

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Establish
Policies, Processes, and Rules to Ensure
Reliable Electric Service in California in the
Event of an Extreme Weather Event in 2021.

R.20-11-003

**REPLY TESTIMONY OF DR. KARL MEEUSEN ON BEHALF OF
WÄRTSILÄ NORTH AMERICA, INC.**

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A. Introduction

My name is Dr. Karl Meeusen, Ph.D. My credentials are contained in my opening testimony and proposal.

In my opening testimony, I introduced Wärtsilä's Path to 100% study for California, which demonstrates that installation of new efficient, flexible, and convertible thermal balancer resources now can accelerate California's 2045 decarbonization efforts.¹ These generation resources currently combust natural gas or natural gas and hydrogen blended fuels, offer highly flexible operating characteristics (e.g., less than 5-minute start up to 100 percent load, minimum operating levels as low as 10 percent per engine,² low start-up costs) to balance the intermittent generation of variable renewable resources, and can be converted to combust 100 percent green (renewable) hydrogen-based fuels in the future. I described how procurement of such convertible balancing technology today can serve the dual purpose of supporting near-term reliability needs and long-term emissions reductions cost-effectively, while maintaining consistency with the objectives of both this proceeding and R.20-05-003 on integrated resource planning. In my reply testimony, I offer comments regarding the following topics based on other parties' opening testimony recommendations:

1. Procurement of convertible thermal balancer generation resources currently capable of combusting hydrogen blends can enhance reliability, reduce emissions, accelerate the renewable transition, and do so at low cost to the system.
2. Increasing the planning reserve margin (PRM) will increase reliability and could reduce emissions.

B. Replies

- 1. Procurement of convertible thermal balancer generation resources currently capable of combusting hydrogen blends can enhance reliability, reduce emissions, accelerate the renewable transition, and do so at low cost to the system.**

¹ See Appendix B of Wärtsilä's opening testimony.

² Most generating stations relying on Wärtsilä engines utilize multiple engines, making it possible to run a 50 MW facility at as low as a couple MWs.

Multiple parties, such as the Sierra Club and the Protect Our Communities Foundation (PCF), oppose procurement of additional gas capacity, expressing concerns about these resources' contributions to both system reliability and climate change. The PCF recommends the Commission ban more fossil fuel procurement and take actions to reduce outages from existing generation facilities, both planned and unforced, especially during the summer.³ The Sierra Club adds that “any gas procurement that requires a system upgrade carries a significant risk of becoming a stranded asset, as the facility may become obsolete before the facility can pay off the cost of the upgrade.”⁴

Wärtsilä, like the PCF and Sierra Club, is committed to mitigating climate change and promoting system reliability, and although Wärtsilä's engine power plants currently operate on natural gas, these resources are primed to alleviate the aforementioned concerns. As noted in my opening testimony, Wärtsilä's balancer engines offer reliability, resiliency, and lower carbon emissions at start-up relative to existing peaking resources.⁵ This last point is particularly important as increased variable renewable energy penetration will result in the need for greater flexibility from firm generating resources to continuously balance the variability of renewable generation. Moreover, replacement of aging gas peakers with Wärtsilä's balancers can offer not only emissions reductions through improved flexibility and thermal efficiency but also immediate opportunities for further decarbonization via hydrogen blending of up to 25-30 percent.

In this vein, Wärtsilä agrees with Diamond Generation Corporation's (Diamond's) recommendation that hydrogen-capable resources should be prioritized in Phase 2 of this rulemaking and any longer-term procurement authorizations adopted in this phase of the OIR.⁶ At the same time, new convertible balancing resources would not be at risk of becoming stranded assets because they could be converted to run on renewable hydrogen-based carbon neutral fuels (e.g., synthetic ammonia, methane, and methanol) by 2025.⁷ Finally, the cost-savings of

³ PCF opening testimony, pp. 17-22.

⁴ Sierra Club opening testimony (Cara Bottorff), p. 13.

⁵ Wärtsilä opening testimony, pp. 7, 12.

⁶ Diamond opening testimony, pp. 3-4.

⁷ Wärtsilä opening testimony, p. 8.

procuring convertible balancers are two-fold: 1) continued investment in existing peakers that are at risk of becoming stranded assets is avoided; and 2) once balancers are converted to fully operate on hydrogen-based carbon neutral fuels, they offer a cost-optimal source of long-duration energy storage, as shown in the Path to 100% study.

As previously expressed by the PCF and Sierra Club, the Commission need not prematurely commit itself to support existing inflexible resources or resources that may become stranded assets. Maintaining these resources could also hinder the transition to carbon-neutral fuels such as renewable hydrogen-based fuels. Mindful of this issue, Calpine is supportive of long-term contracts for existing gas generation but clarifies that such contracts could reasonably be conditioned on commitments to reduce emissions through hydrogen blending.⁸ Although existing gas generators are not necessarily as flexible or as easily convertible as new balancers, Wärtsilä agrees with Calpine that future contracts with thermal resources should require hydrogen blending. Taking this a step further, the Commission should also consider full conversion to hydrogen-based carbon neutral fuels within a predefined term.

2. Increasing the planning reserve margin (PRM) will increase reliability and could reduce emissions.

Wärtsilä is supportive of parties' testimonies that advocate for increasing the planning reserve margin (PRM) through summer 2023 and beyond. For example, the California Independent System Operator (CAISO) and the Public Advocates Office at the California Public Utilities Commission (Cal Advocates) both recommend adoption of a 17.5% PRM for the gross peak demand, and additional reserve margin requirements for the net peak demand.^{9,10} It should be noted, however, even a 17.5% PRM is low when compared to other regions with lower renewable penetration rates. For example, the ISO-NE uses a PRM of 19.8%, while the NYISO has a 20.7% PRM.¹¹ An expanded PRM would mitigate reliability risks associated with extreme

⁸ Calpine opening testimony, pp. 4-5.

⁹ CAISO opening testimony, p. 1.

¹⁰ Cal Advocates opening testimony, p. 2.

¹¹ For NYISO's PRM, see <https://www.nysrc.org/PDF/Reports/2021%20IRM%20Study%20Report%20Body%20Final.pdf> p. 4. For ISO-NE's PRM, see https://www.iso-ne.com/static-assets/documents/2021/06/a6_net_icr_representative_future_net_icr_and_opcap_analysis_for_2021_rsp.pdf p. 9

weather events, such as sustained high temperatures. Furthermore, the resources procured to satisfy an expanded PRM could provide emissions reductions benefits if they displace generation from diesel backup generators that are currently being relied upon during emergencies.

C. Conclusion

Wärtsilä is ready and willing to work with the Commission to address near-term capacity needs. Procurement of new convertible balancer generation resources can not only improve system reliability, but also reduce system costs and emissions over the short- and long-term.

VERIFICATION

I, Dr. Karl Meeusen, am authorized to make this verification on behalf of Wärtsilä North America, Inc. I declare under penalty of perjury that the statements in the foregoing Reply Testimony are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters, I believe them to be true.

Executed on September 10, 2021, at Annapolis, Maryland.

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