

Decision No. 39381

## BEFORE THE RAILROAD COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN CALIFORNIA EDISON COMPANY LTD., for a certificate that present and future public convenience and necessity require or will require the construction and operation of Applicant's electrical generation, transmission and distribution system to render sixty cycle alternating current service, and for an Order fixing said frequency as a standard for said system, and authorizing discontinuance of fifty cycle alternating current service in territory served by Applicant.

**ORIGINAL**

Application No. 26791

ROWELL, COMMISSIONER:

OPINION ON FOURTH SUPPLEMENTAL APPLICATION

By Decision No. 38090, issued July 27, 1945, the Commission granted Southern California Edison Company, Ltd. <sup>(1)</sup> authority to proceed with a program for the establishment of a uniform system-wide alternating electric current frequency of 60 cycles. The Commission also then authorized Edison to assume within reason the direct costs of converting its customers' appliances and equipment for operation at the new frequency, but declared that in providing such assistance to its customers Edison must be governed by uniform nondiscriminatory procedures to be established by supplemental order.

By this Fourth Supplemental Application Edison submits for adoption a comprehensive statement of policies and procedures to be followed in carrying out this frequency change program. A public hearing was held upon such application at Los Angeles on July 25, 1946. With certain modifications suggested by the evidence presented at that hearing, the proposed rules are set forth in full in the order herein made.

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(1) Hereafter referred to as Edison.

Subsequent to the Commission's decision of July 27, 1945, generally approving the frequency change plan, Edison immediately began the organization of a special technical department to plan and engineer the changes required in customers' frequency sensitive utilization equipment in order that such equipment be made capable of performing essentially the same service when supplied with 60-cycle electric energy as previously obtained with 50-cycle energy. To obtain actual experience in the application of cutover procedures, Edison was then granted authority<sup>(2)</sup> to institute 60-cycle service in a relatively small "Pilot Area" containing about 4200 customers, and to adapt appliances of such customers for 60-cycle operation. Additional experience has been gained by the conversion of the plants of several large industrial customers as authorized by the same decision.

During this entire period representatives of both Edison and of the Commission have been engaged in formulating rules and regulations governing Edison's undertaking to aid its customers in the adaptation of their appliances. The rules thus formulated are consistent with the principles outlined by the Commission in its initial decision and are believed to be of sufficient scope to meet most of the physical situations that may be encountered. However, as the rule itself indicates, the Commission retains continuing jurisdiction over the entire conversion program, and these rules as now adopted are subject to such amendments or additions as the Commission may hereafter prescribe in the light of future experience. Most of the provisions contained in these rules are self-explanatory. Therefore, it does not appear necessary to make extended comment thereon.

In Section B of the Rule reference is made to a Frequency Change Manual. Sections VI and VII of the manual will contain standard conversion procedures for the adaptation of customers' frequency sensitive utilization equipment. While not made a part of the rule itself, nevertheless this information will be filed and held available for public inspection. The compilation thus referred to

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(2) Decision No. 38707 issued February 19, 1946.

includes the basic engineering data relating to the required physical changes, if any, that must be made in the types of customers' appliances and assemblies usually found, to assure their efficient functioning at the higher frequency. Because of the large number of employees of Edison and its contractors who will be engaged in the adaptation of customers' appliances, and of the wide diversity in types of equipment encountered, it is obvious that Edison should prepare a comprehensive manual of instructions to its employees in order to assure the uniform application of the basic rules and procedures herein prescribed.

It is anticipated that the great majority of the appliance conversions can readily be made under such uniform and standardized procedures. However, it is inevitable that some situations will be encountered where special adaptation methods will be found necessary and the procedures to be followed in such cases will be in accordance with the general principles incorporated in the Rule now adopted. Should differences arise as to the extent of the change deemed adequate or reasonable in a particular case, it will remain the function of the Commission to determine the dispute.

However, particular reference should be made to the provision contained in Section M, requiring the submission of disputed cases to a three-man board made up of customer, Commission and Edison representatives. The provision does not deprive any customer of the right to present an appropriate complaint for decision by the Commission itself. Its purpose is to establish a procedure whereby such disputes may be promptly passed upon, in the first instance, by those particularly familiar with the technical problems involved. The findings of that board are final only to the extent that the cutover schedules be not interrupted to await the presentation of the matter to the Commission itself for decision. As the cutover schedules must be set up so as to permit of the conversion of large groups of customers in orderly sequence, it is imperative that cutover delays which would adversely affect the majority of those customers must be avoided. The Rule is designed to prevent such delays. At the same time the right of an individual customer to petition the Commission for an

adjustment of his dispute is preserved.

Conversion costs and allowances referred to in the Rule, particularly in Section C, deserve some comment. It is quite apparent that the character of the changes finally adopted eventually reflect in the overall cost of the undertaking. In approving the program in the first instance the Commission contemplated that such aid as was to be given Edison's customers was to provide a maximum of assistance within a reasonable cost. To achieve perfection would result in prohibitive cost. To make no changes in customers' appliances would be equally unwise. The changes therefore which are being authorized are those which can be expected to leave the customer in substantially the same service position after cutover as before, and can be accomplished within a reasonable cost.

No customer should be compelled to permit Edison to convert his equipment. In those infrequent cases where a customer desires to make his own conversion no unnecessary difficulties should be placed in his way. In such cases, however, he is entitled in all fairness to assistance equal to that given other similarly situated customers whose equipment is being converted by Edison. To accomplish this a system of conversion allowances has been devised whereby Edison will make a contribution in money approximating the costs which would have been incurred had Edison performed the conversion. Such a payment, of course, discharges all of the obligations, assumed by Edison, to adapt that equipment for which the conversion allowance is made. While some of these allowances must of necessity be based on averages, and still others based on estimates, those now established, and changes, modifications, and additions, when amended and filed, must of necessity reflect the primary objective of equality of treatment.

The limitation of liability provided by Section K likewise is dictated by the grave responsibility to hold cost of conversion of customers' equipment within reasonable bounds. The expenditures necessary to perform this undertaking must be justified almost entirely from the paramount public interest which will

be enhanced thereby. In a sense, therefore, this undertaking is entirely outside the more usual relationships existing between Edison, its customers and the public. At the outset the Commission made it clear that the program, if it were to be accomplished, was a joint undertaking. While Edison was to be permitted to assume the direct costs involved, no such permission was to extend to the indirect costs which might arise. These were to be the contribution of each individual customer to the indeterminate degree each might be affected thereby.

Section J provides for the use of service contracts under certain circumstances. Little change from present practice is contained therein. Contracts are now commonly used in doubtful cases to insure that costs incident to the establishment of service will be fully met by future use of that service. The provision herein has the same objective. Contracts for terms of three years or less are authorized. Those for longer periods must be submitted for individual review and authorization.

At the hearing it was divulged that Edison and four of its municipal customers were negotiating contracts under which Edison will undertake to perform certain of the conversion operations for these cities' customers. Since the conditions under which these more limited programs will be carried out are to be specified in the contracts, each of which will be submitted for this Commission's review and authorization, there is no need to discuss them further at this time.

Edison has heretofore been authorized to file a rule requiring commercial and industrial customers to provide after December 1945 only such luminous gaseous lighting equipment as would require a minimum subsequent conversion cost. Such rule will be preserved, but incorporated in the Rule herein adopted for the sake of uniformity.

From a consideration of the Rule herein ordered, the evidence offered in support thereof, and the foregoing discussion, it must be concluded that the Commission's initial requirement, that uniform nondiscriminatory procedures be

developed, has been met. Conversions performed in accordance with the Rule must of necessity be held to have been in compliance with the Commission's initial order herein. Coincident with the start of the main conversion program, Edison and its customers may now rely on a much more comprehensive statement of the principles involved to assure a successful prosecution of the undertaking. I recommend the following form of order:

O R D E R

A public hearing having been held, evidence introduced and the matter submitted for decision, and based upon the findings and conclusions in the foregoing opinion, and finding as a fact that the Rule hereinafter specified is just and reasonable and in the public interest,

IT IS HEREBY ORDERED that Southern California Edison Company, Ltd., be and it is hereby authorized and directed as follows:

- 1.. To adopt and make effective Rule and Regulation No., FC-1, Frequency Change Requirements and Procedures, attached hereto and made a part hereof.
- 2.. To file and publish said Rule as a revision of its filed tariff schedules.
- 3.. Upon such filing to withdraw and cancel Supplement to Preliminary Statement C.R.C. Sheet No. 2058-E and Rule and Regulation No., F-1, C.R.C. Sheet No. 2084-E.

The effective date of this order is the date hereof.

This Opinion and Order is ordered filed as the Opinion and Order of  
the Railroad Commission.

Dated at San Francisco, California, this 3<sup>rd</sup> day of  
September, 1946.

Harold P. Hule  
Justin F. Cuevas  
James P. Davis  
Isaac H. Hancock  
A. F. Zimmerman  
Commissioners

RULE AND REGULATION  
NO. FC-1

FREQUENCY CHANGE REQUIREMENTS AND PROCEDURES

GENERAL PROVISIONS

- (1) The Railroad Commission of the State of California by its Order dated July 27, 1945 (Decision No. 38090), found that the present and future public convenience and necessity require the Southern California Edison Company Ltd., hereinafter called the "Company," to establish a uniform system-wide alternating current frequency of approximately 60 cycles, to cease furnishing 50-cycle service at such time as 60-cycle service is available, to make the necessary conversion of its own system, to assist its customers in adapting their apparatus, to assume the reasonable costs of such work and to account for the same in accordance with the provisions of the Order referred to above.
- (2) This rule and regulation is established in compliance with the Order of the Commission above referred to and supplements the rules and regulations and filed tariff schedules of the Company. All rules and regulations and tariff schedules of the Company, in so far as inconsistent with this rule and regulation, are subordinate thereto.
- (3) Pursuant to the Order of the Railroad Commission the conversion program will be carried out under its continuing jurisdiction in conformity with non-discriminatory fair and just rules established by said Commission.
- (4) The Company has the responsibility for developing and activating a sound and workable conversion program and proposes to perform the frequency change work expeditiously and at a reasonable cost.
- (5) The customer has the responsibility of actively cooperating and assisting in the consummation of the conversion program.
- (6) Electric service during the frequency change period will be supplied by the Company at a frequency of approximately 50 cycles, or at a frequency of approximately 60 cycles, the frequency in each case depending upon location. The Company will furnish information upon request as to the frequency available at any particular location.

(A) DEFINITIONS OF TERMS

The following terms when used in this rule and regulation shall have the meanings as stated below.

(1) CUSTOMER

"CUSTOMER" is the electric consumer, owner or person having legal control of the electric utilization equipment at the location where the apparatus or appliances are directly supplied with electric service by the Company at the time of cutover.

(2) UTILIZATION EQUIPMENT

"UTILIZATION EQUIPMENT" includes appliances or apparatus regularly used by the customer for receiving and consuming or converting electric energy to other forms of power or energy.

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RULE AND REGULATION NO. FC-1 (Continued)

(3) REGULARLY USED

"REGULARLY USED" means that the utilization equipment is connected to the Company's system, ready for use continuously or periodically. Spare parts and supplies, equipment and materials in storage, or held for resale, lease, or rental are not considered "regularly used."

(4) SURVEY

"SURVEY" is the accumulation of the necessary nameplate data, physical measurements, tests and other engineering data required to determine which items of the customers' utilization equipment are frequency sensitive and need adaptation.

(5) ADAPTATION OR CONVERSION

"ADAPTATION OR CONVERSION" is the necessary changing or adjusting of utilization equipment required to render it capable of performing essentially the same service when supplied from a 60-cycle alternating current electric system as that previously obtained when supplied from a 50-cycle system.

(6) CUTOVER OR CHANGEOVER

"CUTOVER OR CHANGEOVER" is the time when the Company ceases to furnish 50-cycle service and commences to supply 60-cycle service to the customer.

(B) FREQUENCY CHANGE MANUAL

- (1) The Company shall compile a comprehensive manual of instructions, hereinafter called "Frequency Change Manual" for the use of its employees and contractors in the conduct of the frequency change program.
- (2) Standard conversion procedures as determined by the Company for the adaptation of customers' frequency sensitive utilization equipment will be contained in the following sections of the Frequency Change Manual.

Section VI; INSTRUCTIONS, including survey, engineering, and conversion.

Section VII; CONVERSION DATA, including survey and conversion of specific equipment.

- (3) Copies of Sections VI and VII of the Frequency Change Manual, and amendments and supplements thereto, shall be available for reference at the offices of the Railroad Commission of the State of California at San Francisco and Los Angeles. Copies shall also be available for reference at the Company's General Office, Frequency Change Department and District offices.
- (4) The Frequency Change Manual is not a part of this rule and regulation and may be amended and supplemented from time to time as conditions require.

(C) CONVERSION COSTS AND ALLOWANCES

- (1) The Company will assume the reasonable costs of adapting customers' utilization equipment for operation at a frequency of 60 cycles, except as otherwise provided in this rule and regulation, and will account for the same in accordance with the provisions of the Order of the Commission dated July 27, 1945, or supplements thereto.

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RULE AND REGULATION NO. FC-1 (Continued)

- (2) The cost of additions, betterments, repairs or maintenance of customers' utilization equipment is not a part of the reasonable cost of adaptation. Any such work shall be performed at the expense of the customers.
- (3) A customer may assume the responsibility of adapting his utilization equipment and in such case the Company will make a conversion allowance in lieu of adaptation.
- (4) Conversion allowances shall be based on schedules of adaptation costs which may be developed by the Company from time to time, or on the estimated cost of adaptation of the particular equipment. Schedules of conversion allowances are available for reference in the Frequency Change Manual.
- (5) In exceptional cases or unusual circumstances where utilization equipment cannot be adapted for 60-cycle operation at a reasonable cost because of its condition, age, inadequate, obsolete or nonstandard design, the Company will make a conversion allowance in lieu of adaptation.

(D) SURVEY OF UTILIZATION EQUIPMENT

- (1) A survey will be made of the frequency sensitive utilization equipment connected to the Company's 50-cycle system to determine the changes necessary to adapt the customers' equipment for operation on a 60-cycle system. The survey will be conducted by the Company, or its contractors, with the active assistance of the customer in procuring and supplying necessary information and in providing access to his equipment within the normal working hours of the Company, or its contractors, for the purpose of obtaining nameplate data and making necessary physical measurements and operating tests.
- (2) Frequency sensitive utilization equipment of domestic customers will be surveyed by mail. A letter of instructions will be addressed to each customer enclosing a survey card listing the more usual types of frequency sensitive domestic appliances. To insure adaptation of his equipment, the customer must indicate on the survey card which appliances he has and write in the name of the manufacturer, brand, model, and year of electric refrigerators, home freezers, washing machines, record players, and other equipment, and shall return the survey card promptly to the Company.
- (3) The surveys of frequency sensitive utilization equipment of classes of customers other than domestic will be made during the normal working hours of the authorized representatives of the Company, or its contractors.
- (4) Representatives of the Company and its contractors engaged in the survey will be provided with credentials for identification.

(E) ENGINEERING OF UTILIZATION EQUIPMENT

- (1) The data obtained from the survey of customers' utilization equipment will be analyzed by engineers of the Company, or its contractors, to determine the necessary changes required for adaptation of the equipment to render it capable of performing essentially the same service when supplied from a 60-cycle system as that previously obtained when supplied from a 50-cycle system. Frequency sensitive utilization equipment will be adapted in accordance with standard conversion procedures as determined by the Company. Customers will, upon request, be advised of the proposed changes to be made in utilization equipment.

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RULE AND REGULATION NO. FC-1 (Continued)

- (2) Rotating equipment will require adaptation only if it is speed critical and in such cases mechanical changes will generally be made in the drive or driven equipment. Where mechanical changes are, in the opinion of the Company, not practicable, electrical changes will be performed.
- (3) A substantial amount of customers' utilization equipment now operating on 50-cycle current will operate satisfactorily on 60-cycle current and will not require adaptation because of design, application or operating characteristics. In general this includes equipment supplying heat, incandescent lighting, apparatus performing non-mechanical functions and rotating equipment which is not speed critical, examples of which are as follows:

Radios, vacuum cleaners, domestic refrigerators (sealed units and many belt-driven types), washing machines (except spin dry and automatic types), domestic sewing machines, ranges (except timers), roasters, toasters, coffee makers, grills, waffle irons, hand irons and ironers, food mixers, juice extractors, portable fans, shavers and clippers (except vibrator types), door bells, transformers and small shop equipment.

Incandescent lighting, small neon signs, fluorescent lights (single tube), electric heaters, soldering irons, infra red lamps, diathermy equipment, X-Ray equipment (except timers), heating pads and blankets.

Adding machines, dictating machines, mailing devices, typewriters, cash registers, fountain equipment, coffee grinders, meat slicers, battery chargers, and hand tools.

(F) CONVERSION OF UTILIZATION EQUIPMENT

- (1) The territory served by the Company with 50-cycle electric service will be divided into several areas for the purpose of conversion and each area will be further subdivided into electric feeder areas. The electric service to all customers within a feeder area must be cutover at one time, which will necessitate the full cooperation of each customer in making his utilization equipment available for conversion during the established schedules. All customers will be notified as far in advance as practicable of the conversion schedule and the date of cutover.
- (2) The Company, or its contractors, will make the necessary changes required to adapt the customers' utilization equipment in accordance with the Company's engineering determinations. The customer will, without charge, make his utilization equipment available for adaptation and provide necessary assistance to avoid delays during the progress of the work.
- (3) Conversion work on customers' utilization equipment will be performed within the normal working hours of the Company, or its contractors. When the Company finds it necessary under its schedules and in the best interests of the frequency change program, work may be performed during other than normal working hours. Conversion work may be performed on an overtime or premium basis for the customer's convenience, provided that such work does not conflict with the conversion schedule and the customer agrees to reimburse the Company for the additional cost resulting from such performance of work on an overtime or premium basis.

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RULE AND REGULATION NO. FC-1 (Continued)

- (4) If the customer elects to accept a conversion allowance, he shall execute an agreement with the Company substantially in the form entitled "Conversion Allowance and Release Agreement" (Form FC 257) assuming the responsibility for the adaptation of his utilization equipment.
- (5) Customers' equipment not regularly used or disconnected from the company's system will not be adapted at the time of cutover. If, however, the customer, within 90 days from the date of cutover, agrees to reconnect the equipment in good faith for regular use, then the company will upon reasonable notice adapt the equipment for 60-cycle operation.
- (6) If the customer considers that the work of conversion performed by the Company, or its contractors, is unsatisfactory, he shall notify the Company in writing within 60 days after the date of cutover. In case of seasonal use, such notice shall be given within 60 days after the resumption of seasonal use, but not later than one year after the date of cutover. Upon receipt of such notice and the determination that additional conversion work is necessary, the Company will perform such work.
- (7) The Company shall in no event be liable for any work performed by the customer without the prior written consent of the Company.
- (8) Any material, whether individual parts or complete items of equipment, purchased by the Company for use in the conversion of utilization equipment will, upon installation, become the property of the owner of the utilization equipment.  
  
The Company shall have the right to retain all of the equipment salvaged by it from the adaptation of customers' frequency sensitive utilization equipment.
- (9) Representatives of the Company, and its contractors, engaged in the adaptation of utilization equipment will be provided with credentials for identification.

(G) CLOCKS AND TIMING DEVICES

- (1) Clocks and timing devices in use on the Company's 50-cycle system will be exchanged or adapted for 60-cycle operation in accordance with the Company's standard conversion procedures.
- (2) Clock depots will be established within conversion areas for the exchange or adaptation of portable clocks.

Customers will be notified of the location of the nearest clock depot and shall bring their portable clocks to the depot in order to take advantage of one of the following plans.

PLAN 1 - The customer may select from the stock of several models available from time to time, a new 60-cycle clock in exchange for his old clock and the payment of a charge in accordance with the established schedule.

PLAN 2 - The Company will adapt the customers' 50-cycle clocks for 60-cycle operation without cost, except as hereinafter provided. Conversion materials and workmanship will be guaranteed by the Company for 60 days after the adaptation of the clock.

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RULE AND REGULATION NO FC-1 (Continued)

- (3) Nonportable clocks and timing devices, including range timers, alarm systems and time switches need not be brought to the clock depots, but will be adapted by the Company, or its contractors, on the customers' premises, or removed to a conversion shop.
- (4) In exceptional cases where clocks and timing devices cannot be adapted for 60-cycle operation at a reasonable cost, because of condition, age, inadequate, or obsolete or nonstandard design, the customer may exchange his 50-cycle clock as provided in Plan 1 above, or accept the established conversion allowance in exchange for his clock.

(H) DIRECT CONNECTED DEEP WELL PUMPS

- (1) The Company, or its contractors, will make the necessary changes required to adapt direct connected deep well pumps for 60-cycle operation, in accordance with the Company's engineering determination, or the customer may accept a conversion allowance in lieu of adaptation.
- (2) A survey and pump test will be made by the Company to provide information useful in determining the necessary changes required in the pumping equipment for 60-cycle operation.

The data obtained from the survey and test will be analyzed by engineers of the Company to determine the necessary changes required to render the pump capable of performing essentially the same service when supplied from a 60-cycle system as that previously obtained when supplied from a 50-cycle system. The adaptation of the pumping equipment will be performed by destaging of the pump bowl assembly, or by trimming the pump impeller.

- (3) The Company, or its contractors, will pull, adapt for 60-cycle operation and reinstall the pump without cost to the customer, provided the pump and the well are in normal operating condition, are made available for conversion within the established schedule and the customer executes an agreement, substantially in the form entitled "Customer's Order and Agreement to Adapt Pumping Equipment for 60-Cycle Operation," (Form FC 78).
- (4) The customer may desire to make his own arrangements to adapt his pump for 60-cycle operation, to install new equipment, to repair or overhaul his pump or well, to change pump capacity, to raise or lower the pump setting, to sand pump the well, or to make other changes or improvements. In such cases, the customer shall assume the responsibility of adapting his pumping equipment for 60-cycle operation and shall execute an agreement substantially in the form entitled "Conversion Allowance and Release Agreement," (Form FC 73) and the Company shall make a conversion allowance in lieu of adaptation.
- (5) In exceptional cases or unusual circumstances where the Company finds that the pumping equipment of the customer cannot be adapted for 60-cycle operation at a reasonable cost, because of the condition of the pump or the well, the customer shall assume the responsibility of adapting his pumping equipment for 60-cycle operation by executing an agreement substantially in the form entitled "Conversion Allowance and Release Agreement," (Form FC 73) and the Company shall make a conversion allowance in lieu of adaptation. Such cases will include pump frozen in well, collapsed well, sanding up of well, defective pump and other conditions which prevent the normal adaptation and reinstallation of the pumping equipment.

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RULE AND REGULATION NO. FC-1 (Continued)

- (6) Deep well pumps not regularly used or disconnected from the Company's system will not be adapted by the Company at the time of cutover. If, however, within one year after the date of cutover of the electric feeder supplying the service, the customer signs a service agreement for a minimum term of one year and agrees in good faith to use the pumps regularly, the Company will, upon reasonable notice, adapt the pumps for 60-cycle operation.

(I) INSTALLATION OR REMOVAL OF UTILIZATION EQUIPMENT

- (1) Any additions or removals of customers' frequency sensitive utilization equipment after the survey has been completed and prior to cutover shall be reported promptly in writing by the customers to the Company.

Upon receipt of notice of the installation of additional frequency sensitive utilization equipment, the Company will survey, engineer and adapt such equipment and will endeavor, if the time of the notice permits, to complete the necessary adaptation within the established conversion schedule.

If the adaptation of the additional equipment has not been completed prior to cutover, the Company shall not be liable for loss or damage resulting from 60-cycle operation.

- (2) Rule and Regulation No. F-1, made effective December 1, 1945, in accordance with the Order of the Railroad Commission No. 38336, dated October 30, 1945, is continued in effect reading as follows:

"On and after December 1, 1945, all commercial and industrial consumers installing gaseous tube lighting equipment shall provide equipment which will require a minimum cost of alteration to operate on a frequency of sixty (60) cycles. In the event the consumer does not install equipment of such type, all costs in excess of said minimum, connected with altering the equipment for service at a frequency of sixty (60) cycles, shall be paid by the consumer."

- (3) All other utilization equipment installed after the survey and prior to cutover must be of a type which will require a minimum cost of adaptation to operate on a frequency of 60 cycles, or all costs in excess of such minimum cost connected with adapting said equipment shall be paid by the customer.
- (4) The Company shall not be responsible for the adaptation of customers' utilization equipment installed after cutover, except as otherwise provided in this rule and regulation.
- (5) Customers now supplied by the Company with 50-cycle service moving into a District which has been converted by the Company to 60-cycle service within a period of 60 days after changeover of the District may have their utilization equipment adapted for 60-cycle operation by making written application to the Company. Upon receipt of such application, the Company will survey, engineer and adapt the customers' frequency sensitive equipment within a reasonable time.

(J) CONTRACTS

- (1) If the Company determines that the service is of a temporary or speculative character, or of questionable permanency, or that the cost of adaptation of a customer's frequency sensitive utilization equipment is excessive in relation to the annual revenue, the Company may require a contract as a condition precedent to adaptation of the customer's

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RULE AND REGULATION NO. FC-1 (Continued)

equipment. Contracts for a term exceeding three years may be required based upon the estimated cost of adaptation and the future revenues to be received from the customer and shall be subject to the authorization of the Railroad Commission.

(K) RESPONSIBILITY AND LIABILITY

- (1) The Company, except as otherwise herein provided, has the responsibility for adapting customers' utilization equipment to render it capable of performing essentially the same service when supplied from a 60-cycle system as that previously obtained when supplied from a 50-cycle system.
- (2) The Company's responsibility for the adaptation of the customers' utilization equipment shall cease and terminate 60 days after the date of cutover, except as otherwise provided in this rule and regulation.
- (3) The Company shall repair or replace any defective material installed or workmanship performed by the Company, or its contractors, upon written notice by the customer to the Company within a period of 60 days from and after the date of cutover; or within 60 days after the date of resumption of seasonal use, but not later than one year from the date of cutover.
- (4) In the event any customer's equipment is damaged, as a result of the conversion to a frequency of 60 cycles, the Company and its contractors will be liable only if such damage is due to the negligence of the Company, or its contractors. Such liability shall be limited to the repair of the damaged equipment.
- (5) The Company and its contractors shall not be liable for loss or damage, including but without limitation, loss of use, production or profits resulting from the adaptation of the customers' utilization equipment, or from the conversion of the Company's system to a frequency of 60 cycles, except as provided in the paragraph immediately preceding.
- (6) The Company shall not be liable for loss or damage resulting, in whole or in part, from fire, war, riots, strikes, threat of strikes, labor negotiations, jurisdictional disputes between labor unions, wage disputes, lockouts, threat of lockouts, action of the elements, accidents, acts of God, inability to obtain materials or labor in the open market, or to obtain transportation of such materials, rules and regulations of any federal, state, county, municipal, or any other governmental agency, or other matters beyond the reasonable control of Company, whether similar to the matters or conditions herein expressly enumerated or not, and without regard to whether such causes exist at the date hereof, or hereafter arise.

(L) DISCONTINUANCE OR INTERRUPTION OF SERVICE

- (1) The Company will exercise reasonable diligence and care to furnish and deliver a continuous and sufficient supply of electric energy to the customer during the conversion of the Company's system and to avoid any shortage or interruption of delivery of same. The Company will not be liable for interruption, or shortage, or insufficiency of supply, or any loss or damage occasioned thereby, if same is caused by fire, war, riots, strikes, threat of strikes, labor negotiations, jurisdictional disputes between labor unions, wage disputes, lockouts, threat of lockouts, action of the elements, accidents, acts of God, inability to obtain materials or labor in the open market, or to obtain transportation of such materials, rules and regulations of any federal, state, county, municipal, or any other governmental agency, or other matters beyond the reasonable control of Company.

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RULE AND REGULATION NO. FC-1 (Continued)

- (2) The Company, whenever it shall find it necessary for the purpose of adapting customers' utilization equipment, or converting its system to a frequency of 60 cycles, will have the right to suspend temporarily the delivery of electric energy, but in all such cases, as reasonable notice thereof as circumstances will permit, will be given to the customers and service will be restored as rapidly as may be practicable.
- (3) In the event a customer fails to comply with this rule and regulation, or fails to have his utilization equipment adapted in accordance therewith service may be discontinued, unless the customer notifies the Company in writing and executes an agreement assuming the responsibility for the conversion and relieving the Company of liability for loss or damage resulting from the changeover of his electric service to 60 cycles.

(M) BOARD OF ARBITRATION

- (1) In the event any disagreement arises in connection with the frequency change program, between the customer and the Company, or its contractors, the matter shall be referred to a Board of Arbitration consisting of three members, one appointed by the Company, one by the customer, and one by the Railroad Commission. The finding of the majority of the Board shall be binding upon the Company and the customer, and the cutover shall proceed in accordance with the Company's conversion schedule; provided, however, either party has the right to petition the Railroad Commission for adjustment of the matter in accordance with its Rules of Procedure.

(N) AMENDMENTS AND SUPPLEMENTS

- (1) This rule and regulation shall be subject to amendment or supplement from time to time as conditions require and such amendments and supplements shall become effective upon authorization of the Railroad Commission.