Service Conditions
Rule and Regulation 2

I. Description of Service

Subject to conditions listed below, single-phase or three-phase service will be supplied as required by the customer in accordance with appropriate rates.

1. Voltage supplied will be designated by SMUD.
2. Single-phase service will not be supplied to customers whose panel capacity exceeds 100 kVA.
3. Three-phase service will not be supplied to motor loads of less than 7-1/2 kW, except where three-phase secondary facilities are available at applicant's service location, or where applicant for three-phase service contributes the net estimated installed cost of such facilities (exclusive of meter and service) or such part of the net estimated installed costs as SMUD may consider equitable.

Alternating current service of approximately 60 hertz frequency will be supplied at the following standard voltages:

Secondary Voltages		Primary Voltages	Subtransmission
Single-Phase	**Three-Phase**	**Three-Phase**	**Three-Phase**
120	208Y/120	12,000Δ	69,000Δ
120/240	240Δ/120	20,800Δ	
208Y/120	480Y	20,800Y/12,000	
	480Y/277		
	4160/2400Y		

SMUD will endeavor to maintain its frequency and its service voltage within reasonable limits, but does not guarantee same.

II. Conditions of Service

A. Interference with Quality of Service

If in SMUD's judgment there is an interference with the quality of service supplied to neighboring customers, resulting from the customer's noncompliance with any of the provisions of this rule, SMUD may require the customer to provide at their own expense such special or additional equipment as is required, or SMUD may provide such equipment if customer pays the net estimated installed cost of such equipment. In lieu of payment of such estimated net cost, the customer may, at SMUD's option, execute a contract providing for the rental of such equipment under terms and conditions satisfactory to SMUD. If customer refuses to rent, or to provide their own corrective equipment, or to reimburse SMUD for the cost of such additional or special equipment as is required to eliminate interference with the quality of service to neighboring customers resulting from the customer's operations, SMUD may refuse or discontinue the customer's service.

B. Phase Balancing

Where three-wire single-phase, or three-wire three-phase, or four-wire combination single-phase and three-phase service is supplied, the load must be balanced as nearly as practicable between the two sides or several phases, respectively. In no case is the load on one side of a three-wire single-phase service to be greater than twice that on the other, or the load on any one phase of a three-phase star service greater than twice that on the other phase.

C. Clear Working Space at Electrical Equipment

1. For the safe operation and maintenance of high voltage electrical equipment, an 8-foot clear area must be maintained in front of all operable sections of the equipment.
2. Corrective Action: Customer or owner shall, at the customer's or owner's expense, either correct the access or clearance infractions or pay SMUD its total estimated cost to correct the access or clearance or to relocate its facilities to a new location that is acceptable to SMUD. Customer or owner shall also be responsible for the expense to relocate any equipment that the customer or owner owns and maintains. Failure to comply with corrective measures within a reasonable time may result in discontinuance of service.

III. Special Conditions

A. Voltage Control Within Special Limits

Where customer desires voltage control within unusually close limits, SMUD may require customer to provide at their own expense such special or additional equipment as required, or SMUD may provide such equipment if customer pays the net estimated installed cost of such equipment.

B. Welders

SMUD will provide service, at the applicable rate and without additional compensation, to welding equipment of the limited input type that conforms to the standards of the National Electrical Manufacturers Association (NEMA) and has a maximum input (primary) current rating not exceeding 12 amperes at 120 volts or 50 amperes at 208 or 240 volts.

Welding equipment that does not meet the standards of NEMA, or that exceeds in input rating 12 amperes at 120 volts or 50 amperes at 208 or 240 volts, will also be served at the applicable rate without additional charge, provided that service to such welders has no detrimental effect on service to neighboring customers.

C. Motor Generator Sets and Rectifiers

Motor generator sets and rectifiers shall be considered as power apparatus and shall be rated, for the purpose of determining charges, on the manufacturer's input rating of the set or, at SMUD's option, by actual test.

D. Motor Protective Devices

All motor installations shall have protective apparatus or construction within the motor to accomplish equivalent protection as follows:

1. Motors that cannot be safely subjected to full-rated voltage at startup shall be provided with a device to ensure that on failure of voltage, such motors will be disconnected from the line.
2. Suitable overload and over-current running protection shall be provided for each motor so as to disconnect the motor from the line to protect it from damage caused by overheating.
3. Phase reversal and open-phase protection is recommended on all three-phase installations and is required for such installations involving elevators, hoists, and similar equipment to disconnect motors from the line in the event of phase reversal or opening of one phase.

E. Motor Starting Limitations

1. Single-Phase

a. Automatically controlled, single-phase motorized equipment (except as provided in paragraphs b. and c. below) shall be equipped with motors having locked-rotor currents not in excess of the following:

- 50 amperes at 120 volts
- 80 amperes at 208 volts
- 100 amperes at 240 volts

b. Manually controlled, single-phase motorized equipment (except as provided in paragraph c. below) shall be equipped with motors having locked-rotor currents not in excess of the following:

- 100 amperes at 120 volts
- 160 amperes at 208 volts
- 200 amperes at 240 volts

Room air conditioners, because of their long operating cycles and infrequent starts, even though automatically controlled, will be governed by the limitations of this paragraph.

c. Motors having locked-rotor currents in excess of those allowed by paragraphs a. and b. above may be permitted upon SMUD's written approval.

2. Three-Phase

a. Automatically controlled three-phase motors shall comply with all applicable NEMA electrical standards and shall have maximum locked-rotor currents not in excess of the following:

- 777 amperes at 208 volts
- 673 amperes at 240 volts
- 337 amperes at 480 volts

Maximum permissible current values listed apply to an installation of a single motor. (These values permit, in general, a 50-hp NEMA standard motor.)

b. Manually controlled three-phase motors shall comply with all applicable NEMA electrical standards and shall have maximum locked-rotor currents not in excess of the following:

- 1554 amperes at 208 volts*
- 1346 amperes at 240 volts*
- 673 amperes at 480 volts
- 135 amperes at 2400 volts

*Operation of motors rated 60 hp or larger is not recommended at these voltages.
Maximum permissible current values listed apply to an installation of a single motor. (These values permit, in general, a 100-hp NEMA standard motor.)

c. Three-phase motors, to be used where large loads or special conditions exist, may, upon approval of SMUD, have locked-rotor currents in excess of those allowed by paragraphs a. and b. above.

d. Motors having maximum locked-rotor currents exceeding those stated in paragraphs a. and b. above may be operated if used in conjunction with current-limiting devices designed to limit the starting currents to the above specified maximum values.

e. Current-limiting devices may be omitted on the smaller motors of a group installation when their omission will not result in a starting current in excess of the allowable starting current of the largest motor of the group.

f. The customer should make certain that their own electrical system is capable of handling the locked-rotor currents permitted without excessive voltage drop.

F. Power Factor Correction

In the case of neon, luminous, gaseous or mercury vapor lamps or tubes, electric welders, and other devices having low power factors, the customer may be required to provide, at their own expense, power factor corrective equipment to increase the power factor of any such devices to not less than 90 percent.

G. Special Voltage Requirements

1. Single-phase, two-wire, 120-volt service will not be supplied where more than two 15-ampere branch circuits are connected to such service.
2. Individual three-phase motors less than 50 hp (or less than 30 hp when used for agricultural or drainage purposes) or groups of such motors less than 150 hp will generally be supplied at 208 or 240 volts.

H. Harmful Wave Form

Customer shall not operate equipment that superimposes a current of any frequency or wave form upon SMUD's system or draws current from SMUD's system of a harmful wave form, which causes interference with SMUD's operations, the quality of service to other customers, or interference to communication facilities. Harmful wave forms shall be defined as those that exceed IEEE Standard 519-1992 (IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems).

I. Transfer Switch Equipment

In the case where the customer receives power from multiple sources, SMUD shall inspect all transfer equipment before SMUD service is allowed. The customer shall design, install, operate, and maintain the transfer switch equipment according to SMUD's Protection Practices No. DPP-601 or No. DPP-602. Transfer switch equipment shall be accessible at all times to SMUD personnel.

IV. Special Facilities

A. SMUD normally installs only those standard facilities that it deems are necessary to provide regular service in accordance with the applicable rate schedules, rules and regulations. Where a customer requests SMUD to install special facilities and SMUD agrees to make such an installation, the additional costs thereof shall be borne by the customer, including such continuing service costs as may be applicable.

B. Special facilities are (a) facilities or value-added services equipment requested by a customer that are in addition to or in substitution for standard facilities that SMUD would normally provide for delivery of service at one point, through one meter, at one voltage class under its rate schedules, rules and regulations; or (b) a pro rata portion of the facilities or value-added services requested by a customer, allocated for the sole use of such customer, which would not normally be allocated for such sole use. Unless otherwise provided by SMUD's applicable rates, rules and regulations, special facilities will be installed, owned, and maintained or allocated by SMUD as an accommodation to the customer only if acceptable for operation by SMUD and the reliability of service to SMUD's other customers is not impaired.

C. Special facilities will be installed under the terms and conditions of a contract. Such contract will include, but is not limited to, the following terms and conditions:

1. The customer shall pay a monthly cost-of-service charge for the special facilities based on the installed cost of the special facilities. Where existing facilities are allocated for a customer's use as special facilities, the customer shall pay a monthly cost-of-service charge. This monthly cost-of-service charge shall be assessed on the estimated installed cost of that portion of the existing facilities that is allocated to the customer.

Special Facilities Rates

	Applied to nonstandard portion of electrical equipment, facilities, redundant service, customer-requested redundancy, vaults, or service upgrades.			
Select One:	☐ Option One		☐ Option Two	☐ Option Three
	Monthly lease with advance		**10-year renewable lease**	**One-time payment**
Average Life	Minimum Advance per $1,000	Monthly Cost per $1,000	Cost at beginning of each 10th year per $1,000	Cost per $1,000
10-14	$200	$24.15	$2,148	$4,375
15-19	$150	$17.25	$1,534	$3,125
20+	$100	$12.94	$1,151	$2,344
Transmission 20+	$100	$11.64	$1,036	$2,109

2. All monthly service charges shall be reviewed when changes occur in SMUD's cost of providing such service.

3. The calculation of the annual special facilities charge will be based on the replacement cost new of the customer specific equipment. This includes direct labor, departmental loadings, benefit loadings, and related design work. The replacement cost new is multiplied by the annual economic carrying charge corresponding to the appropriate expected service life. This resulting value is divided by 12 to create monthly payments. This rate may be changed in response to changes in the cost of capital or fluctuations in the replacement cost new of any piece of equipment.

4. Customers selecting option one "Monthly lease with advance," will be required to pay a nonrefundable advance of no less than 10 percent of the installed cost of the new equipment as determined by SMUD. Depending on the financial viability and credit-worthiness of the firm SMUD may require up to a 75 percent advance payment. This advance in no way affects the full-cost calculation of fees and shall not reduce the monthly cost-of-service charge.

5. Commercial and residential developers will remain subject to all conditions covered in Rules 15 and 16.

6. Previously installed services that exceed standard installation will be reviewed by SMUD and the customer. The customer will elect the desired service requirements when services exceed standards. Consideration will be given for any previous customer contributions in reaching an agreeable monthly service rate for special facilities.

(End)