

Memorandum

To: ISO Board of Governors

From: Neil Millar, Vice President of Infrastructure and Operations Planning

Date: December 9, 2020

Re: **Decision on reliability must-run designation for Midway Sunset Cogen**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management is seeking Board of Governor authorization to designate the Midway Sunset Cogen units for reliability must-run (RMR) service contingent upon execution of an RMR contract with rates, terms and conditions acceptable to Management, to ensure compliance with reliability criteria applicable to the balancing authority area.

On September 28, 2020, Midway Sunset Cogeneration Company (MSCC) submitted notice of retirement for two Midway Sunset Cogen generating units, effective December 31, 2020, with the third unit having already been mothballed earlier in 2020. The three generating units are capable of operating 24/7, with two units, designated as A and B, capable of peaker operation and one unit (designated as unit C) capable of base load operation.

The ISO's most recent analysis of supply for 2021 is summarized in Attachment 1 and indicates material reliability concerns particularly during summer conditions.

The analysis demonstrates Midway Sunset Cogen is required for reliable operation of the transmission system in 2021 in compliance with mandatory standards BAL-002-WECC-2a; although, the ISO expects compliance with BAL-001-2 and BAL-003-1.1 would also likely be compromised absent their RMR designation. In assessing the ISO's ability to comply with BAL-002-WECC-2a contingency reserve requirements, the ISO made reasonable assumptions about generation forced outage rates, load forecast variations, and available import levels. The ISO analysis also accounted for resources that are expected to be online in time for the summer operation.

Management therefore seeks Board approval of the designation of Midway Sunset Cogen units as an RMR resource, in order to prevent their imminent

retirement/mothballing. Management notes that neither the RMR designation nor the execution of an RMR agreement precludes the resource from being procured as a resource adequacy resource by a load serving entity.

Management recommends the following motion:

Moved, that the ISO Board of Governors authorizes Management to designate the Midway Sunset Cogen units for reliability must-run service contingent upon execution of a reliability must-run contract with rates, terms and conditions acceptable to Management, as described in the memorandum dated December 9, 2020.

DISCUSSION AND ANALYSIS

In order to maintain reliability, the ISO must comply with several North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) standards in real-time. BAL-002-WECC-2a requires the ISO to carry approximately 6% of expected load as contingency reserves. The contingency reserves required under BAL-002-WECC-2a cannot be used for other types of operational needs other than contingencies unless the ISO is in an energy emergency alert. In addition, the ISO also requires unloaded capacity to meet operational needs like frequency response and regulation pursuant to BAL-003-2 and BAL-001-2. In order to assess the ISO's ability to maintain those reserve margins necessary for reliable service in real time operation, the ISO considered the capacity needs taking into account the overall outage rate of the existing fleet, which is currently about 10% as set out in Attachment 1. The ISO also based its assessment on meeting a 1-in-5 load forecast level. The combined effect of these requirements established a threshold need for a 20% margin above a 1-in-2 load forecast level.

In assessing the ISO's ability to meet that requirement, the ISO accounted for all other available internal resources, resources under development and forecast to be in service by next summer and reasonable import assumptions.

The ISO also identified a need to consider not only peak load conditions, but also reserve levels at times of high loads when solar resources are not available. These requirements, as set out in Attachment 1, demonstrate higher resource requirements and a greater need for the Midway Sunset Cogen during these periods of solar unavailability than during peak load periods, when some contribution from the existing solar fleet helps meet the need.

Based on the analysis presented in Attachment 1, the Midway Sunset Cogen is required for the ISO to meet the 2021 system-wide reliability needs, due to capacity insufficiency at the net peak hour during the months July-September, 2021. Accordingly, the ISO cannot allow the resource to retire or mothball because, absent these units, it faces an inability to meet reliability criteria during these months. At this time, the ISO designation extends to all three units at this site. Although units A and B are immediately available for operation, unit C can only operate when supplying steam to its local steam host. Notwithstanding an RMR designation, the limitations and requirements imposed by unit C operating as a steam supply may preclude achieving an acceptable RMR arrangement for that unit.

Because of imminent inability to meet reliability criteria applicable to the ISO as a Balancing Authority, and to prevent imminent resource retirement/mothballing, ISO Management proposes to designate Midway Sunset Cogen units as an RMR resource under tariff section 41. Upon designation, MSCC would then be expected to develop its own proposed cost of service based *pro forma* RMR Agreement. ISO staff would then work with MSCC to review each proposed cost of service. Subject to further resource adequacy showings, the RMR agreement would be filed with FERC by MSCC and subject to FERC review.

In conclusion, the ISO's analysis indicates it must keep the specific facilities in operation, after considering all other available resources, to reasonably meet established reliability criteria.

POSITION OF PARTIES

Due to time constraints and the release of this analysis on November 30, 2020, the ISO has not yet discussed the potential RMR designation with stakeholders in a public setting. Written stakeholder comments received after the preparation of this memo, will be discussed at the Board meeting.

CONCLUSION

Management recommends and seeks the ISO Board approval of the designation of the Midway Sunset Cogen units as RMR resources.

ATTACHMENT 1: 2021 Reliability During the Net Demand Period

The ISO's analysis consisted of two steps; first assessing the need for capacity required to meet the contingency provisions of BAL-002-WECC-2a, and then assessing the ability of existing and forecast resources to meet those needs in the summer of 2021.

The ISO considers that a 20% margin applied to a 1-in-2 load level is necessary to provide reliable service pursuant to the contingency reserve provisions. This consists of the 6% operating reserve contingency requirement set out in the standard, allowance for 10% for forced outages, and a 4% margin for higher loads than an average 1-in-2 system load forecast. The 4% allowance for load accommodates forecast loads up to a 1-in-5 level above the 1-in-2 forecast used as a baseline. This allowance is necessary – but not excessive – to provide reasonable certainty that BAL-002-WECC-2a compliance can be achieved, as those compliance requirements are expected to be achieved at all times except immediately following an event that calls for activation of the contingency reserves.

Traditionally, such assessments have focused on the peak load hour. However, with the proliferation of solar resources, both behind the meter and grid-connected, the most critical hours the ISO typically faces now are after the peak load period when load is still relatively high, but intermittent resource generation is below its capacity value and output is rapidly declining. The Preliminary Root Cause Analysis (PRCA) specifically pointed to the net demand peak period—the peak of load net of solar and wind generation resources—as an especially challenging period for grid operations during the August 2020 heat storm. This aligns with the 2020 Summer Loads and Resources Assessment¹ prepared in the spring of 2020, that identified the post-solar window as being the highest risk period. Significant renewable penetration has “shifted” the peak to later in the day and “[o]n hot days, load later in the day may still be high, after the gross peak has passed, because of air conditioning demand and other load that was being served by behind-the-meter solar comes back on the system.”²

The ISO performed a stack analysis focused on meeting load plus having sufficient reserves to meet reliability standards requirements, load forecast variability, and generation forced outage rates, during the most critical hour after peak for each month

¹ 2020 Summer Loads and Resources Assessment located at:
<http://www.caiso.com/Documents/2020SummerLoadsandResourcesAssessment.pdf>

² PRCA, p. 79.

June through October 2021. This translated to a 20% margin overall, applied to the baseline 1-in-2 load forecast. The ISO conducted its analysis on the hour that ends (hour ending, HE) at 8 p.m. Pacific Daylight Time (PDT) because solar generation is or is almost at zero by the end of the hour, but the load remains relatively high compared to the peak.³ Table 1 below shows this relationship. In July and August, the load for HE 8 p.m. PDT is over 1,000 MW lower than the peak of the month, which occurs an hour or two earlier. For June, September, and October, the difference is much smaller.

Table 1: Comparison of June-October 2021 Peak Demand and Load for HE 8 p.m. PDT

Month	Peak demand (MW)	Peak demand hour ending (PDT)	Load for HE 8 p.m. PDT	Peak demand minus HE 8 p.m. PDT load ([B] - [D])
[A]	[B]	[C]	[D]	[E]
June	41,421	7 p.m.	41,104	317
July	44,485	6 p.m.	43,306	1,179
August	44,679	6 p.m.	43,644	1,035
September	45,184	7 p.m.	44,861	323
October	37,271	8 p.m.	37,271	0

Figure 1 below shows five illustrative snapshots of renewable generation in the ISO market from the middle of each month from June through October 2020. Each figure shows that by 8:00 p.m. PDT (shown as military time 20:00) solar generation declines from a peak of approximately 10,000 MW or more to less than 300 MW.

³ The net demand peak does not always occur between 7 p.m. and 8 p.m. PDT. All times throughout this filing are noted in PDT.

Figure 1: Illustrative Snapshots of Renewable Generation in ISO Footprint mid-June-October 2020



The ISO reasonably assumed zero solar generation in the stack analysis recognizing the minimal solar output at the end of the hour, if not over the whole hour, for the HE 8 p.m. in each of the summer months. For all other resources, the analysis reflects the 2021 net qualifying capacity (NQC) values available for each month, resources that are expected to be online by summer 2021 by month, and resource adequacy imports based on the historical average from 2015 through 2020 for each month. The total resource stack compares to the California Energy Commission’s (CEC’s) 2019 Integrated Energy Policy Report (IEPR) mid-mid managed 2021 hourly demand forecast for the ISO footprint, plus a 20% margin.⁴

⁴ Note that the CEC IEPR data is in Pacific Standard Time, which does not reflect daylight saving.

Figure 2 below shows the stacked resource columns for June through October 2021 compared with the load for HE 8 p.m. PDT plus a 20% PRM. Table 2 below provides the numerical comparison between the total resource stack versus the load for HE 8 p.m. PDT plus a 20% margin. For illustrative purposes the table also includes a 15% margin applied to the load for HE 8 p.m. PDT.

Figure 2: June – October 2021 Resource Stack vs. Load for HE 8 p.m. PDT Plus 20% PRM

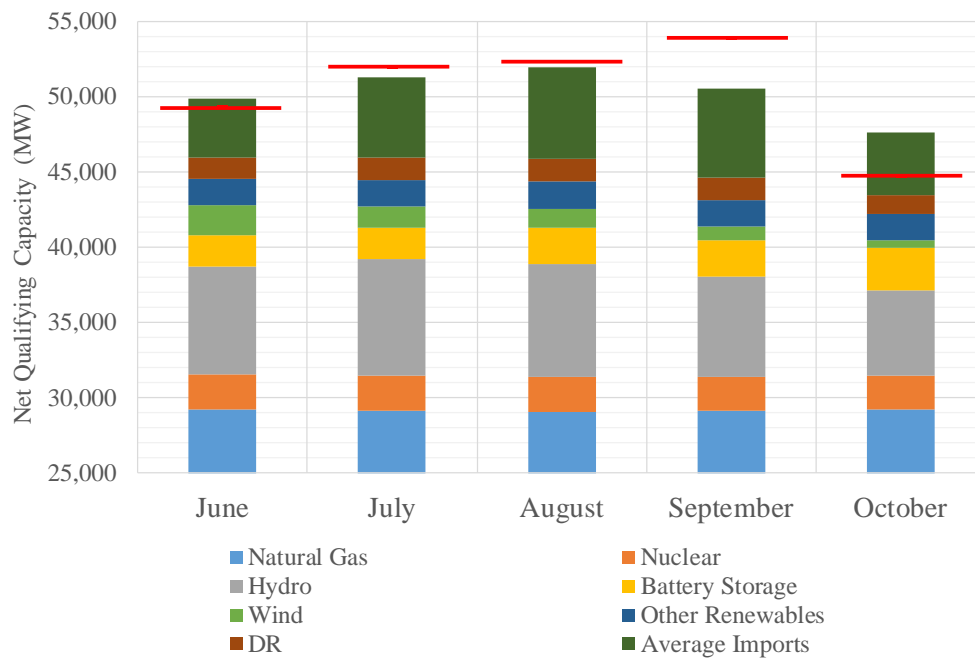


Table 2: Comparison of 2021 Total Resource Stack and Load for HE 8 p.m. PDT Plus 15% and 20% Margin

Month	Total resource stack with average RA imports (MW)	15% PRM plus load for HE 8 p.m. PDT	20% PRM plus load for HE 8 p.m. PDT	Total resource stack minus 15% PRM plus load ([B] - [C])	Total resource stack minus 20% PRM plus load ([B] - [D])
[A]	[B]	[C]	[D]	[E]	[F]
June	49,855	47,270	49,325	2,585	530
July	51,241	49,802	51,967	1,439	(726)
August	51,921	50,191	52,373	1,730	(452)
September	50,518	51,591	53,834	(1,073)	(3,316)
October	47,601	42,861	44,725	4,740	2,876

The results show a distinct difference between the five months. For June and October, the 20% margin level (shown as horizontal red lines in Figure 2) is below the total resource stack. This signals that for June and October there may be sufficient net qualifying capacity (NQC) available for procurement to satisfy a 20% margin. In other words, for these two months load serving entities may be able to contract with existing resources to sufficiently respond to the most critical hour after peak and the Midway Sunset Cogen facility is not required for reliability purposes. Table 2 provides the exact values.

However, the resource stacks in July through September fall below the 20% margin level for HE 8 p.m. PDT as shown on Figure 2, even with Midway Sunset Cogen assumed in service. This means there is insufficient capacity to meet the requirement even when including all of the resources on the NQC list, new resources expected online by summer 2021, plus an average level of resource adequacy imports. For July and August the shortfall between the total resource stack capacity and the load plus 20% margin is approximately 700 MW and 450 MW, respectively, (shown as a negative value in Table 2, column [F]), and the gap for September is over 3,300 MW (shown as a negative value in Table 2, column [F]) based on a 20% margin.

To test the reasonableness of conclusions in its analysis, the CAISO also conducted a sensitivity study using the maximum RA import (contracted) showings over the past five years instead of the average contracted import capacity used in the preceding analysis. The maximum RA import over any summer month over the last 5 years was the showing for September 2020, that was approximately 8500 MW. Even with that assumption, the margin would only reach 18% for September, falling short of the 20% margin the ISO found necessary to meet BAL-002-WECC-2a requirements on a forecast basis.

The pending loss of the Midway Sunset Cogen facility, which is capable of providing service over the critical post-solar window, will exacerbate reliability shortfalls in meeting the requirements of BAL-002-WECC-2a and, it therefore must remain online to help the ISO close the gap to meeting the mandatory reliability standards. The capacity the units provide will assist in meeting load levels in the post-solar window, and the dispatchable units A and B will provide further flexibility to meet the ramping requirements necessary as the solar output drops in the late afternoon.