



Friday, January 31, 2014

Karl Meeusen
CAISO, Market Design and Regulatory Policy Lead
250 Outcropping Way
Folsom, CA 95630

Re: Comments to the California Independent System Operator's Flexible Resource Adequacy Criteria and Must-Offer Obligation, Market and Infrastructure Policy Fifth Revised Straw Proposal, dated January 17, 2014

Dear Mr Meeusen,

Wärtsilä North America (Wärtsilä) is happy to provide the following comments to the California Independent System Operator's Flexible Resource Adequacy Criteria and Must-Offer Obligation, Market and Infrastructure Policy Fifth Revised Straw Proposal, dated January 17, 2014. Wärtsilä is a leading supplier of modern, environmentally advanced, highly efficient and dynamic power plants that allow the maximum amount of intermittent renewable power generation. We offer solutions for power generation markets, from base load to peaking and load following, as well as dynamic system balancing and ultra-fast grid reserve for current and future capacity markets. Our fast track deliveries of complete power plants, together with long-term operation and maintenance agreements, offer our customers flexible capacity in both urban areas and the most demanding remote environments.

In California, our technology is currently serving the grid in three locations: Modesto 50MW, Humboldt 163 MW and Red Bluff 50 MW.



Comments to: Meeusen, K (Jan 17, 2014) Flexible Resource Adequacy Criteria and Must-Offer Obligation, Market and Infrastructure Policy Fifth Revised Straw Proposal, dated January 17, 2014

A) Sub-3 hour net load changes

Table 2, p. 27- The largest 15 min net load ramps are up to 20% (2.118 GW) of the largest 3 hour ramp (9.635 GW), for Dec 2014 (last row, Table 2).

The focus is maintained on the 3 hour product, while it was noted that 15-90 minute ramps may not be sufficiently met by the proposed 3 hour product.

The concern is that if focus is entirely on securing 3-hour ramp capacity, CAISO may not be able to assure reliability at shorter time scales. Example- resources meeting the 9.635 GW 3-hour ramp (average aggregate ramp rate of 53.53 MW/minute) can only meet the 2.118 GW max 15 min ramp if the 9.635 GW (available in 3 hours) can also provide 2.118 GW in 15 minutes (average aggregate ramp rate of 141.2 MW/minute).

Question/Comment: Does CAISO see this (shorter time-scale) need being met by other resources/market mechanisms?

Question/Comment: Would CAISO consider two additional categories? One suggestion would be;

- Monthly Max 15-minute limited 3-hour Net Load change
- Monthly Min 15-minute limited 3-hour Net Load Change

Each defined over 3 hour periods, where Net Load may not exhibit a continuous up-ramp, but which do include significant 15-minute net load changes. Therefore the magnitude specified will equal the largest (and smallest) 15 minute ramp needs. By definition, if flexible capacity can attend to 15 minute net load changes, they can also be useful for 60, 90 and 180 minute net load changes. This may require additional categories (5.4) and definitions of their must offer obligations (5.5).

B) Counting of Flexible Capacity Resources (6)

The definitions for Effective Flexible Capacity (EFC) are divided into 2 categories based on start-up time (SUT): Units with SUT > 90 minutes and Units with SUT <= 90 minutes.

While the summation of EFC may indicate supply of flexible GW to match the largest 3-hour net load change, there is insufficient detail to specify how the aggregate EFC will do this.



Units with SUT > 90 minutes are ramp rate limited and can be considered “Spin EFC”. Because these units are spinning, there are no start-time lags and it can reasonably be assumed they are capable of going from lower loads to the higher load necessary to meet the X GW max 3-hour net load change (yet insufficient information to guarantee it meets the ramp rates needed for intra-3-hour net load changes).

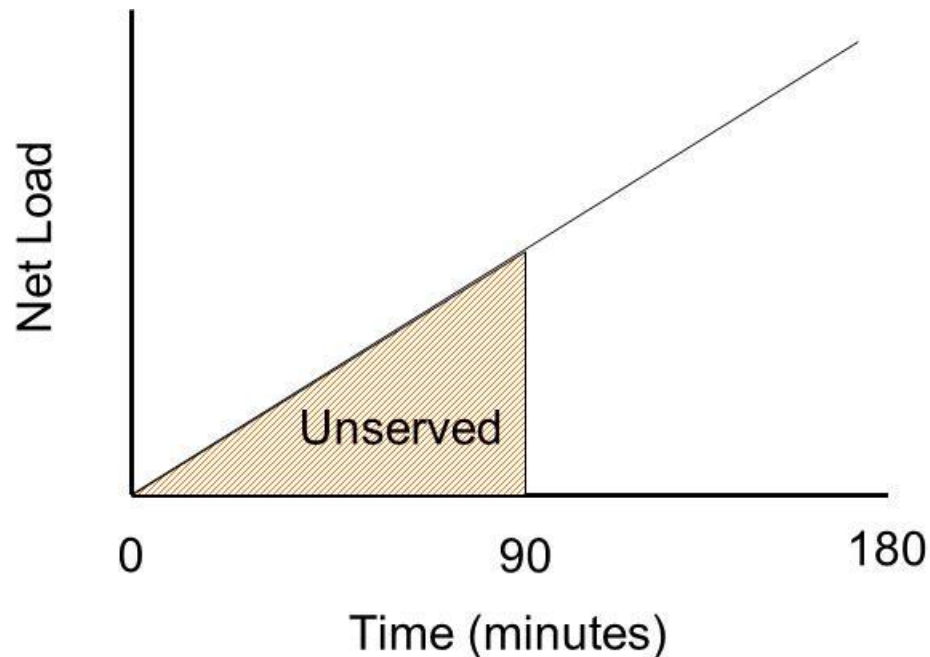
Units with SUT ≤ 90 minutes are limited by SUT and ramp rate. We appreciate CAISOs use of thermal non-spin units as flexible capacity as they provide substantial benefits in providing the needed capabilities while doing so with zero CO₂ generation, and in the context of California’s potential goal of 50% RPS, a valuable means to reduce potential over generation.

Many thermal units with SUT < 90 min can also reach full load in 180 minutes, so they can effectively bid their entire NQC as EFC.

Comment/Question: The concern can best be addressed with a hypothetical scenario. Imagine;

- Max Net Load change over 180 min is a linear ramp
- ALL flexible capacity resources for an SC are in the category SUT ≤ 90 min
- Each unit had SUT = 90 min, and could go from min to full load in 90 min

Under this scenario not a single MW of ramp capacity is provided by flexible capacity resources for the 1st 90 min of net load change, essentially leaving the 1st 90 minutes unserved (see Fig. below). This shortfall can potentially be filled by alternate mechanisms (other sources of reserve energy or ramp capacity), but it would be ideal if the majority of net load change were provided by assets counted towards flexible capacity resources, because that is their stated purpose.



Recommendation: Scale the definition of EFC for units with SUT ≤ 90 min relative to the amount of area they provide under the net load change curve for the expected maximum monthly 3 hour net load change. This would place higher emphasis and weighting on units with shorter start times and faster ramp rates, and would give a clear indication to CAISO regarding alternate mechanisms it must employ to meet any shortfalls. It should also be noted that the larger the amount of EFC provided by short start time, high ramp rate non-spin resources, the greater the potential to help CA meet its goals for reducing CO₂ emissions and potential over generation associated with RPS > 33%.

Wärtsilä appreciates the opportunity to submit the above comments. Should you have any questions, please feel free to contact me.

Sincerely,

Joseph Ferrari
Market Development Analyst – Americas
Wärtsilä Power Plants
900 Bestgate Rd, Annapolis MD 21401
Tel: 410-573-2100
Joseph.ferrari@wartsila.com