Meeting
State of California
California Energy Commission
& USCL Corporation

A meeting was held October 17, 2003 at 2:00 PM at the office of Commissioner Dr. Arthur H. Rosenfeld, California Energy Commission located at 1516 9th Street.

In attendance were:

CEC:

Dr. Arthur H. Rosenfeld, Commissioner
John A. Wilson, Advisor to Commissioner Rosenfeld
David Hungerford, Energy Policy Analyst

Levy Associates:

Roger Levy, President, Consultant to the CEC

USCL Corporation:

Tom Tamarkin, CEO
Phillip M. Fine, Chief Technology Officer
Ray Presgrave, Director

Exhibits: Exhibit "A", Biography of Arthur H. Rosenfeld, Ph.D.

Background:

The California Energy Commission (CEC) provides policy recommendations to the State of California Public Utilities Commission, the executive branch, and other government departments within the state leading to policy decisions on energy and utility matters. The Commission routinely analyzes consumer needs, utility operations and emerging technologies.

Roger D. Levy is a consultant to Commissioner Rosenfeld of the CEC who has been charted to investigate state of the art solutions in the areas of automatic meter reading (AMR,) advanced metering, dynamic real-time pricing and other similar areas. Mr. Levy has twenty years experience in the industry and has served as a consultant to utilities, industry, and the state. Most recently, he has been involved in the investigation of advanced metering and AMR vendors. He is responsible to obtain vendor information, attend seminars and association meetings such as the NMRC, AMRA, etc., to collect information, and keep the CEC aware of recent developments in the industry.

Recently, he was in contact with USCL and suggested that USCL meet with Commissioner Rosenfeld to provide information on its EMS-2020 and EnergyCite services products. Mr. Levy scheduled a meeting between USCL and Commissioner Rosenfeld on October 17, 2003.

Meeting Summary:

The meeting was convened promptly at 2:00 PM in Dr. Rosenfeld's office by Commissioner Rosenfeld.

An overview of USCL and the EMS-2020 product was presented by Tom Tamarkin. A detailed discussion was held regarding the features and functionality of the EMS-2020 and associated system components.

The premise of the EMS-2020 and the need for the product from a societal view was discussed. Dr. Rosenfeld made the point that "USCL was preaching to the choir" with respect to the results deployment of the system would have in terms of power conservation. Dr. Rosenfeld emphasized the following points:

- Use of the EMS-2020 in non-peak periods with traditional rate tariffs would in all likelihood result in an average 10% reduction of power consumption by consumers based on the real-time monitoring of accumulated expense and the economic incentive to reduce expenditures on utility bills.
- Acknowledgement was made of studies by EPRI and others leading to the above conclusion.
- When variable rate structures are implemented, a 15-20% reduction is anticipated.
- Current studies by the CEC have proven conservation in excess of 15% and generally exceeded staff expectations.

Dr. Rosenfeld asked numerous questions about the EMS-2020 system topology and installation within the home. He strongly agreed with and endorsed USCL's architecture involving the stand-alone nature of the EMS-2020 and the fact that it uses wireless radio frequency communications with battery back-up power thus enabling the consumer to move the device from room to room as an "audit tool." The point was made that inclusion of the thermostat set back parameters and control at the EMS-2020 with wireless communications to a HVAC thermostat interface was preferable to including both the thermostat sensing and control electronics and the EMS-2020 display at the thermostat location.

David Hungerford noted the consumer display of information to the consumer in easy to understand terms and format as opposed to engineering units and display practice. Most of USCL's data presentation was novel in comparison to other display products. Much emphasis was placed on the real-time display of the "burn rate" and the provision of consumer established budgets and the associated alarm mechanisms. Questions were asked about the size of the type fonts presented on the display and the physical size of the control buttons.

Dr. Rosenfeld asked how the EMS-2020 is originally set up and programmed at the time of installation and updated as rates change, etc. It was explained that the device would be automatically set up through a communications session with either the utility or third party service provider such as EnergyCite, and that it was not necessary for the consumer to read a complicated instruction book with set up procedures. This was well received.

It was noted by both Dr. Rosenfeld and David Hungerford that the EMS-2020 was unique in the market place. These types of consumer information display panels simply do not exist. It was

noted and agreed to that most work done today in the field has been done with expensive off-the-shelf instrumentation modules and data presentation on PCs which is, 1) not cost effective, and 2) not of use to the average consumer.

Dr. Rosenfeld led a detailed white board discussion and presentation for the record of the various USCL modules and the price of each leading to fully loaded cost of installation analysis. The prices were found to be about ¼ of the CEC's expectations and therefore well within the boundaries of ultimate mass deployment with a pay back ROI to the consumer of 18 months or less.

USCL was asked the origin of the product nomenclature of EMS-2020. It was explained that EMS meant energy management system and that the 2020 meant the monitoring and observation vision and was adopted when Governor Davis introduced the 2020 energy conservation plan in April 2001 (twenty % rebate to consumers who reduce consumption by 20%.)

USCL was asked about the "front end" power sensing electronics and an explanation was provided showing the integration of the EMS-2020 in-home information display and control panel with the revenue kWh meter providing bi-directional data communications to the utility for automatic meter reads, notification of emergency demand related rates, power outage reporting, tamper reporting concerning revenue diversion and optional remote connect/disconnect. The later was put into the context of the "Wattenburg Switch" tuned to each individual house on a distribution transformer by Dr. Rosenfeld. This means the use of a bifurcated dual coil contractor or relay capable of switching one or both legs of the incoming 240 Volt power off and on as may be necessitated by emergency conditions. Unlike the "Wattenburg" project, each home could be "tuned" to insure that no critical life support equipment, etc., was inadvertently turned off in a critical "brown out" period.

Much discussion was held regarding the history and current status of the major meter manufactures in the United States and the CEC's frustration associated with the recent turnover of ownership, consolidation, etc., currently seen in the industry. The discussion was lead to center around Landis+Gyr, formed in 1896 By Thomas Duncan, located on Duncan Road on its original property campus and the commitment by Landis+Gyr to the future through the introduction of highly integrated fully electronic metrology capable of being integrated into various communication strategies both locally in the home, and to the utility, on a cost effective basis, when compared to the bench mark of electro-mechanical meters. USCL explained its strategy of working with Landis+Gyr as opposed to continuing the development of its SUM technology obtained from the development project between the U. S. Department of Defense and SMUD, of which the CEC was well aware.

The CEC acknowledged the substantial market channel controlled by the meter manufacturers and the "brand loyalty" issues within the IOU's metering departments and the resistance this represented with regard to innovative technologies and products.

USCL mentioned that privately funded companies often times are reluctant to fund product development activities such as the EMS-2020 without proven market demand in the form of orders. It was suggested that the certification of USCL's EMS-2020 solution in conjunction with

the L+G kWh meter by SCE or PG&E would be important from a project investment standpoint by industry leaders.

David Hungerford mentioned the nature of several Southern California Edison pilot projects and the current "2,000 unit reference and control project." It was suggested that the EMS-2020 could ideally fit into several such projects. Roger Levy mentioned that those projects were competitively bid and that there was little time left for a new entrant and the "Invensys" project was mentioned which generated additional discussion and concern over the changing nature of the metering industry and whether or not companies have the "staying power" to service a big order in the future when it came. On several occasions it was suggested that there may be room for USCL in these upcoming projects since the projects did not include a similar consumer information display.

USCL stressed the point that kWh meters must have a product life cycle of a minimum of 15 years and must be highly reliable with great MTBF criteria and capable of operating in extreme temperature, humidity and related environmental conditions with no loss of accuracy, and performance. It was stressed that many consumer electronics companies do not incorporate suitable design engineering techniques to meet these rigors. Surge protection, transient suppression, etc., was discussed.

USCL mentioned the stringent testing which would be done regarding the under glass (plastic) portion of the USCL product in conjunction with the meter manufacturer and Ray Presgrave's background in the semiconductor industry with QA specialization was highlighted.

A discussion was held regarding the County of Los Angeles implementation of 600 EMS-2020 units and associated meters, data collection software and back office database (for the county's use) in conjunction with Southern California Edison. Both David Hungerford and Dr. Rosenfeld agreed that this was a meaningful project and asked to be kept informed of the progress. Dr. Rosenfeld mentioned that he did not know Howard Choy.

David Hungerford and Roger Levy mentioned again that numerous pilot projects were going on at Southern California Edison and SDG&E which could greatly benefit from the L+G revenue grade meter with the USCL "information display panel" as they refer to it. Although the CEC cannot involve itself in commercial transactions or referrals, it was indicated that USCL would be placed on a communications list which would be useful in USCL's attempts to locate the correct departments and personnel to contact.

The point was made by Dr. Rosenfeld that all the work and analysis being conducted by the CEC will ultimately lead in a state wide mandate to replace all electro-mechanical single phase meters used by the IOU's (about 10 million) with "communicating meters" (as per the recent action of the Idaho State PUC.) It was estimated that the state was four years away from that action.

Dr. Rosenfeld asked how USCL planed to generate IOU interest and excitement in the product. The concepts of the utility's need to increase customer satisfaction, create new revenue streams from non power related products and services such as the home owners protection plan, increase operating efficiencies, etc. were presented by USCL. On two occasions during this discussion,

USCL was told it "was preaching to the choir." USCL explained the opportunities afforded by municipal owned utilities and REAs or coops, and pointed to the fact that over 500 municipally owned utilities now run fiber optic telecom services with Cable TV, broadband Internet, etc. The City of Glasgow, KY was brought up as a case study in the integration of electric and water AMR over the city run cable system. David Hungerford and Dr. Rosenfeld both agreed that the future ubiquitous nature of the Internet would, to a great extent, drive this technology.

Discussions were held between Dr. Rosenfeld, David Hungerford, and John Wilson about upcoming CEC focus groups. Dr. Rosenfeld raised the specter that the CEC should consider incorporating the EMS-2020 displays and information in the next focus group. David Hungerford suggested that that was probably not appropriate due to the lack of time to prepare. However he agreed that it might be a good idea to incorporate in the next round of focus group sessions. No commitment was made on that point; however, USCL offered to provide all needed hardware and "chart talk" materials if this was to be approved and scheduled.

The meeting was ended promptly at 3:00 PM. USCL committed to forwarding additional system topology descriptions and estimated user cost figures to Dr. Rosenfeld.

Action Items:

CEC:

- David Hungerford will place USCL on the internal distribution list along with cognizant project managers at SCE, PG&E, and SDG&E and other relevant parties.

USCL:

- Tom Tamarkin will follow up by sending Dr. Rosenfeld the additional system topology and pricing information as requested.
- Tom Tamarkin will follow up to explore the focus group possibility and to coordinate this should it be approved.

Respectively submitted,

Tom D. Tamarkin

Tom Tamarkin
President & CEO
USCL Corporation

CC: Dr. Arthur Rosenfeld, Commissioner, California Energy Commission

Exhibit "A": Follows on page 6 hereof.

Exhibit "A"

Arthur H. Rosenfeld, Ph.D.
Commissioner, California Energy Commission
Appointment Designation: Engineer/Scientist

Appointed by Governor Davis - 4/2000 to 1/2005
Phone: 916-654-4930

Arthur H. Rosenfeld, Ph.D. was appointed to the California Energy Commission by Governor Gray Davis in April 2000. The five members of the Energy Commission are appointed by the Governor to staggered five-year terms and require Senate confirmation. By law, four of the five members of the Energy Commission have professional training in specific areas - engineering or physical science, environmental protection, economics, law, and one commissioner from the public-at-large. Commissioner Rosenfeld fills the physical science position.

Commissioner Rosenfeld is presiding member of the Research, Development and Demonstration Committee and the Dynamic Pricing Committee; and the second member of the Energy Efficiency Committee.

Dr. Rosenfeld received his Ph.D. in Physics in 1954 under Nobel laureate Enrico Fermi, then joined the Department of Physics at the University of California at Berkeley. There he joined, and eventually led, the Nobel prize-winning particle physics group of Luis Alvarez at Lawrence Berkeley National Laboratory until 1974. At that time, he changed to the new field of efficient use of energy, formed the Center for Building Science at Lawrence Berkeley National Laboratory (LBNL) and led it until 1994. The Center developed electronic ballasts for fluorescent lamps (which led to compact fluorescent lamps), low-emissivity windows, and the DOE-2 computer program for the energy analysis and design of buildings, for which Dr. Rosenfeld was personally responsible.

Dr. Rosenfeld received the Szilard Award for Physics in the Public Interest in 1986, and the Carnot Award for Energy Efficiency from the U.S. Department of Energy in 1993. He is the co-founder of the American Council for an Energy Efficiency Economy (ACEEE), the University of California's Institute for Energy Efficiency (CIEE), and the Washington-based Center for Energy and Climate Solutions (CECS).

From 1994-1999 Dr. Rosenfeld served as Senior Adviser for the U. S. Department of Energy's Assistant Secretary for Energy Efficiency and Renewable Energy.

Additional information about Commissioner Rosenfeld can be found in his autobiography "THE ART OF ENERGY EFFICIENCY: Protecting the Environment with Better Technology," 1999.