to by the customer and the utility and authorized by the Emergency Power Director.

e. Minimum requirements for electric energy used solely for the protection of public health and safety shall be exempt from the requirements of this rule.

## V SERVICE STANDARDS

### 1. VOLTAGE

The utility may depart from nominal voltage standards specified in its tariff schedules by reducing distribution feeder voltages not more than 5% provided that in so doing voltages at customer meters are not reduced beyond the commercial range of appliance voltages. A report of all such reductions showing location, voltage readings, before and after reduction, and estimates of power saving shall be submitted to the Emergency Power Director.

## VI EMERGENCIES

1. During times of excessive overload, outage or other imminent disturbance which imperil future operations the utility shall take steps as may be necessary to safeguard its facilities, protect the stability of the system and preserve the electric supply to its customers in general. All such actions shall be reported to the Emergency Power Director at once.

VII COMPLIANCE

1. Failure to comply with the foregoing rules will make the party responsible for the violation subject, upon three days' notice, to discontinuance of all electric service to the customer or the premises on which the violation exists.

VIII MODIFICATIONS

The foregoing rules are subject to such amendment, modification, alteration or cancellation as may hereafter be ordered from time to time by the Public Utilities Commission or its Emergency Power Director. In cases where the application of the foregoing rules results in unusual hardship or unjust discrimination, appeals based upon good and sufficient showing may be made to the Emergency Power Director and thereafter to the Commission.

EMERGENCY RULE AND REGULATION
EMERGENCY POWER DIRECTOR

Due to the critical shortage of fuel and the urgent necessity to conserve electric power and energy, the California Public Utilities Commission has established the office of Emergency Power Director and has empowered said Emergency Power Director to issue orders on behalf of the California Public Utilities Commission in respect of said emergency, subject to its review. The tariff schedules, including rates, rules and regulations and contracts of this company on file with the California Public Utilities Commission, or in force or effect, inconsistent herewith, shall be deemed suspended or modified to the extent necessary to remove such inconsistency.

The foregoing would include individual plants which reduce their demand for and use of electricity without curtailing duration of operations, for plants curtailing their use by periods of operation and for plants, industries or associations having seasonal use characteristics. The foregoing would also apply to plants, industries or associations which can curtail the use of electricity by combining operations or substituting other forms of power so as to restrict aggregate demand and aggregate use of that amount used during the corresponding period in the previous year.

## ADDITIONAL MEASURES TO BE CONSIDERED

1. Proposals as to the need for any legislation which would aid this Commission to facilitate energy conservation measures, energy sharing mutual assistance agreements and curtailment procedures.

2. Continuation of daylight savings time on a year round basis.

3. There has been some discussion in various forums across the country of demand inhibitng pricing strategies such as inverted rate structure,[11/] to reduce consumption of electricity. This Commission supported legislation (S.B.1189) during the recently concluded legislative session that would have provided this Commission with the additional staff and funding necessary for the underlying massive economic studies on which such pricing structures would be based.[12/] While development of conservation oriented pricing strategies has merit, the proportions of such an undertaking now, would overshadow the immediate curtailment and conservation issues to be concluded during the next phase of this proceeding. Accordingly, demand inhibiting pricing strategies will be considered in other appropriate proceedings.

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11/ An example of a conservation oriented demand inhibiting pricing policy would be a surcharge for the use of electricity in amounts over a percentage used during the corresponding billing period of the previous year. The amount of the surcharge and the percentage of use during the base period would be designated by the Commission. Uses connected subsequent to the applicable base period would be surcharged according to the same or like uses within the area. The surcharge proceeds would go to an energy conservation research and development fund to be administered by the Commission.

12/ It appears that the assumptions and conclusions advanced by the proponents for such pricing strategies have been based upon theory rather than emperical data. Compare Application of Wisconsin Electric Power Company Docket 2-U-7131, Aug. 1, 1973, Public Service Commission of Wisconsin. It does not appear that a demand inhibiting pricing strategy for electric utility service has as yet been adopted by any state regulatory commission.

FINDINGS OF FACT

1. The United States has approximately 1/16 of the world population while consuming approximately 1/3 of the world's energy. Energy consumption in the United States has more than doubled in the last 20 years and is projected to increase from the equivalent of approximately 32 million barrels of crude oil daily to 67 million barrels daily.

2. The electric utilities must compete with the transportation, industrial, residential, and commercial markets in their quest for energy with the industrial and transportation markets accounting for the largest share of the total consumed.

3. Electricity itself is a clean, convenient, and efficient form of energy and therefore very attractive to industry resulting in an annual growth rate of nearly 8%. Between 1970 and 1990, an annual growth rate of 6.4% is forecast. Because of this growth potential, it is expected that total electric energy requirements must be met from various sources, i.e., nuclear, coal, natural gas, oil, geothermal and hydroelectric.

4. Natural gas supplied approximately one-third of our national energy requirements in 1970; however, domestic production has peaked and is declining. Coal has great potential and is our most abundant resource; however, the increasing severity of air quality standards, environmental problems, associated with strip mining, mine safety and labor problems and competition from oil and gas have depressed the industry. Nuclear power is expected to develop rapidly but lead times are long with environmental concern over safety and pollution likely to increase. Other energy sources include hydroelectric, geothermal, oil from shale or coal, and solar energy still in the development stage.

5. As a result of diminishing deliveries of natural gas and development of clean air standards there has been a substantial shift by electric utilities and industrial users to the use of low sulfur fuel oil (1/2% sulfur content or less) in lieu of natural gas or coal.

6. Over the last twelve months invitations to bid issued by California electric utilities to domestic fuel suppliers have received little response.

7. Attempts by California electric utilities to obtain commitments for deliveries of low sulfur fuel oil from domestic or foreign suppliers have not been sufficiently successful to secure all the low sulfur fuel oil deemed required to meet foreseeable electric generating requirements through 1976.

8. The Los Angeles Department of Water and Power faces curtailment of electric generation starting in February of 1974.

9. The major California electric utilities project uncovered fuel requirements for 1974, 1975 and 1976 as shown in Appendix A hereto, which, if not acquired, will result in curtailment of the generation of electricity.

10. California refiners have contractually committed virtually all residual fuel oil output whether low sulfur or high sulfur through 1974 and to a slightly lesser extent through 1975 and 1976.

11. Major California electric utilities are now in the process of planning and implementing conversion of certain boiler facilities from the burning of natural gas to the burning of fuel oil and crude oil.

12. Construction of additional refinery capacity in California over the next three years will not be sufficient to provide additional supplies of fuel oil in the amounts needed.

13. Deliveries of energy in the form of oil from Alaska, from development of off-shore coastal reserves, from coal gasification or liquefication, from geothermal reserves, or from nuclear generation are not expected to increase in material amounts through 1976.

14. Action by the Congress of the United States would be necessary to obtain supplies of crude oil from the Elk Hills, California, Naval Petroleum Reserve.

15. At present public utilities have a low FPC priority classification for the use of natural gas and are in the next to last priority use classification in the rules and regulations proposed for mandatory fuel allocations by the Office of Energy Policy.

16. Reduction in the use of natural gas and consequent increase in the use of fuel oil will increase sulfur oxide emissions.

17. Since existing fuel oil production at existing maximum refinery output has been committed, it is uncertain whether relaxing of stack emission and fuel oil sulfur content regulations would produce materially additional amounts of fuel oil.

18. There is a pervasive use of electricity in our society and a consequent substantial interdependence between electric utilities, industry and the health and well being of the population.

19. Curtailment of electric generation could adversely affect public health and ultimately could result in detrimental social and economic consequences.

## CONCLUSIONS

1. Unless sufficient fuel oil is obtained to fulfill the uncovered fuel oil requirements shown in Appendix A, curtailment of electric generation will probably result before 1976.

2. Curtailment of electric generation could adversely affect the health, welfare and well-being of the citizens of California and therefore should be avoided, if at all possible.

3. All realistic alternatives to curtailment must be explored and implemented before curtailing of electric generation.

4. Every effort should be made by this Commission to assist the electric utilities in California to obtain the needed amounts of fuel oil, through allocation programs, high priority use classifications of fuel oil, and participation in federal, state and local judicial and administrative proceedings where such participation would assist in informing the reviewing bodies of the true state of facts.

5. There is a need for more expeditious processing of the applications for construction or expansion of power facilities and associated fuel facilities. Proliferation of agencies dealing with such matters could delay further the providing of generating capacity with a consequent further deterioration in the availability of electric energy.

6. An expanded role by this Commission in the collection of data concerning statewide energy requirements, fuel supply and projections therefor and the plans for fulfilling future generating requirements and the alternatives therefor, should be undertaken in order to develop the comprehensive capability of preventing energy shortages while giving full consideration and weight to environmental standards and needs.

7. A showing of conservation of energy practices planned and in effect will be required of every utility, where appropriate, in proceedings before this Commission.

8. Henceforward it will be and it is the policy of this Commission to encourage active conservation of fuel and energy practices by utilities subject to regulation by this Commission.

9. The utility companies subject to the jurisdiction of this Commission should be ordered to file contingency plans for electric generation curtailment, and for mutual assistance during periods of energy shortages as well as for capacity shortages.

10. The utility companies subject to the jurisdiction of this Commission also should be ordered to file with this Commission detailed plans for conservation of energy practices within their own organizations and coordinate actions to be undertaken by their customers and the public within their respective public service areas.

11. Public hearings on the energy conservation, curtailment and mutual assistance plans should be undertaken at the earliest reasonable date.

12. The Commission has the statutory authority and will take measures it deems necessary to order utilities to provide electricity on an equitable and nondiscriminatory basis to protect the health, safety, comfort, and convenience of the citizens of the State.

INTERIM ORDER

IT IS ORDERED that:

1. Respondents Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company are ordered to proceed forthwith on the following enumerated actions and to provide progress reports to the Commission thereon within thirty days of the effective date of this order and every thirty days thereafter until further order of this Commission:

(a) Pursue all appropriate federal regulatory proceedings to increase natural gas and fuel oil supplies, including but not limited to improved electric utility priorities from the FPC and Energy Policy Office.

(b) Seek federal legislative action to increase fuel oil supplies, including but not limited to establishing the availability of the Elk Hills Reserves for electric generating use.

(c) Study and, where appropriate, convert facilities to utilize alternate fuels, including but not limited to direct use of crude oil.

(d) Take all other appropriate actions to contract for additional natural gas, fuel oil, and other appropriate fuels.

(e) Take all appropriate actions to secure the necessary federal, state, and local authority for temporary relaxation of regulations limiting emissions from electric generating plants and the sulfur content of fuels used in electric generation where fuel supplies have a reasonable expectation of being secured that would not conform to existing regulations. Southern California Edison Company shall submit additional data and information including but not limited to estimated fuel savings, and support of a temporary relaxation of the minimum NOx Dispatch Method. If warranted by the present energy and fuel shortage the Commission will consider such temporary relaxation in a supplementary ex parte order.

2. Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company are to prepare plans covering the following enumerated actions and submit such plans for the Commission's consideration within twenty days of the effective date of this order:

(a) Energy conservation plans.
(b) Mandatory curtailment plans.
(c) Agreements for mutual assistance.

3. All other respondents hereto shall have forty-five days from the effective date of this order in which to respond to the foregoing plans. Interested parties are requested to respond within sixty days from the effective date of this order.

4. Publicly owned electrical utilities are urged to proceed to voluntarily support the programs enumerated in these ordering paragraphs and are urged to submit parallel reports to the Commission.

The Secretary is hereby directed to cause certified copies of this order to be served on each respondent to this investigation and also upon the various governmental agencies, publicly owned electric utilities, major fuel suppliers and other informed parties listed in Appendix C to the Order Instituting Investigation herein, to members of the California Legislature, and to those parties entering appearances in the proceedings herein, not otherwise included in Appendix A or C to the Order Instituting Investigation.

C. 9581 ek

Further hearings in this matter are to be held before President V. L. Sturgeon and Examiner B. Banks on November 29 and 30, 1973.

The effective date of this order is the date hereof.

Dated at San Francisco, California, this 25th day of SEPTEMBER, 1973.

President

Commissioners

I abstain.

C. 9581 ek

APPENDIX A

California Electric Utilities
Fuel Supplies
Years 1973, 1974, 1975, & 1976

Millions of Barrels

| | | Gas & Oil Requirement | Gas Supply | Oil Requirement | Oil Contracted & Probable | Oil Storage Draw down | Oil Unassigned |
|---|---|---|---|---|---|---|---|
| 1973 | PG&E | 44.9 | 35.4 | 9.5 | 12.2 | (2.7) | - |
| | LADW&P | 28.6 | 7.3 | 21.3 | 19.5 | 1.8 | - |
| | SCE | 63.3 | 18.2 | 45.1 | 47.4 | (2.3) | - |
| | SDG&E | 14.1 | 4.9 | 9.2 | 10.2 | (1.0) | - |
| | TOTAL | 150.9 | 65.8 | 85.1 | 89.3 | (4.2) | - |
| 1974 | PG&E | 54.7 | 10.5 | 44.2 | 28.3 | (9.5) | 25.4 |
| | LADW&P | 28.8 | 3.2 | 25.6 | 11.6 | (2.9) | 16.9 |
| | SCE | 71.0 | 9.3 | 61.7 | 47.5 | 0.2 | 14.0 |
| | SDG&E | 15.7 | 2.5 | 13.2 | 12.1 | (0.3) | 1.4 |
| | TOTAL | 170.2 | 25.5 | 144.7 | 99.5 | (12.5) | 57.7 |
| 1975 | PG&E | 49.8 | 3.8 | 46.0 | 20.0 | - | 26.0 |
| | LADW&P | 31.3 | 3.2 | 28.1 | 2.7 | - | 25.4 |
| | SCE | 75.3 | 5.0 | 70.3 | 46.8 | (0.5) | 24.0 |
| | SDG&E | 17.9 | 2.0 | 15.9 | 16.0 | (0.9) | 0.8 |
| | TOTAL | 174.3 | 14.0 | 160.3 | 85.5 | (1.4) | 76.2 |
| 1976 | PG&E | 41.6 | 6.2 | 35.4 | 27.7 | - | 7.7 |
| | LADW&P | 31.8 | 3.4 | 28.4 | - | - | 28.4 |
| | SCE | 83.2 | 4.8 | 78.4 | 61.2 | (0.8) | 18.0 |
| | SDG&E | 19.9 | 1.5 | 18.4 | 16.1 | 0.3 | 2.0 |
| | TOTAL | 176.5 | 15.9 | 160.6 | 105.0 | (0.5) | 56.1 |

PG&E = Pacific Gas & Electric
LADW&P = Los Angeles Department of Water & Power
SCE = Southern California Edison
SDG&E = San Diego Gas & Electric

## LIST OF APPEARANCES

Respondents: Chickering & Gregory, by C. Hayden Ames, Edward P. Nelsen, and Allan J. Thompson, Attorneys at Law, for San Diego Gas & Electric Company; Rollin E. Woodbury, Robert J. Cahill, William E. Marx, and Dennis G. Monge, Attorneys at Law, for Southern California Edison Company; Malcolm H. Furbush and J. Bradley Bunnin, Attorneys at Law, for Pacific Gas and Electric Company; Robert F. Harrington, Attorney at Law (Oregon), for Pacific Power & Light Co.; Harvey L. Brown, for California Pacific Utilities Company; and Rolph P. Cromer, for Sierra Pacific Power Company.

Interested Parties: Philip Tyner, for Powerine Oil Company; Col. Frank J. Dorsey, Attorney at Law (Washington), for Executive Agencies of the United States; William H. Fell and Richard L. Young, for City of Glendale, Public Service Department; K. R. Edsall and E. A. Tharpe, III, Attorneys at Law, for Southern California Gas Company and Pacific Lighting Service Company; Arthur T. Devine, Attorney at Law, for Department of Water and Power, City of Los Angeles; Brobeck, Phleger & Harrison, by Gordon E. Davis, Attorney at Law, and Robert F. Burt, for California Manufacturers Association; Pillsbury, Madison & Sutro, by James L. Wanvig and Noel Dyer, Attorneys at Law, and C. J. Carlton, for Standard Oil Company of California; Henry F. Lippitt, II, Attorney at Law, for California Gas Producers Association; Scott Poole, for Gulf Oil Company of California; Robert W. Thompson, for Metropolitan Water District of Southern California; James T. Brodie, for Pasadena Water and Power; James D. Woodburn, for City of Burbank, Public Service Department; Alan R. Watts, Attorney at Law, for the City of Anaheim; Louis Possner, for the City of Long Beach; John W. Whitsett, Deputy County Counsel, for County of Los Angeles and Air Pollution Control District of Los Angeles County; Robert G. Lunche and John S. Nevitt, for the Los Angeles County Air Pollution Control District; Edward E. Clark, Attorney at Law, for Atlantic Richfield Company; Timothy J. Stafford and George C. Bond, Attorneys at Law, for Union Oil Company of California; Lawrence S. Luton and Paula L. Nuschke, for Program in Public Policy Studies of the Claremont Colleges; Chester D. Walz, Attorney at Law, for Shell Oil Company; William L. Knecht, Attorney at Law, for Gerald Geiger, Chairman, Energy Crisis Task Force, and California Farm Bureau Federation; Martin McDonough, Attorney at Law, for Northern California Power Agency;

Kenneth J. Mellor and Charles L. Hair, for Sacramento Municipal Utility District; James F. Sorensen, for Friant Water Users Association; Bert Trask, for California Trucking Association; W. C. Leist and R. F. Smith, for Union Carbide, Linde Division; R. D. Copley, Jr., and L. E. Kell, Attorneys at Law, for Getty Oil Company; C. Rex Boyd, Attorney at Law, for Phillips Petroleum Company; William R. Veal, Attorney at Law, for Exxon Company, U.S.A.; Ms. Cassandra Dunn, Attorney at Law, for U. S. Environmental Protection Agency; and Mrs. Sylvia Siegel, for Consumer Federation of California, San Francisco Consumer Action, Consumers United, Inc., and T.U.R.N.

Commission Staff: John P. Mathis and Rufus G. Thayer, Attorneys at Law, and Page E. Golsan, Jr.