

ORIGINAL

Decision No. 82466

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of
SOUTHERN CALIFORNIA EDISON COMPANY
for an order amending General Order
No. 95, "Rules for Overhead Electric
Line Construction," to Provide Rules,
with Respect to Prestressed Concrete
Poles, Structures and Crossarms.

Application No. 53140
(Filed February 11, 1972;
amended July 25, 1973)

O P I N I O N

Southern California Edison Company (Edison) seeks an order amending General Order No. 95, to provide rules, with respect to prestressed concrete poles, structures and crossarms.

General Order No. 95 contains rules and safety factors for the use of reinforced concrete poles but it presently contains no references to prestressed concrete poles or structures. In order to keep the rules, standards and specifications of General Order No. 95 up to date, there is a need to amend certain portions of the order to include prestressed concrete. In cooperation with major California electric utilities, the Commission staff and other interested parties, proposed modifications and amendments have been developed by Edison to establish appropriate minimum strength requirements for prestressed concrete poles, crossarms and structures. The proposed modifications and additions to Section IV of General Order No. 95 appear in the Appendix attached hereto.

Edison states that prestressed concrete poles, crossarms and structures are manufactured according to specifications set forth by the American Concrete Institute. Very high strength steel is specified for use in reinforcing rods and prestressing tendons. The concrete is also a special high strength mix. Dimensional variations are held to very close tolerances so that strength characteristics of prestressed concrete items are uniform. Edison states that prestressed

concrete poles are highly resistant to weathering because the prestress prevents the formation of cracks which would allow moisture to reach the reinforcing steel. This lack of cracks also makes prestressed concrete resistant to the effects of freezing and thawing. Prestressed concrete poles have been used heavily in Japan and Germany where they have been found to be highly durable. In this country, the durability of prestressed concrete has been proven through many years of experience in bridge structures, where weather and exposure conditions are similar to those experienced by power poles.

Edison claims that because of the structural difference between prestressed concrete and reinforced concrete, considerably lower safety factors can safely be utilized for prestressed concrete.

When Edison filed this application in 1972, it intended only limited uses for concrete poles such as in areas where danger from brush fires existed. Now it appears that prestressed concrete poles may be economical substitutes for wood poles which are becoming increasingly difficult to obtain.

Edison states in its letter of December 24, 1973, that the average cost of a 50-foot wood pole has increased by \$32, from \$115 to \$147, during the past year. The approximate cost of a 15-meter (49.2 feet) prestressed concrete pole is \$156. This concrete pole has a higher usable strength and a longer probable service life.

The proposed modifications to General Order No. 95 set forth in the Appendix have been submitted to and reviewed by:

Department of Water and Power, City of Los Angeles
Pacific Power and Light Company
Pacific Gas and Electric Company
San Diego Gas & Electric Company
Sacramento Municipal Utility District
International Brotherhood of Electrical Workers
Continental Telephone Company of California
General Telephone Company of California
The Pacific Telephone and Telegraph Company

Each of the above has advised Edison that it concurs in and endorses the proposed modifications to the General Order.

The Commission finds that the proposed amendment will not be detrimental to the safety of the general public and will establish uniform requirements, the application of which will help insure adequate service and promote safety to persons engaged in the construction, maintenance, operation, or use of prestressed concrete poles, crossarms, or structures, and concludes that General Order No. 95 should be amended to the extent set forth in the Appendix. ✓

A public hearing is not necessary. ✓

O R D E R

IT IS ORDERED that General Order No. 95, "Rules for Overhead Electric Line Construction," is hereby amended to the extent set forth in the Appendix attached hereto.

IT IS FURTHER ORDERED that the Secretary shall cause a copy of this order and its Appendix to be served upon each electric and telephone utility subject to the jurisdiction of this Commission, State Division of Industrial Safety, and, further, to cause a suitable number of copies to be made available for distribution to such other agencies furnishing utility service, and the general public as may request the same.

The effective date of this order is the date hereof.

Dated at San Francisco, California, this 13th day of FEBRUARY, 1974.

Vernon L. Sturgeon
President
William J. Symons, Jr.
William J. Symons, Jr.
William J. Symons, Jr.
William J. Symons, Jr.
Commissioners

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The Commission's General Order No. 95 shall be amended as follows:

1. The second paragraph of RULE 44, SAFETY FACTORS, will be amended to include a provision for Rules 48.3A and 48.3B, and shall read as follows:

"The safety factors for structural materials other than wood (towers, poles and crossarms) shall be applied as specified in Rule 48.2, 48.3A and 48.3B," and

2. There will be an addition to RULE 44.1, TABLE 4, SAFETY FACTORS, following the provision "Crossarms (wood)," to read as follows:

Element of Line	Grades of Construction			
	Grade "A"	Grade "B"	Grade "C"	Grade "F"
.....	-			
.....				
.....				
Prestressed Concrete Poles, Structures, and Crossarms	1.8	1.5	1.5	--

3. The title of RULE 48.3, REINFORCED CONCRETE, will be amended to read RULE 48.3A, REINFORCED CONCRETE

RULE 48.3B, PRESTRESSED CONCRETE, will be added to this section and shall read as follows:

"Structural Members and their connections shall be designed and constructed so that the structures and parts thereof will not fail or be seriously distorted at any load less than their maximum working loads (developed under the current construction arrangements with loadings as specified in Rule 43) multiplied by the safety factor specified in Rule 44."

"The minimum strength of the materials used in pre-stressed concrete structures used in conjunction with the safety factors given in Table 4 shall be as follows:

Reinforcing Steel - yield strength	40,000 lbs. per sq. inch
Prestressing Steel - yield strength	188,000 lbs. per sq. inch
Concrete - compressive strength	4,000 lbs. per sq. inch
at 28 days	

"Other strength values may be used provided the strength values used for design are proven by tests."

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4. The second paragraph under subsection A. STRENGTH, of RULE 49.1, POLES, TOWERS AND OTHER STRUCTURES, will be amended to include "prestressed concrete" and will read, in part, as follows:

"Metallic, prestressed concrete, and reinforced concrete poles, towers . . . etc."

The third paragraph under subsection C. SETTING OF POLES of RULE 49.1, POLES, TOWERS AND OTHER STRUCTURES, will be amended to include "prestressed concrete" and will read, in part, as follows:

"Metallic and prestressed concrete poles that are set . . . etc."

5. A third section will be added to subsection A. MATERIAL of RULE 49.2, CROSSARMS, and will read as follows:

"(3) Prestressed Concrete - Prestressed concrete crossarms may be used provided they are designed in accordance with Rule 48.3B."

A third section will be added to subsection B. MINIMUM SIZE of RULE 49.2, CROSSARMS, and will read as follows:

"(3) Prestressed Concrete - The minimum dimension of any prestressed concrete member shall be 3 inches."