

30 June 2012

Matthew Pember
MEP Program Manager
Western Australia Independent Market Operator
Level 3 Governor Stirling Tower
197 St George's Terrace
Perth WA 6000
Australia

Dear Matt

Certification of WEMS software version 3.1.42

PA Consulting Group (PA) has been asked by the Western Australian Independent Market Operator (the IMO) to act as an independent market auditor to review and supplement its testing of the Wholesale Electricity Market Systems (WEMS) software to verify compliance with the West Australia Wholesale Electricity Market Amending Rules (the Market Rules).

As a result of our examination of the Market Rules and of the IMO's WEMS software, we are able to provide the following certification:

We certify that the following software products will perform substantially in compliance with the software specifications implied by the Market Rules dated 19 September 2006, as amended by rule changes commencing up to and including 1 July 2012, together with the associated Market Procedures:

- *WEMS version 3.1.42*

Although we have observed and noted some aberrations or anomalies in relation to the software and system specifications, we believe that they are not likely, of themselves, to represent a material deviation from the design concept contained in the Market Rules provided due attention is paid to the points noted in this Certification in the use of the software. All material aberrations or anomalies noted during our examination have been resolved by the IMO through corrections to the software or amendments to the Market Rules.

Scope of the review and certification

This certification is specific to the WEMS software used to clear the short-term energy market, the balancing market, the LFAS market, and prepare the non-balancing dispatch merit orders. The following items, which are associated with the WEMS software, are not covered by this certificate:

continued

- The settlements software, which calculates the amounts due or payable to participants as a result of their market activities;
- The front-end interfaces and databases which calculate, read and store the data used by the WEMS software;
- Data transfer processes between the WEMS software and other software;

In performing the review we have:

1. Identified tests to determine whether the outputs of the software is consistent with those which result from the application of the formulation described in the Market Rules, and reviewed the inputs and outputs of those tests as performed by the IMO;
2. Identified inconsistencies and non-compliance of the software products with the Market Rules accompanied by comprehensive explanations as to how such conclusions were derived;
3. Made specific recommendations as to how the identified inconsistencies and non-compliance could be corrected. Where appropriate, we made recommendations as to how the Market Rules should be amended to achieve consistency with the software, which would result in a more acceptable market performance; and
4. Reviewed the inputs and outputs of any retests of software where fixes have been applied to confirm the new outputs are consistent with the application of the formulations described in the Market Rules.

The review does not include assuring other aspects of software performance other than the correctness of the computations performed therein. This includes, but is not limited to usability, speed and security.

Nature of the tests conducted and results obtained

We have performed a detailed review of the IMO's testing of changes to the WEMS software to implement the new Balancing and Load Following markets.

In reviewing this testing, we have:

- Identified the relevant calculations set out in the Market Rules as amended by RC_2011_10, RC_2012_05 and RC_2012_08, commencing 1 July 2012;
- Reviewed IMO documentation pertaining to the function of the WEMS software;
- Reviewed inputs for the IMO's test cases;
- Identified additional test cases required to provide sufficient coverage of all changes; and
- Verified that the test inputs and outputs together demonstrate that the calculations comply with the Market Rules.

Despite the efforts that are made to educate market participants, the start of any new or restructured market raises the possibility that some market participants will be surprised by the commercial consequences of operating in the new market structure. PA does not audit potential commercial consequences for all or any market participants, although where we observed any potentially unintended consequences, we advised the IMO, and confirmed resolution where required.

Provided the WEMS software is used in the manner intended and with data that conforms to the requirements specified in the Market Rules and associated documents or, if not explicitly discussed therein, is within the expected range of values for data pertaining to the characteristics of the Western Australian electricity system, we have found that the WEMS software correctly calculates the required results.

Subsequent versions

This certificate applies to WEMS software version 3.1.42. This is substantially the same as, but not identical to version 3.1.44, which will be released into production at the IMO on balancing market commencement day, 1 July 2012. We have reviewed the changes made between these versions, and have identified a single change with bearing on market outcomes. Additional testing around this change shows that it has been implemented correctly, and the likelihood of the change introducing errors into other parts of the system is low.

Our certification of WEMS software version 3.1.42 remains valid for versions 3.1.43 and 3.1.44.

Disclaimer of Liability

Despite the extensive testing of the software, this certification is not, and cannot be, in the form of an absolute guarantee. Error-free use and compliant results through time will increase the probability that the software is in strict accordance with the design principles.

Further, our certification is only valid if the software is used with care and for the purpose for which they were designed and tested, and our contract with the IMO limits our liability in connection with this certificate.

Yours sincerely



Tim Robinson
Principal Consultant