

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking into
Implementation of Assembly Bill 1149,
Regarding Underground Electric and
Communications Facilities.

FILED
PUBLIC UTILITIES COMMISSION
JANUARY 6, 2000
SAN FRANCISCO OFFICE
RULEMAKING 00-01-005

**ORDER INSTITUTING RULEMAKING
INTO IMPLEMENTATION OF ASSEMBLY BILL 1149**

Summary

By this order, we institute a rulemaking into the implementation of Assembly Bill (AB) 1149, (Stats. 1999, Ch. 844), which requires the Commission to conduct a study as to ways to amend, revise, and improve the rules for the conversion of existing overhead electric and communications lines to underground service and to submit a report on the study to the legislature by January 1, 2001.

Since 1967, the Commission has required new electric service connections to be placed underground and has funded a gradual program to convert the existing overhead lines to underground service. Cities and local governments, as well as other parties, have raised a number of issues regarding our current program. The purpose of this proceeding is to gather additional information to assist us in framing proposals to the Legislature and our stakeholders for whatever reforms may be necessary.

This rulemaking will provide the opportunity for the Commission to begin consulting with and collaborating with interested stakeholders and other city/local governments that are interested in the undergrounding program. We will address the issues under consideration within this proceeding, but concurrently the Energy Division (ED) will hold workshops to encourage

discussion on which issues should be addressed and in what priority. We will address all other issues through testimony, hearings, briefs, and additional workshops, as necessary.

Respondents will be the Pacific Gas and Electric Company (PG&E), Southern California Edison Company (Edison), and San Diego Gas & Electric Company (SDG&E) representing the electric facilities, and all telephone corporations subject to the Commission's jurisdiction representing the communications facilities. We anticipate that interested parties will include consumers, city/local governments, and advocate groups.

Background

Beginning in 1967, the Commission required new electric service connections to be placed underground and funded a gradual program to convert existing overhead lines, including concomitant communications lines, to underground service. An amalgam of circumstances has prompted the Commission to initiate this rulemaking proceeding. Cities and local governments have raised issues concerning costs, project eligibility, and the accrual and allocation of funds. Specifically, many localities want the program to cover such costs as administrative expenses and necessary improvements to private property. If the program funded these expenses, it would relieve customers and the localities of some major expenses and might help to expedite completion of the undergrounding project. However, if more expenses are paid by the program, fewer miles of line can be undergrounded during a budget period.

Currently, a project is eligible for funding if it (1) improves a public recreation area, or (2) relieves congestion of wires and traffic. There has been

some urging that eligibility criteria be expanded to also include public safety and service reliability.

We issue this rulemaking to further explore these topics and formally solicit input from all interested parties. In addition, we will evaluate the program in light of the Commission goals of improving the environment, public health, public safety, and the quality of electric service - while keeping electric rates as low as possible. The benefits of undergrounding must be compared to its costs and balanced against consumers' willingness to pay for the program.

AB 1149

As noted above, the Legislature passed AB 1149 that required the Commission to conduct a study as to the ways to amend, revise, and improve the rules for the replacement of overhead electric and communications facilities with underground facilities and to submit a report on the study to the Legislature on or before January 1, 2001. The Legislature also directed us to include the following specific issues in our study:

- (1) Discovering and eliminating barriers to establishing continuity of the existing underground system and ways to eliminate uneven patches of overhead facilities.
- (2) How to enhance public safety.
- (3) How to improve reliability.
- (4) How to provide more flexibility and control to local governments.

In addition to these enumerated issues, we also want to look at both the broad policy issues raised by the program, as well as the details of program implementation. In particular, the policy review will include an analysis of the overall cost-effectiveness of the program and the current level of funding. We will use the detailed review to determine if the current program directs funds to the areas of greatest need.

The current undergrounding program consists of two parts. The first requires developers to put utility services underground in new subdivisions. Utilities, both electric and telephone, bear the costs of installation, except for trenching and backfilling expenses, which are the responsibility of developers. The second part of the program governs both when and where a utility may remove overhead lines and replace them with new underground service, and who shall bear the cost of the conversion. Since the program's inception in 1967, this second part of the program has required numerous resolutions and decisions increasing the budgets for underground replacement of overhead facilities. In addition, we have changed the formula used to allocate available program funds among local governments.

The ratepayers' current share of the cost of conversion appears to be between \$130 and \$180 million annually. At this current rate of expenditure, it could take many decades to underground the entire state's distribution system. Therefore, we need to evaluate the history, costs, and accomplishments of the program; its potential future costs and projected benefits; a desirable level of funding; cost containment; allocation to high priority projects; the relationship of the program to Electric Restructuring and other Commission programs; and the interaction with telecommunication issues. These issues can be addressed through a combination of workshops, testimony, hearings, and briefs.

After reviewing all of the above, we will report to the Legislature on whether to (1) continue with the goal of undergrounding the entire system statewide, (2) underground only select portions where the benefits exceed the cost, or (3) end the program.

Scope of proceeding

We issue this rulemaking to initiate a process that provides interested parties and stakeholders with an opportunity for up-front input on both the cost and benefits associated with undergrounding. It is our intent to gather information to assist us in framing the issues and developing proposals for future reforms in the program. We plan to consult and collaborate with interested stakeholders and state and local agencies that have an interest in undergrounding during the course of this proceeding. By the end of 2000, we expect to submit a report on our study to the Legislature and then work with the Legislature and the Administration on any amendment, revisions, or improvements to the current overhead replacement rules.

After considering the issues raised by the Legislature and staff, the focus of this rulemaking is on the existence, nature, and extent of the costs and benefits of undergrounding. As for costs, while residents and governments prefer underground service, the conversion from overhead to underground may not be cost effective where an overhead system is functioning and has considerable remaining life. Utility estimates for conversion range from the high tens to the middle hundreds of dollars per foot of line, anywhere from \$.5 million to \$3 million per mile. Some claim that the costs could be much lower. We will explore whether costs could be lowered through competition, special incentives, or other actions.

The benefits of undergrounding include aesthetics, increases in property value, public and worker safety, service reliability, reduction of fire danger, and reduced utility costs. We will consider the existence, extent, and value of these benefits; whether benefits and cost responsibility are properly linked; and whether alternative programs could obtain similar benefits at lower cost.

The aesthetic benefits are most noticeable along California's scenic highways, in parks and recreation areas, and in crowded urban environments. These aesthetic benefits increase property values to the property owners along the route. Such possible increases raise the issue of distributive equity: does cost responsibility match enjoyment of benefit?

Increased public and worker safety is another undergrounding benefit. The potential reduction in fatalities and injuries due to contact with overhead facilities, as well as reduction of power outages caused by overhead incidents is a desirable goal. However, this benefit must also be subject to a cost-benefit analysis. Perhaps the same benefits could be achieved at lower cost than undergrounding.

Underground lines may provide a higher level of service reliability than overhead lines because of their protection from aircraft, the elements, trees, or even fog, but if there is a failure underground it may be harder to inspect, detect, diagnose and repair. We need to review outage data to assess the reliability benefits.

Undergrounding may also reduce the danger of fire and other threats to life and property. Other potential advantages to undergrounding are a reduction in utility and public costs due to less maintenance, and a reduction in overall public exposure to electromagnetic fields.

We direct our ED to convene a workshop no later than February 2000, to encourage discussion among parties on which issues should be addressed and in what order, as well as on what data requests are likely to be submitted. Attached to this Rulemaking is a White Paper prepared by the ED and we direct respondents and interested parties to submit comments on the White Paper to the ED prior to the workshop. Following the workshop, the ED is to prepare a report setting forth recommendations for Commission action. The presiding

Commissioner may request written comments on the report, and will review the report and any comments in deciding how to proceed.

In addition to the ED workshop report, we need to have data on the contribution of underground lines to service reliability. In order to determine this, we need comprehensive reliability studies that include a database of electric outages, circuit-by-circuit or substation-by-substation, throughout the state. Respondent utilities will be asked by the ED for the data that they have on electric outages and for help in designing and implementing a statewide database on outages.

We require respondent utilities to attend and participate in the workshop and to respond to ED data requests. We invite other interested parties and members of the public to attend.

Comments And Formal Evidentiary Hearing

We urge the parties to read the attached white paper as a guide to potential issues. Except for the workshop identified above, all of the other issues determined to be in the scope of this rulemaking will be resolved via rounds of comments in formal hearings involving legislative facts. We may convene additional workshops or order meet-and-confer sessions, as appropriate.

Preliminary Scoping Memo

Rule 6(c)(2) of our Rules of Practice and Procedure¹ provides that the order instituting rulemaking “shall preliminarily determine the category and need for hearing, and shall attach a preliminary scoping memo.” This rulemaking is preliminarily determined to be quasi-legislative, as that term is defined in Rule 5(d). As indicated earlier, this Order Instituting Rulemaking (OIR) is exploratory. Our intention is to solicit comments and proposals on the existing

¹ Title 20 California Code of Regulations.

policy and rules for the replacement of overhead electrical and communications facilities with underground facilities to determine if any amendments, revisions, or improvements to the rules are warranted.

Consistent with the quasi-legislative category of this proceeding, we anticipate that there will be a formal hearing involving legislative facts.² At this time we do not anticipate holding an evidentiary hearing since we do not foresee a need to receive testimony regarding adjudicative facts.³ There will also be the workshop conducted by the ED to develop the issues. We may convene other workshops, as we deem necessary.

In accordance with Rule 6.3 and 6(c)(2), we provide a preliminary schedule that we propose be followed. The preliminary schedule will be discussed at the first prehearing conference (PHC) and may change as a result.

Schedule

We are mindful of the deadline imposed by AB 1149. We plan to conduct the workshops and hearings on a time schedule that allows us to prepare a thorough report for the Legislature by the close of 2000. We will adopt the following preliminary schedule:

OIR issued	January 2000
Preliminary PHC	February 10, 2000
Workshop	February 2000
Workshop Report	March 2000
Comment Period	March 2000
Final Workshop Report	April 2000

² Rule 8(f)(3) defines “legislative facts” as general facts that help decide questions of law, policy and discretion.

³ Rule 8(f)(1) defines “adjudicative facts” as facts which answer questions such as who did what, where, when, how, why, or with what motive or intent.

Prehearing Conference	May/June 2000
Final Decision and Report to the Legislature	December 2000

The Assigned Commissioner will establish the date for the second PHC but it is anticipated that it will be scheduled in late May or early June 2000. At this PHC if the Commissioner determines that additional rounds of comments are appropriate, or if a formal hearing involving legislative facts is necessary, dates will be established. A scoping memo will be issued following the PHC.

Any person who objects to the preliminary categorization of this rulemaking, the need for hearing, or to the preliminary schedule, shall raise such objections by filing an objection 10 days before the first PHC is held in this proceeding.

The initial service list for this proceeding shall be developed at the preliminary prehearing conference. Persons who want to become a “party” to this proceeding shall appear at the PHC, or at the formal hearing, and fill out the “Notice of Party/Non-Party Status” form (appearance form).

Those persons who do not want to be parties, and only want notice of the hearings, rulings, proposed decisions, and decisions may either appear at the prehearing conference or the formal hearing and fill out an appearance form, or they may mail a written request to the Process Office requesting that they be added to the service list for information only.

Those persons employed by the State of California who are interested in this proceeding may be added to the “state service” section of the service list either by appearing at the prehearing conference or at the formal hearing and filling out an appearance form, or they may mail a written request to the Process Office requesting that they be added to the state service list. All of the names

appearing on the state service list shall be served with all documents that parties may submit or file in connection with this proceeding.

The Process Office shall develop an initial service list based on the appearances at the first prehearing conference. This initial service list shall be posted on the Commission's web site, www.cpuc.ca.gov, as soon as is practicable.

Any party interested in participating in this rulemaking who is unfamiliar with the Commission's procedures should contact the Commission's Public Advisor Office in Los Angeles (213) 649-4782, or in San Francisco (415) 703-2074.

Consistent with Rule 6(e), we expect this proceeding to be concluded within 18 months.

Henry M. Duque shall be the assigned Commissioner, and Carol A. Brown shall be the assigned Administrative Law Judge.

Ex Parte Communications

This proceeding is subject to Rule 7, which specifies standards for engaging in ex parte communications and the reporting of such communications. Pursuant to Rules 7(a)(4) and 7(d), ex parte communications will be allowed in this proceeding without any restrictions or reporting requirements until the assigned Commissioner makes an appealable determination of category as provided for in Rules 6(c)(2) and 6.4. Following the Commissioner's determination, the applicable ex parte communication and reporting requirements shall depend on such determination unless and until the determination is modified by the Commission pursuant to Rule 6.4 or 6.5.

Therefore, **IT IS ORDERED** that:

1. A rulemaking is instituted on the Commission's own motion to conduct a study as to the ways to amend, revise, and improve the rules for the replacement

of overhead electric and communications facilities with underground facilities. A report on this study will be submitted to the Legislature by January 1, 2001, as required by Assembly Bill 1149.

2. Pacific Gas and Electric Company (PG&E), Southern California Edison (Edison), San Diego Gas & Electric Company (SDG&E), and all telephone corporations subject to the Commission's jurisdiction are made respondents to this proceeding.

3. The Executive Director shall cause this Order Instituting Rulemaking (OIR) to be served on respondents and on the service list in Rulemaking (R.) 94-04-031, Investigation (I.) 94-04-032, R.95-04-043, I.95-04-044, R.93-04-003, I.93-04-002, and on the League of California Cities.

4. An initial service list for this proceeding shall be created by the Process Office and posted on the Commission's website (www.cpuc.ca.gov) as soon as it is practicable after the first prehearing conference (PHC). Parties may also obtain the service list by contacting the Commission's Process Office at (415) 703-2021.

5. The category of this rulemaking is preliminarily determined to be "quasi-legislative" as that term is defined in Rule 5(d) of the Commission's Rules of Practice and Procedure.

6. The Energy Division shall convene workshops by the end of February and issue a workshop report to address issues pertaining to the costs and benefits associated with the current program to replace existing overhead lines with underground lines, as well as to discuss which other issues should be addressed and in what priority.

7. Respondent utilities and telecommunication providers are ordered to respond to data requests on outages and work with staff in designing and implementing a statewide database on outages to determine the benefits of undergrounding on service reliability.

8. Parties interested in submitting comments or prepared testimony on the issues identified in this OIR shall submit and serve their comments, testimony, etc., in accordance with the preliminary schedule included herein, unless changed by an assigned Commissioner's ruling.

9. Any person who objects to the preliminary categorization of this rulemaking, the need for hearing or workshops, or to the preliminary schedule, shall raise such objections by filing an objection 10 days before the first PHC is held in this proceeding.

10. A PHC shall be held on February 10, 2000, at 10:00 a.m. in the Commission's Courtroom, State Office Building, 505 Van Ness Avenue, San Francisco.

11. Persons interested in this proceeding shall follow the procedures described in this rulemaking to get on the service list.

This order is effective today.

Dated January 6, 2000, at San Francisco, California.

RICHARD A. BILAS
President
HENRY M. DUQUE
JOSIAH L. NEEPER
CARL W. WOOD
LORETTA M. LYNCH
Commissioners

**The Commission's Program Regarding the
Undergrounding of Electric Distribution Lines**

A White Paper

November 19, 1999

Energy Division

**California Public Utilities Commission
550 Van Ness Avenue
San Francisco, CA 94102**

INTRODUCTION

Since 1967, the Commission has required new electric service connections to be placed underground, and has funded a gradual program to replace existing overhead distribution lines (and concomitant communications lines) with new, underground service. AB 1149 (Aroner) has been signed into law, requiring the Commission to study various aspects of the program, and to report to the legislature by January 1, 2001.¹ In particular, the Commission must study the following issues:

- 1) Discovering and eliminating barriers to establishing continuity of the existing underground system and ways to eliminate uneven patches of overhead facilities.
- 2) How to enhance public safety.
- 3) How to improve reliability.
- 4) How to provide more flexibility and control to local governments.

The Commission may wish to undertake a more thorough investigation of the Electric Tariff Rules, operations, and results related to this program. This white paper identifies various issues, including those enumerated in AB1149, which the Commission may wish to consider.

The program is tied to a number of important Commission goals. In general, the Commission seeks to improve the environment, public health, public safety, and the quality of electric service. At the same time, the Commission wants to keep electric rates as low as possible, other things being equal. To balance these considerations, the Commission may wish to consider the benefits of undergrounding compared to its costs, as well as consumers' willingness to pay for various benefits.

Broadly speaking, the program consists of two parts. The first requires developers to put utility services underground in new subdivisions. The second governs (1) when and where a utility may remove overhead lines and replace them with new underground service, and (2) who shall bear the cost of the

¹ See Appendix A of this white paper for the full text.

conversion. The ratepayers share of the cost of conversions appears to be between \$130 and \$180 million annually.

At this rate of expenditure, as discussed below, it can be argued that it would take centuries to underground the entire state's distribution system. Therefore, at the broadest policy level, the Commission may wish to explore the circumstances where the many benefits to undergrounding exceed the cost. Broadly speaking, there are three options: (1) to underground the entire system statewide, (2) to underground just selected portions (as in the current program), or (3) end the program entirely.

The Commission may also wish to examine the details of program implementation. The question is whether the program best directs available funds to the areas of greatest need, and whether it operates efficiently.

Finally, the Commission may wish to examine how the program coordinates with other aspects of Commission regulation, including various aspects of Electricity Restructuring. More generally, telephone wires and television cables are moved underground along with electric service.

HISTORY OF THE PROGRAM

The program has a long and complicated history. A brief summary appears below.

In 1967, the Commission adopted a policy of encouraging undergrounding. Prior to that time, there was no explicit requirement that new facilities be put underground. Further, property owners desiring to replace an overhead system with an underground system had to form an assessment district to bear the costs. The Commission adopted the new program uniformly for all utilities by prescribing tariff amendments (D.73078, 67 CPUC 490).

New subdivisions (and those that were already undergrounded) were required to provide underground service for all new connections. Utilities (both electric and telephone) would bear the costs of installation except for trenching, conduit, and backfilling. Utilities were authorized to request exemptions from requirements where house lot sizes were very large, or where undergrounding was otherwise impractical. The Commission recognized, however, that it was not generally practical to put transmission facilities underground.

The Commission also established three programs that allowed customers, localities, or utilities to replace overhead with underground service if specified conditions were met. The Commission asked each utility to submit a budget for the new programs. The Commission adopted tariff rules that required communications utilities to coordinate with electric utilities in order to place their lines underground as well.

In 1969, the Commission clarified its policy. In particular, it required all service extensions to be placed underground, with utilities bearing all costs except those of trenching and backfilling, which remained the responsibility of developers (D.76394, 70 CPUC 339). In 1970, the Commission confirmed that underground service was mandatory in new subdivisions (D.77187, 71 CPUC 1134). In 1976, the Commission extended its policy regarding undergrounding to cover distribution lines of any voltage classification (D.85497, 79 CPUC 503).

A number of subsequent resolutions and decisions ordered utilities to increase budgets for replacement of overhead with underground facilities. In 1981, Resolutions E-1930 and E-1931 ordered such increases for PG&E and Southern California Edison in order to “ maintain construction activity at the historical level... ” (D.82-01-18, 7 CPUC 2nd 762).

The Commission has also changed the formula used to allocate available funds among local governments. At first, funds were allocated to local governments based on population. In 1982, the Commission recognized that some areas (where most service was already underground) had relatively little need for undergrounding, and approved a formula based on the number of meters served by overhead lines. The Commission also adopted a procedure for shifting funds away from communities that were not using their allocation promptly. Finally, the Commission allowed local governments to require utilities (for example, through franchise agreements) to install the first 100 feet of utility-owned underground facilities free (D.82-01-18, 7 CPUC 2nd 749).

In 1990, the Commission reexamined the allocation issue, and struck a compromise between the two previous policies. Henceforth, allocations would be based on 1990 levels, with increased funding allocated half-and-half on the basis of total meters and overhead meters, respectively. To the extent that funds exceeded 150% of the previous year’s allocations, however, those funds were allocated according to the number of overhead meters.

ACCOMPLISHMENTS

The Commission may wish to examine the program's accomplishments over the last 30 years, compared to the program's cost. The two main provisions of the program are the requirement that new subdivisions receive underground service, and the rules governing conversion of overhead to underground systems.

The requirement for underground systems in new subdivisions may have had very large effects on California's landscape. During the explosive growth of the last 30 years, California's population has grown by more than 60 percent, largely in new subdivisions. The exact impact is difficult to measure, since many developers might have provided underground service in the absence of these rules.).

The program for undergrounding existing overhead facilities has provided benefits through out the state but has affected only a few percent of the state's overhead facilities. Since 1967, perhaps 4,000² miles have been put underground, leaving roughly 150,000 miles above ground. This progress has cost cumulatively over \$2 million (without adjustments for inflation). These benefits, however, are widely distributed throughout the state, because funds are allocated to each local government entity.

THE COSTS AND BENEFITS OF UNDERGROUNDING

The Commission may wish to encourage undergrounding where the benefits exceed the costs, if those costs and benefits are equitably distributed. The Commission may wish to consider the existence, nature, and extent of these costs and benefits, and how potential benefits can be measured and valued. As is discussed below, the Department of Health Services (DHS), at the Commission's request, is conducting a study of the health impacts of electromagnetic fields (EMFs), which examines undergrounding as a potential mitigation measure. A

² This is a very rough estimate; actual mileage figures are not available. The estimate assumes a cost of \$200 per foot, or roughly \$0.5 million per mile, at the lower end of current cost estimates. This is lower than the costs cited by the Commission in 1982 of \$250 to \$1000 per mile; the lower current cost estimates may be due to newer technology.

discussion appears below of the potential costs and benefits of undergrounding. At the same time, the Commission may wish to consider whether other approaches could yield similar benefits at lower cost.

Costs

It can be argued that, all other things being equal, residents and governments prefer electric lines to be placed underground; but underground service may be relatively expensive, especially where an overhead system is functioning and has considerable remaining life. The Commission may wish to examine what costs are incurred by providing underground service, both in new subdivisions and for conversions.

Costs may be especially significant for conversions. According to Commission staff, utility estimates for conversion range, speaking roughly, from the high tens to the middle hundreds of dollars per foot of line, anywhere from \$.5 million to \$3 million per mile. Some claim, however, that costs could be much lower, perhaps \$.1 to \$.15 million per mile.³ The proponents of lower estimates claim that modern technology, such as remote-controlled drilling, could lower costs substantially. Further, they argue that current projects, as short as 600 feet or a city block, are in many cases too small to exploit economies of scale. The Commission may also wish to explore whether costs could be lowered through competition, special incentives, or other actions.

³ Oakland's fire area was undergrounded under D.92-12-016. In response to a staff data request, PG&E has reported costs of only \$30-\$40 per foot. However, the utility claims that low figure stems from incorrect cost accounting, due to the urgency of the project. Moreover, according to PG&E, costs may have been lower because workers often were able to disregard existing water, sewer and gas lines, since many of these had been destroyed in the fire. Others assert that low costs were due to economies of scale available to a large project, and savings due to extensive use of new technologies, such as remote-controlled, directional drills. A cost of \$30 per foot is equivalent to \$150,000 per mile.

Benefits of Undergrounding

There are many potential benefits to undergrounding.⁴ The Commission may wish to consider the existence, extent, and value of these benefits; whether benefits and cost responsibility are properly linked; and whether alternative programs could obtain similar benefits at lower cost. The examples below illustrate potential benefits. The Commission may wish to ask Utilities Safety Branch (USB) to provide a report, including a data base of recent incidents on the system, to facilitate analysis by parties. The Commission may also wish to collect data from utilities in order to create California outage and circuit data bases.

Perhaps the most noticeable benefits are **aesthetic**. These benefits are arguably greatest along California's miles of scenic highway, in parks and recreation areas, and in crowded urban environments, but there may be some benefit in almost any location.

Along with aesthetic benefits come possible increases in **property value** that accrue primarily to property owners along the route. Such increases raise the issue of distributive equity; more particularly, the extent to which the program matches cost responsibility to the enjoyment of benefits.

There are also potential benefits to **public and worker safety**. Perhaps most dramatic is any potential reduction in the number of fatalities and injuries due to contact with overhead facilities, direct or indirect. Accident reports show that people are killed or injured with some frequency, for example, by driving into power poles, while using metal poles to harvest fruit, or while installing roof antennas. In some cases, such accidents cause power outages, decreasing system **reliability**.

However, merely enumerating accidents in the overhead system does not prove the cost-effectiveness of undergrounding; rather, careful analysis is required. Perhaps 70% of California's line-miles are overhead; thus, it can be argued that by pure chance, one would expect 70% of problems to occur near overhead lines.

⁴ The list of benefits was in part suggested by the report, "Estimate of Potential Annual Avoidable Costs From Undergrounding Electric Power Lines in California," prepared for a stakeholder group in the Department of Health Services Electromagnetic Field Study.

Data from a recent Utility Safety Branch Report may be indicative, if not conclusive. During 1998, utilities reported 18 people were killed at or near above ground lines, while only one was killed near underground facilities (and that was a drowning at a water intake grating), suggesting that underground facilities indeed involve fewer fatalities. The statistics for injuries however, may show a different pattern. In that same year, 36 people were injured at or near overhead lines, while a third as many were injured near underground facilities, indicating no apparent advantage to underground lines. And it appears that utility employees working on underground cables are at more risk of injury than those working on overhead lines.

Safety concerns also highlight another issue: whether the same benefits could be achieved at lower cost through approaches other than undergrounding. For example, the Commission has sponsored a program to encourage use of non-conductive poles in agriculture. Other approaches may include better signage, or even relocation of dangerous lines.

Compared to overhead lines, underground lines may provide a higher level of **service reliability** than overhead lines. Clearly, overhead facilities can be damaged by wind or aircraft, or shorted out by trees or dense fog, interrupting service to customers. Citizens may believe that underground service is more reliable, but there appears to be no conclusive proof of that contention. On the other hand, even if modern underground facilities fail more rarely, they may be harder to inspect, diagnose and repair, increasing the length of any outages that do occur.⁵

To help resolve this debate (and to shed light on other reliability issues) the Commission may wish to order that respondent electric utilities promptly respond to data requests from Energy Division aimed at building a statewide outage and circuit data base, covering at least the last five years. That database would record outages affecting each substation or circuit, shall include the miles of underground and overhead line in each circuit or substation, and other relevant data as requested by Energy Division.

Note that the Commission's Performance Based Ratemaking (PBR) program may provide guidance on the valuation of reliability benefits. These programs place

⁵ Some underground circuits, particularly those buried directly rather than in protective conduit, may actually fail at higher rates than overhead facilities.

an implicit value on reliability, which are roughly equal to \$15 every time a customer loses power; plus \$15 per hour of outage experienced by a customer.⁶ The Commission may wish to ask parties to comment whether these values are reasonable.

Undergrounding may also reduce the danger of **fire** and other threats to life and property. When power lines are near trees, direct contact can start fires (and of course cause outages). Such fires can endanger both lives and property. Further, fallen power poles, and live electric wires can frustrate emergency evacuation; as shown by vivid reports from the Oakland Hills fire.

An additional benefit of undergrounding existing overhead facilities is that it creates a potential for **conversion of existing overhead, copper, communications lines** to high-capacity, fiber-optic lines. Unlike copper lines, fiber-optic lines can be placed very close to electric power lines, potentially reducing total costs.

Some argue that undergrounding can also **reduce utility and public costs**. For example, underground systems may require **less maintenance**, and smaller line losses, than corresponding overhead systems. In turn, smaller line losses may reduce generation and its associated environmental costs.

Finally, burying lines underground may also reduce overall public exposure to **electromagnetic fields** (EMFs). The public has expressed concern that EMF exposure may cause some cancers and other health disorders. In Decisions D.93-011-013 and D.95-11-017, among others, the Commission funded a study by the Department of Health Services of the health effects of electromagnetic fields (EMFs) due to power lines. According to preliminary reports from DHS, undergrounding can reduce EMFs in most cases. However, the potential health effects alone may not justify undergrounding's cost. Therefore DHS is studying whether the many benefits of undergrounding, considered together, exceed those costs.

⁶ The incentives cited apply only to sustained outages (those that last more than 5 minutes), and are currently applicable only to San Diego and Edison; PG&E has proposed a similar mechanism. Various PBR systems include various sets of additional incentives.

OVERALL FUTURE OF THE PROGRAM: WHAT SHOULD THE BUDGET BE?

Clearly, an expanded conversion program has the potential for major cost impacts on ratepayers. If the lowest of the cost estimates are correct, putting all 150,000 miles of overhead lines underground would cost at least \$15 billion, adding roughly 60% to the \$25 billion dollars now invested in electric utility plant. By comparison, annual electric revenues are roughly \$17 billion. The Commission may wish to consider the validity of these estimates, and the likely effect on rates of an expanded program.

One option would be to expand our program to underground all overhead lines statewide over a specified period of time. The Commission may wish to solicit comments from parties on a number of issues related to this option. First, could the state reach the goal within a reasonable number of years without a major increase in rates? Second, do the benefits of this option outweigh the costs and the impact on rates? Third, do Rules 20(A), and 20(B), which place the cost of the program on participating property owners, properly balance benefits and costs? In particular, does the apparently limited demand for conversions under these programs indicate that ratepayers are generally unwilling to bear the costs of statewide undergrounding?

A second option would be to try to set an annual budget that would achieve high priority projects within perhaps 20 years. The current program, for example, allocates sizeable annual allocations which are adequate for only a fraction of the potential undergrounding work. The Commission may wish to consider how many projects are high priority, either because benefits outweigh costs, or for other pressing reasons.

The usefulness of this second option may depend on whether and how one can define “high priority.” One approach would be to define certain types of projects as high priority, and determine how many projects would fit into those categories statewide, and how much those projects would cost. Presumably, those categories would be marked by positive (or relatively high) cost/benefit ratios. Another way of designating high priority projects would be to underground all areas above a particular population density. The Commission may wish to require utilities to report on the number of line miles that run through areas of different population density, including the total number of urban, suburban, and rural line miles.

A third option would be to continue the program at current funding levels. If it is difficult or time consuming to assign strict costs and benefits to projects, but clear that projects benefit communities in important ways, is maintenance of the status quo budget a reasonable option?

A fourth and final option would be to bring substantial ratepayer funding to an end, and rely on variants of Rules 20a and 20b for future conversions. The Commission may wish to consider whether most high priority projects have already been accomplished, and whether remaining projects are likely to show positive cost-benefit ratios.

THE CURRENT PROGRAM: PROBLEMS AND ISSUES

As indicated by above, one can divide the program, and associated rules into two parts. The first part requires that facilities in recent and new subdivisions be placed underground, and determine who pays for which parts of the facilities. The Commission may wish to consider whether these rules meet the Commission's goals, and to report any significant problems with the program. The second part dictates how much utilities (and thus ratepayers in general) must share in the costs of undergrounding existing overhead lines (Rule 20 for the largest utilities). Rule 20a, which provides substantial ratepayer funding, may raise the biggest issues.

Rules Governing New and Recent Subdivisions.

Under Rules 15 and 16, utilities are required to put new distribution facilities and new services underground. Exempted are residential properties, which were legally described before May 5, 1970, in subdivisions with significant overhead services. Overhead service may be provided to subdivisions, if allowed by local ordinance, where the minimum parcel size exceeds three acres. Rules require that utilities (and thus ratepayers in general) eventually pay for cables, switches, and transformers. Other costs (including trenching and backfilling) are borne by the developer; though such facilities are conveyed to the utility, which henceforth is responsible for maintenance. To deviate from these rules, utilities must file advice letters with the Commission's Energy Division, showing that parcel sizes are large, or that undergrounding is not practical locally.

New construction may be the optimal time to achieve the benefits of undergrounding, since minimal additional trenching and backfilling, beyond that required for water and other services, are required. The rules may help to preserve the appearance of subdivisions that are predominantly underground.

The Commission may wish to consider several issues. The first is whether the current program meets Commission goals, and whether the benefits of the rule outweigh the costs. The second is what difference exists in costs, both to ratepayers and to members of the public, between overhead and underground service. The Commission may wish to consider whether the cost-effectiveness of the program can be improved.

The Commission may wish to focus its investigation by deferring consideration of changes to line extension rules (such revisions to free footage allowances), unless these are clearly tied to necessary changes in the broad direction of the undergrounding program.

The Commission may wish to consider whether deviations from undergrounding rules are granted appropriately. One approach would be to require each electric utility to provide a data base on each deviation granted over the last 5 years; including the date, the advice letter number, the number of parcels affected, the average size of parcels covered by each application, the justification for the exemption, and whether the Commission approved the advice letter.

Rules Governing Undergrounding of Existing Above-Ground Facilities.

Rules 20a, 20b, and 20c provide three approaches to undergrounding existing facilities, under which ratepayers fund decreasing shares of project costs, respectively. Unsurprisingly, available data suggest that utilities spend more on Rule 20a than on 20b and 20c combined. Furthermore, demand for undergrounding under Rule 20a exceeds currently budgeted funds, while utilities fund all eligible Rule 20b and 20c projects. Because of the larger subsidy provided for Rule 20a projects, that rule is probably the focus of most controversy.

Rule 20c

Under Rule 20c, any electric customer may convert as long as it reimburses the utility for all costs. In particular, the customer must make a non-refundable advance to the utility equal to the cost of the underground facilities, less the estimated net salvage value and depreciation of the replaced overhead facilities. Under these Rules, it would appear that conversion has minimal impacts on other ratepayers. The Commission may wish to consider: (1) whether the program achieves Commission goals cost-effectively; (2) whether the program in fact results in ratepayer indifference to such a project, and (3) whether any changes are required. The Commission may wish to require reports from each respondent utility on miles undergrounded, costs to ratepayers, and other matters.

Rule 20b

Rule 20b provides limited ratepayer funding for conversions if certain conditions are met. Ratepayers bear the cost of cables, transformers, and other electrical equipment, but the balance of the cost, including conduits and structures, must be borne by the applicant.

The applicant must satisfy a number of conditions. First, all property owners served by the overhead lines must agree to conversion in writing; or local governments must require those property owners to make any necessary wiring changes (that is, the new electrical service line and panel). Second, as in Rule 20c, the customer must make a non-refundable payment, but in this case it must be “equal to the excess, if any, of the estimated costs, of completing the underground system and building a new equivalent overhead system. In practice, this may involve forming a special assessment district. Third, the project must include both sides of the street and extend for one block or 600 feet, whichever is smaller. Finally, the lines to be converted must be along public streets and roads, unless the utility and the applicant agree to make an exception. As for Rule 20c, the Commission may wish to require respondent utilities to submit a report on the such projects, including, for example, miles undergrounded, and ratepayer costs.

On its face, Rule 20b(2)(c), which governs the amount contributed by the customer, is ambiguous. Under one possible interpretation, the applicant must

pay the cost of conversion less the cost of a new overhead system. It can be argued that ratepayers in general bear the same cost as they would if an entirely new overhead system were installed, as well as the cost of depreciation on the old system, but benefit from any salvage value remaining in the latter. Thus, the customer would pay less than under Rule 20c.

The Commission may wish to consider a number of issues. First, how is Rule 20c(2)(c) actually interpreted in practice? Second, what share of total project costs are borne by ratepayers, both in percentage terms, and by accounting category? Is this degree of cost sharing equitable, or should the Commission adjust the formula? Third, are Commission Rules burdensome in any way, and if so, how can they be changed to make it easier for communities to participate? In particular, does the requirement for a non-refundable charge, or the probable need to form a special assessment district hamper participation? In sum, does the program meet the Commissions goals, or could changes improve the program?

Rule 20a

Because ratepayers bear most of the costs of undergrounding under this rule, demand for conversions under this rule is relatively high, and the potential for controversy relatively great.

Budget Levels and Cost Sharing

Rule 20a arguably balances society's interest in undergrounding with the interests of individual property owners who benefit directly from the work. In brief, this balance is accomplished by: (1) fixing a budget for the program (roughly \$130 million for all jurisdictional electric utilities), (2) allocating these funds among local governments according to the number of overhead and underground meters, (3) empowering local governments to designate which projects receive these funds, under defined criteria, and (4) requiring that homeowners pay for upgrades to their own property, which appear to total roughly 10-20 percent (in many cases, over \$1000) of total project costs.

Efficiency of Rule 20a

The Commission may also wish to concentrate on how to make the Rule 20a program most efficient, whatever the budget level. The Commission may wish

to consider several issues. First, does the program encourage the lowest possible costs? Second, how can the program direct funds to high priority projects? Third, what level of cost sharing is appropriate, considering both equity and efficiency issues? Fourth, is the current form of program finance, and traditional incentives for participation, consistent with the performance based ratemaking systems (PBRs) and other aspects of Electric Restructuring and/or competition? Should potential technical or economic changes in electric markets (e.g., Distributed Generation, or DG) be considered?

Holding Costs Down

The Commission may wish to consider whether the program achieves results at the lowest cost possible. In this connection, the Commission may wish to consider three issues. The first issue is whether the program encourages the use of the newest, most efficient technology. The second is whether the program encourages projects at the most efficient scale. The third issue is whether the Commission should attempt to introduce additional competition into the program.

Undergrounding work has traditionally involved extensive and costly excavation and construction, but technology changes constantly. The Commission may wish to consider whether new technologies can achieve similar results at lower cost, provided that any technologies chosen strike an appropriate balance between costs and benefits. The Commission may wish to consider potential problems with the new technologies, including safety issues.

At least as important is the scale of the projects themselves. Commission Rules allow projects as short as a city block. The Commission may wish to ask parties to comment the relative efficiency of projects which meet these minimum guidelines, as well as the efficiency of the average project under the current system. At what project size can efficiencies of scale be realized?

There are at least three ways in which the Commission could encourage larger projects. The first, increasing size requirements, could increase efficiency, but could also force jurisdictions with relatively small allocations to postpone projects until the minimum size can be reached. The practical effect may be that some communities might have to wait years to receive full funding of projects. A second approach would be to administratively rotate funds over a period of years, with a preference for neighborhood or city-wide projects. The

Commission may wish to consider the equity of delaying funding to one group of jurisdictions, while accelerating projects in another. A third approach would be to facilitate but not mandate large projects. For example, the Commission could explicitly allow jurisdictions to enter into agreements rotating full funding. Areas with pressing needs might agree to receive a smaller share of funds sooner. The Commission may wish to ask parties to comment on the extent to which municipalities are already entering into such agreements.

Finally, the Commission may wish to consider the potential for increased competition and resultant cost savings. Current Commission Rules allow parties to construct electric facilities and to contribute them to the utility, as long as the utilities (and thus ratepayers) are made whole for any associated tax impacts. The Commission may wish to determine the extent to which such provisions are used now in the undergrounding program, and whether rule changes are appropriate to encourage more competition.

Directing Allocations to High Priority Projects

The Commission may wish to consider the manner in which Rule 20a funds are allocated between projects. The current rule allocates to each local government in part according to the community's number of total overhead line miles, and in equal part on the community's total line miles.⁷ At that point, each local government decides which projects should be funded. However, they are required to choose projects that relieve congestion of traffic or electric lines, or that bury lines crossing through recreation or scenic areas. The Commission may want to make a number of changes to the allocation method or guidelines.

The Commission may wish to consider allocating funds to high priority projects statewide. One way to do this could be to directly allocate funds to projects of special merit, perhaps through requiring and reviewing cost benefit studies. However, this would place a heavy administrative and adjudicative burden on the Commission. Another approach could be to establish criteria that would tend to fund high priority projects. However, it might be difficult to design suitable criteria, and the Commission might have to settle disputes among parties. The Commission may wish to consider retaining allocations to local governments, but to make other changes in the program.

⁷ Where a year's undergrounding allocation exceeds the previous year's by a specified amount, the excess is allocated solely on the basis of overhead miles.

First, the Commission could change the formula for allocation between communities. For example, should the balance between overhead line miles and population be retained? Or should the Commission add a provision to direct more funds to low-income areas?

Second, the Commission could expand the criteria for projects. For example, the Commission could add public safety, reliability, and economic development to existing criteria. If the Commission takes this approach, it may wish to consider whether current criteria are functioning well, and whether to adopt dispute resolution processes to be followed when cities and utilities disagree about the meaning of the criteria.

Third, the Commission could eliminate most criteria. For example, the Commission could give more discretion to local governments to allocate funds to any undergrounding projects in the community.

In closing, the Commission may wish to consider whether allocations should be restricted to undergrounding projects. For example, should a local government, either through its own discretion or through agreements with its local distribution utility, be able use the allocation for other purposes entirely? The Commission may wish to order respondents to report any actual redirections of funds during the program's history.

Sharing Responsibility for Costs

The Commission may wish to consider whether the program pays too much or too little of total project costs. As described above, the current program pays for what will become utility property only. Using 20a allocations for other purposes could benefit customers and cities, but would also change the balance between private and public funding, and reduce the total miles undergrounded (assuming a fixed budget for the program). There are at least two potential rule changes.

First, parties report that many projects stand virtually finished but yet unused, because homeowners have not yet installed the necessary underground service connection and panel. The Commission may wish to authorize use of 20a funds for such customer costs. This could expedite projects, but might also reduce the number of line miles undergrounded by 10-20 percent. If the Commission finds

that most of the delays occur in low-income areas, it may wish to fund panel and service conversion only in such areas.

Second, local governments say that administrative costs, and concomitant improvements (such as conversion of city-owned streetlights), place a substantial burden on participating cities. This may be particularly true in low-income areas. The Commission may wish to fund such activities, particularly in low-income areas, limited to a fixed amount of total funding. This change would reduce the total number of miles undergrounded, if budget levels are fixed, by a proportionate amount.

UNDERGROUNDING IN THE RESTRUCTURED ELECTRICITY MARKET

The Commission may wish to consider whether changes are warranted under the new market structure for electricity. While distribution and transmission remain regulated, the Commission may wish to consider whether a market solution to undergrounding might be available. If the Commission wishes to retain an undergrounding program through the UDCs, however; it may wish to consider the incentives for utility participation as well as the equity impacts of any changes.

Currently, utilities recover undergrounding costs only when a project goes into service. At that point, the utilities can put capital costs into ratebase. The Rule 20 “budget” does not represent a pool of dollars, but rather an advance approval of capital additions to utility property.

Under restructuring, however, routine additions to utility capital do not receive funding; these are already funded in the adopted rates. The question is whether Rule 20 expenditures are routine. Insofar as Rule 20 is over 30 years old, the Commission may wish to confirm that such funds routine, and therefore included in current rates.

The counter-argument is that the incentives for utility performance may be weak, since delaying projects makes funds available for other utility uses. Thus the Commission may wish to structure ratemaking to encourage utility compliance. Depending on the incentives inherent in current ratemaking, the commission may wish to monitor the progress of the program more closely, and to impose sanctions where delays are traceable to the utility. As noted above, there are many other causes of delay. Therefore, the commission may wish to investigate

what barriers to completion exist, and which are ultimately the utility's responsibility.

Telecommunications Tariffs

The Commission may wish to consider whether current Telecommunication Tariffs Rules adequately achieve the Commission's goals. For example, as discussed above, the Commission may wish to consider whether overhead telephone or data lines should be replaced with fiber optic lines in areas to be undergrounded. Similarly, the Commission may wish to consider whether its current rules should or do assure whether other utility wires, such as television cables, are buried along with electric utilities.

Transmission Projects

As noted above, the Commission declined to require that new transmission service be placed underground. The Commission may wish to consider whether advancing technology has made feasible a program to underground transmission lines and/or whether the current CPCN process for transmission lines gives adequate consideration of building new lines underground.

Setting Priorities for an Order Instituting Investigation

If the Commission decides to issue an Order Instituting Investigation, it may need to establish priorities among the many issues raised above. The Commission could choose to examine issues of cost effectiveness first; if the Commission decides that all or part of the program is not cost effective, then all or many implementation issues, respectively, become moot. However, such a course would delay consideration of implementation issues that may be central to parties' concerns. In any case, the Commission may wish to defer consideration of cost effectiveness until the DHS EMF study is completed (see Benefits, above). The Commission may wish to schedule a workshop with parties to gather information, and perhaps to reach consensus on priorities.

Assembly Bill AB 1149

CHAPTER 844

An act relating to public utilities.

(Approved by Governor October 8, 1999. Filed
with Secretary of State October 10, 1999.)

LEGISLATIVE COUNSEL'S DIGEST

AB 1149, Aroner. Underground electric and communications facilities.

Under existing law, the Public Utilities Commission has regulatory authority over public utilities and, under that authority, has adopted rules for the replacement of overhead electric and communications facilities with underground facilities.

This bill would require the commission to conduct a study as to the ways to amend, revise, and improve those rules, as specified. The commission would have the authority to revise these rules without prior approval of the Legislature. The commission would be required to submit a report on the study to the Legislature on or before January 1, 2001.

The people of the State of California do enact as follows:

SECTION 1. (a) The Public Utilities Commission shall conduct a study as to the ways to amend, revise, and improve rules governing the replacement of overhead electric and communications facilities with underground facilities. The issues to be addressed shall include, but not be limited to, all of the following:

(1) Discovering and eliminating barriers to establishing continuity of the existing underground system and ways to eliminate uneven patches of overhead facilities.

(2) How to enhance public safety.

(3) How to improve reliability.

(4) How to provide more flexibility and control to local governments.

(b) The Public Utilities Commission may revise these rules without prior approval of the Legislature.

(c) Notwithstanding Section 7550.5 of the Government Code, the Public Utilities Commission shall submit a report on the study required by subdivision (a) to the Legislature on or before January 1, 2001.