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Reliability Forecasting Methodology Issues Paper

The Australian Energy Council (AEC) welcomes the opportunity to submit to the Reliability Forecasting Methodology Issues Paper: How to produce the reliability forecast under the Retailer Reliability Obligation (RRO).

The AEC is the industry body representing 23 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. These businesses collectively generate the overwhelming majority of electricity in Australia and sell gas and electricity to over 10 million homes and businesses.

Introduction

The RRO places AEMO's forecasting role in the critical position of recommending whether to call a T-3 or T-1 gap. If called, a major readiness and compliance exercise is undertaken by the industry, the costs of which will ultimately be borne by customers. It is therefore crucial that AEMO has assessed reliability using the best and fairest possible interpretation of the data to hand.

The AEC accepts reliability forecasting necessarily involves some judgement in dealing with uncertainty. In that regard it is crucial that such judgement is made expertly and in the absence of any bias favouring either conservatism or cost minimisation. Transparency is key to gaining stakeholder confidence in these judgements, and AEMO's work to improve this, through this paper and through the Forecasting Reference Group, are most welcome.

The AEC supports AEMO's approach of aligning its RRO forecasting techniques with its other forecasting responsibilities. If performed properly, a T-1 or T-3 gap or non-gap forecast should not surprise the market as it would have already been anticipated in the annual Electricity Statement of Opportunities (ESOO) and the weekly MTPASA.

The Issues Paper necessarily mostly covers matters related to forecasting in general rather than AEMO's RRO role, and likewise our comments below. With respect to actions that cannot be implemented in time for the start of the RRO, we hope they will be taken into account as AEMO continuously improves its forecasting processes over time.

The Role of the T-3 forecast

AEMO must recognise the importance of its role in providing its best possible forecast at T-3. The RRO is intended to be invoked only when a reliability shortfall is apparent three years into the future, and is then not remedied in the subsequent two years. The RRO is intentionally designed to *not* address shortfalls that emerge unexpectedly with less than three years' notice as this would cause rushed contracting arrangements with costs borne by customers. For such unforeseen deteriorations in the outlook, the design intentionally relies instead on the emergency safety-net mechanisms, rather than participant re-contracting.

This is the reason for the "double-gate" design. AEMO has been tasked with a critical role in deciding when to leave the T-3 gate closed, and the design assumes this function will be properly exercised according to the conditions at that time. There are, however, several areas in the paper where AEMO appears to bias the T-3 decision towards leaving the first gate open *just in case* conditions deteriorate. This misunderstands the role of the T-3 decision which precisely empowers AEMO to leave the first gate closed. And where this decision is made in good faith, AEMO should feel no regret if conditions subsequently deteriorate.

Indeed if AEMO were not expected to act this way, the design would include no first gate.

Demand Forecasts

When calculating Unserved Energy (USE), the characteristics of the 10% Probability of Exceedance (PoE) demand trace is most critical. Consistent with historical practice, AEMO will select historical actual demand traces and scale them such that their peak aligns with the 10% peak demand forecast for that future season.

In doing this it is important to ensure the demand trace's shape does not become unrealistic. If many days from a mild year are scaled up in this manner, then the new trace will unintentionally contain an unrealistic number of days with near 10% extreme demands, which would produce excessive USE.

A "10% summer" still implies that only one of the days in the entire summer will actually experience the 10% POE conditions. In order to avoid other days from a non-extreme historical trace being unrealistically scaled, there are several options, such as:

- Assuming all the other days fall within a normal seasonal distribution, i.e. one could assume only a 50% chance that the second highest day of a 10% summer would exceed the 50% POE demand forecast; or

- drawing a series of no more than, say, three consecutive days (representing a heatwave) from another historical year's 10% event and scaling only these three days for the year being modelled.

Other days in the forecast year would then be scaled only according to forecast energy growth only.

The paper proposing reducing the expected performance of energy efficiency in extreme weather upon the provision of upcoming consultancy advice. It is not apparent why this would be the case. In any event, the effect, if it exists, should already be present in the historical extreme demands from which the shape of projected 10% days are derived.

Large Industrial Loads

The AEC supports AEMO's direct survey approach to these loads. The proposed requirement to take into account only formally announced closures may prove too restrictive, as in some cases companies will resist making such announcements even when closure circumstances are evident. AEMO should leave itself some discretion in interpreting this survey information. For example it could call upon independent economic advice in how to treat certain large industrial loads given the contextual circumstance, and be able to rely on this advice rather than announcements.

Availability of Network Critical Peak Programs

When performing long and medium term reliability forecasting, the long-term forecaster must assume that the short-term operational decision making is effective. AEMO already takes this approach in many areas, such as:

- Assumptions that planned outages not occur at the critical time. This is the correct approach, despite the fact that operational errors can result in the regretted permission of a discretionary outage that ultimately contributes to a shortfall.

- Assumptions that plant will be manned, fuelled and committed at the critical peak time. This is also correct, despite the fact that it assumes the effectiveness of short-term forecasting and management processes.

To do otherwise would not be sensible, as operational effectiveness cannot be addressed through installation of more capacity.

The treatment of demand-side programs, including network programs, is no different. If the program is designed to be exercised in conditions consistent with the extreme peak, then it is reasonable for the forecaster to assume its operator will effectively operate it in that way.

It is understood that AEMO is concerned that as some programs are contractually only available on five days a summer, and that its scheduler may fail to predict the critical day. AEMO should not attempt to presume operational ineffectiveness. The five peak day challenge is contextually similar to, say, the operation of some hydro schemes where AEMO correctly assumes its operator will successfully schedule the release of very limited energy stocks at the time of greatest market need.

New Entrant Generation

Commitment criteria will be a critical input to the T-3, and to a lesser extent, the T-1 trigger. The AEC supports ongoing refinement of the criteria based on its demonstrated accuracy. The AEC understands that AEMO recently introduced a “Com*” category with less strict criteria than the “Committed Project” criteria, but is now withdrawing it. It is important this decision is considered carefully.

Given the importance of committed plant to determining an instrument, it would be worthwhile AEMO studying and publishing the historical accuracy of the commitment criteria. For example it could assess over the last, say, five years, how many false positives and unidentified developments actually occurred. Such analysis would provide data regarding the decision to discontinue the Com* category, as well as the effectiveness of the general Commitment category.

Two of the major new supply sources, being large-scale solar and large-scale batteries, have very short commitment lead times. In this case, a form of Com* may be essential to capture such plants that at T-1 have not met all criteria but are nevertheless extremely likely to complete their construction. The AEC understands, for example, that some recently constructed solar farms began generating *before* they were listed in AEMO’s Generation Information Page as Committed projects, although they were listed as Com*.

The AEC is concerned by the implication in the text (section 3.2) that the Com* is only being withdrawn as AEMO feels it needs to intentionally bias its inputs conservatively at T-3 in order to retain a power to call the instrument at T-1. The AEC considers this an inappropriate motivation. As discussed above, AEMO’s role at both times should be to forecast the most likely outlook in an unbiased manner.

Dispatchable Generator Availability

AEMO appropriately collects accurate information about the expected de-rating of generators during the high temperatures expected to coincide with 10%POE demand conditions. AEMO presently uses temperature-reduced capacities for its supply availability calculations. Two points should be noted in this:

- AEMO needs to adjust historical data to ensure that such de-ratings have not altered measurements of historical forced outage levels – as this would double-count the effect.

- The growth of variable renewable generation means that tight supply/demand conditions are now more likely to occur away from the pure 10% POE ambient conditions, when temperatures are less extreme, for example after sunset. Applying the fully de-rated capacity in these conditions is incorrect. It would be appropriate to obtain a de-rating versus temperature relationship, and apply this in accordance with the ambient conditions implied by the demand trace and time of day.

Forced Outage Rate Variability

The proposal, in 3.4.1, to apply varying Forced Outage Rates (FORs) is incorrect and should be discarded. It is the role of the random simulation model to recreate statistically credible plant variability, and preferences should never be induced by artificially adjusting FOR data. It may be true that recent years have had more actual FOR variability than the model has anticipated. Whilst this could indicate an issue in the model's application of failure rates, it could also be that recent years simply had high volatility due to chance. In either case, AEMO should not be manipulating FOR inputs in this arbitrary manner.

The nature of outliers modelling means that applying successive 1.8%, 3% and 4.2% annual FORs would create considerably more USE than a single average 3% FOR, and so such an approach will incorrectly bias the outcome.

This problem of the model under-estimating volatility in its outputs, should it exist, must be considered and rectified with a scientific approach rather than attempting to counteract it by introducing artificial volatility into its inputs.

Forced Outage Rate Historical Sampling

The AEC has some experience with historical FOR collection thanks to its annual Electricity and Gas Australia (EGA) publication which aggregates these confidential statistics. Actual FORs have always shown large stochastic variation from year to year. Many power stations have experienced sequential years in their history where actual FORs far exceeded the long-term average, then reverted. This is unexceptional, it is the expected behaviour of such a random parameter.

AEMO's approach appears to strongly presume contemporary FORs are and will remain far more adverse than historical and that it must therefore apply a much higher statistic. The AEC is unconvinced this case has been sufficiently made to justify such an approach which has major impacts on forecast USE and therefore customer costs.

Whilst current operational practices and plant age will influence FORs, the dominant issue is the asset's underlying construction. When a station's FORs move away from the long-term average for a few years, this could indicate a new trend, but is more frequently the simple expression of random variability. In the absence of specific information regarding the former, AEMO should always assume the more likely latter explanation.

In that regard, AEMO should always take advantage of the full historic time series of outage information of a given plant to determine the most accurate current FOR, i.e. it should not discard older information without identifiable rationale. To discard historic information without good cause means AEMO cannot benefit from the rich lifetime data set about the underlying asset that can overcome the anomaly problem.

AEMO's proposal to discuss reasons for variation from long-term averages with the relevant plant owners is supported. It would be also be useful to seek and publish expert international advice about how FORs can change in middle-aged, conventional plant. If after these discussions and advice AEMO remains unable to identify a rationale for a change to a new FOR, it should assume recent anomalies are simply that normal expression of natural statistical variation, and apply a long-term average FOR.

Selection of Reliability Gap Period

The RRO requires AEMO to identify a gap period, a novel task without historical practice to draw upon. AEMO has proposed identifying those intervals where Loss of Load Probabilities (LoLP) exceed arbitrary specific percentages. The AEC understands that other stakeholders will propose other techniques, also based on LoLP, but that may remove the need for application of an arbitrary percentage. The AEC supports AEMO studying their practicality.

In the absence of better approaches emerging, the AEC supports AEMO's arbitrary LoLP technique. The AEC thanks AEMO for the provision of the addendum which shows some examples of how the suggested 2% and 5% thresholds would operate in some real examples.

Continuing from our earlier comments that the RRO assumes that AEMO will apply the same conservatism to both the T-3 and T-1 assessments, the AEC believes the thresholds should be equal. As discussed earlier, the "double-gate" design is intentional – the RRO is only supposed to apply to shortfalls that exist at both T-3 and T-1. If it has done its forecasting role to the best of its ability, AEMO should not feel concerned if a benign T-3 outlook subsequently limits AEMO's freedom to invoke the instrument at T-1. As explained above, such outcomes are intended by the RRO design.

With respect to the percentage to be used at both T-1 and T-3, the AEC recognises the proposed technique requires judgement, with the period roughly consistent with those critical periods which we would expect prudent retailers to be well contracted. From the data provided, it would appear that at least a 5% value should be applied to both, with possibly the most appropriate being something between 5% and 10%.

South Australian Derogation

The paper does not discuss any changes to AEMO's actions in the case where the SA minister has unilaterally invoked the instrument. The AEC supports AEMO, in this case, acting in the same manner with respect to identifying gap MW and timing periods, even if these produce a null outcome.

Any questions about our submission should be addressed to me by email to ben.skinner@energycouncil.com.au by telephone on (03) 9205 3116.

Yours sincerely,

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