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SOUTHERN CALIFORNIA EDISON COMPANY
and SAN DIEGO GAS & ELECTRIC COMPANY

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	Docket Nos. 50-361 OL
)	50-362 OL
SOUTHERN CALIFORNIA EDISON)	
COMPANY, et al. (San Onofre)	AFFIDAVIT OF ROBERT H.
Nuclear Generating Station,)	BRIDENBECKER IN SUPPORT
Units 2 and 3).)	OF MOTION FOR SUMMARY DIS-
)	POSITION OF FRIENDS OF THE
)	EARTH, ET AL., CONTENTION
)	<u>9 (URANIUM FUEL COSTS)</u>

STATE OF CALIFORNIA)	
)	ss.
COUNTY OF LOS ANGELES.)	

ROBERT H. BRIDENBECKER, being first duly sworn,
deposes and says that if called as a witness herein he is
qualified to testify as follows:

1. I am currently Manager of Fuel Supply of the Fuel Supply Department (hereinafter "Fuel Supply") of Southern California Edison Company (hereinafter "SCE") and duly authorized to make the statements contained herein. Fuel Supply has responsibility for all aspects of fuel development, procurement and management to meet the requirements of the electrical generating power plants operated by SCE, including nuclear and fossil fueled plants. As Manager of Fuel Supply, among other responsibilities, I am responsible for, and direct and supervise, work related to the procurement of nuclear fuel for the San Onofre Nuclear Generating Station Units 2 and 3 (hereinafter "SONGS 2 and 3").

2. I have been employed by SCE since 1966 and have held various positions in power plant engineering, fuel oil distribution and fuel supply. I joined Fuel Supply in 1971 and from 1973 to 1975 I held the position of Manager, Fuel Contracts. I next held the position, until 1980, of Manager, Nuclear Fuel Supply, and in February 1980 I became Manager of Fuel Supply.

3. In 1966 I obtained a Bachelor of Science degree in Mechanical Engineering from California State University at Los Angeles, and in 1972 I obtained a Master of Science degree in Management Science from the University of Southern California. I have also attended various post-

graduate university courses in fuels technology and fuels management as well as a course at Argonne National Laboratory dealing primarily with nuclear fuel cycle management. I have previously appeared on behalf of SCE as a witness in state and federal regulatory proceedings on matters pertaining to fuel procurement, including price projections for nuclear as well as fossil fuels.

4. In 1977 SCE submitted in this docket its Environmental Report in support of its application for an operating license for SONGS 2 and 3. In that connection Fuel Supply performed uranium market evaluations and projected uranium fuel costs for SONGS 2 and 3 which resulted in the inclusion in the Environmental Report of a 30-year levelized fuel cost of 17.2 mills/kwh and 18.3 mills/kwh for SONGS 2 and 3, respectively. These values include levelized costs for waste disposal and storage charges of 1.0 and 1.1 mills/kwh respectively.

5. At the time Fuel Supply prepared the above levelized fuel costs for SONGS 2 and 3, it concluded that the then current NUEXCO Exchange Value,^{1/} \$42/lb. for U308,

^{1/} The NUEXCO Exchange Value is NUEXCO's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the last day of the month. NUEXCO (Nuclear Exchange Corporation) is the leading domestic corporation, headquartered in Menlo Park, CA., which publishes on a monthly basis a report on the uranium market including (cont'd.)

was an adequate price to cover the costs of development and operation of new mines under conditions of lower ore grades and deeper depths, including sufficient allowance to replace mined-out reserves, recover sunk costs, and provide a reasonable return on investment. A constant escalation rate for uranium prices of 7 percent per year was also assumed over the life of SONGS 2 and 3. Seven percent was chosen as a conservative escalation rate based upon the performance observed at that time of indices representative of the costs of mining and producing U308, their historical rate of increase, and their projected rate of increase. Further, this 7% escalation rate provided for some degree of real price escalation to reflect higher mining costs due to declining ore grades and deeper ore bodies. The indices considered in this determination were Average Hourly Earnings - Mining Industries; Average Hourly Earnings - Chemical and Allied Products; Wholesale Price Index - Industrial Commodities; Wholesale Price Index - Construction Machinery and Equipment; and Gross National Product - Implicit Price Deflator as published by the U.S. Bureau of Labor Statistics and U.S. Dept. of Commerce.

6. The SCE uranium price forecast was incorporated in a computerized simulation of the economics of

transactions and prices from which the Exchange Value is determined.

operation of SONGS 2 and 3 over its lifetime using the computer program FUELCOST-IV, a computer simulation generally accepted and in use in the nuclear industry. The computer simulation produced 30-year levelized fuel costs for SONGS 2 and 3 without an allowance for costs associated with waste disposal and storage of 16.2 and 17.2 mills/kwh. In the simulation an escalation rate of approximately 6 percent per year was utilized for all fuel cycle goods and services other than the price of U308.^{2/} The 1 percent higher escalation rate assumed for U308 was meant to account for the effects of consuming a depletable resource.

7. The methodology employed by SCE in projecting uranium fuel costs in 1977 has to date proven to be conservative. The SCE projected price for uranium concentrates for the year 1980 was \$51.45/lb., whereas the NUEXCO Exchange Value for April 1980 was \$32/lb. or only 62 percent of the SCE projection. "Southern California Edison Company, Projection of Average Cost of Uranium U308), August, 1968 - December 1985" exhibit 1 to this affidavit, and by this reference incorporated herein, depicts the correlation

^{2/} This escalation rate was adopted by SCE to represent the general effect of inflation and therefore applies equally to all fuel sources.

of the SCE uranium price projections with the NUEXCO Exchange Value in the near term.

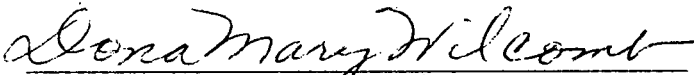
8. As of this date the SCE methodology of predicting future uranium concentrate prices is expected to yield results over the lifetime of SONGS 2 and 3 which are conservative, although it is recognized that over this 30 year period the price for uranium concentrates at any particular time may be higher or lower than the then projected SCE price. "Southern California Edison Company, Projection of Average Cost of Uranium (U308), August 1968 - December 2015" exhibit 2 to this affidavit, and by this reference incorporated herein, depicts the SCE price projection for uranium through the year 2015 and correlates those values with the NUEXCO Exchange Value to date. Exhibit 2 places into perspective the near-term rise and fall of the price of uranium relative to SCE's long-term price projection over the life of SONGS 2 and 3.

9. Using conservative price projections for uranium fuel, which adequately account for escalation, SCE's computation of 30-year levelized fuel costs for SONGS 2 and 3 results in values for these units (supra, Paragraph 4) which validate the cost-benefit analysis. Notwithstanding the conservatism of SCE's projections, even a doubling or trebling of the uranium price projection would not materially alter the resulting cost benefit analysis because the

uranium cost component of this analysis is a relatively small component in the determination of relevant costs, representing only 9 percent (15 percent with indirect interest charges) of overall power costs.


Robert H. Bridenbecker

Subscribed and sworn to before
me this 5th day of June, 1980.


Notary Public
for the County of Los Angeles,
State of California

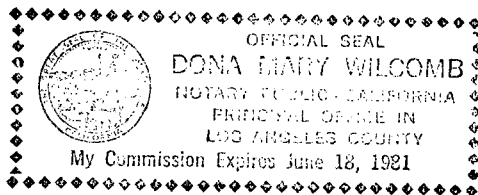


EXHIBIT 1
SOUTHERN CALIFORNIA EDITION COMPANY
PROJECTION OF AVERAGE COST OF URANIUM (U308)
AUGUST 1968 - DECEMBER 1985

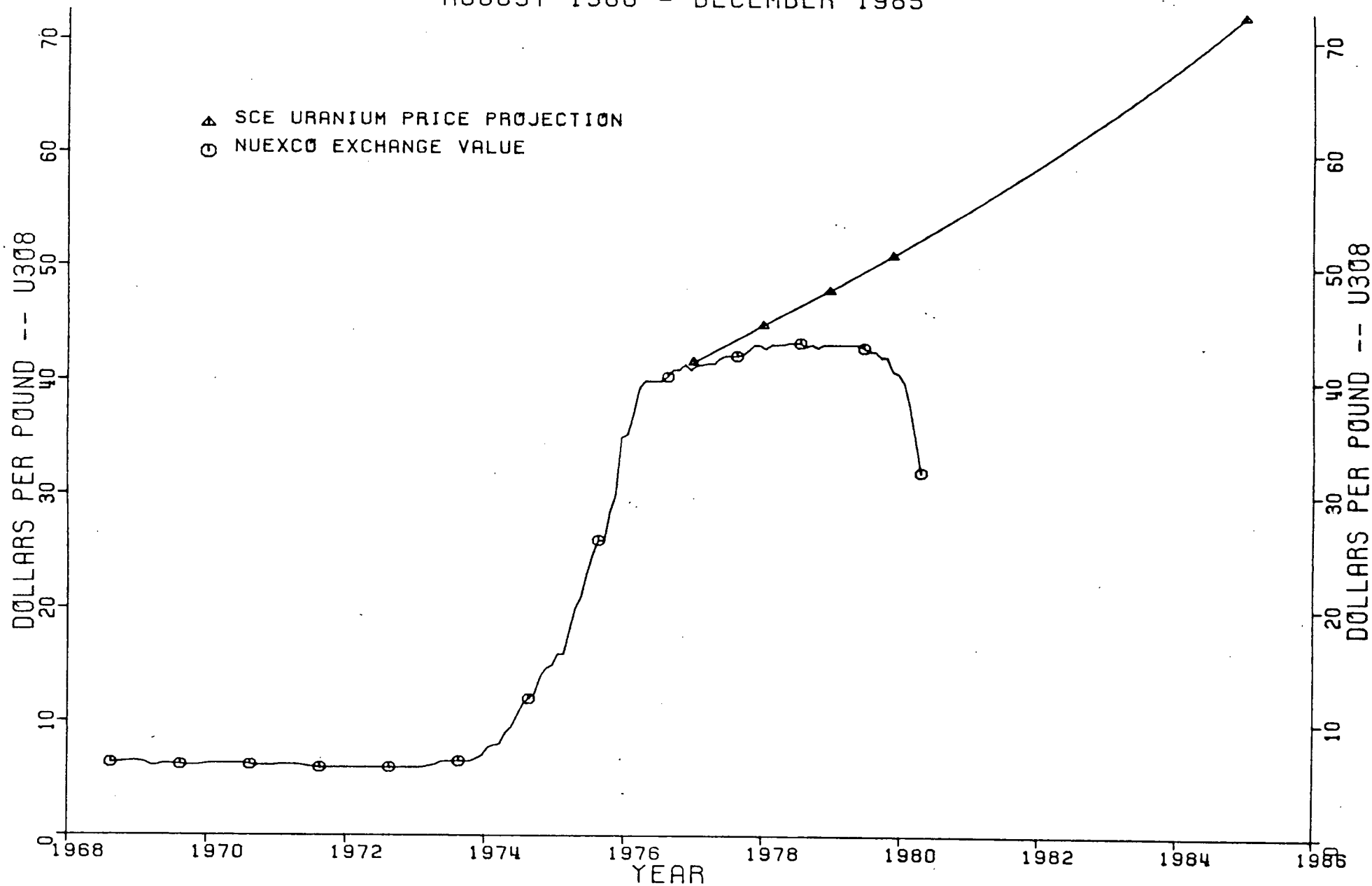


EXHIBIT 2

SOUTHERN CALIFORNIA EDSION COMPANY
PROJECTION OF AVERAGE COST OF URANIUM (U308)
AUGUST 1968 - DECEMBER 2015

