

# WA Independent Market Operator

Assessment of the IMO's processes for  
market software management

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## **1. INTRODUCTION**

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The document sets out the results of the market audit by PA Consulting Group in carrying out its assessment of the IMO's processes for software management.

### **1.1 SCOPE OF THE MARKET AUDIT**

This market audit has been carried out under Market Rule 2.14.3 (c) which requires that:

The IMO must ensure that the Market Auditor carries out the audits of such matters as the IMO considers appropriate, which must include:

- (a) the compliance of the IMO's internal procedures and business processes with the Market Rules;
- (b) the IMO's compliance with the Market Rules and Market Procedures;
- (c) the IMO's market software systems and processes for software management.

### **1.2 MARKET AUDIT PROCESS**

In conducting the market audit on the compliance of the IMO's market software systems and processes for software management with the Market Rules, PA has:

- Examined the procedures developed by the IMO for the management and control of changes, etc to its market software resources to determine whether those procedures comply with both the Market Rules and good industry practice given the nature of the IMO's business, and
- Examined evidence to support the appropriate use of those procedures.

There are limitations to any external audit. Audits are not an absolute guarantee of the truth or reliability of agency information or the effectiveness of internal controls. They may not identify all matters of significance. This is because external audit techniques involve:

- Professional judgement as to "good industry and market operational practice"
- Use of sample testing
- Assessment of the effectiveness of internal control structures and
- Assessment of risk.

## **2. ASSESSMENT OF THE SOFTWARE MANAGEMENT PROCEDURES**

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### **2.1 DOCUMENTATION**

Management of the market software in an appropriate manner by the IMO given the nature of the business risk to both the IMO and the Western Australia Electricity Market is essential and is recognised as such by the IMO.

Although there are no relevant Market Procedures relating to this subject, there are three Internal Procedures

- Internal Procedure: Change Management Procedure
- Internal Procedure: IMO Change Management and Testing
- Internal Procedure: Release Management (draft).

### **2.2 IMO COMPLIANCE WITH THE MARKET RULES AND INDUSTRY PRACTICE**

#### **2.2.1 Procedures**

The requirements set out in Market Rule 2.36.1 are:

Where the IMO uses software systems in the Reserve Capacity Auction, STEM Auction or settlement processes, it must:

- (a) maintain a record of which version of software was used in producing each set of results, and maintain records of the details of the differences between each version and the reasons for the changes between versions;
- (b) maintain each version of the software in a state where results produced with that version can be reproduced for a period of at least 1 year from the release date of the last results produced with that version;
- (c) ensure that appropriate testing of new software versions is conducted;
- (d) ensure that any versions of the software used by the IMO have been certified as being in compliance with the Market Rules by an independent auditor;
- (e) require vendors of software audited in accordance with clause (d) to make available to Rule Participants explicit documentation.

Examination of the procedures set out in the three Internal Procedures above shows that the procedures conform generally to good industry practice as demonstrated by other electricity market operators and, if followed, will comply with the requirements.

In particular:

- With respect to item (a) above, the IMO maintains a record of all versions of market software used together with their dates in service, details of the differences between each version and the reasons for the changes between versions.
- With respect to item (b) above, the IMO is able to roll back versions of the market software by re-installing previous versions of the software and a restore of the database backup to the point before the implementation of the version.

- With respect to item (c) above, the IMO tests all new releases of the market software prior to their being placed in service.
- With respect to item (d) above, the IMO has a policy of having an independent auditor test and certify the market software at six monthly intervals. PA accept that this does comply with section 2.36.1(d), although we shall make further comment on this point below
- With respect to item (e) above, the IMO provides documentation on the functionality of the market software and the IMO is also provided with copies of the release notes provided by the vendors. Given the degree of confidentiality over the software imposed by the vendors, PA accepts that the degree to which the IMO provides documentation is sufficient for compliance with this Market Rule.

### 2.2.2 IMO compliance with good industry practice

Our opinion as to good industry practice is not required by the Market Rules. However, in the course of our audit, we made some observations which may be to the benefit of both the IMO and the Rule Participants.

Firstly, we note that the IMO is a new organisation which has spent the past twelve months not only running the electricity market but also bedding down procedures to ensure its efficient and secure operation. Secondly, we have noted above that the software management procedures used by the IMO generally conform to good industry practice and that they comply with the requirements of the market rules.

#### a. *RELEASE SIGN-OFF RECORDS*

Although formal procedures have been prepared and are understood to be followed, the small number of staff in the IMO, with the same staff carrying out most of the software management and testing, means that some aspects of the formal tracking and recording of the actions required by the procedures has not been put in place. The IMO currently relies upon the notes and actions recorded in its Release Management System to create an audit trail of who did what and when. The IMO has indicated that it will continue to review its internal procedures and processes. For example, the IMO has indicated that it plans to implement a formal release sign-off form to complement the approvals currently issued through the Release Management System.

Given the small size of the office, together with the use of the Release Management System to manage the changes and upgrades to software, a formal check list might appear to be a bureaucratic extravagance. However, PA believes that the use of a formal sign-off record will have benefits to the IMO and, by extension, to the market.

Such a record will greatly simplify the annual market audit in that there will be a formal audit trail available for all changes to the market software that indicates

- what was done,
- why it was done,
- when it was done, and
- who authorised it.

All of this information is currently present in the Release Management System but not in a readily accessible form. Similarly, such a record will provide an explicit version control

mechanism as each version of the software that has been installed will have its own record. The present system complies with the requirements of the Market Rules but could be made more robust.

Besides simplifying the annual audit process, should problems be found later with the software, there will then be an explicit audit trail available to help back track what went wrong.

The present system does comply with the requirements of the Market Rules but could usefully be made more robust.

*b. MARKET SOFTWARE AUDITING BEFORE ENTRY TO SERVICE*

Market Rule 2.14.3 (c) requires that the Market Auditor carry out audits of the IMO's market software systems. In principle, this must be done once a year as part of the Market Audit; in practice the IMO has such an audit done at six-monthly intervals.

However, this exposes the IMO to the possibility that market software could be changed, for whatever reason, after a market audit and that the new software not be audited until some months later. This could raise a commercial risk if that software were then found to be defective.

Elsewhere, many electricity markets have all market software independently tested and certified before the software goes into service, although it must be acknowledged that this is not a universal practice with some markets never having their market software independently verified. Should the IMO decide to follow the practice of testing and certification prior to software being placed in service, we have indicated in the present IMO software change control process below, with the insertion in red, of points at which the Market Software Auditor might be involved.

The first point allows the auditor to express an opinion as to whether further involvement is required.

The second point is where, if required, the market software auditor would independently test the software and provide certification. The Market Rules prescribe that this would be required where changes to the software could have a material effect on the prices or quantities resulting from the use of the software.

Nevertheless, we accept that the decision as to when to have market software independently tested, provided is it at least annually so as to comply with Market Rule 2.14.3 (c), is a position on risk management for the IMO to take.

### **2.3 OPINION**

The software management processes employed by the IMO, as documented, comply with the requirements of the Market Rules.

We have noted two areas in which the IMO might improve its procedures so as to provide a more robust software management environment.

**APPENDIX A: INDEPENDENT TESTING OF SOFTWARE MODIFICATIONS**

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**A.1 POINTS AT WHICH AN INDEPENDENT SOFTWARE AUDITOR MIGHT BE INVOLVED**

