

## **ISSUE 9: USE OF PEAK DEMAND IN PRE-DISPATCH SEQUENCE**

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### **Date Raised**

Initially raised in the first Market Surveillance Panel (MSP) Report on Oct 07, 2002, and further discussed in subsequent MSP reports.

### **Description**

The Market Surveillance Panel first observed, in its Oct 2002 Report, that the pre-dispatch prices have been consistently higher than the real time prices. The MSP identified several factors contributing to this difference including the demand forecast error. One of the components of the forecast error is the use of the forecast peak demand as opposed to using the forecast average demand value expected within the hour. This component introduces a natural bias in the forecasting of the HOEP. The MSP did not recommend that the IMO discontinue the use of the peak demand in favour of the average demand because of the potential impact on system reliability. Instead, the MSP recommended many other approaches that could reduce the price forecast error.<sup>1</sup>

The MSP has identified the use of peak demand as a problem for two reasons. First, the use of peak demand results in a persistent positive difference between the pre-dispatch price (market signal) and the real-time prices (HOEP, at which loads pay for their consumption. This provides market participants with an inaccurate market signal from which to plan their operations. Second, the use of peak demand means that too many imports (too few exports) may be scheduled in pre-dispatch than what are required (efficient) in real-time, especially in those intervals with demand lower than the peak. Similarly, the use of peak demand may affect the start (shut-down) decision of fossil units with the units either starting sooner or shutting down later than is efficient given their start-up costs and speed-no load costs.

### **Background**

The Market Rules (Chapter 7, Section 5) mandates the IMO to “determine pre-dispatch schedules in order to provide itself and market participants with advance information and projections necessary to plan the physical operation of the electricity system.” The Rules describes the information that the IMO needs and the algorithm that the IMO should take in the pre-dispatch sequence. However, it does not explicitly require the IMO to use the forecast peak demand.

The use of peak demand was introduced as a result of the testing that took place before market opening. In the testing period, the forecast average demand,

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<sup>1</sup> See the MSP Report on March 24, 2003

rather than the estimated peak demand was used. The IMO observed that quite often fewer resources were scheduled in pre-dispatch than were required to meet the real time peak demand. This raised a potential reliability issue for the real time dispatch. The pre-dispatch scheduling of additional online units induced by the use of peak demand ensures that sufficient supply is available in real-time to absorb the potentially large interval-to-interval changes in demand and to minimise the occurrence of operating reserve shortfalls, which are frequently caused by contingencies such as failed transactions, forced outages or the under-performance of generators. Having the additional units on-line also reduces short-term price volatility.

There is some question whether it is possible for the IMO to use the average demand rather than the peak demand during some delivery hours when the demand does fluctuate much within the hour.

### **Why a Pricing Issue**

The use of peak demand impacts the guiding principles of efficiency and transparency.

First the use of peak demand impacts market efficiency as it results in an inefficient scheduling of resources in pre-dispatch (too many imports, too few exports or possibly the advanced start or delayed shut-down of fossil units causing unnecessary fuel costs and speed-no load costs). The pre-dispatch information is, as a matter of fact, the only and most up-to-date market information that the market participants have for their business decisions in the coming hours. An upward biased pre-dispatch price will provide market participants with an inaccurate market signal, and thus could result in inefficient pre-dispatch schedules.

Second, the use of peak demand may lead to inefficient dispatch in real time. The use of peak demand tends to over-forecast the pre-dispatch demand and thus leads to the dispatch of more high cost imports and/or fewer exports than is economic. In real time, all imports (including those high-priced ones) are treated as non-dispatchable, and as a result may crowd out the low cost domestic offers when the real time demand is actually lower than the pre-dispatch forecast.

Third, the use of peak demand impacts market transparency as it leads to incorrect market price signal in pre-dispatch. Because the pre-dispatch demand and price are the only market signals that market participants have for the coming hours, accurate market signals and more information regarding the key factors driving the difference between pre-dispatch signals and real-time outcomes is important.

### **Impacts of Issue**

#### *Market Impact*

The use of peak demand in the pre-dispatch sequence will lead to two adverse impacts to the market. First, the use of peak demand as opposed to the average demand will tend to over-forecast the real time price, and thus send inaccurate market signals to the market participants. This impacts the guiding principle of transparency. Second, the use of peak demand tends to result in inefficient pre-dispatch and real time dispatch, which impacts the guiding principle of efficiency

#### *Participant Impact*

(TBD)

#### *IMO Processes and Procedures Impact*

No significant impact is identified. The Market Rules do not explicitly require the IMO to use the forecast peak demand in pre-dispatch sequence. Most important is that the Rules do not prescribe how the peak demand should be constructed. Thus a change in the methodology of forecasting peak demand does not require any change in Market Rules.

### **Options Considered**

[To be developed]

### **Related Issues**

- 001: Pre-Dispatch Price Bandwidths
- 010: Over-forecasting of Peak Demand
- 013: Impact of Out of Market Resources on the Market
- 014: Hour(s)-Ahead Price Signal Uncertainty
- 015: Restriction on Changes to Dispatch Data between 4 and 2 hours ahead of Dispatch Hour

### **Selected References**

1. Market Rules, Chapter 7.
2. The Market Surveillance Panel Report of Oct 2002,  
[http://www.theimo.com/imoweb//pubs/marketSurv/ms\\_mspReport\\_2002oct07.pdf](http://www.theimo.com/imoweb//pubs/marketSurv/ms_mspReport_2002oct07.pdf)
3. The Market Surveillance Panel Report of June 2004,  
[http://www.theimo.com/imoweb/pubs/marketSurv/ms\\_mspReport-20040614.pdf](http://www.theimo.com/imoweb/pubs/marketSurv/ms_mspReport-20040614.pdf)