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JOINT AGENCY WORKSHOP ON ENERGY RELIABILITY IN SOUTHERN CALIFORNIA

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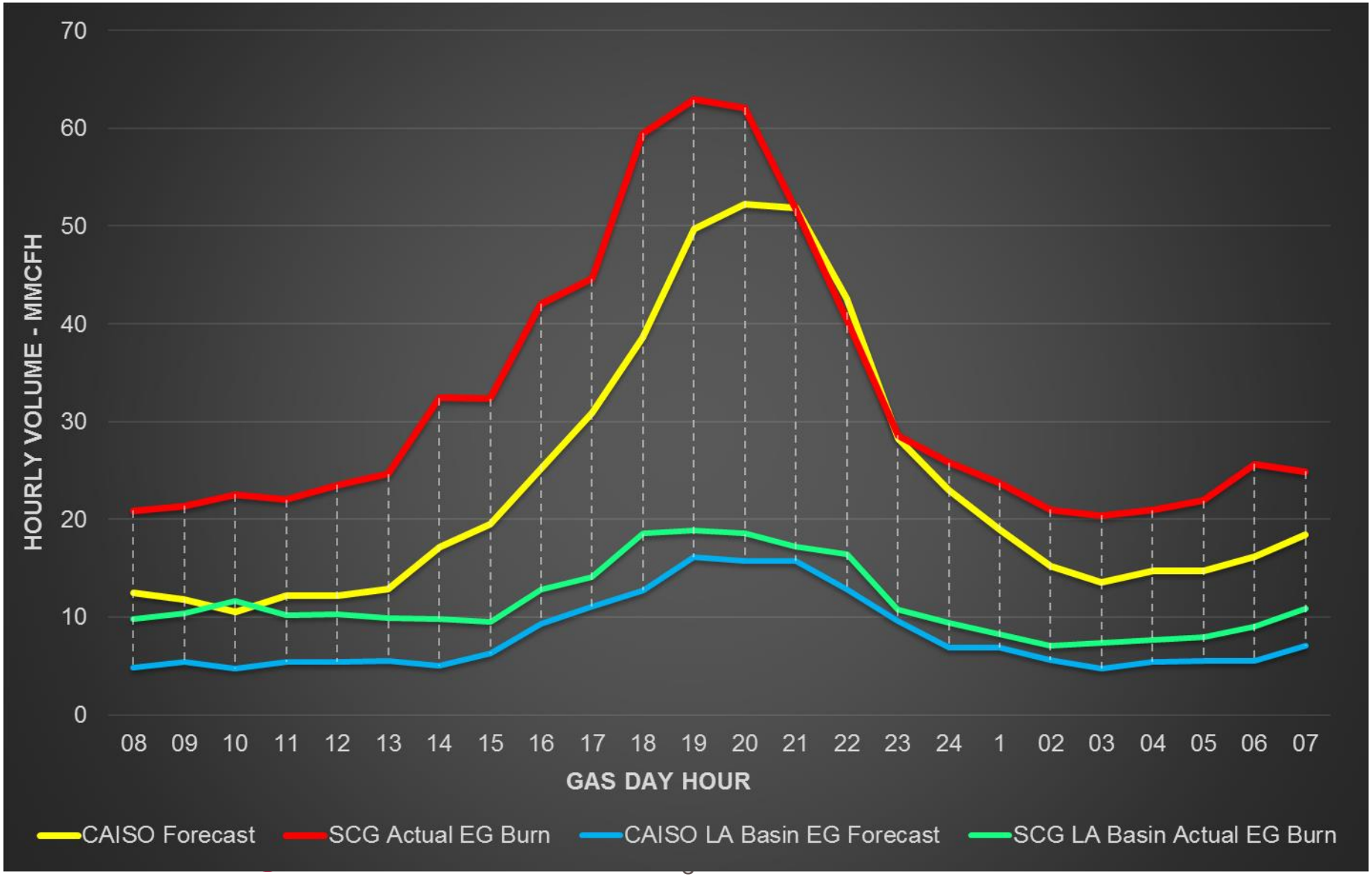
Concerns About the Summer Operating Season

- Only one gas system scenario was analyzed and presented in the 2017 Summer Assessment
- Assumptions used in the Gas Hydraulic modeling were extremely optimistic and did not account for contingencies on the gas system, for example:
  - 100% receipt point utilization
  - 100% storage capability and utilization (excluding Aliso)
- Modeling results may lead to an overly optimistic conclusion about the summer operating conditions this summer season
- Storage inventory levels were assumed to be at levels required to support withdrawals
- Potential cumulative impact on storage withdrawal capability due to multiple hot weather periods throughout the summer were not considered
- Impact of differences between EG forecast and actual demand was not addressed

Recent Example of EG Forecast vs Actual Mismatch - 5/3/2017



SoCalGas Hydraulic Modeling

- Hydraulic analysis simulates the physical operations of the SoCalGas transmission and storage system using various assumptions while operating within the safe limits of the system
- The hydraulic analysis in the 2017 Summer Assessment calculated the maximum theoretical system capacity using the directed inputs, however the System Operator cannot operate at these extreme levels
- Unlike during a computer modeling exercises, SoCalGas' System Operator can't "re-run" or "hit the reset button" on the actual day and must be more conservative than the model would suggest
- In comparison, the 2016 assessment looked at actual historical operating days where the system performed within its capabilities and then modeled the system without Aliso Canyon

2017 Summer Assessment Assumptions

Natural gas system hydraulic analysis was based on:

- Hydraulic model inputs directed by the CPUC
- No additional transmission or storage facility outages (beyond the current Line 3000 outage)
- 100 percent utilization of receipt point capacity – 3.185 Bcfd
- 100 percent withdrawal capacity at the other three fields available – 1.47 Bcfd
- No withdrawal utilization from Aliso Canyon

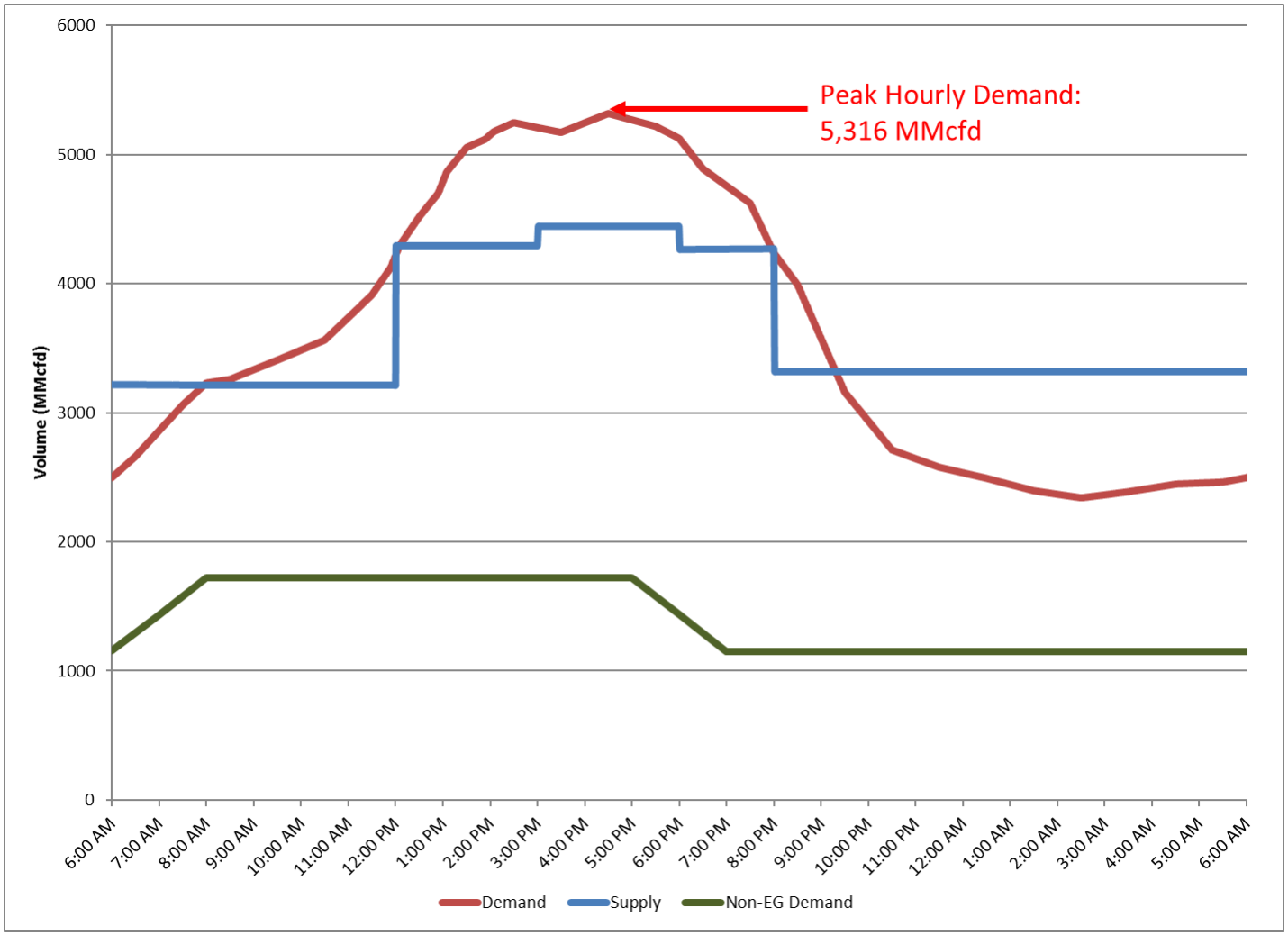
Contingencies Not Addressed: System Upsets and Constraints

- Pipeline and storage outages resulting from safety or compliance related work
- Unplanned outages on SoCalGas pipelines or compressor stations
- Unplanned outages at SoCalGas storage facilities, such as the loss of a dehydration unit or other gas processing equipment, or a pipeline facility issue within the storage field
- Planned or unplanned outages on interconnecting upstream pipelines or within the supply basin causing a disruption in the supply chain
- Supply deliveries not at 100 percent of capacity due to customers/shippers balancing to the lower bound of the balancing rules

Hydraulic Modeling Results

- Analysis shows that with optimistic assumptions, the maximum theoretical sendout that could be supported without Aliso Canyon is 3.6 Bcfd with a peak hourly sendout equivalent of 5.316 Bcfd
  - Maximum usable hourly withdrawal equivalent is 1.270 Bcfd
- SoCalGas conducted a second analysis, with reduced withdrawal capacity, in which the maximum theoretical system capacity falls to approximately 3.2 Bcfd
  - Maximum usable hourly withdrawal equivalent is 800 MMcfd
- Second analysis confirms that any loss of flowing supply from assumed levels will reduce sendout capacity on an approximately one-to-one basis

Hydraulic Simulation
Maximum Theoretical System Sendout – 3.638 Bcfd



CAISO Gas Supply Shortfall Assessment

- CAISO conducted an analysis of gas supply shortfall shown in Table 4 and Figure 5 of the 2017 Summer Assessment for different power flow cases
- Results of the analysis from Figure 5 indicate the following:
  - SoCalGas would need an additional 110 – 153 MMcf of gas over the peak 8 hour period, requiring a withdrawal rate of 330 – 459 MMcfd from Aliso Canyon or curtailment of electric generation

Maintaining Energy Reliability This Summer

- Mitigation measures help, but do not eliminate the risk of curtailment
- SoCalGas will continue to closely coordinate operations with CAISO and LADWP
- SoCalGas will continue using the revised low Operational Flow orders (OFOs)
- Maintenance outages will continue to be adjusted to occur during periods of low demand when possible except for identified safety issues or regulatory requirements
- SoCalGas has already begun to enhance storage injections to increase inventory to support SoCalGas' storage capability system noncore reliability

Maintaining Energy Reliability This Summer

- Advice Letter filed May 19, 2017 to further enhance storage injection capability to increase inventory
- Safety enhancement work at the other storage fields has been delayed, as directed by the CPUC, to maintain specified minimum withdrawal capabilities
- Since November of 2015, SoCalGas has complied with mandated safety regulations at Aliso Canyon and the field is ready for normal operation
- SoCalGas stands ready to support the energy reliability needs of Southern California by returning Aliso Canyon to service.

Questions?

» **Thank you for your time and attention.**

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