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Application of Southern California Gas Company (U 904 G) and San Diego Gas & Electric Company (U 902 G) for Authority to Revise their Curtailment Procedures	A.15-06-____ (Filed June 26, 2015)

CHAPTER II

NEW CURTAILMENT ORDER

PREPARED DIRECT TESTIMONY OF

STEVE WATSON

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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PREPARED DIRECT TESTIMONY

OF STEVE WATSON

I. PURPOSE

The purpose of my direct testimony on behalf of Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) is to describe the reasoning and analysis behind the new curtailment order SoCalGas and SDG&E are proposing to replace the current order in SoCalGas Rule 23 and SDG&E Gas Rule 14, as we focus on local service zone constraints rather than system-wide curtailments.

II. CURRENT CURTAILMENT ORDER

The current curtailment order is described in detail in the testimony of Mr. Nguyen. Generally, SoCalGas first curtails interruptible end-use customers on a pro-rata basis, then curtails firm noncore end-use customers based on alternating 20 MMcfd blocks of UEG/cogeneration and other noncore customers. SDG&E currently first curtails all interruptible service on a pro-rata basis, followed by firm electric generation (EG) on a pro rata basis, and finally rotating blocks of cogeneration and non-EG noncore customers. This system is unwieldy, and potentially unfair in an environment with few curtailments. The design makes it likely that customers will be totally curtailed when their block is reached, and firm noncore customers in the curtailed blocks bear the brunt of the curtailment while other firm noncore customers continue to receive uninterrupted service. The current system requires the notification of a significant number of noncore customers, many of whom have little experience or knowledge regarding curtailment protocols, in order to achieve a significant volume reduction.

III. OTHER CURTAILMENT ORDERS CONSIDERED

Pacific Gas & Electric Company (PG&E) makes no distinction between firm and interruptible service. In the event of a curtailment, PG&E requires all noncore customers in a locally-constrained area to reduce their load on a pro-rata basis relative to their recent historical peak burns. This distributes the pain of a curtailment across all customers in the constrained area and often avoids having to totally shut down certain noncore customers' operations.

SDG&E curtails all of its EG load first before it curtails any of its other firm noncore load. Although this approach usually only impacts a few EG customers, it potentially increases the risks of electric blackouts and disruption of electric service to all noncore and core customers.

IV. PROPOSED CURTAILMENT ORDER

In their Application for Low Operational Flow Order (OFO) and Emergency Flow Order (EFO) Procedures (A. 14-06-021), SoCalGas and SDG&E proposed to eliminate provisions related to the curtailment of standby procurement service from SoCalGas Rule 23 and SDG&E Gas Rule 14. The Commission granted A.14-06-021, including the elimination of the standby procurement service curtailment provisions, on June 11, 2015, when it adopted Decision (D.) 15-06-004. As described later in this testimony, SoCalGas and SDG&E propose to remove off-system service and storage withdrawal from the current curtailment order and implement off-system service and storage withdrawal cuts in a manner consistent with both SoCalGas and SDG&E's Rule 30. In her prepared direct testimony, Ms. Gwen Marelli is proposing, as on the PG&E system, to eliminate the current distinction between firm and interruptible end-use noncore customers, eliminating the need to make a distinction in the curtailment order. This elimination of noncore service distinctions suggests a new curtailment order for noncore load in the event of demand exceeding local pipeline redelivery capacity.

SoCalGas and SDG&E are proposing a revised curtailment order that blends concepts from the current SDG&E method and the current PG&E method, while making changes that should enhance electric grid stability. First, gas service would be curtailed to dispatchable EG customers that are not operating at the time the curtailment is called. Next, SoCalGas and SDG&E propose to curtail <u>up to</u> 60% of the currently dispatched EG load in a constrained local service zone. This load is large and can be curtailed quickly, which is an important gas operational consideration. SoCalGas and SDG&E expect its transmission constraints to occur in its winter peak periods, not during the summer. According to my analysis, described below, up to 60% of gas EG load can be curtailed in the winter period without creating a blackout potential for the respective electric grid operators, assuming electric transmission assets are operational. The reduction in gas-generated electrical output can be compensated for by the grid operator with an increased reliance on imported electricity. Essentially, during a localized winter gas curtailment, SoCalGas would be compensating for its constrained winter pipeline capacity with excess electric transmission capacity. Electric transmission capacity is more heavily utilized during summer peak generation periods.

In return for placing up to 60% of dispatched EG load in the lowest-priority step, SoCalGas and SDG&E would place the remaining 40% in the highest-priority noncore step. The middle priority noncore step would consist of cogeneration and non-EG noncore customers, whose load would be curtailed on a pro-rata basis based on their prior years' peak winter (or summer) consumption. In other words, this step would operate much like PG&E's curtailment system does. The testimony of Mr. Nguyen provides details on how Curtailment Baseline

Quantities (CBQ), from which a pro rata curtailment will be determined for these customers. The existing curtailment priority and curtailment order for core customers would not change. The resulting curtailment order is summarized in the following list.

Step 1: Dispatchable EG not currently operating
Step 2: Up to 60% of currently dispatched operating EG load
Step 3: Up to 100%, pro-rata Cogeneration and non-EG noncore load[1]
Step 4: Remaining dispatched and operating EG load
Step 5: Large Core (Priority 2A)
Step 6: Small Core Nonresidential (Priority 1)
Step 7: Residential (Priority 1)

V. NEW CURTAILMENT PROCESS

The curtailment of EG load would work as follows: If the SoCalGas and SDG&E System Operator (System Operator) forecasts a constraint in any local service zone, they would note the current dispatched EG load on that system. They would first require that the EG load in the zone not exceed the load at the time of the curtailment until the end of the curtailment episode. This would be accomplished by not allowing EGs not operating at the time of curtailment to turn on unless another with equal or greater use of natural gas turns off. The System Operator would then, as necessary, reduce up to 60% of the currently dispatched EG load based on those observed hourly consumption figures. Operational circumstances permitting, the System Operator will contact the affected grid operators and give them the opportunity to tell us which EG units in the affected local service zones to curtail. SoCalGas and SDG&E will then use the information provided by the grid operators to curtail Step 2 customers. If grid operators are not able to provide such information, or if there is not enough time to contact grid operators prior to implementing a Step 2 curtailment, the default will be pro rata among all currently dispatched EGs within the affected zones. In any event, the usage of natural gas by the

[1] Electric generation load that is not dispatchable by an electric grid operator and therefore not subject to curtailment in step 2 will be considered non-electric generation noncore load for the purposes of curtailment.

dispatched EG in the zones will not exceed the volume set by the System Operator until the curtailment order has been lifted.

Since, EG burn comprises about 22.5% of system-wide burns during the winter, 60% reductions in EG load would relieve capacity constraints in most local service zones most of the time. (60% times 22.5% = a 14% reduction in load). This is especially true for the zones with relatively high EG loads—the Southern zones, the Los Angeles Basin, and the Northern system. Therefore, curtailment of cogeneration and non-EG noncore customers would be unlikely unless the utility fails to build additional capacity as demand in a zone grew and curtailments of EG load began to occur.

Nevertheless, if a 60% reduction in EG load was insufficient to reduce burn below the gas local service zone capacity, the System Operator would calculate the additional volume reduction required over the day. The System Operator would then determine how much cogeneration and non-EG noncore load could be permitted, and prorate that capacity among those customers, who would be required to stay below a given percentage of their CBQ. For example, in the winter season, that percentage would be equal to: permissible cogeneration and non-EG noncore load divided by the sum of peak cogeneration and non-EG noncore winter loads.

A Step 4 curtailment would work similarly to Step 2. If operational circumstances permit, the System Operator will work with the grid operators in the affected local service zones to reduce the remaining EG load as needed, which SoCalGas and SDG&E will then effectuate with these customers via a curtailment order. As with Step 2, if grid operators are not able to provide such information, or if there is not enough time to contact grid operators prior to implementing a curtailment, the default will be pro rata among all currently dispatched EGs within the affected zones.

VI. WHY 60% IS AN APPROPRIATE LEVEL TO CURTAIL ELECTRIC GENERATORS

As discussed in Ms. Marelli's testimony, this revised curtailment process proposal balances the need to get large amounts of load off the system quickly while minimizing the risk of electric grid blackouts. Table 1 below provides the winter import capabilities of the three grid operators in SoCalGas and SDG&E's service territories (the California Independent System Operator (CAISO), the Los Angeles Department of Water and Power (LADWP) and the Imperial Irrigation District (IID)), and shows that electrical blackouts resulting from a gas system curtailment should be unlikely because the grid operators have enough electrical transmission capacity to import anywhere from 74% to over 200% of their 1-in-10 winter peak hour electrical energy requirements. SoCalGas and SDG&E's proposed 60% cut of dispatchable EG is based on the grid operator who currently has the least percentage amount of import transmission capacity into the SoCalGas and SDG&E service territory—CAISO.

TABLE 1

	Winter Peak Hour (MW)	Winter Import Capability (MW)	Import/ Peak
CAISO	22600	16820	74%
LADWP	5120	13540	265%
IID	472	568	120%

SoCalGas and SDG&E developed a base case that approximated 2014 CAISO operations in the following manner. We first obtained the 2014 hourly electrical load for the CA-ISO SP15 region from the CAISO. Next, we subtracted out the energy produced by non-gas, local sources. Again, we used CAISO data that has the hourly production by resource type for the CAISO territory. To generate the numbers for the Southern California region, we prorated the CAISO non-thermal production by the ratio of Southern California non-gas generation capacity relative to total CAISO non-gas generation capacity. Next, we examined SoCalGas and SDG&E data on the gas usage of all gas electric generators in the CA-ISO region for all 8,760 hours of 2014. We assumed that any level of gas EG usage used the most heat efficient units in the CAISO territory. We ignored transmission losses and congestion. Using these assumptions, we estimated the electrical production of gas generators for all 8,760 hours in 2014. Finally, we derived electrical hourly imports by subtracting local non-gas production and local gas production from the total hourly load provided by CAISO.

After developing a base case that approximated 2014 CAISO operations, SoCalGas back-tested the impact of different levels of gas generation cuts during the winter months. We assumed that any reduction in energy output from gas generators would be met with increases in imported electricity—up to the limits of the import capacity of the CAISO. We found that a 60% cut in gas generation output could have been accommodated last winter, with over 1,000 MWs of import capacity to spare for every hour of the winter (Jan-Mar, Nov/Dec 2014), as shown in Table 2 below.

Table 2

	BASE CASE													
	Load MW/Hr			Non Gas Gen MW/Hr (est.)			Imports MW/Hr (est.)			Gas Burn (MMBtu/Hr)			Cuts Hours	Cuts Days
Month	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max		
1	13,209	10223	16777	1,724	533	4,089	8,170	5,752	11,196	24,394	13,543	51,593		
2	12,875	9982	16178	2,303	559	5,309	6,994	3,504	9,991	26,424	13,726	64,523		
3	12,837	9746	15918	2,720	682	6,233	7,465	4,519	10,416	19,649	8,417	41,083		
11	13,019	9708	17471	2,252	505	5,929	7,162	3,552	11,832	26,968	9,738	76,532		
12	13,317	9892	17131	1,913	604	5,211	7,836	4,526	11,341	26,675	7,987	62,819		

Cuts:	0.6
Import Capacity	15050

	WITH CURTAILMENT													
	Load MW/Hr			Non Gas Gen MW/Hr (est.)			Imports MW/Hr (est.)			Gas Burn (MMBtu/Hr)			Cuts Hours	Cuts Days
Month	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max		
1	13,209	10223	16777	1,724	533	4,089	10,244	7,214	13,605	9,758	5,417	20,637	0	0
2	12,875	9982	16178	2,303	559	5,309	9,228	5,771	12,864	10,569	5,490	25,809	0	0
3	12,837	9746	15918	2,720	682	6,233	9,168	5,774	12,984	7,860	3,367	16,433	0	0
11	13,019	9708	17471	2,252	505	5,929	9,384	5,272	13,671	10,787	3,895	30,613	0	0
12	13,317	9892	17131	1,913	604	5,211	10,041	5,278	13,743	10,670	3,195	25,128	0	0

The same analysis shows that, as reflected in Table 3 below, only 30% cuts to EG loads could be accommodated during summer months without risking blackouts because that is the peak season for the EGs. Nevertheless, as discussed above, SoCalGas and SDG&E expect gas transmission constraints to appear in winter months, not summer months. If a constraint does arise during the summer, it is unlikely that SoCalGas and SDG&E would need a more than 30% cut in EG demand to maintain gas service to all other customers.

Table 3

	BASE CASE														
	Load MW/Hr			Non Gas Gen MW/Hr (est.)			Imports MW/Hr (est.)			Gas Burn (MMBtu/Hr)			Cuts	Cuts
Month	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Hours	Days
4	13,250	10072	18410	3,284	654	6,820	6,734	3,558	10,719	24,056	8,391	58,636		
5	14,456	9941	24492	3,911	869	7,173	7,576	4,666	12,565	22,444	5,252	85,252		
6	15,010	10372	20777	4,306	1,012	7,635	7,660	4,674	11,285	22,618	8,818	72,070		
7	17,224	11641	25541	3,618	1,031	6,219	8,943	6,309	13,977	35,586	14,436	95,261		
8	16,898	11560	24394	3,367	1,249	6,610	8,807	4,959	13,189	35,685	17,548	94,510		
9	17,136	10707	27679	2,946	924	5,729	9,018	5,027	13,942	40,158	18,129	107,660		
10	14,754	10472	21735	2,429	567	6,016	6,902	3,718	11,970	41,959	18,719	100,036		

Cuts:	0.3
Import Capacity	15050

	WITH CURTAILMENT														
	Load MW/Hr			Non Gas Gen MW/Hr (est.)			Imports MW/Hr (est.)			Gas Burn (MMBtu/Hr)			Cuts	Cuts
Month	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Hours	Days
4	13,250	10072	18410	3,284	654	6,820	7,710	4,359	12,071	16,839	5,874	41,045	0	0
5	14,456	9941	24492	3,911	869	7,173	8,477	5,042	14,098	15,711	3,676	59,677	0	0
6	15,010	10372	20777	4,306	1,012	7,635	8,598	5,285	12,405	15,832	6,173	50,449	0	0
7	17,224	11641	25541	3,618	1,031	6,219	10,258	7,069	15,050	24,910	10,105	66,683	1	1
8	16,898	11560	24394	3,367	1,249	6,610	10,149	6,138	14,569	24,979	12,284	66,157	0	0
9	17,136	10707	27679	2,946	924	5,729	10,438	5,801	15,050	28,111	12,690	75,362	14	4
10	14,754	10472	21735	2,429	567	6,016	8,379	5,226	13,311	29,371	13,103	70,025	0	0

VII. DISTINCTION BETWEEN A CURTAILMENT AND A CUT TO INTERRUPTIBLE STORAGE

Commission Resolution G-3439 affirmed that the curtailment of Standby Procurement Service implemented on December 7, 2013, was necessary and consistent with the procedures defined in SoCalGas' rules. The Commission asked, however, that the distinction between a "curtailment" of interruptible storage withdrawal per current SoCalGas Rule 23, C.1(4) and a "cut" to interruptible storage withdrawal in SoCalGas Rule 30, D.4 be clarified. As part of the proposed revision of SoCalGas Rule 23 and SDG&E Rule 14, we are proposing the deletion of the "curtailment" of either interruptible storage withdrawal per current Rule 23, C.1(4) or firm storage withdrawal per Rule 23, C.1(7). Curtailing withdrawal does not help the utility maintain service to its end-users—quite the opposite, it may jeopardize such service. Cuts to interruptible storage withdrawal would only be done in accordance with Rule 30, D.4 and would be a normal part of the daily scheduling process.

Rule 30 D.4 states that the utility will exercise cycle-by-cycle discipline on how much withdrawal is scheduled every day. Simply put, no more withdrawal can be scheduled than the System Operator determines can be physically accommodated based on their best available information in that cycle. Interruptible withdrawal would have the lowest priority and might be "cut," or "pro-rated," several times during the year even if there is no threat to end-use customer service. In other words, regardless of whether a low OFO is in effect, SoCalGas intends to exercise daily scheduling discipline to ensure nominations that exceed the withdrawal capacity of the system are rejected in every cycle of every day. Since SoCalGas' withdrawal capacity is so large, it is unlikely that reductions in withdrawal nominations would be required the large majority of days. Such cuts might be necessary under Rule 30, however, if customers want to avoid high-priced flowing supply for a day and use more "interruptible" withdrawal than system capacities could accommodate. The same logic will be applied on the injection side of the equation if SoCalGas' new high OFO proposal is adopted.[2]

VIII. OFF-SYSTEM DELIVERY

For reasons similar to those provided above for withdrawal services, the current provisions concerning the curtailment of interruptible and firm off-system delivery services will be deleted from SoCalGas Rule 23 since Rule 30 adequately deals with off-system delivery services. As with storage withdrawal capacity, the System Operator determines on a cycle-by-

[2] Over-nominations of injection capacity are much more frequent than withdrawal capacity because there is so much less injection capacity on the SoCalGas system. In the past SoCalGas has only limited injection nominations after a high OFO is called.

cycle, daily basis how much off-system capacity is available at each point of the system and will cut excess off-system nominations in the manner described in that Rule. Interruptible off-system capacity is a function of displacement volumes and other considerations that have nothing to do with the capacity to serve end-use customers in particular local areas where demand is exceeding the capacity of pipelines to serve that demand. In other words, interruptible off-system service only affects system supply; it does not affect the capacity to serve end-users in a constrained transmission zone. Low OFOs, once implemented, will provide the appropriate market signal to help ensure that sufficient on-system supplies are delivered, whether or not off-system services are being provided on that day. It is quite conceivable to have off-system deliveries at Kramer Junction, for example, at the same time there is a both a low OFO and a curtailment of a local service zone—say, one of the Southern System zones. The System Operator will continue to determine the level of available off-system capacity based on system-specific circumstances and constrain such service, as necessary, using the guidelines in Rule 30. Furthermore, no firm off-system service can be provided except under specific terms approved in some future application for such service.

This concludes my prepared direct testimony.

IX. QUALIFICATIONS

My name is Steve Watson. I am employed by SoCalGas as the Capacity Products Staff Manager. I also manage utility personnel who forecast gas-powered electrical generation on the utility system. My business address is 555 West Fifth Street, Los Angeles, California, 90013-1011. I received a Bachelor's degree in History and International Relations from the University of California, Davis, and a Master's Degree in Public Policy from the University of California, Berkeley. I have been employed by SoCalGas since 1986. I have worked in Gas Supply, Customer Services, the Strategic Planning and Transmission Capacity Planning Departments. I am currently the Capacity Products Staff Manager, responsible for staff support to our Pipeline Products Manager and Storage Products Manager. Before joining SoCalGas I worked as a natural gas analyst at the Department of Energy.

I have previously testified before this Commission.