
Agenda Item 6: Assessment of Fuel Capacity Requirements to meet System Reliability in the SWIS

1. BACKGROUND

In order to be assigned Capacity Credits from the Reserve Capacity Mechanism (RCM), each generator (other than Intermittent Generators) must demonstrate to the Independent Market Operator (IMO) that it is likely to be available at “daily peak demand times”. Among other things, Facilities must demonstrate that fuel storage, supply and transport arrangements are sufficient to allow 14 hours of continuous operation.

As was noted at the 11 March 2009 MAC Meeting, there is a common view among many stakeholders that the 14-hour requirement is excessive when applied to all Facilities. A range of plant availabilities operate in the South West interconnected system (SWIS) and it is normally expected that many Facilities will only be required for shorter durations in order to supply the SWIS demand profile. As such the IMO considered that modelling was required to evaluate whether a reduction to the 14-hour requirement could reduce costs to the market without impacting system reliability.

The IMO engaged McLennan Magasanik Associates (MMA) to undertake this modelling. MMA was asked to analyse the interpretation of “daily peak demand times” and simulate cost savings and system reliability for several alternative methods to the current 14-hour fuel inventory requirement.

This paper outlines the results of MMA’s analysis. The full report from MMA is attached as Appendix 1.

2. REPORT RECOMMENDATIONS

The report points out that the SWIS operates with a mix of plant types for which fuel storage volumes could be reduced as the marginal cost of operation increases, thus linking fuel requirements to the Dispatch Merit Order. However, dispatch requirements for intermediate and peaking plant can change according to various factors (e.g. weather variations, forecast accuracy, reliability of all generators in system, intermittent generation contribution and gas supply reliability). To best account for such variation, MMA recommends that a long-term minimum standard be applied to physical storage and long-term supply contracts to ensure long-term security of supply, with a mechanism to relax fuel requirements in the short term when feasible.

The report then lists a range of options to be explored, along with the advantages and disadvantages of each:

- The current 14-hour requirement;
- A recalculation of the current method based on meeting the unserved energy (USE) criterion with full capacity credits at 41°C;

- An enhancement to the previous method that allows non-firm fuel supplies to be credited with a discount mechanism;
- Setting minimum storage volumes based on facility class and indicative merit order; and
- An enhancement to the previous method permitting trading of stored fuel obligations within the plant classes.

The options listed become increasingly complex, with associated increases in implementation and administration costs.

The benefits of relaxing the fuel storage requirements in non-peak periods are also analysed, considering reductions in the April-November non-peak season, reductions on weekends and the combination of both. The economic benefits are calculated by assuming that generators can sell their spare gas transport capacity to other users at a reduced value. These simulations show that the limit for these periods can be reduced to 10 hours with negligible increases in USE. They also show that most of the economic benefits are obtained by reducing the fuel storage requirement in the non-peak season with only small benefits from a weekend reduction. In order to yield positive economic benefit, the value of recovery of gas transport cost would need to be 15% or greater. Potential trading mechanisms for reducing fuel storage are discussed.

The IMO Board identified the need to investigate dual fuel capabilities as part of this study. This has been conducted using gas supply disaster scenarios identified by the Gas Supply and Emergency Management Committee report produced for the Office of Energy. The effect of various mitigation alternatives are simulated:

- Dual-firing conversion of some CCGT units;
- An increase in fuel supply limit from 14 to 18 hours of operation per day;
- Utilisation of 100 TJ/day from increased gas storage for 90 days; and
- More secure liquid fuel supply, with an increase in availability of 3 days of fuel per week to 4.5 days.

The most significant impact came from the gas storage option, with USE reducing to 25% of the base case value. A 50% reduction was achieved through a combination of the dual-firing conversion and 18 hour fuel storage increase. The last option, in isolation, provided little benefit in reducing USE.

While the immediate availability of liquid fuel can significantly reduce the severity of a disaster event, the infrequency of such events can mean that Market Participants may not make this investment. Thus, MMA recommends in the paper that consideration be given to creating a market-based mechanism that incentivises reserve liquid storage capacity and gas storage capacity. This would include a payment for reserve storage capacity for both liquids and gas.

3. CONCLUSION

The IMO recommends that the firm fuel requirement of 14 hours be relaxed to 12 hours. It is difficult to recommend the more complex proposals provided in the paper for sculpted fuel arrangements at this stage. This is given the Gas Supply and Emergency Management Committee recommendations for establishing bulletin board/gas trading arrangements and a Gas Statement of Opportunities.

The IMO also recommends that the options for incentivising dual fuel and gas storage capabilities proposed in the paper be progressed.

4. ACTIONS

It is recommended that the MAC:

- **Review and discuss** the recommendations arising from the “Assessment of Fuel Capacity Requirements to meet System Reliability in the SWIS” report.