

September 08, 2017

The Honorable Jerry Brown
Governor, State of California
c/o State Capitol, Suite 1173
Sacramento, CA 95814

RE: SB 649 (Hueso) – Small Cell Wireless Facilities

Honorable Governor Brown,

I have recently learned of proposed Bill SB 649 regarding the streamlining of small cell wireless facilities.

As a member of the Physics department of Ariel University, and before that the Hebrew University of Jerusalem, I have studied the subtle effects of electromagnetic radiation on biology and biological materials. I have published more than 50 articles in the field of Dielectrics (the study of the interaction of materials with radio waves), including many on the interaction of cellular frequencies with biological materials such as proteins and blood. My last article investigated the interaction of 5G electromagnetic radiation with human skin.¹ One could argue that I have a certain amount of expertise.

In light of our work and a growing number of publications showing the frequency range of 5G can have serious biological effects, we believe that current efforts to accelerate the implementation of 5G should be delayed until additional studies are made to assess the critical impact on human health.

It is not for me to lecture to elected officials on how cities should develop technologically, nor is it for me to try and stop the juggernaut that is the cellular industry. However, I would like to point out to you important information on the possible public health implications of the explosion in unregulated cellular phone and wireless device use.

The term “health” has never featured too heavily in the lexicon of the Cellular Industry. It has been assumed, conveniently, that any possible effects on the human anatomy from the use of cell phones would be only mild heating. And that this is something that the body could easily deal with. As a consequence, the governing safety limits were set in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) based on the premise that if radiofrequency radiation limits protected human tissue from overheating, then the public was adequately protected. They considered that the effect to humans would at most cause the agitation of water inside cellular tissues that would dissipate as heat, similar to what a microwave oven does, but at far lower energies.

The trouble is that our knowledge has progressed in the last 19 years and we now understand that the interaction of microwave energy and our tissues is far more subtle. There is increasing evidence of non-thermal biological consequences arising from our interaction with cellular phone radiation. A few examples; in 2014 a team from the University of Exeter, UK published a report linking the effect of

¹ Betzalel, Noa, Yuri Feldman and Paul Ben Ishai. “The Modeling of the Absorbance of Sub-THz Radiation by Human Skin.” *IEEE Transactions on Terahertz Science and Technology* PP.99 (2017): 1-9. [doi: 10.1109/TTHZ.2017.2736345](https://doi.org/10.1109/TTHZ.2017.2736345).

cellular phones on declining sperm quality.² They based their research on over 1492 subjects from around the world. In 2009, Columbia University showed that radio frequencies were leading to stress in living cells.³ This in turn seriously affects their ability to perform, as particular cellular pathways were disrupted. Further evidence along this direction was provided by a group from the University of Rennes.⁴ I can add plenty more examples, but I think that it is summed up by a recent public announcement. Advisors to the World Health Organization International Agency for Research on Cancer (WHO/IARC), themselves well versed in radio frequencies and in cancer, have publicly stated that evidence has been met to classify cellular radiation as meeting scientific criteria for a Group 1 carcinogenic agent to humans.^{5,6}

As I said above, it is not my job and neither is it realistic for me to stop the placing of thousands of antennas throughout your state. But it is my job to point out the health hazard to you before you make such a momentous decision.

Yours sincerely



Dr. Paul Ben Ishai
Department of Physics
Ariel University

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Tom Dyer, Chief Deputy Legislative Affairs Secretary

² Adams, J.A., et al. "Effect of mobile telephones on sperm quality: a systematic review and meta-analysis." *Environment International* 70 (2014): 106-12. [doi: 10.1016/j.envint.2014.04.015](https://doi.org/10.1016/j.envint.2014.04.015).

³ Blank, M. and R. Goodman. "Electromagnetic fields stress living cells." *Pathophysiology* 16.2-3 (2009): 71-8. [doi: 10.1016/j.pathophys.2009.01.006](https://doi.org/10.1016/j.pathophys.2009.01.006).

⁴ Habauzit, Denis, et al. "Transcriptome analysis reveals the contribution of thermal and the specific effects in cellular response to millimeter wave exposure." *PloS One* 9.10 (2014): e109435.

[doi: 10.1371/journal.pone.0109435](https://doi.org/10.1371/journal.pone.0109435)

⁵ "Cancer Expert Declares Cell Phone and Wireless Radiation As Carcinogenic to Humans." Environmental Health Trust (2017). <https://ehtrust.org/cancer-expert-declares-cell-phone-wireless-radiation-carcinogenic-humans/>

⁶ Carlberg, Michael and Lennart Hardell. "Evaluation of Mobile Phone and Cordless Phone Use and Glioma Risk Using the Bradford Hill Viewpoints from 1965 on Association or Causation." *BioMed Research International* 2017 (2017): 9218486. [doi: 10.1155/2017/9218486](https://doi.org/10.1155/2017/9218486).

Decision 06-01-042 January 26, 2006

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to update the Commission's policies and procedures related to electromagnetic fields emanating from regulated utility facilities.

Rulemaking 04-08-020
(Filed August 19, 2004)

**OPINION ON COMMISSION POLICIES ADDRESSING ELECTROMAGNETIC
FIELDS EMANATING FROM REGULATED UTILITY FACILITIES**

I. Summary

Today's decision affirms our "low-cost/no-cost," policy¹ to mitigate EMF exposure for new utility transmission and substation projects. As a measure of low-cost mitigation, we continue to use the benchmark of 4% of transmission and substation project costs for EMF mitigation, and combine linked transmission and substation projects in the calculation of this 4% benchmark. In addition, this decision adopts rules and policies to improve utility design guidelines for reducing EMF, and provides for a utility workshop to implement these policies and standardize design guidelines.

In order that utilities may proceed with a workshop, we define and adopt EMF mitigation polices and rules which address underground transmission lines, application of the 4% mitigation benchmark to EMF priority classes, EMF

¹ This terminology is used rather than "prudent avoidance" as it more clearly defines our purpose in addressing electromagnetic fields (EMF).

mitigation modeling techniques, and the locations for measuring EMF mitigation. We also direct utilities to initiate standardized field reduction techniques and develop a table to reflect EMF reduction measures taken or rejected.

As stated in the rulemaking initiating this proceeding,² at this time we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences. However, this decision directs the Commission's Energy Division to pursue and review all available studies regarding EMF, and to review scientific information and report on new findings. Should such studies indicate negative EMF health impacts, we will reconsider our EMF policies, and open a new rulemaking if necessary.

II. Procedural Background

The Commission opened R.04-08-020, on August 26, 2004, to address public concern regarding exposure to EMF,³ an issue that has consistently generated strong public opinion in recent transmission and substation projects.⁴ The rulemaking identified three issues to explore:

1. The results of the Commission's current "low-cost/no-cost" mitigation policy and the need for modifications.

² Order Instituting Rulemaking, (R.) 04-08-020, *mimeo.*, p. 7.

³ R.04-08-020 (pp. 6-7) explains why the Commission has exclusive jurisdiction over issues related to EMF exposure from regulated utility facilities.

⁴ *Id.*, p. 1.

2. Improvement in the implementation of the existing “low-cost/no-cost” mitigation policy.
3. As new EMF-related scientific data becomes available, new or revised Commission EMF mitigation policies.

On October 28, 2004, a prehearing conference (PHC) was held to identify parties and establish a service list, to consider whether hearings or workshops should be held, and to establish a schedule. At the PHC, parties requested an opportunity to provide comments on the scope of the issues to be considered in the proceeding, whether hearings were necessary, and a proposed schedule.

On December 31, 2004, comments were received from Leeka Kheifets (Kheifets), Sierra Pacific Power Company (Sierra), Citizens Concerned About EMFs (CCAЕ) and Fund for the Environment (FUND),⁵ 280 Corridor Concerned Citizens Group (280 Citizens), The Concerned Residents of Burlingame (CRB), Pacific Gas and Electric Company (PG&E), Southern California Edison Company (Edison), The California Municipal Utilities Association (CMUA), San Diego Gas & Electric Company (SDG&E), and PacifiCorp.⁶ Reply comments were received on January 28, 2005, from Edison, PG&E, SDG&E, CCAЕ and FUND, Sierra, and PacifiCorp.

CRB, CCAЕ and FUND, and 280 Citizens requested that the scope include utility information regarding EMF design guidelines, consideration of whether the 4% benchmark is sufficient for EMF mitigation, and inclusion of electric distribution lines in the proceeding. CRB, CCAЕ and FUND and 280 Citizens

⁵ CCAЕ and FUND submitted joint comments.

⁶ PacifiCorp requested authorization to file late-filed comments on January 4, 2005; its motion is unopposed and is granted.

recommended formal consideration of the Department of Health Services (DHS) Final Report issued June 2002,⁷ consideration of EMF impacts on property values including appropriate compensation, inclusion of EMF measures adopted in D.04-08-046, and the appearance of Dr. Raymond Neutra, the lead author for the DHS Report.

Utility parties, including PG&E, Edison, SDG&E, PacifiCorp, and CMUA recommended against expanding the scope of the proceeding, inclusion of distribution lines as an issue, reexamination of the DHS Report, establishment of numeric EMF standards, and any consideration of EMFs as an element in the Commission's California Environmental Quality Act (CEQA) reviews. Utility parties generally requested that the scope of the proceeding include Commission guidance on engineering options for EMF mitigation, the 4% benchmark, and use of a 15% EMF mitigation target at the utility right of way (ROW).

After consideration of the parties' comments, the Assigned Commissioner issued a Scoping Memo and Ruling on March 1, 2005 (Scoping Memo). The Scoping Memo focused the proceeding on the issues identified in R.04-08-020, and denied requests to consider extraneous issues. The Scoping Memo also provided parties an opportunity to review and comment on respondent utilities' design guidelines,⁸ and consider new scientific information such as an anticipated World Health Organization (WHO) study.

On April 4, 2005, a PHC was held to discuss the process for resolving Scoping Memo issues. At the PHC, the utilities were directed to provide their

⁷ The DHS report was ordered by Decision (D.) 93-11-013.

⁸ PG&E, SDG&E and Edison are named as respondent utilities.

design guidelines for EMF mitigation and following receipt of the guidelines, to provide representative field management plans (FMP) for transmission line projects. Parties would review the FMP and consider how the utilities applied their respective design guidelines. Parties could then recommend improvements or changes in the design guidelines.

Design guidelines and FMP⁹ were provided by PG&E, Edison and SDG&E on April 11, 2005 and May 26, 2005, respectively. Comments were received from 280 Citizens, CCAE and FUND, ORA, and Kheifets on July 26, 2005; reply comments were received from SDG&E, PG&E, Edison, CCAE and FUND, and Kheifets on August 26, 2005.

No party has proposed evidentiary hearings, although 280 Citizens proposed a workshop to discuss standardizing utility design guidelines. As we are ordering the utilities to hold a workshop to standardize design guidelines, no other workshops or evidentiary hearings are necessary. Therefore, this proceeding is deemed submitted on August 26, 2005.

III. Discussion

Two of the three issues identified in this rulemaking (results of current policy, and improvements in mitigation policy) are evident in the utility design guidelines employed for EMF mitigation and the application of these guidelines to transmission line and substation projects. The comments and reply comments of parties form the basis for our decisionmaking. We thank those parties that

⁹ PG&E and Edison provided five plans each. SDG&E provided three plans.

contributed useful comments on the utility design guidelines and proposals to improve current mitigation practices.¹⁰ We address each of these matters below.

IV. The 4% Benchmark

D.93-11-013 in Order Instituting Investigation (OII) 91-01-012¹¹ adopted a benchmark of 4% of total budgeted project costs for low-cost EMF mitigation in new and upgraded projects unless exempted by a utility's design guidelines exemption criteria.¹² ORA contends that the Commission should remain flexible in applying the 4% benchmark as minor increases in EMF mitigation costs may result in significant EMF reductions. ORA recommends that the Commission not consider 4% as an absolute cap, but does not propose a specific alternate percentage benchmark.

While we are not convinced a change in the 4% benchmark is warranted, we believe ORA's argument is consistent with our current policy that provides for potential mitigation measures that might exceed the 4% benchmark. In D.04-08-046 (Application (A.) 02-09-043 addressing construction of the Jefferson-Martin transmission line) we provided additional EMF mitigation which exceeded the 4% benchmark. Although this was a special condition applied to construction of the Jefferson-Martin transmission line, we recognize

¹⁰ Some comments seek to recommend or address numeric EMF exposure standards, apply EMF mitigation to electric distribution lines, and argue for EMF mitigation policies expressly rejected by R.04-08-020, and the Scoping Memo. We do not further address these matters.

¹¹ OII 91-01-012 was an investigation to develop policies and procedures for addressing the potential health effects of electric and magnetic fields of utility facilities.

¹² Ordering Paragraphs (OP) 1 and 6, pp. 55-56.

there may be a future unique instance in which the 4% benchmark might be exceeded. Therefore, while we continue our current policy of low-cost/no cost EMF mitigation, as defined by a 4% benchmark of total project cost, we would consider minor increases above the 4% benchmark if justified under unique circumstances, but not as a routine application in utility design guidelines. We add the additional distinction that any EMF mitigation cost increases above the 4% benchmark should result in significant EMF mitigation to be justified, and the total costs should be relatively low.

Parties ask whether the 4% benchmark calculation should apply to the total costs of electric projects which include transmission lines and substation components, or whether the transmission lines and substations should be evaluated separately. In D.04-08-046,¹³ we stated that the low cost EMF measures would be based on the total project cost, including both the transmission line and substations. No party has recommended applying the 4% separately. Therefore, we will apply the 4% benchmark calculation to the total project cost.

V. Prioritizing Land Use

Parties generally agree on the following group prioritization for land use categories in determining how mitigation costs will be applied:

1. Schools and licensed day care¹⁴
2. Residential

¹³ *Mimeo.*, p. 101.

¹⁴ As an additional fixed location of young children, we will add hospitals to this category.

3. Commercial/industrial
4. Recreational
5. Agricultural
6. Undeveloped land

However, parties request guidance on aspects affecting these priority groups including: (a) when to consider an area as residential;¹⁵ (b) whether residential land should be in the same category as schools, (c) whether utilities should investigate potential future uses of undeveloped land, (d) whether mitigation measures should be limited or not applied if it is not possible to provide equal treatment to all members within a priority group, and (e) whether to address separately within priority (1) public schools under California Department of Education (CDE) EMF reduction policies.

We begin by noting that determining the future use of undeveloped land is both speculative and difficult. While 280 Citizens argues that EMF mitigation should be undertaken where development “is reasonably foreseeable,”¹⁶ it is apparent that such a task requires many assumptions and is likely to lead to substantial disputes. Planning agencies frequently change land use designations, and it is unlikely that parties to future designs of transmission lines could agree on the location and boundaries of schools, residences, or commercial properties many years in the future. In addition, if the anticipated change in land use does

¹⁵ Edison asks whether an area should be considered residential when the FMP is prepared or at the time of construction.

¹⁶ 280 Citizens Comments, July 26, 2005, p. 14.

not occur, utility ratepayers could end up paying for unnecessary mitigation costs. Accordingly, we will not require utility design guidelines to include low-cost EMF mitigation for undeveloped land. Utility design guidelines should consider EMF mitigation at the time the FMP is prepared, although mitigation may be justified for those portions of undeveloped land on which people reside and permanently occupy structures.

We are sensitive to CCAE and FUND's argument that children may spend more time at home than in schools,¹⁷ and therefore, residences should have the same priority as schools. However, schools, licensed day-care centers, and hospitals (which we have added to the first priority) can be specifically identified in FMP at fixed locations, while identifying those residences in which children might spend significant time is uncertain given the changing uses within houses and as a result of home sales. Furthermore, the application of low-cost options to entire residential areas in order to accommodate the potential that some homes house children may disfavor spending EMF mitigation funds for schools, day-care centers and hospitals where children are known to be present. Therefore, we will maintain our priority of schools, day-care centers, and hospitals over residences.

We agree with Edison that the CDE and our EMF reduction policies should be consistent,¹⁸ although we are concerned that applying low-cost options to the portions of transmission lines near existing schools will consume a disproportionate share of low-cost funds. It is unclear how this alignment of

¹⁷ Joint Comments of CCAE and FUND, July 26, 2005, p. 4.

¹⁸ CDE requires minimum distances between new schools and transmission lines.

policies can occur, although utilities should meet with CDE and develop additional design guideline criteria. Any proposed changes in guidelines should be provided through an advice letter process and should be consistent with the EMF policy established in this decision and in D.93-11-013.¹⁹

In A.02-09-043, PG&E proposed not to adopt mitigation measures in residential areas unless equal mitigation could be provided for the entire priority group, and the cost of the mitigation was within the 4% benchmark. Although equal mitigation for an entire class is a desirable goal, we will not limit the spending of EMF mitigation to zero on the basis that not all class members can benefit. We expect that utilities will modify their design guidelines so that those residences most impacted by EMF will receive some mitigation within the 4% benchmark. As a guideline for accomplishing this task we expect that EMF reductions will be 15% or greater at the utility ROW as further discussed below.

VI. Modeling EMF Mitigation

CCAЕ and FUND and 280 Citizens recommend that Commission EMF policies measure actual EMF on constructed transmission lines and thus validate whether persons living, working or attending schools near power lines are exposed to particular levels of EMF. CCAЕ and FUND argue that it is irrelevant whether particular EMF reductions have resulted; instead, persons need to know absolute EMF exposure values. As an additional criticism of utility modeling, CCAЕ and FUND recommend that EMF modeling assume maximum peak power flow rather than projected peak loads in the year of construction.

¹⁹ This advice letter may be separate from the advice letter requested as a result of the utility workshop ordered later in this decision.

Our review of the modeling methodology provided in the utility design guidelines indicates that it accomplishes its purpose, which is to measure the relative differences between alternative mitigation measures. Thus, the modeling indicates relative differences in magnetic field reductions between different transmission line construction methods, but does not measure actual environmental magnetic fields. In the same way, these relative differences in mitigation measures will be evident regardless of whether a maximum peak or a projected peak is used for the comparisons.

It is also true that post construction measurement of EMF in the field cannot indicate the effectiveness of mitigation measures used as it would be extremely difficult to eliminate all other EMF sources. We note that ordering EMF field measurements would lead to arguments regarding the risks associated with absolute EMF values and an attempt to determine health based standards, an issue excluded from this proceeding.

VII. Should Underground Lines be Considered for Additional Mitigation?

In some instances, a new transmission line may be constructed underground rather than overhead. 280 Citizens recommends that although a transmission line may be placed underground, this should not prohibit consideration of additional mitigation measures for an underground line. Sierra and PacifiCorp argue that the cost of underground construction and the resulting reduction in EMF are sufficient to meet the Commission's Prudent Avoidance Policy. Thus, Sierra and PacifiCorp recommend against any additional EMF mitigation spending for underground lines. PG&E, quoting D.04-08-046, recommends that underground lines not receive any low-cost mitigation funds except for "typical trenching and duct bank construction costs that may be

incurred because the route may not be as direct as otherwise possible if strategic placement were not undertaken”²⁰

As noted in the utility design guidelines,²¹ underground transmission lines typically reduce magnetic fields in comparison to overhead line construction. We also note that underground lines are usually more costly than overhead line construction. Nevertheless, there may be instances in which additional mitigation may be appropriate for an underground transmission line. In D.04-08-046 we noted the intense public concern regarding the particular circumstances in locating a portion of the Jefferson-Martin transmission line in a residential area, and thus we required PG&E to lower the trench depth of this underground transmission line by an additional five feet in all residential areas where this would lower magnetic fields by at least 15%.²² This additional depth was required as well as strategic line placement that already mitigated EMF exposure.

Although we expect that placing a transmission line underground should normally provide sufficient mitigation, we will not adopt a policy that totally excludes additional mitigation for underground lines should special circumstances warrant some additional cost in order to achieve significant further EMF mitigation.

²⁰ D.04-08-046, *mimeo.*, pp. 105-106.

²¹ See, for example, SDG&E EMF Design Guidelines For Transmission, Distribution and Substation Facilities, May 23, 1994, p. 28.

²² D.04-08-046, *mimeo.*, p. 107.

VIII. Standard Table of Reduction Measures

ORA proposes that utilities clearly state the mitigation alternatives they are considering for transmission and substation projects. ORA's proposal for transmission line and substation projects would include a standardized table summarizing the estimated costs and reasons for adoption or rejection of the EMF mitigation alternatives, thus providing a simpler and more transparent evaluation. Utilities also support this proposal.

We agree such a table is useful in evaluating new transmission and substation projects. Although no party provided an outline of the format for a standardized table, we direct the utilities to provide this table as part of the utility workshop ordered below, and submit this as part of the revised utility design guidelines.

IX. Choosing the Location for Measuring EMF Mitigation

280 Citizens proposes that the Commission state that the proper location for measuring EMF mitigation is at the edge of the utility ROW,²³ if the public is barred from the ROW. Otherwise, 280 Citizens would measure EMF mitigation from the nearest point to a point that is "routinely" used by people. Although PG&E, SDG&E and Edison's current design guidelines generally use the ROW as the location of measurement, PG&E proposes that measurement occur at the edge of occupied buildings.

For determining the appropriate location for measuring EMF mitigation, we point out that our EMF policy seeks to reduce public EMF exposure at those

²³ SDG&E points out that the EMF measurement location was as a result of workshops that followed the adoption of D.93-11-013.

locations where people tend to live, work, or go to school, and not in every area that may be used by people for short periods of time. Second, as explained above with regard to undeveloped land, it is not in the interest of ratepayers who must bear utility construction costs to speculate about future land uses and pay additional costs that cannot be justified by what is unknown at the time a FMP is developed. As PG&E points out, people contemplating changes in land use will have a choice regarding whether to construct buildings, including homes, next to existing or planned transmission lines or substations.

Generally we favor measurement of EMF mitigation at the ROW as this is the location where the utilities maintain access control; however exceptions may occur. For example, D.04-08-046 directed PG&E to strategically locate portions of the Jefferson-Martin transmission line at least 34 feet from occupied buildings where feasible, even if the EMF reduction was less than 15%.²⁴ In ordering this line location, we noted that the strategic line placement generally would entail minimal costs,²⁵ and in this way we balanced slightly greater construction costs against unique circumstances.

Consistent with our policy stated above that FMP should not include low-cost mitigation for undeveloped land, measuring EMF mitigation at the ROW should not apply to agricultural, rural and undeveloped land where

²⁴ Parties disagree whether the use of a 15% reduction factor is a significant measure of EMF mitigation. CCAE and FUND argue that absolute measures of EMF are necessary to determine meaningful mitigation. However, this proposal is based on numeric measures of EMF, an issue not considered in this proceeding. As no party has proposed changes in use of the 15% factor, we find no reason to change our use of 15% as a factor for measuring significant EMF mitigation.

²⁵ D.04-08-046, *mimeo.*, p. 107.

people can make choices about future construction and decide whether they choose to permanently live and work in these areas. For land uses in which rural housing or schools exist, we expect utilities to treat these locations as if the area was an urban school or residential location. As we have stated elsewhere, this policy applies only to consideration of low-cost mitigation measures. No cost mitigation measures that currently exist, or which may result from the recommendations of the utility workshop ordered in this decision should always be applied in all locations, including undeveloped land.

X. Consideration of New Scientific Data and Studies

The third issue identified in R.04-08-020 and in the Scoping Memo for exploration in this proceeding is consideration and receipt of new EMF-related scientific data that in turn may lead to new or revised EMF policies. At the April 4, 2005 PHC, the assigned Administrative Law Judge (ALJ) provided an opportunity for parties to address this issue and comment on the process of gathering scientific data.²⁶ Also, at the PHC, Kheifets, a professor in Epidemiology, provided some background on an anticipated scientific EMF study due from the WHO. Kheifets suggests the WHO study is likely to recommend no and low cost exposure reduction measures, similar to those adopted in this decision.²⁷

280 Citizens recommends that the proceeding should be closed so that improvements in policy and implementation can be applied, and that

²⁶ Tr. 124.

²⁷ Comments of Leeka Kheifets, July 26, 2005, p. 2.

Commission staff should be assigned to gather information and data on new scientific EMF research. 280 Citizens recommends opening a new rulemaking after new scientific research is available. Edison also supports the assignment of Commission staff to monitor EMF health and engineering research.

We agree with the recommendation of 280 Citizens and Edison. Accordingly, rather than leaving this proceeding open for new EMF related scientific data, we direct the Commission's Energy Division to monitor and report on new EMF related scientific data as it becomes available. When new scientific research becomes available, we will then consider opening a new rulemaking. As a result, prospective policy changes regarding EMF health effects should not be litigated in future utility Certificate of Public Convenience and Necessity (CPCN) or Permit to Construct (PTC) proceedings.

XI. Utility Workshop Standardizing Design Guidelines

280 Citizens recommends that the Commission require utilities to amend their design guidelines to include measures which may be listed in the guidelines of one utility but not another. 280 Citizens also recommends expansion of design guidelines to include less typical mitigation measures such as those applied or ordered in A.02-09-043. While Edison supports standardization of field reduction techniques,²⁸ Edison notes that new mitigation techniques must not

²⁸ PG&E believes that its design guidelines include the same options available under Edison and SDG&E's guidelines.

compromise safety and other standards and regulations as required in the Commission's General Orders (GO) 95 and 128.²⁹

We agree with 280 Citizens and Edison that some standardization of design guidelines would be a useful tool in evaluating EMF mitigation measures, provide common approaches and procedures, and lead to improvements in implementing our low-cost/no-cost policy. Accordingly, we will order the utilities to convene a workshop to consider changes, modifications and additions to current utility design guidelines. As other parties have already submitted comments on the design guidelines for PG&E, Edison and SDG&E, we will direct the utilities to meet and consider design guideline changes without further input. We have stated our EMF mitigation policies in this decision and we expect the utilities to implement these policies in revised design guidelines including engaging CDE to develop consistent mitigation measures. We will require that the proposed design guidelines be submitted within six months as an advice letter, subject to review and approval by our Energy Division.³⁰

In ordering a utility workshop, we are mindful that changes in design guidelines should not compromise safety, reliability, or the requirements of GOs 95 and 128. Furthermore, we do not request that utilities include non-routine mitigation measures, or other mitigation measures that are based on numeric values of EMF exposure, in revised design guidelines or apply mitigation measures to reconfigurations or relocations of less than 2,000 feet, the

²⁹ GO 95 addresses overhead electric line construction requirements. GO 128 addresses underground electric and communication systems construction requirements.

³⁰ We note that this process is similar to the development of design guidelines ordered in D.93-11-013. (OP 10.)

distance under which exemptions apply under GO 131-D. Non-routine mitigation measures should only be considered under unique circumstances.

XII. Conclusion

A number of improvements in mitigating EMF exposure have been developed since we last addressed EMF policies in D.93-11-013. Although recent proceedings such as A.02-09-043 have ordered various EMF mitigation measures, today's decision provides policies allowing regulated utilities to modify and improve existing design guidelines. We remain vigilant regarding new scientific research on EMF, and are prepared to open a new rulemaking if warranted. Until that time we emphasize that our continuing EMF policy is one of prudent avoidance, and application of low-cost/no-cost principles to mitigating EMF exposure.

XIII. Comments on Draft Decision

The draft decision of ALJ Bruce DeBerry in this matter was mailed to the parties in accordance with Section 311(g)(1) of the Public Utilities Code and Rule 77.7 of the Commission's Rules of Practice and Procedure. Comments were filed by Edison, Leeka Kheifets, SDG&E, Sage Associates,³¹ ORA, and PG&E.

We have carefully considered the comments on the issues addressed in today's decision. In response to comments, we have modified the draft decision to clarify the relationship between CDE and Commission EMF policies.

³¹ Neither Sage Associates nor Cindy Sage is an active party to this proceeding, although Cindy Sage, Sage Associates is listed as an "Information Only" party. Although Sage Associates does not have the standing of a party in the proceeding, we have considered these comments along with the comments of other parties.

XIV. Assignment of Proceeding

Michael R. Peevey is the Assigned Commissioner and Bruce DeBerry is the assigned ALJ in this proceeding.

XV. Categorization and Need for Hearings

The Commission preliminarily categorized this proceeding as quasi-legislative, and preliminarily determined that hearings were necessary. No party has requested hearings. Given this status public hearing is not necessary and the preliminary determination made with regard to hearings should be altered, but the categorization remains the same.

Findings of Fact

1. The purpose of this rulemaking was to determine if improvements should be made to existing Commission rules and regulations concerning EMF associated with transmission lines and other electric facilities.
2. Current Commission policy requires utilities to implement low-cost/no cost EMF mitigation measures to minimize public EMF exposure.
3. Low-cost measures have been defined as mitigation measures that cost 4% or less of the total project cost, which is also referred to as the 4% benchmark.
4. Although some parties have proposed that EMF mitigation costs may exceed the 4% benchmark, no party has recommended a specific alternate benchmark percentage.
5. As discussed in the rulemaking, a direct link between exposure to EMF and human health effects has yet to be proven despite numerous studies including a study ordered by this Commission and conducted by DHS.
6. EMF results from many electric sources outside of the control of the utilities.

7. PG&E, Edison and SDG&E each employ their own set of design guidelines for applying EMF mitigation measures to electric transmission, distribution and substation facilities.

8. No party has proposed evidentiary hearings.

9. Determining the future use of undeveloped land is speculative and difficult.

10. If an anticipated change in future land use does not occur, ratepayers could pay for unnecessary EMF mitigation costs.

11. Schools, day-care centers and hospitals can be identified in FMP at fixed locations.

12. Any proposed changes in guidelines should be consistent with the EMF policy established in this decision and in D.93-11-013.

13. Identifying residences in which children spend significant time is difficult and uncertain due to changing uses within houses and home sales.

14. Utility modeling methodology is intended to compare differences between alternative EMF mitigation measures and not determine actual EMF amounts.

15. EMF from underground transmission lines is usually less than overhead transmission line EMF.

16. A table listing the various EMF mitigation alternatives and costs is a useful tool for evaluating FMP.

17. The appropriate location for measuring EMF mitigation is the utility ROW as this is the location at which utilities may maintain access control.

18. Low-cost EMF mitigation is not necessary in agricultural and undeveloped land except for permanently occupied residences, schools or hospitals located on these lands.

19. People can make choices regarding new construction on undeveloped and agricultural land knowing that transmission lines either exist or are planned for those lands.

20. A 15% reduction in EMF is the current measure of significant EMF mitigation. No party has proposed a different measure of significant EMF mitigation.

21. No party provided new EMF scientific data or scientific research.

22. The Energy Division should monitor and report on new EMF related scientific data or research.

Conclusions of Law

1. The Commission has exclusive jurisdiction over issues related to EMF exposure from regulated utility facilities.

2. EMF concerns in future CPCN and PTC proceedings for electric transmission and substation facilities should be limited to the utility's compliance with the Commission's low-cost/no-cost policies.

3. A utility EMF workshop should be held for the purpose of developing standard approaches for design guidelines including the development of a standard table showing EMF mitigation measures and costs.

4. Low-cost EMF mitigation should use four percent of total project cost as a benchmark.

5. Revisions to utility design guidelines should not compromise safety, reliability or the requirements of GOs 95 and 128, or apply to reconfigurations or relocations exempted under GO 131-D.

6. This proceeding should be closed.

O R D E R

IT IS ORDERED that:

1. Respondent electric utilities shall convene a utility workshop to develop standard approaches for design guidelines including the development of a standard table showing electromagnetic field (EMF) mitigation measures and costs as discussed in this order.
2. Respondent electric utilities shall implement low-cost/no-cost EMF mitigation measures in new and upgraded transmission line and substation projects as discussed in this order.
3. Respondent electric utilities shall file revised design guidelines as an advice letter within six months of the effective date of this order.
4. No hearings were necessary for this proceeding.

5. Respondent electric utilities shall file an advice letter showing any proposed changes in design guidelines after meeting with the California Department of Education as discussed in this order.

6. Rulemaking 04-08-020 is closed.

This order is effective today.

Dated January 26, 2006, at San Francisco, California.

MICHAEL R. PEEVEY

President

GEOFFREY F. BROWN

DIAN M. GRUENEICH

JOHN A. BOHN

RACHELLE B. CHONG

Commissioners