E/PCG/BW/WPSC

Decision 93785 DEC - 1 1981

ORIGINAL

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of SAN DIEGO GAS & ELECTRIC COMPANY for a certificate that present and future public convenience and necessity require or will require the construction and operation of: a double circuit 230 kV transmission line from Mission Tap to Miguel Substation; and a single circuit 500 kV transmission line from Miguel Substation to the Palo Verde Nuclear Generating Station Units 1, 2, and 3, Switchyard.	Application 59575 (Filed April 4, 1980; amended March 24, 1981 and June 1, 1981)

(See Appendix A for Appearances.)

I N D E X

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O P I N I O N

In Application (A.) 59575 San Diego Gas & Electric Company (SDG&E) seeks a certificate of public convenience and necessity for construction and operation of: a double circuit 230 kV transmission line from Mission Tap to Miguel Substation (Miguel), both in San Diego County; and a single circuit 500 kV transmission line from Miguel to the Palo Verde Nuclear Generating Station Units 1, 2, and 3 Switchyard (Palo Verde) in Arizona.

After being advised that such an application was to be filed, the staff entered into an agreement in May 1979 with the United States Bureau of Land Management (BLM) to undertake the

joint preparation of the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) required by National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The Draft EIS/EIR was issued on August 15, 1980, the Supplemental EIS/EIR on April 27, 1981, and the Final EIS/EIR on October 2, 1981. Commission hearings extended from the prehearing conference in September 1980 to the oral argument in September 1981.

In this decision this Commission grants a certificate for construction along the route identified in the Final EIS/EIR as the environmentally preferred route, including the segment north of Yuma, subject to mitigation and monitoring measures.

The Eastern Interconnection Transmission Line Project (Project) is needed to displace oil-fired generation. We have adopted mitigation and monitoring measures designed to reduce Environmental Impacts resulting from this Project.

The measures:

1. Require use of single pole tabular steel towers with specular conductors and reflective markers throughout agricultural land.

2. Require SDG&E to investigate complaints and eliminate induced current, audible noise, and radio and telephone interference.

3. Require SDG&E to undertake Phase III site-specific studies before construction.

4. Require the establishment of a Construction Liaison Officer program under supervision of the Commission staff to oversee completion and results of the Phase III studies and the implementation of the mitigation program.

Background

In Decision (D.)88758 dated May 2, 1978 resulting from hearings in Order Instituting Investigation (OII) 4, this Commission recognized the inordinate reliance placed by SDG&E on the use of oil and natural gas for electric generation and ordered SDG&E to:

> "Continue to use its best efforts to negotiate a contract for the purchase of Mexican power... (and) continue to analyze and pursue the concept of building a transmission system to the Arizona border..."

Thereafter, SDG&E began negotiations on several fronts, resulting in the following agreements:

1) Both Tucson Electric Power (TEP) and Public Power of New Mexico (PNM) agreed to sell coal-fired electricity to SDG&E from 1982 through 1988 providing firm capacity in amounts ranging from 236 megawatts (MW) to 870MW. In addition, both TEP and PNM agreed to make economy energy available to SDG&E.

2) Commision Federal de Electricidad (CFE) of Mexico agreed to sell to SDG&E 150MW of firm electric generating capacity from its Cerro Prieto geothermal power plants from May, 1984 through 1990.

3) Southern California Edison (SCE) agreed to provide 205MW of firm transmission service from the Palo Verde Nuclear Generating Station (PVNGS) to San Diego through its Devers substation by using the Palo Verde-Devers 500 kV Transmission Line, which is currently under construction. SDG&E's Arizona purchases are deliverable at PVNGS. The firm transmission capacity would be made available through May of 1986. Thereafter, SCE would continue to make interruptible transmission service available to SDG&E.

4) On November 8, 1978, SDG&E and Arizona Public Service Company (APS) entered into a letter of understanding to procure the necessary approvals and then to construct, operate and maintain 500kV transmission lines, substations and communication facilities which will interconnect the electric power networks of the two utilities. This system is referred to as the Eastern Interconnection. The lines would run from PVNGS through Yuma and then across the bottom of California to San Diego.

In the current application, SDG&E seeks a certificate to construct the Eastern Interconnection.

Project Description

The Project is a transmission system consisting of transmission lines at various voltage levels, substations, and communications facilities connecting the electric power networks of the Phoenix, Arizona, and the San Diego regions.

The primary component of the interconnection is a 280-mile single circuit 500 kV transmission line between Palo Verde (40 miles west of Phoenix) and Miguel (10 miles southeast of San Diego). The proposed 500 kV transmission line will also have lower voltage connections with the electric systems of IID and possibly the Commision Federal de Electricidad (CFE).

The 230 kV transmission line is a 24-mile double circuit tower line to be constructed in existing rights-of-way from Miguel northerly to Los Coches in Lakeside and then westerly to Mission Tap north of Santee.

The proposed 500 kV single circuit transmission line would have a normal capacity rating of 1,000-1,200 MW and emergency rating of 2,000 MW. The conductors would be 2,156 KCMil ACSR and hung on 80- to 195-foot steel lattice towers. Tower spacing would range from 1,300 feet to 2,000 feet. The minimum ground clearance of conductors would be 35 feet in California. Outside tower base dimensions would be 38 feet times 38 feet. The line would be located within a new 200-foot right-of-way.

The proposed 230 kV double circuit transmission line would have a normal and emergency capacity of 440 MW. The conductors would be 1,033 KCMil ACSR and hung on 105- to 155-foot steel lattice towers. Tower spacing would range from 800 feet to 1,600 feet. The minimum ground clearance would be 30 feet. Outside tower base dimensions would be 32 feet times 32 feet. The line would be located within an existing 150-foot transmission line right-of-way.

Ancillary facilities include intermediate substations at Yuma, Arizona and the Imperial Valley, California; a 161 kV transmission line to interconnect the 500 kV transmission line with the local power network in Imperial Valley; a 69 kV transmission system to interconnect the 500 kV transmission line with the local power network in the Yuma area; and communications facilities throughout the system. A new 500 kV substation would be required in the Imperial Valley and possibly in the Yuma area. At two of the four alternative substation sites in the Yuma area (North Gila and Dome Valley) a new substation would have to be developed. Existing substations at Palo Verde, Miguel, Los Coches, and at two of the four Yuma alternative sites (Yucca and Gila) would be expanded or modified.

The proposed communications system would require the addition of new facilities and the upgrading of several existing facilities. The new and upgraded facilities would be required to provide an intertie of microwave systems among APS, SDG&E, and IID. Communication services to be provided include protective relaying, system dispatching, system monitoring, and control.

APS would have an 11% (or 110 MW) entitlement between Palo Verde and Yuma and would also be responsible for 11% of the costs. Construction would begin in January 1982 and be completed in May 1984. The life of the proposed Project is estimated to be 50 years.

Compliance with the California Environmental Quality Act (CEQA)

After SDG&E announced its intention to pursue the project, the BLM and the Commission staff developed the procedure for the environmental review. Under 14 California Administrative Code 15063(d), if a project requires both an Environmental Impact Statement under the NEPA and an Environmental Impact Report under CEQA, a combined document can be prepared by the state and federal lead agencies. A cooperative agreement was executed by the BLM and the Commission on May 4, 1979 to undertake the joint preparation of an environmental document, following the receipt of the proposal and data from APS and SDG&E. The objectives of the joint effort were to reduce delay and expense by elimination of duplication, to integrate public consultation and coordination efforts, to emphasize cooperation between BLM and the Commission, to ensure swift and fair resolution of any disputes and to define the responsibilities of the respective agencies. The BLM and Commission held joint scoping meetings in La Mesa on June 28, and in El Centro on July 5, 1979, to solicit input for the environmental document. Wirth Associates, Inc., an environmental consultant firm, was retained by SDG&E and APS to prepare the environmental document under the direction of the environmental staffs of BLM and the Commission.

A.59575 was filed April 4, 1980 by SDG&E for a certificate to construct the Project. Pursuant to CEQA, the DES was completed with notice provided to affected property owners on August 15, 1980. Notice also was published. A PEC was held on September 24, 1980. Public hearings commenced October 6, 1980.

There was opportunity for public comment in writing and at hearing as to the adequacy, completeness, and accuracy of the DES. All parties had opportunity to present testimony and to cross-examine withnesses.

A joint decision was made by BLM and the Commission staff to issue a SDES. The decision was the result of comments, suggestions, and requests by individuals and various public entities. Notice of Completion of the SDES and the hearing schedule to complete the hearings in A.59575 adopted in hearing on April 2, 1981 were mailed by letters dated April 27, 1981 to all appearances, other hearing participants, and property owners along the route including alternate routes. Notice also was placed in newspapers of general circulation.

The same opportunities for written comments and hearing participation provided following completion of the DES were provided following completion of the SDES.

At the June, 1981 hearings a panel of experts who participated in the formulation and preparation of the DES and SDES presented testimony and were then cross-examined. The panel consisted of Rod Heller, project director, Garlyn Bergdale, project manager, Dr. Jeff Johnson, geotechnical studies, Dr. Walter Odening, ecological studies, Dr. Clyde Woods, cultural resources studies, Pam Bergmann, socioeconomic studies, Christine Keller, suitability/feasibility studies, Jan Townsend, archaeological resource studies, and Bill Bilbo, agricultural resource studies. Preparation of the environmental documents was directed by staff project manager, Bill Y. Lee and BLM project manager Stan Wagner.

Following the last day of hearing on July 9, 1981, the two lead agencies, BLM and the Commission, prepared the combined Final Environmental Document (FES)[4/] for the project. The FES is part of our record in this proceeding. It was filed October 2, 1981.

4/ The combined federal/state Final EIS/EIR.

Route Selection

In order to select the environmentally preferred route, the Consultants first examined the potential for siting transmission lines within various broad corridors in Southern California. Then, more narrow corridors were drawn for more in depth study within the most suitable broader regions. These secondary, or Phase II studies, were designed to use survey or sampling techniques to identify the best areas for construction of the project. For this 280 mile transmission project, over 1,000 miles of alternative routes were studied to the Phase II level. Other alternative routes were considered, but find to be infeasible due to legal or technical limitations, or unsuitable in terms of their inability to overcome environmental problems identified through the Phase II studies.

The Phase II studies provide an adequate data base to choose the least adverse corridor. However, it will be necessary to perform site-specific or Phase III studies prior to construction in order to determine the best location for each tower and road. It would not have been a reasonable use of time or money to have required Phase III studies for all of the alternatives presented.

The Consultants found that significant adverse effects would result no matter where the project is constructed. It was therefore necessary to develop a weighting system for the potential adverse effects to determine which route would product the least adverse results. In conjunction with BLM staff, the Consultants compared the alternative routes and derived the environmentally preferred route which is described below.

For the Arizona portion, that state's citing authority has approved the environmentally preferred route. It would originate at Palo Verde, and proceed generally in a southwesterly direction through the Sonoran Desert landscape of the Basin and Range Province. The route would parallel the Southern Pacific Railroad and traverse isolated parcels of agricultural land, the foothills of the Gila Bend Mountains, Dendora Valley, pass between Oatman and Face mountains and continue through the basin of Hyder Valley. The preferred route would proceed through the basin/bajada landscape, typical of the area north of the Gila River, then skirt the southern edge of the Muggins Mountains.

In the Yuma area the northern environmentally preferred route would cross the Gila River before turning north to skirt the west side of the Laguna Mountains and then west to cross the Colorado River just below the Laguna Dam, circumventing the City of Yuma in the north.

In the Yuma area, the southern environmentally preferred route would cross the Gila River, skirt the Gila Mountains, circumvent the City of Yuma to the south, cross the Yuma Mesa, and traverse the Yuma Valley before heading north to cross the Colorado River. The southern route is an alternative to the northern route in the Yuma area, both in Arizona and in California.

This decision will not discuss environmental consequences in Arizona. Section 21080(b)(15) of the Public Resource Code and Section 1002 of the PU Code preclude this Commission from including consideration of strictly out-of-state environmental factors in its decision-making process.

The northern route after crossing the Colorado River into California would proceed in a westerly direction crossing the Picacho Basin and turn southwest at the base of the Cargo Muchacho Mountains before entering the Sand Hills.

The northern portion of the environmentally preferred route in California just west of Arizona is generally characterized as having moderate-to-high environmental consequences with several significant unavoidable adverse impacts in the FES. There would be visual impacts. The preferred route would pass through 0.2 mile of Colorado River habitat and cross several park, preservation, or

recreation areas. The route would also traverse areas of archaelogical concern designated by BLM as having "very high" sensitivity. Numerous cultural-resource sites of Native American concern would be potentially affected.

The southern route in California would proceed generally in a westerly direction from the Colorado River, crossing the southern tip of the Fort Yuma (Quechan) Indian Reservation, south of Pilot Knob.

The southern portion of the environmentally preferred route in California just west of Arizona can generally be characterized as having moderate-to-high environmental consequences with several significant unavoidable adverse impacts. There would be visual impacts. The preferred route would pass through 0.2 mile of Colorado River habitat and cross one park, preservation, or recreation use area. The route would also traverse an area of archaeological, historical, and Native American concern.

The preferred route from Sand Hills to Mission Tap would traverse the Colorado Desert, Salton Trough, and Peninsular sections of two physiographic provinces. The route would cross the southern portion of the Algodones Dunes (Sand Hills) and agricultural land of southern Imperial Valley. Continuing west,

the preferred route would traverse In-Ko-Pah Gorge and Mountain Springs Grade and proceed into heavily vegetated rocky hills and valleys west of Imperial Valley, generally paralleling the International Border. The route would then proceed northwesterly, through the hills south of Dulzura and Engineer Springs, cross Jamul Mountains and continue along the southern edge of San Miguel Mountain. The final portion of the preferred route would turn northeasterly, and proceed from Miguel Substation across the northwest face of the San Miguel Mountain, through steep hills, to Los Coches Substation west of Lake Jennings. The preferred route would then proceed west, traversing areas of urban development and steep hills, to Mission Tap.

The environmentally preferred route between Sand Hills and Mission Tap is generally characterized as having moderate environmental consequences with several significant unavoidable adverse impacts in the FES. There would be visual impacts. The preferred route would pass through 79.6 miles of special-status plant habitat and traverse raptor nesting areas and the habitats of the Andrew's scarab beetle, flat-tailed horned lizard, bighorn sheep, and magic gecko. Approximately 22.4 miles of agricultural land would be crossed and 10.1 acres would be excluded from productive use. The preferred route crosses several park,

preservation, or recreation use areas; one single-family dwelling and one mobile home would be highly impacted. The route would also traverse areas of archaeological concern designated by BLM as having "very high" sensitivity and "severe density" of sites. One historical site and numerous cultural resource sites of Native American concern would be potentially affected.

An environmentally preferred route was identified in the FES with two alternative environmentally preferred routes in the Yuma area, each route reflecting a different set of values, or point of view, in trade-offs between resources. The southern preferred alternative represents the route with the least environmental impacts to the natural environment. The northern preferred alternative responds to public concerns expressed and gives greater significance to land-use conflicts and agricultural impacts in Arizona. In California, SDG&E's preferred route and the BLM's preferred route on public lands is the northern environmentally preferred route.

Hearings

A prehearing conference (PHC), 39 days of public hearing, and one day of oral arguments were held before Administrative Law Judge (ALJ) J. J. Doran[1/] in San Diego County and in Imperial County. The PHC was held in San Diego on September 24, 1980. Hearings to receive public comment on the Draft Environmental Document (DES)[2/] and Supplement to the Draft Environmental Document (SDES)[3/] were held in El Centro on October 6, 1980 and June 17, 1981, in El Cajon on October 7, 1980, and in San Diego on June 18, 1981. Public hearings were also held in San Diego on October 8-10, December 2-4, 8-11, 1980; January 12-13, February 24-27, March 10-11 and 31, April 1, June 22-25, 29-30, July 1-2, 7-9, 1981; and in Chula Vista on January 14-15, March 12, and April 2, 1981.

Concurrent briefs were required to be mailed no later than August 31, 1981. The matter was submitted following oral argument in San Diego on September 17, 1981.

1/ With Commissioner Claire T. Dedrick on December 9, 1980, and Commissioner Priscilla C. Grew on June 24, 25 and September 17, 1981.

2/ The combined federal/state EIS/EIR.

3/ The combined federal/state Supplement to the Draft EIS/EIR.

Position of the Parties

Position of SDG&E

SDG&E, as applicant, was active in all phases of the proceeding: Witnesses, exhibits, cross-examination, briefing, and oral argument. SDG&E states that the record fully supports certification of the proposed transmission lines with a planned in-service date of May 1984 along the environmentally preferred route.

It states that by definition, an environmentally preferred route is one that has, on balance, the least impact of any of the alternative routes considered.

It states that there are no other feasible alternative routes or mitigation measures available which would substantially lessen significant environmental impacts and SDG&E further states that significant impacts of the Project along the environmentally preferred route will be reduced to an acceptable level by implementation of the committed generic and selective mitigation measures.

Witness Roemmelt, SDG&E's manager of system planning, quoted from our D.88758 that ordered SDG&E to continue to analyze and pursue the concept of a transmission line to the Arizona border. He testified that SDG&E responded by initiating action on the Project, and signing agreements with Tuscon Electric Power (TEP) and Public Service Company of New Mexico (PNM) for power purchases.[5/] SDG&E has attempted to obtain firm transmission from Southern California Edison Company (SCE) by using existing transmission facilities to bring in the above east of California power. Only interruptible service is available over existing facilities. Further, SDG&E attempted to obtain firm transmission service in SCE's proposed Palo Verde-Devers transmission line and was only able to obtain 205 MW for the period May 1982 through May 1986. During the above period, maximum capacity purchased from TEP and PNM would range from 466 to 566 MW, leaving the excess over 205 MW dependent on interruptible service. After May 1986 when the

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5/ PNM agreement extends to April 30, 1988 and TEP extends to December 31, 1988.

firm transmission service by SCE terminates, the maximum capacity purchased would range from 436 to 736 MW. Only interruptible service would be available. The Project would provide a firm route to receive this coal-generated energy.

The witness estimated annual deliveries from TEP and PNM ranging from 2,000 gWh in 1984, to 3,600 gWh in 1987, and to 3,100 gWh in 1988 during the period 1984 to 1988. This is equivalent to displacing 3.4 to 5.2 million Bbls of oil per year of 20 million Bbls during 1984-1988. During the same period, SDG&E's system energy requirements are estimated to increase from 11,400 to 13,000 gWh. Therefore, the Project would play a very significant role in reducing SDG&E's oil burn.

SDG&E's total capacity requirements, CEC's BR III* peak demand with 20% margin, increases from, 2,500 to 2,900 MW during 1984 to 1988. During this same period, capacity under contract from TEP and PNM to be delivered through the Project ranges from 300 to 500 or 300 to 700 MW at the time of system peak demand.

SDG&E and CFE have agreed that SDG&E will purchase 150 MW of CFE's geothermal capacity from Cerro Prieto during the period 1984 to 1994. They have not as yet determined if the energy will be delivered over the Project or over CFE's 230 kV transmission system which would require facilities both in Mexico and in California.

*The California Energy Commission's Third Biennial Report.

SDG&E's manager of system planning testified about the purposes of the Project.

The purposes are:

1. To deliver low cost non-oil generated energy and capacity under contracts with Tucson Electric Power in Arizona and with Public Service Company of New Mexico.

2. To be used to deliver economy or surplus energy that could be available east of SDG&E's service area.

3. To provide for the delivery of geothermal power currently being developed in the Imperial Valley and encourage the development of more geothermal sites.

4. To assist in negotiations for further purchases of power which would move more seriously if the transmission line exists.

5. To provide a contingency plan for meeting projected demand if the additional San Onofre Nuclear Generating Units, scheduled to begin operating by 1984, are delayed.

Witness Haney, SDG&E's manager of financial services, testified that the Project's total cash construction costs to SDG&E to be $271 million. He estimated over one-half of the costs to occur in 1983 and over one-quarter in 1982. The witness also stated that about two-thirds of the funding would be external sources, using conventional capital markets or other forms of financing such as construction trusts.

He testified that construction expenditures as a percent of total capitalization ranged between 14 to 18% over the past five years. Projected spending, including this Project, is estimated to range between 11 and 14% for 1980 to 1983, and to be 9% in 1984. The financial witness stated that if Project cost overruns occur, the total capital budget would probably not change significantly. If the total budget became too large, lower priority items would be deferred. The staff witness said a construction cost overrun would be more likely in a power plant than in this transmission line. SDG&E concludes it will be able to finance the Project.

SDG&E's manager of system planning testified that the TEP and PNM firm capacity and energy from coal generation is cheaper than oil-and gas-generated energy. He stated that the cumulative Energy Cost Adjustment Clause (ECAC) savings of $521 million on a present value basis of the TEC and PNM contracts from the 1984-1988 operations (first five years) would exceed the present value of the total revenue requirement of $434 million for the 50-year life of the Project.

SDG&E is negotiating with TEP and PNM for additional purchases. It has economy energy agreements with these and other utilities, including APS and Salt River Project. Economy energy purchases would shorten the Project pay-back period, which is now estimated to run into the fifth year of operation. The witness presented an exhibit showing the effects of also including 5% of available economy energy (107 gWhs in 1984) and Mexican geothermal under contract (420 gWhs in 1984). He further testified that the annual net savings resulting from oil displacement would range from $53 to $149 million. These amounts are after deducting the annual cost of the Project capital recovery and of the energy purchases.

Position of the Commission Staff

The staff was active in all phases of the proceeding: witnesses, exhibits, cross-examination, briefing, and oral argument.

The staff position is that from an economic and electric planning perspective, SDG&E must find a way to displace oil and gas consumption and the Project should be built to help meet that need.

The staff testified that the resources provided by the Project are needed, that no alternate plan is more practical and that the Project is financially beneficial. Further, the staff testified that SDG&E's latest demand forecast indicates that new resources will not be necessary until after 1988, compared to the scheduled Project completion of 1984. Further, the staff testified that this indicates that the Project might be postponed a few years, but the advantages of increase in reliability, displacement of oil and gas, possible purchase of economy energy, and possibility of acquiring additional purchased power would be lost during the delay.

The staff and a panel of experts representing the environmental consultants testified concerning the contents of the environmental documents. Mitigation and monitoring measures were specifically covered.

An environmentally preferred route was identified in the FES, including two alternatives (northern and southern) in the Yuma area extending east and west of the Colorado River. The staff made no recommendation as to the preferred route.

Position of Imperial County

Imperial County (County) was active in cross-examination, briefing, and oral argument related to routing in the County. County does not oppose the Project, but does oppose the route. County, however, disagreed with the Commission/BLM staff determinations that the "environmentally preferred" transmission line corridor runs through the populated and irrigated agricultural areas of the County. It is the position of County that a northern transmission corridor route by, or through, the Salton Sea area, avoiding the irrigated agricultural lands of County, is feasible and should be directed by the Commission. County states that adequate consideration has not been given to the Salton Sea route, which would provide for a transmission line corridor avoiding the irrigated areas of the County.

County recommends that the Project be approved and that a certificate for the Project be granted.

It also recommended that the "environmentally preferred" route for the Project transmission corridor in County be disapproved and that a Salton Sea corridor be approved through County.

Position of City of Calexico

The City of Calexico (Calexico) presented a witness stating that the environmental documents do not adequately identify the impacts on Calexico. Calexico also cross-examined witnesses and made oral argument. Calexico noted the proposed corridor is within three miles of the city limits and that Calexico is the fastest growing community in the Imperial Valley, and that the proposed alignment would adversely effect the growth of the city.

Position of California Farm Bureau Federation and Imperial County Farm Bureau

The California Farm Bureau Federation and the Imperial County Farm Bureau (CFBF) were active in cross-examination, briefing, and oral argument related to routing in Imperial County. Further, they presented three pilots, an extension farm advisor, and a grower as witnesses.

CFBF wants to see lower cost power made available to SDG&E and IID customers. They state that the power should be made available without an undue burden on the Imperial Valley farming area. The proposed route is seen by them to impose a substantial burden on Imperial Valley agriculture. They urge that the Commission defer a decision on the Project and direct the staff and SDG&E to conduct further studies into the alternative routes and selective undergrounding.

They state that there are four alternatives to the proposed route which look promising: the International Border route, the Salton Sea route, the Banning Pass route, and Palo Verde-Devers. They further state that all would avoid agricultural land.

CFBF recommended mitigation in case the proposed route is authorized. For agricultural pilot safety, there should be high visibility markings on conductors and towers where aircraft are known to fly, whether required by other governmental agencies or not. Transmission line towers should be marked on top with some sort of a light. Tower structures in the agricultural area should be of the steel tubular pole variety and not steel lattice-type. This will enhance flying safety, and aid farming operations since less land will be taken and insects and weeds cannot grow under the pole towers. Transmission lines should be located near the edges of fields for both pilot and farmer convenience, but transmission lines should avoid obstacles, such as distribution lines, underneath them. For pilot and farmer safety and convenience, diagonal crossings of fields should be avoided to the maximum extent possible.

Position of Imperial Valley Corridor Committee

The Imperial Valley Corridor Committee (IVCC) entered its appearance on the 29th day of hearing. It represents farmers along the environmentally preferred route in Imperial County. IVCC participated in the cross-examination of the staff panel, presented testimony through an entomologist, a cable engineer, and a farmer, filed a brief, and made oral argument.

IVCC states that the DES and SDES erroneously conclude that the impact on agriculture of Link 129, the preferred route, will not be significant. IVCC states that the staff and its consultants did not make a sufficient degree of analysis of the severity and probability of occurrence of injury and death to humans, and loss to agricultural production, to accurately assess the impacts.

It states that the DES and SDES are inadequate. They have not been prepared with a sufficient degree of analysis to provide decision-makers with information which would enable them to make a decision which intelligently takes account of environmental consequences.

With respect to Link 129, IVCC recommends that the Commission order the staff and SDG&E to:

1. Determine and compare for each alternative the severity and probability of injury and death to humans.

2. Recalculate the loss of agricultural production, and reconsider the conclusion that impact is moderate.

3. Analyze selective undergrounding for each Imperial Valley alternative.

4. Conduct detailed studies of the Salton Sea, All-American Canal, Interstate 8, and Highway 98 alternatives.

IVCC recommends adoption of an alternative route.

Mr. Menvielle, a farmer called as a witness for IVCC, was an individual appearance and also a member of IVCC. He cross-examined witnesses and made oral argument. He expressed concerns about diagonal crossing, about towers being within the right-of-way inside the edge of the field, and distribution lines being outside of fields on roadways or ditch banks. He opposed construction along Link 129 which crosses his land.

Position of Eucalyptus Hills Landowners Association

The Eucalyptus Hills Landowners Association (EHLA) cross-examined witnesses, filed a brief, and made oral argument. EHLA's position is that the DES and SDES are inadequate, incomplete, and do not comply with CEQA and NEPA; the proposed Project is inconsistent with the Lakeside Community Plan; and the Commission did not allow EHLA to introduce direct testimony and effectively cross-examine witnesses.

EHLA first appeared to cross-examine witnesses on the 31st day of hearing. It filed a brief and made oral argument. EHLA does not question the need for the Project. It does not want the transmission line placed next to the existing transmission line in the existing right-of-way through Eucalyptus Hills, but rather placed north of it or placed underground.

The San Diego Board of Supervisors has expressed its support of this project, but did call for further studies in the Eucalyptus Hills Area.

Position of Community Energy Action Network

The Community Energy Action Network (CEAN) protests the granting of a certificate. CEAN presented a witness, cross-examined witnesses, filed a brief, and made oral argument. CEAN's position is that additional conservation and alternative technologies are alternatives. Further CEAN states that alternative routing, including the Palo Verde-Devers corridor, should be considered. It questions the reliability and cost of the Project and the forecast data adopted in the California Energy Commission's Biennial Report III.

Positions of Other Parties

Protestant William Bretz, for himself, has participated in this Project since the scoping meeting in La Mesa on June 28, 1979. Dr. Bretz testified, cross-examined witnesses, filed a brief, and made oral argument. Dr. Bretz's position is that the Project is unnecessary in light of the potential for developing alternative energy sources.

If the Project is approved, Dr. Bretz recommends the Palo Verde-Devers corridor, liability insurance for biological and health effects, notice to property owners about the electromagnetic field, mitigation requirements, and conditions on selling transmission service or ownership to IID.

Arnold Hunsberger, appearing for himself and the Jumul/Dulzura Planning Group, testified, cross-examined, and file a brief. His position is that the Project be denied because of the financial and energy advantages of using the recent technological advances in the field of amorphous silicon cell photovoltaics.

Anita Hamlet, appearing for self and spouse, recommends that the Project be denied. Mrs. Hamlet cross-examined, filed a brief, and made oral argument. Mrs. Hamlet's position is that the purpose and need were not demonstrated, the routing description and

notice were not adequate, the absence of health and safety hazards and radio interference were not adequately demonstrated, and liability within the right-of-way and mitigation were not adequately handled. A similar position was contained in a brief tendered by an individual who was not an appearance.

Sam Dawson, appearing for himself, presented testimony, cross examination, and made oral argument. Mr. Dawson's position is that the Project not be approved. He also states that if the Project is approved the Commission should establish a minimum distance from the end of the easement to habitable structures. He states that the biological effects testimony is inconclusive as to potential health hazards. He states that federal requirements precluding the use of natural gas for electric generation after 1990 have been removed through statutory amendments. He believes the Project should be delayed until alternative energy costs improve. He states that the shorter depreciation periods allowed in the new federal tax laws will cause electric rates to increase. Further, there may be severance taxes on imported electricity.

The position of Gregory Marshall, appearing for himself, is that radio frequency interference and mitigation have not been adequately assessed (in particular along Link 144). Mr. Marshall

presented testimony, cross-examined, and made oral argument. Further, he filed comments about the environmental documents. These comments have been responded to in the FES. SDG&E is required to comply with the regulations of the Federal Communications Commission and will be required to respond to radio and telephone interference complaints.

Cliff Hurley, appearing for himself, stated that his position is that the environmental documents may not be properly prepared, and that NEPA and CEQA have not been completely followed. Mr. Hurley testified, cross-examined, and made oral argument. His observations were filed as comments to the environmental documents and were responded to in the FES.

DISCUSSION

As virtually all participants in this proceeding have agreed, SDG&E must take steps to ease its dependence on oil and natural gas as boiler fuels. The Company relies on those fuels to generate almost all of its electricity (2279MW out of 2366MW), yet oil and natural gas are very expensive fuel options. A transmission line to the East represents a major step toward breaking SDG&E of this over dependence on oil and gas.

As SDG&E witness P. J. Roemmelt stated, the Eastern Interconnection will enable SDG&E to secure delivery of its contracted Arizona and New Mexico coal-fired power purchases. It will enable SDG&E to compete in the economy energy market. It will provide for delivery of geothermal power currently being developed as well as encourage accelerated development. Most importantly, it provides options for the future. SDG&E will be able to bargain from a position of greater strength for extensions of its power purchase agreements in order to continue to displace oil and gas generation into the 1990's and to meet demand shortfalls currently expected to occur beyond 1988.

While the notion of connecting SDG&E to the East is a simple one, the legitimate concerns raised by a project of this magnitude are considerable. To comply with CEQA and with Public Utilities Code Section 1001, we must be certain that the proposed project represents the best way to meet the identified need. If a transmission line is the best answer, we must determine the route for the line with the least adverse environmental consequences and identify all mitigation measures that must reasonably be required to minimize significant environmental impacts.

We have fully considered the alternative routes, project alternatives and need for the project as well as all other information as developed in the record to this proceeding, the application and in the environmental documents. We have also fully considered the comments of parties, individuals and other agencies which are included in the FES. In this decision, we find that the FES has been completed in compliance with CEQA.

The level of high quality participation in these proceedings by groups and individuals is worthy of note. In the discussion which follows, we will address the major concerns raised by those participants and our statutory responsibilities.

Alternative Sources

The DES and SDES include an analysis of the potential for meeting the stated needs of oil displacement and late-1980's capacity additions through the use of other generating technologies which might not require major new transmission capacity such as the proposed Project. While there are promising developments pertaining to the expanded use of low-head hydroelectric, pumped storage, geothermal, cogeneration, wind, and photovoltaic generating sources, and we urge SDG&E to pursue these sources, we consider their development to be complementary to, rather than an alternative to the Project.

Some public participants in the proceeding argued that alternative generation projects in conjunction with accelerated conservation and load management efforts could supplant the need for this project. These witnesses were Sam Dawson, Jay Powell, William Bretz, Arnold Hunsberger, and Dr. Charles E. Backus.

Dr. Charles E. Backus, Assistant Dean of Engineering at Arizona State University and a photovoltaics expert, called as a witness by Sam Dawson, stated on cross-examination that he was not

in disagreement with the following finding contained in a draft study prepared for the DOE by Science Applications, Inc., entitled "San Diego County: A Case Study of Opportunities for Grid Connection Photovoltaic Power Systems":

> "At DOE prices, central station photovoltaics may be attractive to SDG&E even with expanded coal siting.
>
> "SDG&E depends heavily on costly oil-fired generation. Any capacity that displaces oil must be seriously evaluated. And, as expected, our analysis shows that SDG&E should install as much coal capacity as possible to displace oil. However, our analysis also shows that because photovoltaics can be brought on line in less than half the time needed to bring a coal plant on line, photovoltaic systems at DOE prices have value as oil displacers even under greatly expanded coal siting.
>
> "Further, the longer coal siting is delayed, the greater the photovoltaic value becomes. This value is due both to lead time effects and declining price of photovoltaic systems."

Dr. Backus was optimistic that the DOE 1986 cost goal of $1.60 to $2.20 per peak watt could be achieved. Assuming the goals are met, he is of the opinion that the national production will increase from 4 MW in 1980 to 500 MW in 1986. Further, it may supply 5% or more of our electric energy by 2000. The witness stated it will be 2000 before we see the impacts from new materials to reduce costs to the order of 10 cent per peak watt.

Dr. Backus responded on cross-examination that an expenditure of $300 million on photovoltaics might produce about 413 gWh annually compared to 3,100 to 3,600 gWh in 1987 and 1988 from only the TEP and PNM firm contracts. The firm capacity from such a scheme might range from 38 to 56 MW compared to 890 MW from the Project.

SDG&E's manager of system planning acknowledged that the utility does not have any staff actively working on the development of wind-generated power. He estimates the development of 17 MW of cogenerated electricity by 1988, despite the fact that both the utility and the CEC estimate a potential for 70 to 76 MW. He also states that due to the anticipated availability of the new San Onofre units and the Project, SDG&E feels no pressure to complete a study of the potential for central station photovoltaics development at the Sundesert site. He says that if SDG&E gets approval of the Project, then it will start looking at other options.

The staff and SDG&E testified that while it is very important to promote each of these technologies as they become available, SDG&E's reliance on oil-fired generation is so great as

to require actions on many levels, including the purchase of eastern coal-fired power. The CEC expressed this view through the statement of its executive director, John Geesman, and in its comments filed in response to the DES.

At hearing, Geesman urged the Commission to approve the Project. He noted SDG&E's heavy dependence upon oil for electricity and its resultant high electrical rate which forces cutomers to pay the second highest price in the country. He called the Project a key link in bringing geothermal power from the Imperial Valley and Mexico to San Diego. Geesman stated that the Project would make a notable contribution toward the goal of getting California utilities off oil as quickly and economically as possible. Further, he stated that presently there is no direct way to get that geothermal power to San Diego. The Project is an essential link in assuring that SDG&E's ratepayers can benefit from this new energy source and break the cycle of escalating oil prices. He also stated that due to possible purchase contracts for up to 500 MW of coal-generated electricity from TEP and PNM, regional reliability may be improved and reserve margin requirements reduced, furthering the goal of increased power pooling among utilities.

The SDES states that although a principal objective of the utility is to reduce oil and gas dependence, all types of potential generating capabilities were considered, including the addition of new oil- and/or gas-fired units, repowering of existing units, the addition of coal or nuclear plants, development of hydroelectric facilities, development of geothermal power, cogeneration, purchases from Mexico, wind turbines, solar energy, biomass, and new technologies. SDG&E did not find these alternatives reasonable because of constraints of capital costs, national energy policy, environmental regulations, state-of-the-art technologies or lead-time required to construct new generating facilities in relation to time-of-need. Most of the alternative generation sources considered by SDG&E would be located off-system and would require new transmission facilities to deliver energy from each of the alternative generation sources to the SDG&E service area.

In addition to considering individual generation alternatives, SDG&E also considered the cumulative effects of some of the alternatives in combination that passed an initial screening based on criteria that they reduce oil/gas requirements and meet

the time limit of the stated need. A potential range of capacity for eight alternatives--additional conservation, hydroelectric and geothermal development, purchases from Mexico, cogeneration, wind, solar, and biomass development--was then compared to realistic estimates. The results indicated that if total maximum potential capacity were fully realized, approximately half of the capacity to be provided by the Project could be met. This does not suggest, however, that the Project is unnecessary or that it should be downsized. Rather, these resources can and should be developed in conjunction with the Project to the extent that they can reduce SDG&E costs by displacing oil and natural gas.

Alternative technologies such as wind, small hydroelectric, cogeneration, and photovoltaics can, with the proper degree of attention from SDG&E management, make a significant contribution to the company's resource plan.

Conservation

There was also considerable dicussion concerning the potential for accelerated conservation activities. When cost-effective, such an effort would not defeat the potential for rapid oil and dollar savings provided by the proposed Project.

SDG&E asserts that its potential for saving more through conservation than is reflected in the BR III forecast is nil. The assertion is based on the fact that all conservation "reasonably expected to occur" is already factored into the BR III demand forecast. However, we take notice of the CEC's finding that additional conservation (beyond that contained in BR III) is achievable with the implementation of several programs not yet in place at the time BR III was produced, such as the Residential Conservation Service and utility financing programs.[6/] And SDG&E's conservation witness Dougherty agreed that the BR III projections do not assume the existence of a zero interest loan program (ZIP) for conservation measures installed on a retrofit basis.

6/ California Energy Commission, Electricity Tomorrow, 1981 Final Report, p. 151.

The record in this case does not contain a comprehensive analysis of the potential for additional conservation to serve as an alternative to the Project. We conclude not that the conservation potential is trivial, but rather that SDG&E should be actively promoting such conservation in addition to the Project, in order to further reduce the company's dependence on oil and natural gas.

Routing Alternatives

Various parties have raised objections to the adoption of certain segments of the environmentally preferred routes.

Representatives of agricultural interests in the Imperial Valley asserted that there are various routes across the Valley that would avoid agricultural impacts and, therefore, be superior to the preferred route. They argued that the line could be placed in the northern part of the valley, running through the Banning Pass or across the Salton Sea, in the southern portion of the valley along the International Border, through the center of the valley along the Holtville Drain or to the Northern in a route that would circumvent Yuma and run parallel to SCE's Palo Verde-Devers route. This Commission has examined each of the proposed alternatives and finds that the environmentally preferred route, utilizing the northern portion in the Yuma area, represents the best option.

It was not necessary to perform Phase II studies to determine that the Banning Pass and International Border alternatives cannot compete favorably with the environmentally preferred route. Each would cross as much or more agricultural land as would the preferred route. Banning would also be substantially longer and would require placing yet another trans-

mission line in the already congested Banning Pass. While we also are aware that it would very difficult to obtain the necessary right-of-way across Morongo Indian lands through the Pass, our rejection of that alternative rests totally on the other above stated factors.

An International Border route south of El Centro could not be sited close enough to the border to avoid impacting agricultural land. The All-American canal runs very close to the border in this area. Agricultural lands run up to the right-of-way on the north edge of the canal. In many places there is a space of less than 60 feet between the southern edge of the canal and the international border. Since the required 200 foot right-of-way could not be secured south of the canal, it would be necessary to site a "border route" on the north side of the canal. This could not be done without using agricultural land for the right-of-way to an extent that would be at least equal to the agricultural right-of-way along the environmentally preferred route. Further, an International Border route would require either placing the line through the middle of the town of Calexico, or circumventing that city by placing the line along the city's borders on two sides. In either event, impacts to the City of Calexico would clearly be greater if a border route was used than they would be with the preferred route.

The Salton Sea route is similarly unacceptable. Representatives of the California Farm Bureau Federation and the Imperial County Farm Bureau, the County of Imperial and the Imperial Valley Corridor Committee suggested that the Commission staff failed to adequately analyze this alternative. A substantial portion of this alternative would be along segments of other routes for which Phase II studies have been completed. On the basis of that Phase II data alone, it can be found that the Salton Sea route would avoid the agricultural impacts in the preferred route but result in increased impacts in almost all of the other resource areas studied. The consultant's preliminary study indicates that some or all of the paths available for crossing the sea itself would have significant impacts on waterfowl and migratory birds.

However, our rejection of this alternative does not rest on consideration of the crossing of the Salton Sea itself. It is the opinion of this Commission that the very legitimate concerns that have been expressed related to agricultural impacts must be balanced along with other environmental factors which we are required to assess. The main environmental impacts of this Project through agricultural lands are related to farmworker health and crop productivity. The preservation of prime agricultural land is of vital concern, but it also must be remembered that such land is already in a highly developed state.

There are also a relatively few people living on cultivated lands as compared to neighboring towns. Therefore, it is fundamentally the impacts on farmworker safety and crop productivity that must be addressed in assessing relative impact levels. As will be discussed below in the Agricultural Impact section, we find that fully mitigated impacts to agriculture, while potentially significant, will not be as severe as impacts to other resources on any of the proposed alternatives. We find this to be true when the preferred route is compared to the Salton Sea route as well. Various routes through the cultivated fields of the Imperial Valley have been explored. We find that the preferred route would produce the least severe impacts to farm productivity and farmworker safety.

Some participants in this proceeding felt that SDG&E and the staff should have more thoroughly pursued analysis of an alternative route which would have avoided Yuma and proceeded directly west from Palo Verde parallel to or on an SCE right-of-way over which a line that terminates at Devers substation is currently under construction. On cross-examination of Mr. Roemmelt the staff developed information concerning the Palo Verde-Devers alternative route. It was argued that this approach would greatly reduce enviornmental impacts by avoiding the establishment of a new major

east/west transmission corridor. From Devers it would be necessary to either build additional lines through the Banning Pass area to Rainbow, or to upgrade SDG&E's interchange capability at San Onofre. Earlier in the review process, the staff had rejected the notion of an alternative routing through the Banning Pass as infeasible, due to the lack of success experienced by SDG&E and SCE in attempting to obtain easements across Morongo Indian Land or to cross Wilderness Study Area 193 in that area.

In addition to the problem of crossing Morongo Land, the staff project manager Lee testified that a Palo Verde-Devers route was rejected because without a connection to the Imperial Valley it would not serve the purposes that were applied for. Such alternative route would not serve the consumers in that area and it would not be available to collect geothermal-generated electricity.

SDG&E's manager of system planning stated three reasons why the company found the Palo Verde-Devers alternative unacceptable:

1. He assumed that SCE would be involved, and that a fee for the use of the lines would be required. He further stated that the real advantage in connecting with other utilities in a manner independent of SCE is to enable SDG&E to transact with those other

utilities directly. He said that SCE today is making significant purchases of economy energy for the benefit of their customers. SDG&E is of the opinion that unless they have this separate line they cannot make significant purchases of economy energy.

2. A separate southern line provides separate access to Imperial Valley geothermal energy.

3. The southern line could facilitate delivery of purchased Mexican energy produced at geothermal plants in Cerro Prieto. It should be noted, that the company will not acknowledge that it intends to use the project for these deliveries. An option exists for having the power delivered through Tijuana.

In its brief, the staff stated that no one from SDG&E indicated why a line parallel to Palo-Verde-Devers, if owned by SDG&E, could not provide it with the capability to make independent purchases.

However, there is no indication that either the U.S. Congress or the Morongo tribe would be amenable to granting a right-of-way in the foreseeable future. SCE has been trying for years to acquire a right-of-way across the Morongo reservation, and has not as yet been successful. SDG&E estimates that the Palo

Verde-Devers route would cost over $42 million more than the environmentally preferred route and that the annual system energy losses are estimated to increase $8 million. The Palo Verde-Devers route would not provide access to potential geothermal energy in the Imperial Valley and Mexico. A Palo Verde-Devers route would not enhance system reliability for IID. For these reasons, we find the Palo Verde-Devers route does not comprise a suitable alternative to the preferred route.

The City of Calexico states that the nearest portion of the preferred route, about three miles to the north of the established community, would restrict future growth. The FES addresses that issue and finds that the preferred route would not inhibit growth in Calexico. This finding is reasonable.

Residents of the Dulzura area initially protested the location of the preferred route through Dulzura as indicated in the DES. The SDES reflects a new alternative to the south of Dulzura which has been selected to be the preferred route. Since the issuance of the SDES, criticisms as to route alignment have not been further raised by the Dulzura residents.

Residents of the Eucalyptus Hills area along the route of the proposed 230 kV line from Miguel to Mission Tap oppose routing through the existing right-of-way. The existing utility right-of-way through that area contains lower voltage transmission lines. SDG&E proposes to add a 230 kV line and new towers in that existing right-of-way. Residents protested the cumulative impact of adding more lines through this area and found the DES inadequate for failing to include any alternatives to that route. The principal staff consultant explained that any new corridor from Miguel of Mission Tap, or from Los Coches to Mission Tap, would result in substantially greater environmental impact than construction of the Project within the existing right-of-way. This includes the alternative routing proposed in the comments of the Eucalyptus Hills Landowners Association. The analysis of potential alternatives to the 230 kV route contained in the FES convinces us that no reasonable routing alternatives exist.

The FES fully describes and supports the environmentally preferred route. There are no transmission lines, existing or proposed which could serve the needs of SDG&E and its ratepayers as well as the proposed Project. The route identified in the FES as the environmentally preferred route north is found to be the most feasible and reasonable route.

Several questions regarding the relationship of this Project to future transmission construction in Southern California remain unresolved. SCE has several transmission lines either in early stages of development or already before this Commission for certification which would transport power through areas discussed in this case. We find disturbing SDG&E's argument that the avoidance of coordination with SCE is adequate reason to dismiss the Palo Verde-Devers alternative. While we find the evidence regarding the desirability of this route convincing, the need for increased coordination in future resource planning is apparent.

Undergrounding Alternative

James A. Moran, Jr., an engineer with Power Technologies, Inc. of Schenectady, New York, testified on behalf of the Imperial Valley Corridor Committee (IVCC). His company manufactures and sells an advanced underground transmission cable system. He suggested that the DES is inadequate for failure to consider the full range of available underground transmission technologies, as well as for failing to consider the selective use of underground construction near residential areas and in agricultural regions.

A number of participants suggested constructing an underground transmission system rather than an overhead system across residential areas and irrigated farmland in the Imperial Valley, Tecata/Dulzura and Eucalyptus Hills/Lakeside area, and beneath the Colorado River and Salton Sea.

The FES states in response that design parameters and thermal limitations prohibit the use and application of underground transmission cable systems for long-distance transmission. For these reasons alone, without consideration of the cost factor, with notable exceptions (submarine) there are no underground transmission systems in the U.S. at voltages 230 kV and above exceeding approximately 15 miles.

Further, practically all of the less than 3,000 circuit-miles of underground transmission cables 60 kV and above have been installed in major cities, or for specific short-length installations such as exits from generating stations, or in areas of severe systems congestion. By comparison, as of January 1, 1979, there were an estimated 300,000 circuit-miles of overhead EV transmission lines. Costs of underground systems vary from 13-to-30 times the cost of equivalent overhead systems, depending on particular restraints, geography, urban-versus-suburban scenarios and systems requirements.

The FES also states that the principal environmental benefit of an underground system involves elimination of adverse visual impacts; however, on balance, the environmental benefits of undergrounding do not appear to outweigh the adverse impacts. Few studies have documented the impact of an underground system. Many of the potential environmental impacts would be similar to those resulting from pipeline construction. Greater impacts to the agricultural resources of Imperial Valley would result from total removal of the right-of-way from agricultural use. To the ecological resources, greater impacts would potentially occur in the Colorado River and Salton Sea areas (riparian habitat removal) and

the Tecate/Dulzura areas (loss of federal- and state-protected plant species and habitat removal). In the Imperial Valley a substantial reduction of the visual impact could occur; however, in southern San Diego County visual scarring of the landscape could potentially result in a significant impact.

Cross-examination of the staff panel and the IVCC witness shows that a 500 kV cable under the about 12-mile crossing of the Salton Sea would have greater environmental and economical impacts than the environmentally preferred route. In the existing right-of-way in the Eucalyptus Hills area, undergrounding next to the existing overhead transmission facilities would cause a significant potential for erosion in the hilly area, increased scarring, and greater cost when compared to the proposed Project.

The FES in summary states that for construction of an underground system the energy requirements would be approximately six times that of the proposed Project. Finally, considering the technical complications, economic and environmental costs, and accessibility (for repairs and maintenance), an underground system - regardless of length - is not a viable alternative.

Biological and Health Effects

Perhaps no issue in this proceeding has raised as much concern as the potential for adverse biological and health effects due to exposure to the electric and magnetic fields produced by 500 kV transmission.

Two experts on the subject testified and amplified on the conclusions contained in the DES. Dr. Solomon M. Michaelson, Professor of Radiation Biology and Biophysics at the School of Medicine and Dentistry of the University of Rochester testified on behalf of SDG&E. Dr. Charles E. Beck, Professor, School of Engineering and School of Medicine, Tulane University testified on behalf of property owners of the Dulzura area.

Dr. Michaelson testified that he reviewed the design criteria described in the DES. For the proposed two 230 kV lines, the electric field is estimated to be .5 kV/m at the edge of the right-of-way. For the 500 kV line, the electric field is estimated to be 1.5 kV/m at the edge of the right-of-way. The electric short circuit current for both lines will be 5 mA.

The witness states that the estimates are compatible with figures developed from experience with lines of similar design characteristics. On the basis of the design criteria and his 25 years of experience investigating electromagnetic pathophysiology and extensive continual review of the world literature in this

area, it is the witness' professional judgment that the proposed lines will not have any deleterious or other detrimental effect on man or animals residing or passing in the vicinity of these lines. He reports that another expert, Andrew Marino, has identified probable effects of exposure of various laboratory animals, but that he has never said that these lines are dangerous.

Dr. Beck stated that research funded by the Electric Power Research Institute (EPRI) has found evidence of neurological effects from exposure to fields in the order of 1 volt per meter. Further research is needed to determine whether harm to health will result.

The State of New York has undertaken a $5 million research program investigating the biological effects of transmission line-induced electric fields.

Dr. Beck testified that the risks inherent in exposure to these lines are unknown and that it is urgent and imperative to postpone siting any 230 kV or 500 kV lines in populated areas until further research is completed. He states that if such lines are to be built, steps could be taken to lessen the potential for adverse health effects. Fields could be reduced by increasing any major dimension of the line.

The biological and health effects study came to the following conclusions:

1. But for instances in which a conductive object within the electric field takes on as much as a 5 mA induced current, induced current problems will result in annoyance rather than adverse health effects.

2. Several animal studies have pointed out possible effects due to long-term exposure to electrostatic fields. The credibility of these studies has been brought into question by many experts in the field.

3. The results of studies reported to date on biological effects from electric fields are inconclusive in establishing that such effects do occur. On the other hand, it has not been clearly demonstrated that such effects do not occur. And if they do, experts are not in agreement as to whether they pose a potential biological or health hazard.

4. A limited number of studies on the effects of human exposure to electromagnetic fields have suggested that no significant adverse effects occur.

5. Damage to vegetation exposed to electric fields associated with high voltage transmission lines has been observed, and it is minor in nature.

6. A possibility exists that some types of pacemakers, if worn within the electric field will revert to an asynchronous mode, but the effects associated with long-term reversion of this type have not been conclusively established.

The FES states that effects from electrostatic and magnetic fields that develop around a transmission line are of general concern because of the potential for induced voltage onto conductive objects within the electrostatic field, instantaneous ignition of fuel, electric shock to human beings, and possible health and biological hazards. Short-circuit current from induced voltage would be limited by the proposed Project's line design to compliance with national and state safety codes, and the electrostatic potential would be eliminated for all permanent structures by grounding within 200 feet of the right-of-way. Line design will limit to 5.0 mA, the short-circuit current from metallic objects. Studies have shown that let-go threshold for human beings is equal to or greater than 5.0 mA. Interference that might result from induced voltage from a magnetic field to pipelines, rails, overhead communications circuits or other electric lines would be mitigated by SDG&E to the satisfaction of affected utilities and individuals.

SDG&E will be required to follow the National Electric Safety Code (NESC) provisions related to short-circuit currents. Further, it shall investigate any induced current complaints. If it is established that the nuisance is being caused by SDG&E facilities, every reasonable effort shall be made to promptly eliminate the nuisance.

In summary, the FES states that the results of studies, reported to date, on biological and health effects from electric fields are inconclusive in establishing that such effects do occur. On the other hand, it has not been clearly demonstrated that such effects do not occur. If they do, in fact, occur, experts are not in agreement that they pose a potential biological or health hazard. Reversion of pacemakers is the most substantial effect noted, although it is not considered a serious problem when it occurs for short periods of time. To date, no evidence that a transmission line has caused a serious problem to the wearer of a pacemaker has been found.

We find that present available information concerning health effects does not indicate that the exposure to electric fields in the Project right-of-way will induce detrimental biological effects. We shall also direct our staff to monitor ongoing studies 6/ on biological effects of transmission lines, as well as any new studies. However, on the basis of data reasonably available today, we cannot say that this project will lead to significant biological and health effects for those plants and animals exposed to the project's electric fields.

6/ Including the State of New York study.

Noise and Radio Interference Effects

James C. Berry, an acoustic consultant, testified on behalf of property owner Sam Dawson. Witness Berry feels that the DES fails to completely address the effects of varying atmospheric conditions on relative noise levels. Without an accurate measurement of ambient noise levels, it is not possible to understand the relative noise impact of the transmission lines. Such ambient measurements should also vary with the types of residences that are likely to be found along the proposed right-of-way.

He feels that ambient measurement should be taken at no fewer than three different locations reflecting variances in terrain. At each location the measurements should be taken under three or four different meteorological conditions. Only one day's reading under each meteorological condition would be required.

It is conceded that the transmission line will cause a greater amount of noise in foul weather than it will in fair weather. In addition, certain kinds of terrain may either enhance or attenuate the line noise from what is considered average.

Gregory Marshall, a resident of the San Diego area, testified that the ambient studies underlying conclusions concerning radio interference impacts were inadequacy results from improper study design. He proposed an alternative study methodology.

It is assumed that radio-frequency interference will occur. SDG&E has agreed and the FCC requires that harmful interference from the transmission line be eliminated.

The FES states that corona, which is the discharge of energy from an energized line when the voltage gradient exceeds the breakdown strength of air, is greatest during wet weather. Effects of corona are audible noise, visible light, photochemical oxidants, and radio and television interference. No significant adverse effects from audible noise, visible light, and photochemical oxidants are anticipated. Radio and television interference would be most pronounced in areas of weak reception and where antennae are located close to a transmission line.

The occurrence of audible noise, and radio and television interference are minimized by line design. SDG&E shall respond promptly to complaints regarding audible noise, and radio and television interference, and implement appropriate corrective measures. Further, SDG&E shall take all reasonable steps to eliminate or circumvent project-related interference that causes unsatisfactory radio and television service and adverse effects from audible noise.

The FES states that ambient audible-noise measurements were taken at 52 sites along the proposed transmission route. The average of the highest measurement taken was 52 dBA and the average of the lowest measurement taken was 43 dBA. Line noise will normally be inaudible at the edge of the right-of-way during fair weather. The noise, radio, and television interference impacts of the Project are not expected to be significant.

Agricultural Effects

A number of witnesses expressed concerns with the notion of placing additional transmission lines across the fertile agricultural lands in the Imperial Valley as well as with the adequacy of the agricultural analysis contained in the DES. Two farmers, three crop duster pilots, a farm extension advisor, and an entomologist testified that the lines will interfere with farming operations, including irrigating and harvesting. They also stated that the lines will create hazards for field workers who face potential electrocution and crop dusters who fly mostly at night and would face an increased risk of collision. They emphasized that if lines must be placed in the area, diagonal crossings must be avoided wherever possible. Further, single-pole steel towers should be used instead of four-legged lattice towers. They also suggest that the conductors should carry reflective balls and the towers should be illuminated for easier nighttime visibility.

The entomologist Meister stated that the transmission lines will eliminate from use all of the more than 500 acres of land which will lie within the right-of-way in agricultural areas. This is because it will not be possible to maneuver crop-dusting planes around the conductors and towers effectively enough to provide the maximum insecticide coverage necessary to raise high-priced vegetable crops. However, he acknowledged that it is rare to find a farmer who does not plant and harvest crops within utility transmission rights-of-way, but contends that the yields are lower.

Staff consultant Bilbo, who prepared the studies underlying the assessment of agricultural impacts contained in the DES, responded to each agricultural issue. These issues are further responded to in the FES. Overall, the impacts on agriculture are deemed to be moderate when compared to other types of significant impacts.

The consultants and several other participants proposed that single-pole towers be used in agricultural areas to aid crop cultivation and aerial spraying. This proposal is more fully discussed in the mitigation section.

All parties agree that if transmission lines must exist in agricultural area, diagonal field crossings are the most damaging to normal farm operations.

SDG&E shall be required to consult with county officials, land owners, and aerial applicators to determine the least harmful location for each tower to be located within the corridor through agricultural lands.

SDG&E shall be required to use reflective markers to increase the night visibility of the transmission towers. Further, SDG&E shall prohibit all obstructions from within the 200-foot right-of-way and coordinate with IID and The Pacific Telephone and Telegraph Company (PT&T) on eliminating or minimizing existing and future distribution and telephone lines adjacent to the Project. The Project will present a new hazard to aerial applicators. However, the record indicates that careful tower placement and adequate tower markings will enable prudent aerial applicators to continue to work in the vicinity of the transmission lines without adding measurable risk to an already hazardous occupation.

The issue of potential electrocution of farm workers from exposure to the 500 kV transmission line, raised by farm interests along the preferred route, was discussed by witness Bilbo (staff agricultural consultant). Based upon his work experience, including installing 40-foot sprinkler pipes in the San Joaquin Valley, he did not recall any report of farm workers contacting a 500 kV line. These lines are much higher than distribution lines. It was

suggested that an imprudent worker could make contact with a conductor from this line by standing along pipe on end while unloading it from a truck. While such an accident is possible, it is an unlikely result if workers exercise normal caution.

There are, of course, fatal accidents to California farm workers. California farm worker fatalities in 1979, the latest year in this record, totaled 63, including six from electric contacts, seven from machinery, nine struck by objects, and 31 from motor vehicles.

Our General Order 95, Minimum Standards of Construction for Overhead Lines, provides protection to the public from electric lines. Cal OSHA Electrical Safety Orders also provide protection to farm workers. Farm operators should be familiar with the safety orders that are applicable to farm workers in order to ensure safety in the work place. The Project is not expected to increase the potential for farm workers to contact electric lines.

Mitigation

This Commission has an affirmative duty to require that all feasible steps be taken to lessen the significant environmental impacts which could result from this project. Public Resources Code Section 21002.1(b) states that "Each public agency shall mitigate or avoid the significant effects on the environment of

projects it approves or carries out whenever it is feasible to do so." Subsection (c), which follows the above quoted language, states that a finding of infeasibility must be based on "economic, social or other conditions".

As part of the Phase II environmental studies, the consultants prepared detailed recommendations as to mitigation measures which could be selectively utilized to lessen significant environmental impacts. They also recommended that certain mitigating steps be taken on a project-wide basis. The Company agreed, in advance of certification, to adopt some of the selective mitigation measures and all of the general measures identified by the consultants. This Commission must now determine whether the Consultant's selective mitigation measures which the Company has not volunteered to adopt should be required. Elsewhere in this decision, we have identified and required the implementation of mitigation measures derived from comments to the draft environmental documents and testimony received in the hearings.

The remaining selective mitigation options can be divided into four categories:

1. Access Roads

The Consultants recommended that SDG&E avoid the construction of access roads entirely in some sensitive areas by utilizing helicopters for construction. In other cases, the

Consultants would restrict the widening or alteration of existing roads, require road alignments that are sensitive to land contours and require the permanent closing of roads after work on the Project is completed.

2. Tower and Conductor Design

It has been suggested by the Consultants that various modifications of tower placement and design of both towers and conductors be required in certain sensitive areas. For instance, single-pole, tubular steel towers would be used instead of four-footed lattice steel towers in agricultural areas; in some places conductors would be of non-specular materials to reduce visual contrast; the finish on some towers would be dulled for similar reasons; special tower placement would sometimes be required to reduce a land-based or visual impact.

3. Construction Schedule

Along the portions of the line in San Diego County, the Consultants recommend that construction activities be curtailed during the breeding season of certain sensitive wildlife species.

4. Preconstruction Survey Program

SDG&E has agreed, as recommended by the Consultants, to site-specific geotechnical field review of tower and access-road design to identify potential soil-erosion impacts, leading to possible minor adjustments in tower and road locations, restricting

access during periods of high moisture and utilizing selective biodegradable soil stabilizing agents. Other necessary mitigation may become evident as a result of the study.

The Consultants also recommended that Phase III, site-specific ecological field review of tower and access-road design be undertaken to identify impacts to threatened endangered, or otherwise sensitive vegetation and wildlife and determine the best applicable mitigation measures. Among other options, such mitigation might include minor adjustments in tower and road locations, closing access roads, relocating sensitive species and habitat improvements.

The Company argues that none of these additional mitigation measures should be required. The staff has not offered an opinion as to which of these measures should be required. The record does not suggest that any of these measures would be infeasible. The Company acknowledges that single-pole, tubular steel towers would lessen impacts through agricultural areas and then argues that it would be more cost-effective to simply enhance the visibility of towers and lines. Enhanced visibility will do nothing to effect the ease of maneuvering large agricultural equipment, which Imperial Valley participants claim will be enhanced with the use of single-pole structures. Further, SDG&E's cost-effectiveness argument is not persuasive in that it has developed no evidence to indicate that single-pole structures would be prohibitively expensive.

The Company also specifically argues against the required use of helicopter construction instead of the construction of access road in certain sensitive areas. The Company cites its application in claiming that this mitigation measure would add $5 million to the cost of construction. However, at the time of the application, the Consultants had indicated seven segments of the line along which helicopter construction would be required. Only three of those segments are included in the line which we are approving today. This factor alone suggests that the anticipated cost of this mitigation measure would be substantially less than claimed by the Company. It is also not clear that the cost of building access roads was subtracted from the helicopter construction figure to determine the net cost difference.

The comprehensive approach to mitigation planning which has been designed and utilized by the Consultants in this proceeding is to be commended. SDG&E has not persuaded this Commission that any of the recommended mitigation measures are infeasible. In this decision, we will require that the complete mitigation program be implemented as set forth in Table X in Volume 1 of the Phase II Corridor Study and in Table 1-V in the Supplement to that study.

Monitoring

The mitigation program required by the Commission (whether or not its elements were first adopted by SDG&E) is meaningless unless SDG&E performs the required actions. Some of the measures adopted or proposed require the performance of Phase III (site-specific) studies prior to construction. In the absence of further intervention by this Commission, the utility would exercise its own judgment as to project changes which should follow the results of the Phase III studies.

SDG&E has already indicated how those decisions would be made. Ed Gabrielson, testifying for the company, agrees that in placing towers, the company's judgment could have significant impact on the effects of the projects on individual homeowner's property and on the natural environment (Tr. 1601). He states, however, that onsite decisions as to tower and road placement would be made by weighing the cost of placing the tower or road in an environmentally preferred location with the cost of paying for

otherwise resulting damage (Tr. 1602). This suggests that where damage to the natural environment need not or cannot be compensated, the Company may choose to take a cheaper, more environmentally damaging route. As Gabrielson explains it, "Basically it comes down to an economic analysis" (Tr. 1604).

Gabrielson feels that if this Commission instructs the company to construct a portion of the line in the least environmentally restrictive manner, the only way for the Commission to enforce this requirement would be to come out after the construction and see where the tower or road was placed. (Tr. 1602). However Rod Heller of Wirth Associates, testified that an effective mitigation monitoring program by the licensing agency is not only possible, it is a very important condition to the certification of the project (Tr. 3161).

BLM has already committed to a very active monitoring effort on federal lands, including direct involvement in the siting of each tower and road. Heller states that while a less active pre- and post-construction reporting requirement could be useful, it would not provide the best assurance that the mitigation program is carried through to completion (Tr. 3162).

To rely on the Company's own mitigation efforts and subsequent reports to the Commission places the success of these efforts totally on the good faith efforts of the company. CEQA requires that only the licensing agency can reject a mitigation

measure on economic grounds. The Company should not be effectively given that authority by the Commission's inaction. Heller has proposed a procedure modelled on the BLM approach, which would provide more realistic assurance of compliance with the mitigation program.

> "The first part would be for CPUC and BLM project staff, with the assistance of Wirth Associates, to prepare a general scope of work or work plan for the mitigation program, including survey methods, reporting procedures, and minimum professional qualifications of personnel conducting the studies.
>
> "Secondly, based upon this general work plan, the applicant would prepare and submit for CPUC approval a detailed work program.
>
> "The applicant would subsequently conduct the required surveys and studies utilizing their own staff, consultants, or a combination thereof.
>
> "Whether staff or consultants, personnel conducting the studies would have to meet the minimum professional requirements set forth in the general work plan.
>
> "Third, and in order to implement the second mitigation monitoring option, CPUC would retain a full-time construction liaison officer.
>
> "This liaison officer or field inspector would continually monitor on-site construction activities to assure that mitigation procedures are being adhered to and that the project is being constructed in the most environmentally sensitive manner possible.

"The liaison officer's expertise would be supplemented as required by staff of consulting environmental specialists in the areas of soil, ecology, archaeology, agriculture, and visual analysis.

"These specialists would be utilized on an as-needed basis to review and interpret survey results and provide input to on-site technical issues.

"The preferred make-up of this consulting team would be personnel from different state agencies.

"For instance, personnel from the State Office of Historic Preservation are currently monitoring the National Historic Preservation Act compliance procedures on the project, and the California Fish and Game Department has expressed interest in being involved with the mitigation program." (Tr. 3162-3164).

It is Heller's opinion that this liaison officer would resolve issues which develop when the results of a study or studies suggest conflicting mitigation decisions. The officer would be able to halt construction work if mitigation procedures are, in fact, not being followed.

We agree that an approach along the lines of that suggested by Mr. Heller should be adopted and in this order we direct the Executive Director to report to the Commission within 60 days as to the Staff's recommended mitigation monitoring plan and its estimated cost. The Staff should strive to coordinate with BLM mitigation efforts where combined efforts appear reasonable. The Staff's plan should rely upon the expertise of representatives of various state agencies that have an interest in the outcome of this project. The Staff plan may call for the hiring of consultants, but such hiring should be limited to the greatest extent possible.

The goal of the program will be to assure that the mitigation program adopted today is fully implemented and that additional mitigation takes place consistent with the results of the Phase III studies. It is expected that monitoring personnel will work with the company and all interested parties to resolve any differences which may arise concerning proper implementation of the program. All costs related to the mitigation monitoring program will be borne by the company as part of the project costs.

Project Cost

In its application filed April 4, 1981, SDG&E estimated its costs for the construction of this project to be $292,287,000. In its closing brief, filed August 30, 1981, the company repeated that estimate.

No detailed derivation of this cost estimate was provided by the company, either in its application or in subsequent testimony. Looking ahead to the time when this Commission must determine the prudency of actual construction expenditures, we believe that a more detailed pre-construction estimate is needed. We will require SDG&E to file such an estimate in order to provide staff with the needed information. We also direct our staff to evaluate this filing.

We assume that the current cost estimates were given to this Commission in good faith, and that project costs contained in the more detailed filing will not deviate substantially from the current estimates, except for costs related to new mitigation requirements ordered herein. If this is not the case, we will investigate the matter of project cost further and, possibly, reconsider the certificate granted today. Further, the eventual rate base treatment of the project facilities will be limited to the current cost estimates absent persuasive showing by the company as to why the estimates could not be met.

To further insure that only prudent levels of project expenditures are incurred, we will direct the Executive Director to investigate possible cost monitoring mechanisms for this project. We would expect that his investigation will include the explicit consideration of a "milestones" approach to project cost monitoring, in which estimates of costs for the various phases of the project's development are secured prior to project construction and then actual costs for each phase are obtained as the project unfolds.

We feel that goal-oriented monitoring mechanisms such as this can provide greater incentives for utility cost control.

It is not our role to manage utility construction programs and we do not seek that end here. It is our role to protect ratepayers and insure that rates reflect reasonable costs. By obtaining fuller cost information which will enhance our ability to evaluate the prudency of project costs, and by enhancing utility cost control incentives through new cost monitoring mechanisms, we are taking steps aimed at fulfilling this regulatory responsibility.

Conclusion

A comprehensive record on environmental matters was developed in this proceeding through issuance of the DES, SDES, and FES, consultation with public agencies and others, and public hearings. All are elements in the environmental process which culminated in the issuance of the final document.

The public safety, health, comfort, convenience, and necessity require the installation, maintenance, operation, and use of the Project. The Project does not compete with any person, firm, or public or private corporation in the public utilities business for furnishing or supplying electric service to the public in or adjacent to the territory in which the Project shall be located.

The mitigation measures recommended in the Final EIS/EIR and contained in this opinion have been designed to reduce Project impacts and are adequate to protect the environment. We conclude that the Project should be authorized subject to implementing the mitigation and monitoring measures in the Final EIS/EIR, and in this opinion.

Findings of Fact

1. SDG&E seeks authorization to construct and operate a double-circuit 230 kV transmission line from Mission Tap to Miguel, and a single-circuit 500 kV transmission line from Miguel to Palo Verde.

2. SDG&E must take steps to ease its inordinate dependence on oil and natural gas-fired generation.

3. SDG&E's electric rates are among the highest in the nation.

4. SDG&E has agreements to purchase firm coal-generated capacity and energy with PNM through April 30, 1988 and with TEP through December 31, 1988. There are indications that these agreements can be extended.

5. SDG&E has an agreement to purchase Mexican geothermal-generated electricity through 1990.

6. SDG&E has an agreement to transmit 205 MW capacity across SCE's Palo-Verde Devers line through May, 1986.

7. The proposed Project will enable SDG&E to secure delivery of its contracted coal-fired power purchases.

8. The proposed Project will reduce SDG&E's dependence on oil and natural gas-fired generation.

9. The proposed Project will help SDG&E to meet its future forecasted demand in the mid- to late 1980s.

10. The proposed Project would facilitate the transmission of:

a. Economy energy purchases.

b. Geothermal energy from the Imperial Valley.

c. Geothermal energy from Mexico.

11. The proposed Project will enhance system reliability.

12. The estimated cost of the Project, including transmission line and ancillary facilities, is approximately $292 million.

13. The Project will enable SDG&E to annually purchase 2 to 3.6 billion kWh of firm energy from PNM and TEP during 1984-1988.

14. The above purchases will reduce oil consumption by 3.4 to 5.2 million barrels annually.

15. After recovery of the annual cost of the Project including capital recovery and energy purchases, there will be a net decrease in cost resulting from oil displacement ranging from $53 to $149 million per year.

16. The present value of fuel oil savings resulting from the Project will exceed the present value of the total revenue requirements for the 50-year life of the Project during the fifth year of operation.

17. The extent to which additional conservation potential could accelerate the company's reduction in oil and natural gas use has not been determined herein.

18. Alternative technologies such as wind, small hydro-electric, cogeneration, and photovoltaics can make a significant contribution to SDG&E's resource plan. However, the availability of these resources does not eliminate the need for the Project.

19. Phase II (resource survey and sampling level) studies provide an adequate base for choosing the least environmentally adverse corridor.

20. Over 1,000 miles of corridor have been studied at a Phase II level.

21. It is necessary to perform Phase III, or site-specific studies prior to the determination of the best location for each tower and road.

22. The noise, radio, and television interference impacts of the Project will not be significant.

23. The Project will not significantly increase the potential for farm workers to contact electric lines.

24. The Project will increase the hazards to aerial applicators compared with those now facing them.

25. Eliminating the diagonal crossing over agricultural areas will reduce the impacts on agricultural production and aerial application.

26. Based on the analyses in the FES, the route identified as the environmentally preferred route, including the northern portion in the Yuma area, is the most feasible and reasonable route.

27. A corridor one-quarter mile wide from each side of the center line of the adopted route is necessary to enable SDG&E to implement the mitigation measures for the new right-of-way.

28. Both the Banning Pass and International Border routes would cross as much or more prime agricultural land as would the "preferred route".

29. The Banning Pass alternative would be substantially longer than the preferred route and would require placing another transmission line through the already-congested pass.

30. The International Border route cannot be sited south of agricultural lands.

31. The International Border route would also have increased impact on the City of Calexico.

32. While avoiding agricultural impacts, a Salton Sea route has been found (on the basis of Phase II data alone) to have unreasonably high impacts on other environmental resources.

33. The preferred route through agricultural lands is environmentally preferable to any other proposed crossing through or around the agricultural lands.

34. A route in the Interstate 8 right-of-way through the Imperial Valley would result in higher residential and agricultural impacts than any other Imperial Valley link.

34. The Palo Verde-Devers route will cost over $42 million more than the environmentally preferred route and annual system energy losses will increase $8 million. Further, it would not meet the need to provide transmission capability to and through El Centro.

35. A new corridor from Miguel to Mission Tap, or from Los Coches to Mission Tap, would result in substantially greater environmental impact than construction of the Project within the existing right-of-way.

36. Single pole tubular steel towers are technically feasible and, if used in agricultural areas, will reduce agricultural impacts.

37. Lattice construction with nonspecular conductors is appropriate along the other portions of the Project.

38. The Project will not be a significant hazard to air safety.

39. Undergrounding of either the 230 kV or 500 kV lines is not an economically feasible alternative to overhead construction.

40. Undergrounding is not environmentally feasible in selected areas, such as Eucalyptus Hills or the Salton Sea.

41. Mitigation measures required to minimize the Project impacts as contained in the Phase II studies, FES, and in this opinion are reasonable.

42. The Project will provide access to less expensive sources of power and will reduce the quantity of oil consumed by SDG&E.

43. The proposed Project is required to meet the present and future public convenience and necessity.

44. There are a number of "preferred" resources which SDG&E can also develop to reduce its dependence on oil and gas. We view these not as alternatives to the Project, but rather as supplements to it.

45. Present available information concerning health effects does not indicate that exposure to electric fields in the project will induce detrimental biological effects.

46. This project will not preclude the cultivation of agricultural lands within its right-of-way.

47. The expected impacts on agriculture from this project are deemed to be moderate when compared to other types of significant impacts.

48. The selection of a construction liaison officer as recommended by witness Rod Heller is necessary to assure the proper implementation of the mitigation program.

49. Expenses related to the construction liaison officer program, as described in this decision, are part of reasonable construction expenses for this project.

50. The proposed Project will have a significant effect upon the environment; however, such effect is outweighed by the beneficial effects of the Project.

51. We have reviewed the record, the Final EIS/EIR, received on October 2, 1981, and the comments filed, and find that the Project, subject to the mitigation measures set forth, will not produce an unreasonable burden on natural resources, aesthetics of the area in which the proposed facilities are to be located, public health and safety, air and water quality in the vicinity of park, recreational, and scenic areas, or historic sites and buildings, or archaeological sites.

Conclusions of Law

1. SDG&E should comply with measures listed in the FES to mitigate the electrostatic and magnetic field effects of the Project.

2. SDG&E should comply with the measures listed in the FES to reduce the noise and radio and television interference produced by the Project.

3. SDG&E should be required to eliminate the diagonal crossing over agricultural production areas.

4. SDG&E should undertake the generic mitigation measures listed in the FES.

5. SDG&E should undertake the site-specific mitigation measures which are listed in the Phase II studies, the FES, and this decision.

6. SDG&E should undertake all Phase III site-specific studies listed in the Phase II studies and the FES prior to construction.

7. In agricultural areas, SDG&E should: (1) increase the night visibility of transmission poles, including use of reflective markers; (2) prohibit all obstructions within the 200-foot right-of-way; and (3) coordinate with IID and PT&T on eliminating or minimizing existing and future distribution and telephone lines adjacent to the Project.

8. Single pole, tubular steel towers should be required through agricultural areas.

9. Specular conductors should be required throughout Imperial County agricultural areas.

10. Where the use of a single pole, tubular steel tower for an angle tower would result in greater impact than a lattice tower, a lattice tower should be used after review and approval by the staff.

11. SDG&E should be required to meet with county officials, landowners, aerial applicators, and the construction liaison officer to make all reasonable accommodation concerning locations within the corridor.

12. The staff should monitor any new or continuing studies of the biological effects of high-voltage transmission lines.

13. SDG&E should pursue development of alternative supply sources and additional conservation to further reduce its use of oil and natural gas.

14. The present and future public convenience and necessity require the construction and operation of the Project.

15. The Final EIS/EIR has been completed in compliance with CEQA and the CEQA Guidelines. We have reviewed and considered the information contained in the Final EIS/EIR in reaching this decision. The Notice of Determination for the Project is attached as Appendix B to this decision.

16. The route identified in the FES as the environmentally preferred route north is the least environmentally adverse of the alternatives and represents the most feasible and reasonable route.

17. Changes have been required in the project which mitigate the significant effects thereof as identified in the FES.

18. Any remaining environmental impacts are outweighed by the beneficial effects of the Project.

19. The action taken should not be considered as indicative of amounts to be included in future proceedings for the purpose of determining just and reasonable rates.

20. The implementation of a mitigation monitoring program as described in this decision should be required and is necessary to assure the successful completion of the mitigation program.

21. SDG&E should include the cost of the construction liaison officer program as part of the reasonable construction costs for this project.

22. Pursuant to Public Utilities Code Section 1001, a 230 kV transmission line from Mission Tap to Miguel and a 500 kV line from Palo Verde to Miguel should be authorized as set forth in the following order.

23. SDG&E should be required to make filings of more detailed cost estimates than provided for in this proceeding.

24. Staff should evaluate SDG&E's detailed cost estimates and the desirability of an ongoing construction cost monitoring program.

O R D E R

IT IS ORDERED that:

1. A certificate of public convenience and necessity is granted to San Diego Gas & Electric Company (SDG&E) to construct and operate a double-circuit 230 kV transmission line from Mission Tap to Miguel Substation, and a single circuit 500 kV transmission line from Miguel Substation to the Palo Verde Nuclear Generating Station Units 1, 2, and 3 Switchyard along the adopted route in this proceeding subject to the mitigation measures recommended in the Phase II Environmental Studies, the Final Environmental Impact Statement/Final Environmental Impact Report, and in this opinion.

2. A variation of one-quarter mile from each side of the center line of the adopted route is authorized for the final alignment.

3. SDG&E shall comply with measures listed in the FES to mitigate the electrostatic and magnetic field effects of the Project.

4. SDG&E shall comply with the measures listed in the FES to reduce the noise and radio and television interference produced by the Project.

5. SDG&E shall eliminate the diagonal crossing over agricultural production areas.

6. SDG&E shall undertake the generic mitigation measures listed in the FES.

7. SD&GE shall undertake the site-specific mitigation measures which are listed in the Phase II studies, the FES, and this Decision.

8. SDG&E shall undertake all Phase III site-specific studies listed in the Phase II Studies and the FES prior to construction.

9. SDG&E shall: (1) increase the night visibility of transmission poles, including use of reflective markers; (2) prohibit all obstructions within the 200-foot right-of-way; and (3) coordinate with IID and PT&T on eliminating or minimizing existing and future distribution and telephone lines adjacent to the Project.

10. SDG&E shall use single pole tubular steel towers through agricultural areas. However, where the use of single pole towers for an angle tower would result in greater impact than a lattice tower, SDG&E shall use a lattice tower after review and approval by the staff.

11. SDG&E shall use specular conductors throughout Imperial Valley agricultural areas.

12. SDG&E shall meet with county officials, landowners, concerning aerial applicators and the construction liaison officer to make all reasonable accommodations concerning tower locations within the corridor.

13. SDG&E shall continue to fund EPRI studies of the biological effects of high-voltage transmission lines and shall keep us informed of the study results. The staff is directed to monitor any other new or continuing studies of these effects.

14. Within 90 days from the effective date of this decision, SDG&E shall undertake and file with the Commission a report setting forth in detail its pre- and post-construction plan for implementing the mitigation measures required by this decision. SDG&E shall use qualified engineering, cultural, and ecological resources personnel in conducting all surveys and in selecting all sites. The plan shall set forth the qualifications of personnel that will be used in the pre-construction surveys and in selecting all access roads, tower sites, pulling and tensioning sites, and all other construction sites involving ground disturbance.

15. SDG&E shall undertake and report on Phase III site-specific studies prior to construction.

16. SDG&E shall file quarterly reports with the Commission, setting forth in detail the status of the mitigation program.

17. Within 60 days, the Executive Director shall prepare and present to the Commission a recommended mitigation monitoring program consistent with the discussion herein. The recommendation shall include an estimated cost for the program.

18. All reasonable costs related to the mitigation monitoring program shall be considered as reasonable construction expenses related to this project.

19. Within sixty days, the Executive Director shall formulate and implement a procedure through which SDG&E will provide detailed pre-construction cost estimates for evaluation by Commission staff.

20. The Executive Director shall evaluate the need for a construction cost-monitoring program prior to commencement of this project and shall implement such a program as he sees fit. His evaluation shall include the explicit consideration of a goal-oriented "milestones" approach to cost monitoring, wherein estimates of costs for the various phases of the project are compared with actual costs as the project unfolds.

21. SDG&E shall comply with all filing requirements for cost information and shall cooperate fully with the staff's subsequent evaluation efforts and with any cost monitoring program that is developed.

22. SDG&E shall pursue development of alternative supply sources and additional conservation efforts to further reduce its use of oil and natural gas.

23. After the exhaustion of all administrative remedies in this proceeding, the Executive Director of the Commission shall file a Notice of Determination for the project as set forth in Appendix B to this decision with the Secretary of Resources.

This order becomes effective 30 days from today.

Dated December 1, 1981, at San Francisco, California.

JOHN E. BRYSON
President
RICHARD D. GRAVELLE
LEONARD M. GRIMES, JR.
VICTOR CALVO
PRISCILLA C. GREW
Commissioners

I CERTIFY THAT THIS DECISION WAS APPROVED BY THE ABOVE COMMISSIONERS TODAY.

Joseph E. Bodovitz, Executive Director

APPENDIX A

LIST OF APPEARANCES

Applicant: Manning W. Puette and Barton M. Myerson, Attorneys at Law, for San Diego Gas & Electric Company.

Protestants: Jay Powell and Donald R. Cohen, for Community Energy Action Network; and William L. Bretz, for himself.

Interested Parties: Bill Hillyer, Attorney at Law, for John Morgan Twyman and Wesley Stark; John Massie, for California Department of Fish and Game Environmental Services; Charlotte M. Holcomb, for Mountain Empire Farm Bureau Center; Michael Christopher Spata, Attorney at Law, for United Enterprises, Inc. and Eucalyptus Hills Landowners Association; Glen J. Sullivan and Allen R. Crown, Attorneys at Law, for California Farm Bureau Federation and Imperial County Farm Bureau; Anita Deaune Hamlet, for self and spouse; Meserve, Mumper & Hughes, by Lawrence H. Thompson, Attorney at Law, for Nova Financial Corporation and Moreland Investment Company; Thomas M. Fries, Assistant County Counsel, for Imperial County; Gray, Cary, Ames & Frye, by Eugene L. Freeland and David S. Porter, Attorneys at Law, for Imperial Valley Corridor Committee; Miguel Sanches, for City of Calexico; Stan Wagner, for U.S. Bureau of Land Management; Arnold Humsberger, for Jumul/Dulzura Planning Group and himself; and Harry Morel, San G. Dawson, Jack P. Peterson, Michael Brad Cooper, Helen D. Aronson, Richard I. Magozzin, Donald E. Scheckler, Sandra L. Murphy, Frank A. Murphy, Gregory Marshall, Cliff Hurley, and Ralph Menvielle, for themselves.

Commission Staff: Steven Weissman, Attorney at Law, Bill Yuen Lee, and Richard Finnstrom.

(END OF APPENDIX A)

APPENDIX B

NOTICE OF DETERMINATION

TO: Secretary for Resources
1416 Ninth Street, Room 1312
Sacramento, CA 95814

FROM: California Public Utilities Commission
350 McAllister Street
San Francisco, CA 94102

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 22152 of the Public Resources Code

Project Title

APS/SDG&E Intercomection Project - A-59575

State Clearinghouse Number (If submitted to State Clearinghouse)

SCH 79061204

Contact Person	Telephone Number
Bill Yuen Lee	(415) 557-1748

Project Location

San Diego and Imperial Counties

Project Description

SDG&E - a double circuit 230 kV T/L from Mission Tap to Miguel Substation, and; a single circuit 500 kV T/L from Miguel Substation to the Palo Verde Nuclear Generation Units 1, 2 & 3 Switchyard.

This is to advise that the California Public Utilities Commission (Lead Agency or Responsible Agency) has approved the above described project and has made the following determinations regarding the above described project:

1. The project [x] will have a significant effect on the environment.
   [ ] will not

2. [x] An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.

   [ ] A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.

   The EIR or Negative Declaration and record of project approval may be examined at 350 McAllister St., San Francisco, CA

3. Mitigation measures [x] were, [ ] were not, made a condition of the approval of the project.

4. A statement of Overriding Considerations [ ] was, [x] was not, adopted for this project.

Date Received for Filing _____

Executive Director
Date _____