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Witness: Christopher H. Roberts

PREPARED DIRECT TESTIMONY OF
CHRISTOPHER H. ROBERTS
SOUTHERN CALIFORNIA GAS COMPANY

September 3, 2003

2005 BIENNIAL COST ALLOCATION PROCEEDING

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PREPARED DIRECT TESTIMONY OF
CHRISTOPHER H. ROBERTS
SOUTHERN CALIFORNIA GAS COMPANY

A. PURPOSE

The purpose of my testimony is to sponsor Southern California Gas Company's ("SoCalGas") core market gas demand forecasts, expected temperature conditions for the Biennial Cost Allocation Proceeding ("BCAP") period of January 1, 2005 through December 31, 2006, and the forecasted unaccounted-for ("UAF") gas factor. My testimony is arranged as follows:

- Section B summarizes the core market demand forecast results;
- Section C discusses the factors that drive the core market demand forecast, i.e., weather, meter growth, and economic conditions;
- Section D discusses the residential demand forecast methodology;
- Section E discusses non-residential core market demand forecast methodologies for core commercial and core industrial ("G-10"), Gas Air Conditioning ("Gas A/C"), Gas Engine, and Natural Gas Vehicles ("NGV") market sectors;
- Section F discusses the UAF gas factor.

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B. OVERVIEW OF CORE MARKET GAS DEMAND FORECAST

The following table summarizes the core market demand forecasts for years 2005 and 2006 in thousands of decatherms ("MDth").

Table 1
Summary of Core Demand Forecast
MDth

Ln		2005	2006	Average
	Average-Year			
1	Res.	272,993	276,186	274,589
2	G-10	98,645	98,952	98,799
3	Gas A/C	191	191	191
4	Gas Eng.	2,762	2,826	2,794
5	NGV	7,551	8,225	7,888
6	Total Core	382,141	386,379	384,260
7				
8	**Cold-Year**			
9	Res.	300,351	303,911	302,131
10	G-10	102,888	103,172	103,030
11	Gas A/C	191	191	191
12	Gas Eng.	2,762	2,826	2,794
13	NGV	7,551	8,225	7,888
14	Total Core	413,742	418,324	416,033
15				
16	**Peak Month**			
17	Res.	45,752	46,179	45,966
18	G-10	11,736	11,721	11,728
19	Gas A/C	13	13	13
20	Gas Eng.	73	75	74
21	NGV	672	728	700
22	Total Core	58,246	58,717	58,481
23				
24	**Peak Day**			
25	Res.	2,763	2,790	2,777
26	G-10	575	574	575
27	Gas A/C	0.4	0.4	0.4
28	Gas Eng.	2	2	2
29	NGV	23	25	24
30	Total Core	3.364	3.392	3.378

C. FACTORS THAT DRIVE CORE MARKET GAS USAGE

This section describes major factors that drive core market gas usage forecasts, i.e., weather, meter growth, and economic conditions.

1. Weather

For the average-temperature-year over the BCAP period, SoCalGas forecasts 1,386 heating degree-days ("HDDs") based on a 20-year average of recorded system average HDDs. For each historical year, a system average HDD figure is calculated by aggregating 15 weather stations into six weather zones, then combining the six weather zones into a system average HDD by weighting weather zone data using the number of core market customers in each zone. SoCalGas used this method in all previous BCAPs.

This forecast of 1,386 HDDs is 13.4 percent higher than the 1,222 HDDs proposed by SoCalGas in Application No. (A.) 98-10-012 (the 1999 BCAP) and 2.1 percent higher than the 1358 HDD proposed by the Office of Ratepayer Advocates ("ORA") in the 1999 BCAP.[1] SoCalGas' 1,222 HDD figure was based on a downward trend in recorded HDD data from 1950 through 1997, whereas the 1,386 HDD represents a return to the 20-year average methodology adopted in earlier BCAPs. Figure 1, below, shows the last 53 years of recorded HDD data in SoCalGas' service territory:

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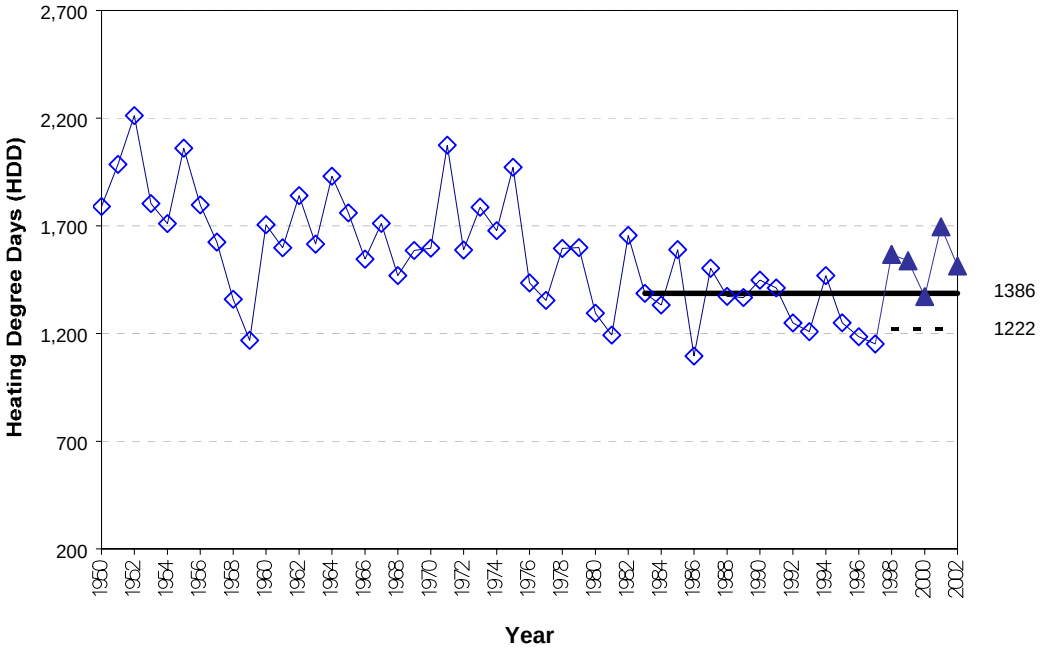
[1] The Joint Recommendation approved by Decision No (D.) 00-04-060 in the 1999 BCAP adopted a throughput forecast and did not expressly adopt a HDD value.

Figure 1
Last 53-Years of SoCalGas Weather



The first 48 years from 1950 to 1997, shown with diamond markers, represent the data used with a linear trend model to calculate the 1,222 HDD forecast. The last five points shown with triangle markers represent the weather experienced data after the 1,222 HDD forecast was made. The dashed line from 1998 to 2002 represents a 1,222 HDD forecast while the heavy line from 1983 to 2002 represents the average of the last 20-years of data, SoCalGas' proposed forecast of 1,386 HDD.

These data show that the apparent downward trend in the data through 1997 was not sustained during the 1998 through 2002 period. Consequently, the 1,222 HDD forecast proposed by SoCalGas in the 1999 BCAP turned out to be low compared to the HDDs experienced in each year of the 5-year 1998 to 2002 period.

An analysis of the last 20 years of HDD data shows there is no statistically significant trend in the data, and four of the last five years since the 1999 BCAP have been above the average. ORA and the majority of California's electric and gas utilities (Pacific Gas & Electric, San Diego Gas & Electric, and Southern California Edison) rely upon historical averages to arrive at forecasted heating and cooling degree days.[2] As a result, SoCalGas believes at this point in time that using a 20-year average is fair, reasonable, straightforward, and consistent method for forecasting average-temperature-year HDDs.

For a cold-temperature-year SoCalGas forecasts 1,708 HDDs. This forecast was calculated based on the variability of recorded HDDs over the 20-year period that had a standard deviation of 160 HDDs. This cold-year forecast represents a 1-in-35 year event, or a probability of occurrence of 2.86 percent. The proposed cold-year forecast is 4.9 percent higher than the 1,629 HDDs SoCalGas proposed in the 1999 BCAP, and 1.6 percent higher than the 1,682 HDDs ORA proposed in the 1999 BCAP.

January has long been considered the coldest month in SoCalGas' service territory; however, based on the historical 20 years of HDD data used in this analysis, SoCalGas now proposes December as the peak month with an average of 372 HDDs. This forecast of 372 HDDs is 8.5 percent higher than the 343 HDDs SoCalGas proposed for the January peak-month in the 1999 BCAP.

For extreme peak day, SoCalGas continues to use a 1-in-35 year event, or an average daily temperature of 38 degrees Fahrenheit based on 53 years of data from 1950 to 2002.

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[2] ORA Report on SoCalGas' 1999 BCAP, A.98-10-012, at 3-2 and 3-3.

2. Residential Customer Growth

Customer growth in SoCalGas' residential market depends on a number of factors including the health and expansion of the southern California economy. After a major slump in home building through the early- and mid-1990s, SoCalGas' service area has seen both an increase in home building construction and a substantial decline in residential vacancy rates in the last five years. While the annual average residential active-meter growth rate was 1.38 percent during the five recorded years 1998 to 2002, SoCalGas expects a slower growth rate of 1.25 percent for the 4-year period 2003 through 2006. As a result, SoCalGas expects residential active-meter growth of 61,880 and 66,785 for the years 2005 and 2006, respectively.

3. Economic Environment

Southern California is experiencing an economic slowdown, which began in late 2000 and intensified through 2002. Table 2 shows the recorded and forecast employment growth rates according to Global Insight's (formerly DRI-WEFA) December 2002 CONTROL1202 regional area forecast. These data show non-farm employment experiencing its lowest growth in the last recorded period, year 2002, with some recovery in the forecast period. Manufacturing jobs are expected to decline during the forecast period but at a rate that is not as severe as experienced in years 2001 through 2003. The commercial employment, on the other hand, is expected to moderately increase through the forecast period.

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Table 2
SoCalGas Area Annual Employment Growth

Year	Non-farm	Manufacturing	Commercial
2000	2.7%	-0.2%	3.2%
2001	1.7%	-4.3%	2.1%
2002	-0.1%	-6.7%	0.9%
2003	0.4%	-3.0%	0.9%
2004	1.9%	0.0%	2.1%
2005	1.5%	-0.4%	1.7%
2006	1.1%	-1.0%	1.3%

D. RESIDENTIAL GAS DEMAND SUMMARY

This section provides a summary of the residential demand forecast, a description of the forecasting model, the post-model Energy Efficiency ("EE")[3] program adjustments, and recorded and forecast residential use per meter data.

1. Residential Demand Forecast

As shown in Table 1, above, average-temperature-year residential gas demand is forecast to average 274,589 MDth during years 2005 and 2006, or 7.8 percent higher than the 254,685 MDth adopted in D.00-04-060 for year 1999. This increase is driven by the higher average-temperature-year HDD forecast described in Section C.1, above, and customer growth described in Section C.2, above, offset by higher natural gas prices and conservation.

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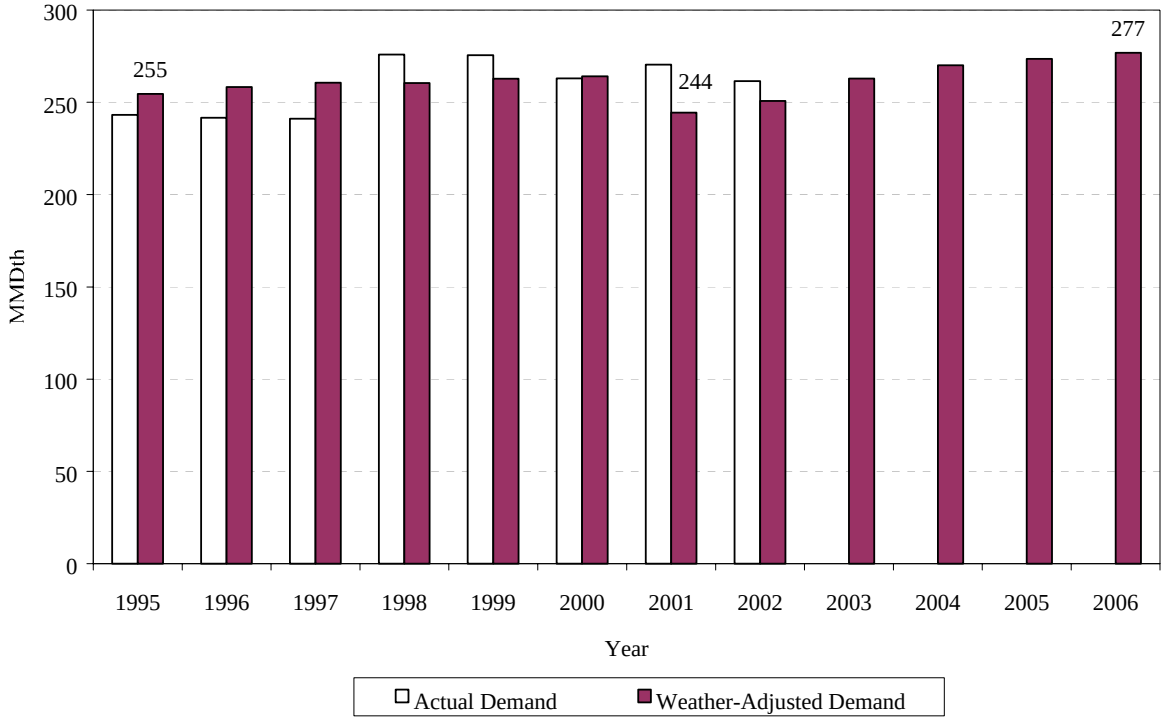
[3] Energy Efficiency programs were previously referred to as Demand Side Management ("DSM") programs.

Figure 2, below, shows eight years of historical residential usage from 1995 through 2002 and four years of forecast data. The historical data is weather-adjusted to average-temperature-year conditions and shown along side the recorded residential gas usage. Forecasted average-temperature-year residential gas demand is shown for years 2003 through 2006. These data show that on a temperature-adjusted basis, residential gas demand increases from approximately 255,000 MDth in 1995 to 277,000 MDth in year 2006. The temperature-adjusted low of 244,000 MDth in year 2001 reflects the impact of reduced usage during the energy crisis. Over the eleven (11) year period from 1996 to 2006, however, residential gas demand growth reflects an annual average growth rate of 0.8 percent.

Figure 2
Residential Gas Demand



Cold-year, peak-month, and peak-day residential gas demand forecasts shown in Table 1, above, for the BCAP period are higher than adopted in D.00-04-060 for year 1999 due to customer growth and the increase in projected HDDs. The cold-year residential gas demand is forecast to average 302,131 MDth for years 2005 and 2006, a throughput level that is 4.6 percent higher than the 288,850 MDth adopted for year 1999.

The December peak month residential gas demand of 45,966 MDth represents the average of December 2005 and December 2006 figures and is an increase of 10.0 percent compared to the January peak month demand of 41,771 MDth adopted for year 1999.

The 1-in-35 extreme peak day residential gas demand is forecast to average 2,777 MDth for years 2005 and 2006, a throughput level that is an increase of 5.0 percent over the extreme peak day demand of 2,644 MDth adopted for year 1999.

2. Description of Residential Gas Demand Forecast Methodology

An initial residential demand forecast (including the affect of EE measures already in place and in effect) is developed by fitting econometric models using monthly recorded data from January 1980 through March 2003. From this initial forecast, projected incremental residential EE savings are deducted as an offset to obtain the "net" residential gas demand forecast.

The initial forecast for the residential customer class as a whole is developed by aggregating forecasts of five residential segments, i.e., single-family, multi-family less than five units, multi-family five or more units, master-metered, and sub-metered. The forecast for each segment equals a use per meter forecast multiplied by a forecasted number of meters for each segment. Each of the five econometric models employed to forecast use per meter is a nonlinear econometric model similar to that used in previous BCAPs.

3. EE Programs

SoCalGas promotes more efficient use of energy by administering certain EE and Direct Assistance Programs ("DAP"). These programs are intended to improve both appliance and building-shell energy efficiencies more rapidly than expected from price signals and state energy standards. The forecast residential gas demand calculated with the residential gas demand econometric model reflects the reduced consumption associated with existing EE and DAP measures. Forward-looking SoCalGas-administered incremental EE program savings are forecast[4] to be 516 MDth and 703 MDth in years 2005 and 2006, respectively. These savings are deducted from the residential gas demand econometric model results.

4. Residential Gas Use per Meter

Figure 3 shows temperature-adjusted annual gas use per meter for the recorded period 1995 through 2002 and the forecast period to 2006. These data show gas use per meter is forecast to be approximately 535 therms per year for years 2005 and 2006.

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[4] Energy Efficiency forecasts are based on SoCalGas' filing as approved in D.03-04-055.

Figure 3
Temperature-Adjusted Residential Gas Use Per Customer

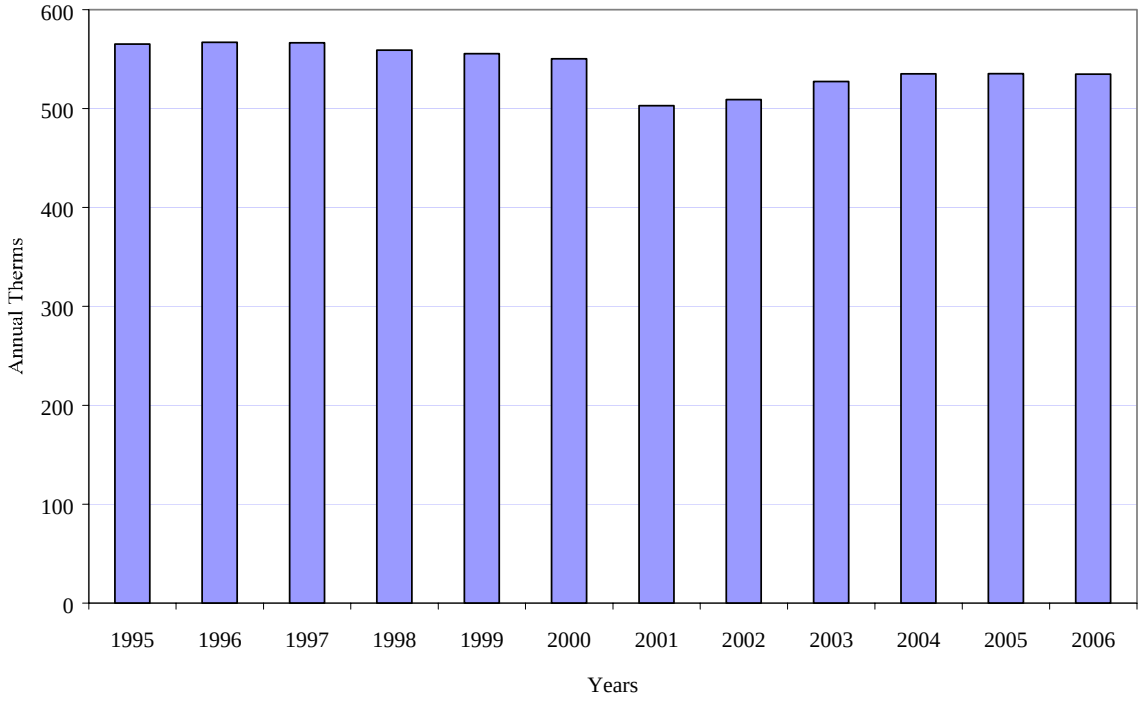

Figure 3 shows a significant drop in use per meter as a result of the energy crisis in late 2000 and early 2001. Figure 3 also shows that use per meter was slightly higher in 2002 as compared to 2001, but still depressed from historical levels. During the forecast period, use per meter is forecast to return to historical levels with a 0.3 percent long-term rate of decline. The decline in use per meter is due to the effects of improvements in the energy efficiency of residential dwelling units and appliances from California-adopted building and appliance standards and the effects of utility-sponsored conservation programs.

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E. NON-RESIDENTIAL CORE DEMAND FORECASTS

1. Summary of Core Commercial and Industrial Gas Demand Forecast

The average-temperature-year core commercial and core industrial gas demand, including the Gas A/C and Gas Engine markets, is forecast to average 101,783 MDth for years 2005 and 2006, or 19.5 percent higher than the 85,187 MDth adopted in D.00-04-060 for year 1999.

Under a cold-year scenario, core commercial and industrial demand is forecast to average 106,015 MDth for years 2005 and 2006, or 17.6 percent higher than the 90,169 MDth adopted for year 1999.

The December peak month demand forecast averages 11,815 MDth for years 2005 and 2006, or 15.2 percent higher than the 10,254 MDth adopted for January 1999.

Based on a 38˚ Fahrenheit 1-in-35 year occurrence, the extreme peak day demand is forecast to average 578 MDth per day for years 2005 and 2006, or 10.7 percent higher than the 522 MDth adopted for 1999.

2. Nonresidential Core Gas Demand Forecast Methodology

The core commercial and core industrial demand forecasts described above are the sum of the forecasts for G-10, Gas A/C, and Gas Engine rate classes.

Core commercial and core industrial forecasts are developed separately for the G-10 market using econometric models disaggregated into a number of sectors by type of business activity. In previous BCAPs, SoCalGas used 4-digit Standard Industrial Classification ("SIC") codes to identify business types; however, since SIC codes are being replaced by 6-digit North American Industrial Classification System ("NAICS") codes, NAICS codes were used for this

analysis. Separate core commercial and core industrial forecasts were developed using the same general models that have been used by SoCalGas in previous BCAPs.

The forecast is driven primarily by business activity and the general economic environment in SoCalGas' service area discussed in Section C.3, above, HDDs, natural gas rates, space and non-space heating efficiency indices, and seasonal effects. The relationship between gas throughput and these factors is developed based on historical data from January 1980 through March 2003. Other factors include a number of post-model adjustments described below.

After forecasts are developed for the core commercial and core industrial markets, the estimated incremental savings from SoCalGas-administered EE programs are deducted from the forecasts. These EE savings are forecast[5] to be 1,094 MDth and 1,469 MDth for years 2005 and 2006, respectively.

The City of Vernon ("Vernon") is expected to implement its own gas distribution service in late 2004 as discussed by SoCalGas witness Mr. Luis Pando. Vernon's core commercial and core industrial forecast for the years 2005 and 2006 are 1,050 MDth, and 1,527 MDth, respectively. As a result, these amounts have been deducted from SoCalGas' core commercial and core industrial forecasts.

SoCalGas projects a portion of noncore commercial and industrial demand will switch to G-10 service during the BCAP period. The forecasted post-model adjustments to core commercial and core industrial demand are 4,596 MDth and 5,169 MDth for years 2005 and 2006, respectively, as discussed by of SoCalGas witness Mr. Mark Otrhalek.

[5] Energy Efficiency forecasts are based on SoCalGas' filing as approved in D.03-04-055.

Finally, an adjustment to the econometric forecast includes the addition of new cogeneration or electric self-generation gas demand served under the G-10 rate. This new core self-generation demand due to new capital-cost subsidies for customers from the State of California ratepayers is forecast to be 949 MDth and 1,085 MDth for years 2005 and 2006, respectively, as discussed by Mr. Otrhalek.

3. Other Nonresidential Core Markets

This section describes the demand forecasts for the Gas A/C, Gas Engine, and NGV markets.

The Gas A/C and Gas Engine market demand forecast is based on historical usage and information provided by customers to SoCalGas customer contact representatives. For both Gas A/C and Gas Engine markets, the demand forecast equals the forecasted number of customers times their projected use per meter.

For the Gas A/C market, there was an average of 21 Gas A/C customers with a combined load of 166 MDth in 2002. SoCalGas expects there to be 22 Gas A/C customers in years 2005 and 2006. Based on the average historical usage for years 2000 through 2002, the annual demand per Gas A/C customer is 8.7 MDth. As a result, the Gas A/C demand forecast is 191 MDth for years 2005 and 2006. This forecast is 59.2 percent higher than the 120 MDth adopted for 1999.

For the Gas Engine market, there was an average of 1,007 customers with a combined load of 2,515 MDth in 2002. Based on the average historical usage for years 2000 through 2002, the annual demand per Gas Engine customer is 2.5 MDth. Using historical growth rates and customer input, SoCalGas forecasts there will be 1,082 and 1,107 Gas Engine customers in years 2005 and 2006, respectively. As a result, the average Gas Engine market demand forecast is

2,794 MDth for years 2005 and 2006. This forecast is 74.2 percent higher than the 1,604 MDth adopted for 1999.

The NGV market had recorded consumption of 1,825 MDth in 1998 and 5,495 MDth in 2002, a 31.7 percent average annual growth rate. However, as the market matures, the growth rate is expected to decline. Based on historical usage, customer feedback, and existing government mandates (South Coast Air Quality Management District fleet rules), SoCalGas forecasts NGV demand of 7,551 MDth and 8,225 MDth for years 2005 and 2006, respectively. This represents a 10.6 percent average annual growth rate from 2002 to 2006. SoCalGas expects 98 percent of the NGV load to be on the uncompressed tariff in years 2005 and 2006.

Gas A/C, Gas Engine, and NGV gas loads do not vary with HDDs. As a result, the cold-year forecast equals the average-year forecast for each of these markets.

F. UNACCOUNTED-FOR GAS

Unaccounted-for gas is the difference between measured gas receipts into SoCalGas' system and measured gas deliveries to all customer facilities and for company operations. SoCalGas proposes a UAF factor equal to 1.37 percent of total annual gas deliveries. This factor represents the average of actual UAF data for the 36-month period ended June 2003**.**

This concludes my prepared direct testimony.

G. QUALIFICATIONS

My name is Christopher H. Roberts. My business address is 555 West Fifth Street, Los Angeles, California, 90013-1011.

I am employed by SoCalGas as Forecasting and Analysis Manager for the core markets of SoCalGas.

In 1977, I graduated from California Polytechnic State University, San Luis Obispo with a B.S. in Industrial Engineering. In 1981, I received a M.S. in Industrial and Systems Engineering from the University of Southern California. In 1977, I began work at SoCalGas as an Industrial Engineer and have been employed there continuously since then. From 1978 to 1998, I held positions in Operations Research, Information Systems, Engineering, Marketing, and Regulatory Affairs. On April 1, 2002, I assumed my current position.

For my first 15 years with SoCalGas I performed a variety of engineering and cost benefit studies, project management assignments, and data analyses and forecasting for staff and line organizations. In the last 10 years, I have been involved in preparing advice letters, applications, and cost studies for filings and proceedings before this Commission. Since I assumed my current position, I have been involved in demand forecasting and analysis of gas core markets.

I have previously testified before this Commission.