Exhibit No. 1
Experimental License Application

- Bandwidth determined by data rate and "chipping rate" required to achieve SCADA rain fade margins for a given antenna size.
- Antennas ranging from 18" x 18" (LDR Terminal) to 30" in diameter (HDR Terminal) will be tested. Comparisons will be made between flat array and dish antennas at the higher aperture sizes.
- The goal would be to minimize bandwidth requirements subject to data rate and reliability levels for different applications.

antenna, are more reliable technologies that keep certain facilities operational during those emergencies when ongoing service and rapid restoration are most important.

B. System Description

Electric utilities with large operating territories, like SCE, must establish Supervisory Control and Data Acquisition ("SCADA") communications with a large number of remotely-located operational sites. In addition to more traditional facilities, SCE uses remotely-located windmill and other diverse power generation methods. These diverse operations, and the additional complications introduced by the deregulation of key elements of the power system, demand that SCE have an enhanced ability to control its electrical power system. Because of its diverse facilities and remote locations, in operating a SCADA system, SCE must be able to install SCADA terminals on utility poles, power grid towers, etc., to monitor and control circuit breakers, switches and other equipment. The remote terminal must be a small, lightweight, single unit that can connect directly to electrical equipment, but still can withstand rugged outdoor environments. It must also be easy to install.

With this in mind, SCE has developed a satellite-based communications system to fulfill its SCADA requirements. The design is based on a new technology and has been awarded United States patents, with foreign patents pending. The ability of this small antenna technology to comply with the performance criteria of § 25.209 is paramount. SCE is working to achieve improved antenna performance characteristics with its small flat array design. The antenna that is the subject of this experimental authorization request represents next generation technology that SCE hopes will improve its SCADA network operations and reduce operating costs, while still achieving the non-interference performance criteria required by the Commission.

C. Need for Testing Next Generation Flat Array Antenna

SCE wishes to test new antenna designs under this experimental license in conjunction with its existing Ku-band satellite network. The antennas will operate with these technical characteristics:

Emission designator:	IM00G7D
Maximum power output:	10 Watts
Maximum EIRP:	34 dBW
EIRP density:	-20.2 dBW.4 kHz

Through testing, SCE will be able to demonstrate that use of the next generation flat array antennas in its network will not create any interference concerns and will comply with the antenna performance standards set forth in § 25.209.

D. System Architecture Designed to Insure Compliance with Interference Criteria

In addition to the design performance criteria that will be incorporated into the next generation flat array antennas, to ensure ultimate compliance with the FCC's interference

standards, the following overall system architectural characteristics have been implemented in SCE's network to prevent interference concerns even during this experimental testing phase:

- 100% deterministic (synchronized) operation of the network
- All transmissions are under direct control of the **Regional Control Center** terminal
- The Regional Control Center terminal continuously monitors end-to-end radio frequency power calibration of the LDR or HDR terminals and makes automatic adjustment as necessary
- The Regional Control Center terminal implements rain fade compensation in such a manner that eliminates the possibility of increased interference despite variations in the spatial distribution of the rain fade.

E. Testing Plan

- The Regional Control Center terminal uses the RF head and antenna authorized under the current FCC earth station licenses, call signs E940064 and E940065. Under SCE's operating Ultra-Net system, four (4) Regional Control Center terminals and two remote-DAC terminals have been installed and fully tested. One hundred and ninety remote satellite terminals have been installed and fully tested to monitor and control remote substations. SCE now seeks authority to add up to 200 next generation flat array or 30" reflector antennas to the network to complete full testing of this equipment. During the period of the experimental authorization, the next generation flat array antennas will be fully tested so data may be developed to present to the Commission to obtain regular operational authority for the new design.

- Data Rate

The next generation remote terminal will be used for information data rates of [10 kbps] or less. Typically, in a SCADA system, multiple remote terminals will communicate with a single Regional Control Center terminal.

- FAA Compliance

SCE will install its next generation remote terminals on structures that already meet Federal Aviation Administration requirements. Moreover, remote terminals are always mounted below the top (the authorized height) of the structure in question.

F. Point-of-Contact

SCE will maintain its testing records of location and frequency use with the following point of contact:

Mr. Robert J. DeMartino (Phone: 626-302-6200)
Southern California Edison
2244 Walnut Grove Avenue

Rosemead, California 91707

G. Radiation Frequency Hazard Compliance

30"x 30" Antenna

In accordance with FCC rules, SCE performed a radiation hazard study for its 30"x 30" remote terminal. The FCC-OET Bulletin No. 65, "Evaluating Compliance with FCC Specified Guidelines For Human Exposure to Radio Frequency Radiation" was used as a reference guide. The formulas were adjusted for the antenna's square aperture and absence of a feedhorn. The parameters set forth in Table 1 (Radiation Hazard Study Parameters) were used in the study:

Table 1 Radiation Hazard Study Parameters

Item	Units	Value	Remarks
Antenna size	Inches	30"x 30"	Flat Array HDR Terminal
Antenna efficiency	Percent	57	
Transmit Power	Watts	Up to 1 W	Max. Power is up to 1.0 W @ 50% duty cycle averaged over 2 seconds.
Antenna transmit surface area	Square inches	900	
Frequency	GHz	14.22	Transmit frequency.

The remote terminals are located in areas not accessible to the public, such as on utility poles, high voltage towers and fenced substations. The results of the SCE's study are summarized in Table 2:

Table 2 Summary Table

Region	Radiated Level (mW/cm*2)	Hazard Assessment
Far field, Rf=4.7m	< 0.11	Complies with guidelines
Near field, Rn=2.0m	< 0.33	Complies with guidelines
Transition region, Rt Rn<Rt<Rf	< 1=0.16	Complies with guidelines
Between main reflector & feedhorn	N/A	N/A
Main transmission surface	< 0.26	Complies with guidelines
Between Antenna & ground	< 0.24	Complies with guidelines

Based on the above analysis, it is concluded that harmful levels of radiation will not exist in regions normally occupied by the public or by the earth stations operating personnel. The transmitter will be turned off during antenna maintenance so that the 5.0 mW/cm*2 standard will be observed even in those areas with close proximity to the reflector that exceed acceptable hazard levels under normal operations.

30" Diameter Antenna

In accordance with FCC rules, SCE performed a radiation hazard study for its 30" diameter terminal. The FCC-OET Bulletin No. 65, "Evaluating Compliance With FCC Specified Guidelines For Human Exposure to Radio Frequency Radiation" was used as a reference guide. The parameters set forth in Table 1 (Radiation Hazard Study Parameters) were used in the study:

Table 1 Radiation Hazard Study Parameters

Item	Units	Value	Remarks
Antenna size	Inches	30" diameter	Reflector HDR Terminal
Antenna efficiency	Percent	47	
Transmit Power	Watts	Up to 1 W	Maximum power is up to 1 W @ 50% duty cycle averaged over 2 seconds
Antenna transmit surface area	Square Inches	1400	
Frequency	GHz	14.22	

The remote LDR terminals are located in areas not accessible to the public, such as on utility poles, high voltage towers and fenced substations. The results of the SCE's study are summarized in Table 2:

Table 2 Summary Table

Region	Radiated Level (mW/cm*2)	Hazard Assessment
Far field, Rf=4.7m	< 0.11	Complies with guidelines
Near field, Rn=2.0m	< 0.33	Complies with guidelines
Transition region, Rt Rn<Rt<Rf	</=0.16	Complies with guidelines
Between main reflector & feedhorn	N/A	N/A
Main transmission surface	< 0.26	Complies with guidelines
Between Antenna & ground	< 0.24	Complies with guidelines

Conclusion: Based on the above analysis, SCE has concluded that harmful levels of radiation will not exist in regions normally occupied by the public or by the earth stations operating personnel. The transmitter will be turned off during antenna maintenance so that the 5.0 mW/cm*2 standard will be observed even in those areas with close proximity to the reflector that exceed acceptable hazard levels under normal operations.

Antenna Pattern Data

Figure E-1 shows the antenna pattern for SCE's experimental license using a 30" reflector antenna. In experimenting with various antennas roughly of this aperture or smaller, SCE will adhere to the EIRP power density constraints using the Ultra-Net™ integrated power control techniques of SCE's Ultra-Net™ permanent operating license for the 10" x 16" dish network.

Exhibit No. 2
Experimental License Application

SCE seeks an experimental license to test a flat array antenna with the characteristics identified in this request. SCE has received domestic fixed satellite service licenses under the call signs E940064 and E940065 for its VSAT system operating in the Ku-band using 10" x 16" conventional dish reflector antennas. In addition, SCE has applied for permanent authorization for advanced flat array antennas, measuring 18" x 18" and 30" in diameter both with a superior beam pattern and pointing accuracy.

SCE wishes to complete performance testing of a next generation flat array antenna in preparation for final antenna development. Testing of this new flat array antenna design will take place throughout the continental United States in order to obtain data for a variety of temperature and weather conditions. Experimental authority is requested to give SCE the ability to test new antenna designs which may lead to breakthroughs in the development of smaller antennas able to meet the antenna performance criteria established by the Commission in 47 C.F.R. § 25.209.

A. Applicant Background

SCE is the second largest utility in the nation. Its service area stretches from Los Angeles, California, east to the Arizona border, and north to the Mono Lake region. Within this 50,000 square mile expanse, SCE serves over four million residences, schools, hospitals, businesses and government facilities. In total, SCE provides electricity to approximately 9 million people, or almost one in every thirty persons in the United States.

To ensure that its essential service is provided safely and efficiently to all of its customers, SCE maintains a large, complex internal telecommunications network. SCE extensively employs private wire and fiber lines, the public switched telephone network, land mobile radio, microwave radio and satellite earth station facilities in its internal telecommunications network. Together these services enable SCE to meet its enormous public service obligations. A reliable communications network is indispensable to customer service and for the maintenance, repair and emergency preparedness activities associated with SCE's distribution system, its generating plants and its major transmission facilities.

SCE's territory is known for severe natural disasters and extreme weather conditions, including El Niño, forest fires, mud-slides and earthquakes such as the one centered in Northridge on January 17, 1994. Consequently, reliable communications are critical to SCE's ability to quickly detect service outages, to promptly restore service and to protect the public from downed "live" wires and other safety hazards that can occur during emergencies. Landline communications facilities, such as telephone lines and fiber optic cable are sometimes ruptured during earthquakes and other emergencies. For this reason, radio-based communication facilities, like the satellite network that will be supported by SCE's next generation flat array

BORESIGHT w/ SHIMS
FILENAME: edison.009
FREQ: 14.220 GHz
POLARIZATION: H-PLANE
El = 0.00 Degrees

10/01/98 16:35:59

PLOT: Channel 1
Data: ——