Application of SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E) For Authority To Update Marginal Costs, Cost Allocation, And Electric Rate Design.

Application 15-04-012
Exhibit No.: SDG&E-05

PREPARED DIRECT TESTIMONY OF

JOHN BARANOWSKI

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY IN SUPPORT OF SECOND AMENDED APPLICATION

CHAPTER 5

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

February 9, 2016

SDGE

#301911

TABLE OF CONTENTS

#301911

PREPARED DIRECT TESTIMONY OF

JOHN BARANOWSKI IN SUPPORT OF SECOND AMENDED APPLICATION

CHAPTER 3

I. OVERVIEW AND PURPOSE

The purpose of my direct testimony is to address San Diego Gas & Electric Company's ("SDG&E") distribution planning practices and process. In this testimony, I will explain how SDG&E's distribution system design is not based on coincident system peak demand loads, but rather how SDG&E's electric distribution system is designed to meet non-coincident peak demand. Specifically, SDG&E's distribution system is designed to meet individual customer service requirements and not designed for coincident system peak demand. Coincident peak demand is the energy demand required by a given customer or class of customers during periods of peak system demand. Non-coincident peak demand is the sum of the individual peak demands of the components of the system within a specific period (day, week, month, year) regardless of whether the system is peaking. Designing the distribution system using non-coincident peak demand increases the distribution system's operational safety and reliability and decreases the possibility for equipment overloads and failures. SDG&E's distribution planning practices and processes support the testimony of SDG&E witness Cynthia Fang (Chapter 1) and Christopher Swartz (Chapter 2) who discusses SDG&E's proposals for non-coincident demand charges.

II. SDG&E EQUIPMENT LOAD VS. SYSTEM-WIDE LOAD

SDG&E designs its distribution facilities to meet the peak demand for that portion of the distribution system which serves customers located in the specific area. This means that a substation transformer, distribution transformer, or circuit is designed to meet the peak demand at its specific location. This method of design is the standard distribution planning process, not only at SDG&E but also throughout the utility industry. This method of design takes into account the individual customer loads on each circuit and substation bank.

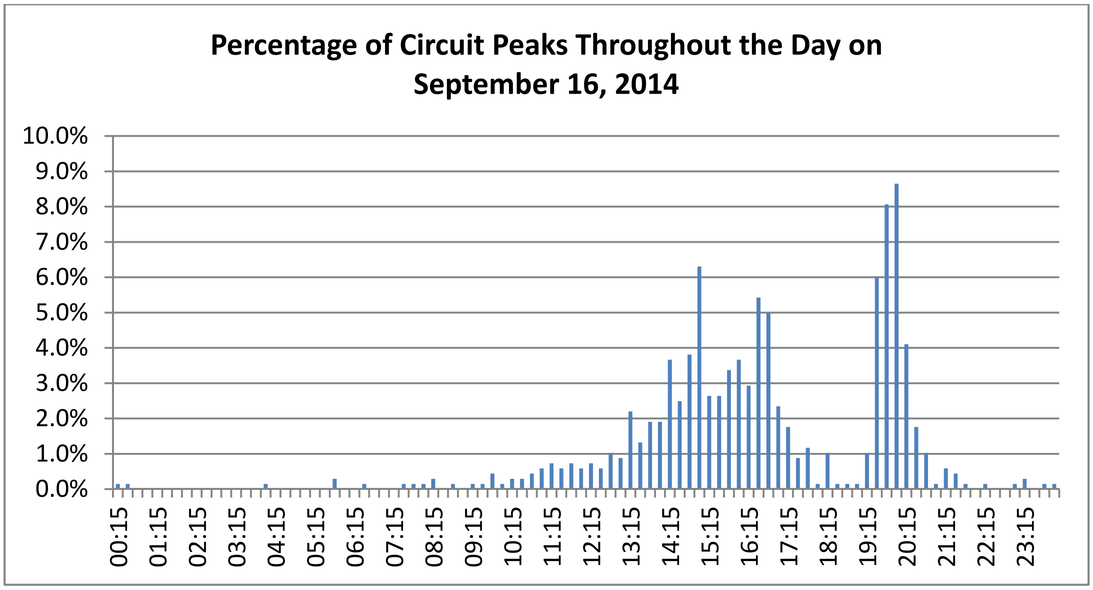
A. SDG&E Circuit Loading Data

SDG&E has 1,032 energized distribution circuits served by 133 distribution substations in its electric system.[1] These facilities span a territory that includes mild coastal weather to extreme desert temperatures, and customer types from single residential homes to industrial manufacturing facilities. This type of diversity in climates and users represents a significant challenge to distribution planners as each area and customer type imposes different demands on the electric system. Figure 1 below shows when each circuit peaked on the SDG&E system by the time of day on September 16, 2014, the day of SDG&E's all-time system peak.[2] The figure shows that while a significant number of circuits peak within an hour of the system peak (which occurred at 3:52 p.m. on September 16), the majority of circuits did not show peaks coincident with the overall SDG&E system.

[1] As of 11/19/2015.

[2] SDG&E's system peak in 2015 was lower than that of 9/16/2014, which continues to be SDG&E's all-time peak day. When comparing system needs to the non-coincident needs of the distribution system, using the all-time peak system demand is most appropriate.

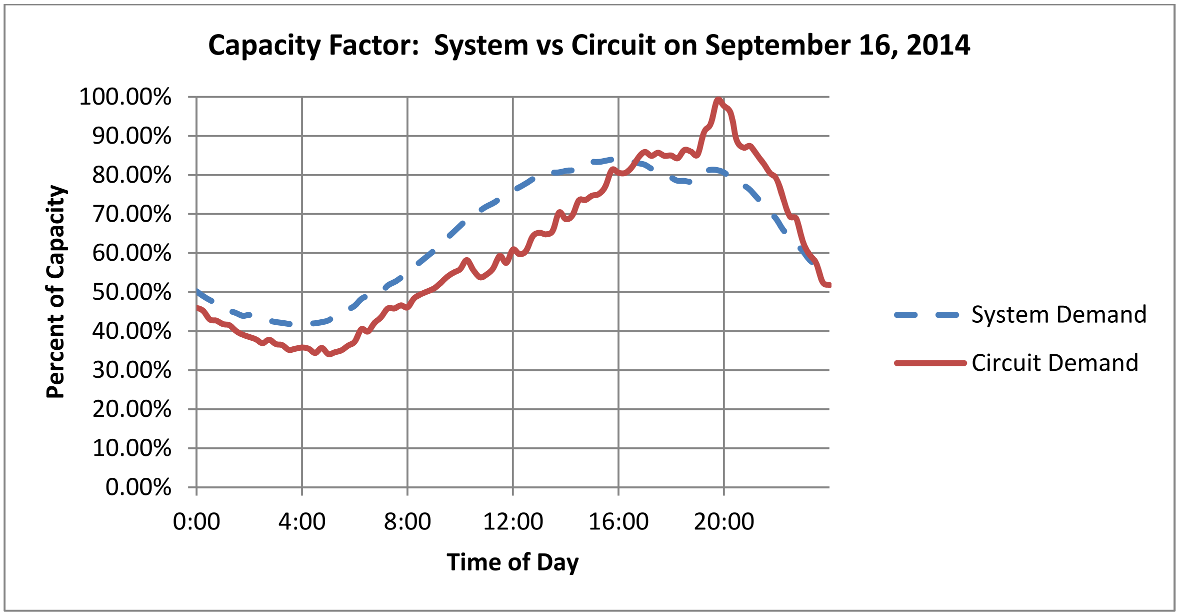
Figure 1



As the figure shows, attempting to plan the distribution system based on a system peak would result in overloads for those circuits that do not peak at the same time, even on the day of an all-time peak. This is because a plan with the system peak in mind would not capture the higher demand of those circuits and substations that do not peak coincident with the rest of the system. While Figure 1 shows a broad look at the system during the course of SDG&E's all-time peak day, Figure 2 shows a comparison between SDG&E system demand and the demand of a single distribution circuit during that same day.

Figure 2 highlights the need for demand charges based on non-coincident demand and non-coincident distribution planning. This figure shows that an individual circuit may be approaching or at capacity, while the overall electric system has the ability to serve additional demand. It is because of this disconnect between circuit peak and system peak that requires a non-coincident demand charge. Details regarding SDG&E's proposals for non-coincident demand charges are presented in Mr. Swartz's testimony (Chapter 2).

Figure 2

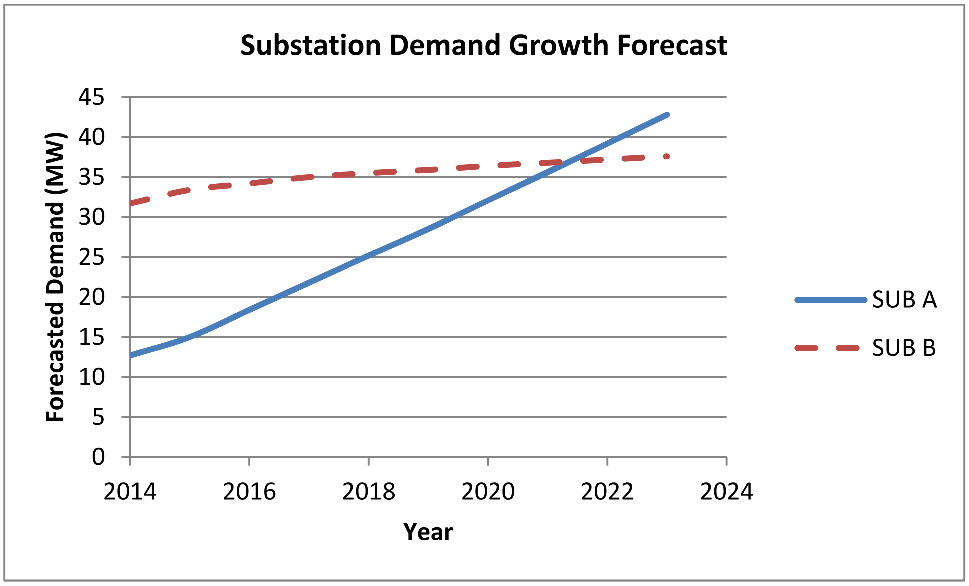


B. Distribution Planning Methods

The goal of a distribution planning department is to ensure that each distribution circuit and substation has adequate capacity to serve its local peak demand, regardless of when it occurs. Each year, SDG&E's distribution planning department performs analysis to maintain the reliability of the distribution system. This analysis starts with a load forecast, in which engineers determine and estimate what will be the local peak demand of each circuit and substation in SDG&E's distribution system. At SDG&E this forecast is produced showing forecasted demand for each circuit and substation for the next ten years. The load forecast is the key component of the distribution planning cycle, as the results of the forecast will determine what capacity upgrades are required on the distribution system. The forecast includes all known specific load additions, as well as the organic growth in demand resulting from existing customers that increase their demand over time. Figure 3 shows the difference between a high growth substation and a low growth substation.

#301911

Figure 3



As can be seen from the figure above, these two substations present different challenges to the distribution planner. While their respective forecasted peak demands are not significantly different, their growth vectors are very different. Substation A will require increases in capacity in the future, based on projected growth in demand, while Substation B is less likely to require capacity upgrades based on more sedate growth projections. The same localized impacts can also be seen at the circuit level. Figure 4 shows the demand forecast for several circuits.

Figure 4

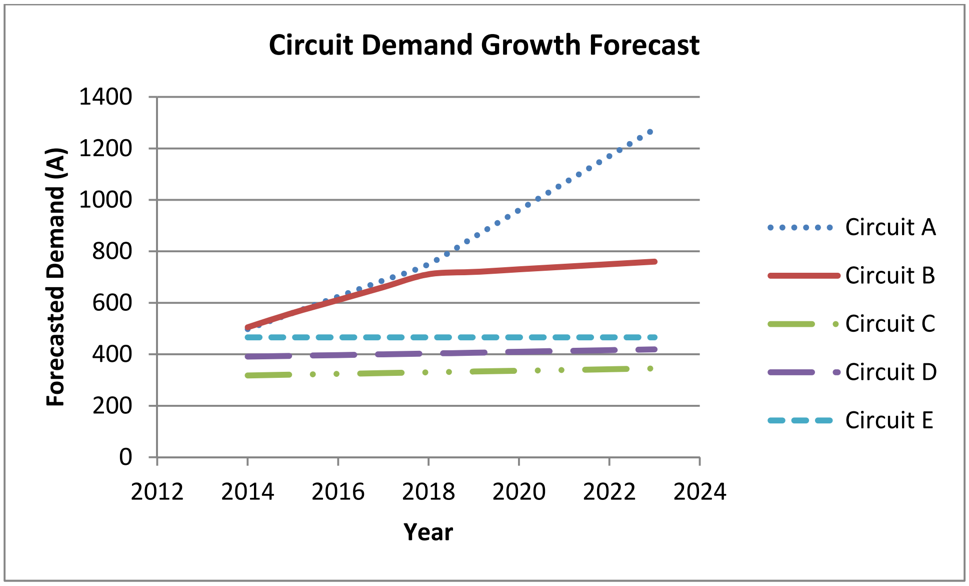


Figure 4 clearly shows that forecasted growth on Circuit A is significantly higher than the other circuits, and will exceed its capacity as early as 2016. Circuit B shows moderate growth, also requiring capacity upgrades, while Circuits C through E show little to no growth. The capacity plan for each of these circuits will be significantly different, based on their respective demand forecasts.

Once the forecast for a given circuit is generated, the peak demand is loaded into a power flow model, which is used to analyze each circuit. This power flow model enables the engineer to run scenario analysis, including topographic changes and demand increases over time. The engineer then utilizes the power flow model to determine what deficiencies, if any, exist in the distribution system. These deficiencies are addressed on the appropriate level, i.e., circuit or substation. For example, if a distribution circuit is found to have inadequate capacity, a reconductor of that individual circuit to a larger wire size may be proposed. This is a local solution for a local problem. Other solutions that may be proposed, depending on the deficiency, are circuit cutovers, additional capacitors, new circuit additions, new transformer additions, or entire new distribution substations. Each of these solutions is correct under the appropriate conditions.

Given that a distribution circuit or substation has its own demand profile that would drive a capacity upgrade, it is imperative to ensure that customers see the right price signals to lower demand overall rather than just reduction of demand targeted at times of system peak. Only when demand reductions can be proven to be firm at the circuit level could SDG&E incorporate it into its load forecasting model.

III. SUMMARY AND CONCLUSION

In summary, SDG&E's distribution system is designed to meet the peak demand on that portion of the distribution system when that peak demand occurs. Designing the distribution system based on customer load coinciding with system peaks would erode the safe and reliable operation of the distribution system. Because SDG&E is ultimately responsible for providing safe and reliable service, SDG&E does not base its distribution system design on coincident system peak, but rather the peak of each area being served by the distribution system.

This concludes my prepared direct testimony.

IV. WITNESS QUALIFICATIONS

My name is John Baranowski and my business address is 8316 Century Park Court, San Diego, California 92123. I am the Electric Distribution Planning Manager in the Electric System Planning Department of San Diego Gas & Electric ("SDG&E"). My primary responsibilities include load forecasting, project scoping, cost estimating, project design, engineering review, and construction support for all of SDG&E's electric distribution capacity upgrade projects, as well as real-time operational support for all of SDG&E's electric distribution system.

I began work at SDG&E in June 2004 as an Engineer and have held positions around the company on both transmission and distribution sides ranging from system planning to project and construction management. Since 2004, I have held positions of increasing responsibility with a large portion of work in Transmission and Distribution Planning.

I graduated from California State University of Sacramento with a Bachelor of Science in Electrical Engineering with a concentration in Power Systems. In 2007, I earned my license as a Professional Engineer in the State of California. I have previously testified before the Commission.