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Report

IMO Administered Markets Readiness Report

Report to MoEST March 28, 2002

Issue 2.1

This document provides an assessment of the readiness of the IMO Administered Market as of March 28, 2002

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1. Purpose of this document

This document is the second release of the IMO's report on the readiness of the IMO-Administered Markets. The version 1 of the report was delivered to the Ministry of Energy Science and Technology (MoEST) on December 17, 2001 along with an accompanying letter from the Chairman of the IMO. On December 18, 2001 the Premier and the Minister of Energy announced a market opening date of May 1, 2002.

Version 1 contained a number of exceptions and a timetable for their resolution. This report provides a status update on each of these exceptions. One further version will be issued in late April towards the end of the Coupled Operational Dry Run (CODR).

The information contained within the document is provided to MoEST for use regarding the opening of both the retail and IMO-Administered electricity markets. It should be noted that one of the exception items relates to participant readiness. In this case the IMO is assessing readiness on the basis of the completion by participants of the market entry process specified in the market rules. This process assures the IMO that the participants meet the prerequisite legal and commercial minimums and that they can interface with the IMO in the manner prescribed in the market rules and manuals. It is up to individual participants themselves to assure their own commercial and technical readiness to operate in the IMO-Administered Markets.

– End of Section –

2. Structure of this document

The remainder of this document is structured into the following sections:

- **Summary:** A summary of the entire document;

- **Market opening timelines constraints and assumptions:** A description of the necessary steps and timelines that precede an opening of the IMO-Administered markets.

- **IMO-Administered market opening conditions:** A description of the seven opening conditions that have been used to make the readiness assessment;

- **IMO testing:** Much of the IMO's assessment is based upon the results of the IMO's testing. This section provides an overview of the types of testing that the IMO has undertaken**.**

- **Status of exceptions:** This section deals with each of the exceptions to the market opening conditions identified in the first release of the report. Where an exception is now removed this is noted. Where an exception remains the status and expected resolution timeframe are noted. Where a new exception condition has arisen, this is also noted.

– End of Section –

3. Summary

Based on the assessment set out in this report the IMO remains confident that its systems and capabilities will support a market opening of May 1, 2002.

This assessment is based upon the following:

- IMO business process managers have indicated formally that they are (or will be) able to support the processes in production.
- Viable contingency arrangements have been identified to embrace all critical non-ready participant types.
- The number of participants who have completed ability testing, together with a review of possible contingency arrangements, indicate a high level of participation will be possible.
- Although, as is to be expected, some issues continue to be identified no items have been identified that pose an unacceptable level of risk to system reliability.
- Testing of systems has taken place over an extended period and has exercised the systems in many different ways (see section 6 for a high level description of the testing undertaken). This testing provides confidence that computer systems are sufficiently stable to support production operation.
- The legal documentation is either already in place or is scheduled to be so in advance of May 1, 2002.
- The latest eighteen month IMO assessment of system adequacy is considered to be acceptable.

In addition, Production Environment Validation (PEV) has demonstrated that the conditions defined as prerequisites for the commencement of CODR have been met. Further information is included in Appendix A.

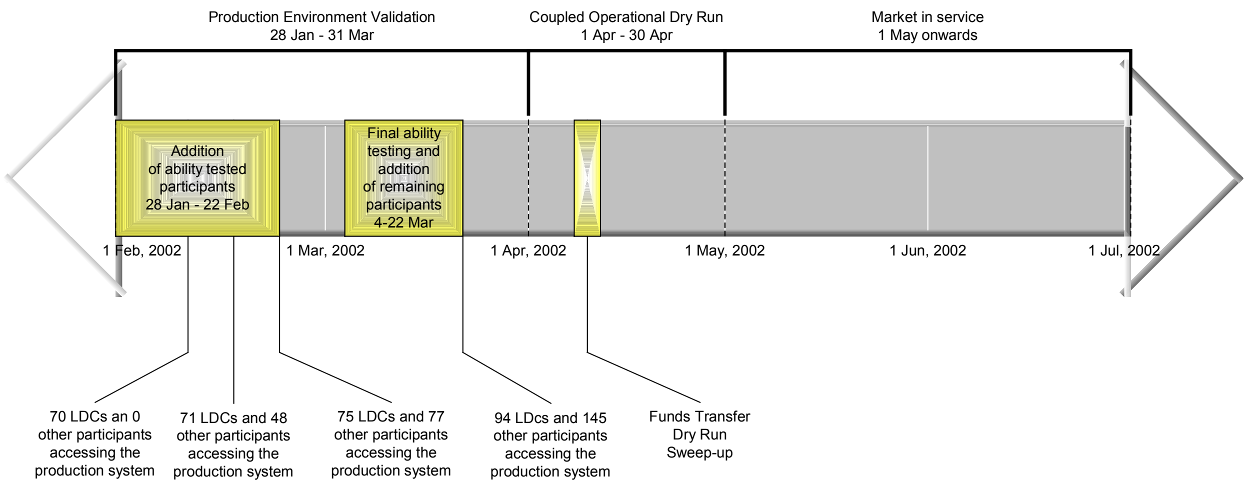
PEV has not only proved of enormous value in terms of allowing the stabilisation of systems, it has also afforded an early opportunity for the IMO to observe the interaction of participant behaviour with the market rules. To date, with the interaction of market characteristics and the offer strategies being tested by the limited number of participants involved prior to CODR, price excursions have been observed. However, although PEV has provided the best environment to date to simulate operation of the market, the IMO recognises that this is still subject to a number of constraints, a limited number of participants, no competitive intertie trading and it is naturally a period of experimentation and learning. Although CODR will continue to be subject to some constraints in its operation, it will provide the most realistic environment yet to observe the operation of the market. With the commencement of CODR, as bid and offer strategies of all market participants are being refined toward market conditions, those participants are expected to learn to anticipate and react to market fluctuations. CODR will provide the necessary basis for monitoring these aspects of market testing.

– End of Section –

4. Market opening timelines, constraints and assumptions

Timeline

The diagram below shows the key timings relative to the May 1, 2002 market opening date:



The components of the above diagram are described below:

- **Production Environment Validation (PEV):** During this period participants have been added to the production environment in a progressive manner.

- **Coupled Operational Dry Run (CODR):** During this period the IMO-administered markets will operate in full with the exception that interchange schedules will be limited and that settlement and funds transfer will continue to be effected under the current arrangements.

- **Market in service:** Full operation of the IMO-Administered Markets.

- **Addition of ability tested participants:** Addition of participants who had already completed their ability testing to the Production Environment Validation activity. Access to PEV enables participants to validate their data set-up and test their own systems using production metering and settlement data flows from the IMO.

- **Final ability testing and addition of remaining participants:** A final tranche of ability testing followed by the final entry of participants prior to the start of CODR.

- **Funds Transfer Dry Run Sweep-up:** A re-run of the Funds Transfer Dry Run (FTDR) test for participants that were either not included last time or for the few participants who failed to complete the test successfully last time. The test involves the transfer of a nominal sum of money from participants to the IMO and back again to test that banking details are correctly established.

Constraints and assumptions

The following constraints apply to the above timeline:

- Market opening date of May 1, 2002.
- Due to the nature of CODR, once it has commenced it would be undesirable to suspend or extend.

The following assumptions underpin the above timeline:

- An urgent rules amendment mechanism is in place.
- No major impediment is encountered prior to market opening which would prejudice the effective operation of the market or the IMO controlled grid.

– End of Section –

5. IMO-Administered Market opening conditions

Seven conditions have been identified as necessary to be satisfied to allow the IMO-Administered Markets to open. These largely follow the six conditions reviewed with MoEST in July/August 1999, but include an additional item to cover system adequacy.

Each of the conditions is sub-divided into several "Areas of Demonstration" and each area is further sub-divided into a set of criteria.

The table below sets out the conditions and the areas of demonstration for each one.

Conditions	Areas of Demonstration
Condition 1 - IMO readiness: The IMO is able to meet its obligations as set out in the market rules for the IMO-Administered Markets.	• IMO Readiness Checklist – enterprise wide sign-off by department & business process covering: a. Market Assessment & Compliance b. Finance c. Legal and Corporate Affairs d. Market Operations & Forecasts e. Market Services f. Information Technology and Infrastructure • Financial – prudentials, banking and insurance
Condition 2 - Participant readiness: All participants authorized by the IMO meet the prudential, technical, interface and training requirements of the IMO and have confirmed their readiness to commence participation in the IMO-Administered Markets. Note: Participants are not required to lodge prudentials until two weeks before market opening. The final status of fully qualified participants will be updated at that time.	• Conditional authorisation • Ability tests • Digital certificates • Emergency preparedness plan • Participation agreement • OEB licence • Prudential support • Facility information • Delivery point relationships • Meter registration • Emergency restoration plan • Connection agreement

Conditions	Areas of Demonstration
Condition 3 – Contingency arrangements: The IMO is able to operate and reliably settle the market even if some participants are not fully compliant with the market rules.	• Transitional IMO Market Rules • Process published • Complete data sets permit required settlements tool functionality
Condition 4 – Reliable operations: Continued reliable operation of the IMO-controlled grid is assured.	• Energy Management System (EMS) availability • Control Performance • Operating Reserve • Outage Scheduling • Communications • Ancillary Services • Operating security limits • Emergency preparedness • Load forecasts
Condition 5 – Market design: The IMO-Administered Markets are able to function in accordance with the market rules.	• Performance of IMO-Administered Markets "bid to bill"
Condition 6 – **Legal framework –** All IMO developed legal documents that govern the operation of the IMO-Administered Markets are complete.	• IMO Market Rules • IMO Market Manuals • IMO agreements
Condition 7 – System adequacy: The assessment by the IMO of system adequacy during the period of transition to the new market and initial operations.	• 18 month outlook

– End of Section –

6. IMO Testing

Much of the IMO's assessment is based, directly and indirectly, upon the results of the IMO's testing. In order to provide context for the remainder of the report this section provides an overview of the key testing that the IMO has undertaken.

System Integration Testing (SIT)	
Objective	Test that all systems inter-operate and that individual functions within each system perform as expected.
Nature of testing	A combination of scripted testing and ad-hoc tests
When undertaken	Performed each time a new release is received from software vendors
Participant involvement	None formally, though for certain interface tests participants were involved on an ad-hoc basis.
User Acceptance Testing (UAT)	
Objective	Test that all systems and user procedures are robust and meet the user requirements.
Nature of testing	Scripted testing with known results based upon the IMO's business processes
When undertaken	Performed after selected releases from software vendors
Participant involvement	None.
Structured Market Testing (SMT)	
Objective	Provide assurance to both the IMO and Market Participants that they are able to inter-operate and meet their obligations as defined in the Market Rules and Market Procedures.
Nature of testing	Scripted testing with known results based upon the market rules and procedures.
When undertaken	December, 2000 until May, 2001
Participant involvement	Selected group of key market participants.

Uncoupled Operational Dry-Run (UODR)	
Objective	To provide sufficient evidence that the market functions as envisaged and that the IMO and a sub-set of market participants are able to meet their obligations in the market on a sustained basis.
Nature of testing	Production simulation without dispatch and funds transfer. Certain pre-defined scenarios triggered to force specific events and circumstances
When undertaken	May and June, 2001.
Participant involvement	Selected group of key market participants
Performance testing	
Objective	To provide specific testing on system performance where other tests have either indicated some concerns or have not adequately exercised a system component at production loads.
Nature of testing	Stress test communication front end to participant interface to bids/offers/settlement data Stress test of Participant interface to metering data (simulation of 100 concurrent participants)
When undertaken	Staged, final tests and monitoring during January – March 2002.
Participant involvement	None
Fail Over, Fall Back and Fall Forward (FO/FB/FF)	
Objective	Build confidence that the IMO has the business processes, procedures, technical solutions and trained staff in place that address most likely system failure scenarios
Nature of testing	Scripted testing of FO/FB/FF scenarios
When undertaken	October till December, 2001
Participant involvement	None.
Retail Feeds and Market Settlement support	
Objective	To provide production data feeds to LDCs and other participants over a sustained period of time in order to test the IMO's metering and settlement systems and processes in production and allow LDCs to fully test their settlement systems
Nature of testing	Non-scripted, simulation of production settlement operations
When undertaken	August until December, 2001
Participant involvement	42 LDCs and 3 non-LDC have participated in the tests

Sandbox	
Objective	Enable participants to test their interfaces with the IMO
Nature of testing	Non-scripted.
When undertaken	October 2001 until market in service
Participant involvement	Four dispatchable participants
Funds Transfer Dry Run (FTDR)	
Objective	To confirm bank account information for each participant and that the electronic funds transfer between the participants' banks and the IMO bank operate correctly including second layer PKI testing.
Nature of testing	Scripted tests
When undertaken	November 2001 and April 2002
Participant involvement	All participants were invited, 176 participated, over 90% completely successful
Market Readiness Shadow Operations (MRSO)	
Objective	To operate the EMS/MIS systems in production mode with OPGI over a sustained period of time in order to test the IMO's scheduling and dispatch systems and processes and allow OPGI to test their automatic dispatch systems.
Nature of testing	Non- scripted, simulation of production operations
When undertaken	Phased with increasing functions brought on-line between October 2001and January 2002.
Participant involvement	OPGI
Production Environment Validation (PEV)	
Objective	To allow participants to validate their data set-up in the IMO's systems and access production metering and settlement data for an extended period.
Nature of testing	Progressive addition of all participants to the production environment. Those participants who had already passed ability testing were admitted first. Participants who had not completed ability tests by the start of PEV were admitted from March 4 onwards. The nature of testing was similar to that undertaken during retail feeds. PEV also allowed much of the type of testing conducted in MRSO to continue within the production environment.
When undertaken	January 28 till March 31, 2002
Participant involvement	All participants

Coupled Operational Dry-Run (CODR)	
Objective	Provide final evidence that the market functions as envisaged and that the IMO and all the day one participants are able to meet their obligations in the market on a sustained basis.
Nature of testing	Full production, without funds transfer.
When undertaken	Commences April 1, 2002 and completes on April 30, 2002.
Participant involvement	All participants who will be active in the market on the first day of trading.

– End of Section –

7. Status of exceptions

The following table lists all the exception items identified in version 1.4 of this report that was submitted to MoEST on December 17, 2001, although a number were still anticipated to be in an incomplete state at this time. For each item the current status is identified and where the item remains an exception the expected resolution date is provided. New exceptions that have arisen since December 17 are also noted in the table below.

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
Condition 1 – IMO Readiness			
C1.1	Market assessment and compliance – monitor markets. Procedures are in place. Tools expected in place for March 1.	Tools ready for market opening.	Complete
C1.2	Finance – manage prudential risk. Additional reports to assist in the daily monitoring are scheduled for January 14.	Additional reports and functionality delivered and tested.	Complete
C1.3	Market operations and forecasts – address constraints. An updated version of the 115kv model is required to address issues identified during MRSO. This will be available in January.	The 115kV Model was made available in January as planned and workarounds have been developed to deal with remaining issues.	Complete
C1.4	Market operations and forecasts – facilitate transmission rights market. Modifications to the system are required to address public reporting and web site access.	Modifications delivered and tested.	Complete

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
C1.5	Reference not used		
C1.6	Market operations and forecasts – process market contracts (see C6)	See C6	
C1.7	Market services – acquire market participant. Delays to the set-up of the production PKI service have delayed the process for issuing production certificates. This process is anticipated to complete in early January	The production PKI service was deployed in early January.	Complete
C1.8	Market services – maintain and retire market participant. Work rounds to cope with defects in the PLC system are under development	A co-ordinated, corporate-wide set of internal procedures to handle suspension, termination and withdrawal are being developed. They will be finalised during CODR.	May 1
C1.9	Market services – contingency trading arrangements. Population of contingency data is planned to complete by the end of December.	Contingency arrangements have been defined and established within the market rules. The expected extent of their application is described in Appendix B. The final extent will be determined during CODR. Databases have been populated with contingency trading arrangements data and settlement statements were produced during PEV. Revisions to CTA data will be made at IMO's discretion during CODR	Complete with exception of any changes that are determined as necessary during CODR
C1.10	Market services – process revenue metered data. Additional monitoring and support is being deployed to ensure that the meter data collection systems function as required. This should be in place by the end of December.	Manual workarounds are required due to issues with the tools. Due to the extent of the manual intervention required additional staff may be required to sustain the processes. This will be assessed during CODR and additional measures taken as required.	May 1

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
C1.11	Market services – register meter service provider. Approved by IMO Board awaiting participant signatures	The Meter Service Provider (MSP) agreement has been approved by the IMO Board. Responsibility now rests with participants to sign the agreement.	Complete from IMO perspective. Participants must now sign.
C1.12	Market services – publish notification. IMO procedures will be completed by end of December.	IMO procedures were completed as planned. All reports are being produced for PEV or are near completion.	April 1
C1.13	Market services – Testing of some outstanding charge codes that relate to the disbursement of the OPGI power mitigation rebate are scheduled for January.	Included within C1.14	
C1.14	Market services – commercial reconciliation for real time markets.	Manual workarounds are required due to issues with the tools. Due to the extent of the manual intervention required additional staff may be required to sustain the processes. This will be assessed during CODR and additional measures taken as required.	May 1
C1.15	Market services – process market rule changes. Rule making authority has not yet been passed to the IMO.	Rule making authority will not pass to IMO until market launch.	May 1
C1.16 **[New Exception]**	Information Technology & Infrastructure – Procedures for fail over, fall back and fall forward.	Fail over, fall back and fall forward of the computer systems between the Clarkson and backup site has been successfully tested with the exception of the metering systems which will be tested during CODR. While successful, the testing raised some concerns over the duration of outages and the number of staff required. As a result work has been initiated to streamline the capability. The current capability is acceptable for initial market in service.	May 1 for testing of metering systems. Post market in service for further enhancements

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
Condition 2 – Participant Readiness			
C2.0	Status report	Refer to Appendix C.	May 1
Condition 3 – Contingency Arrangements			
C3.0	Ability to open the market with some non-ready participants	Contingency arrangements have been defined and established within the market rules. The expected extent of their application is described in Appendix B. The final extent will be determined during CODR.	May 1
Condition 4 – Reliable Operations			
As the ability to maintain reliable operations is a key factor of market readiness a full update of the original text from version 1 of the report is included in Appendix D. This update shows that further comfort has been gained across all the previously identified areas, although additional confirmation during CODR is required. One new area has also been identified (intertie scheduling) which will be tested in a limited manner during CODR. This is described below.			
C4.1	All fail over, fall back and fall forward testing of the EMS systems that is considered necessary is scheduled to be completed by late December.	Failover fallback testing was completed in December. A dry-run failover and fallback exercise on the production systems (with the exception of some metering systems)was completed in early March. A dry run for the metering systems will be executed prior to market start-up at a convenient time. In order to meet the IMO's goals of testing failover procedures on an ongoing monthly basis, performance needs to be improved to reduce outage impacts on the market.	Complete

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
C4.2	Final verification of IMO's system operations function's ability to: • Achieve acceptable control performance; • Procure adequate operating reserve; • Communicate effectively with all participants; • Produce accurate forecasts.	To be finally verified during CODR according to the CODR exit criteria.	May 1
C4.3	See C6.16.	See C6.16	
C4.4 **[New Exception]**	Intertie scheduling	Until market opening, by law, only OPGI is allowed to hold title to imports and exports. As such the IMO processes surrounding intertie scheduling have not been extensively tested. During CODR, OPGI has agreed to undertake specificlimited activities to allow the IMO to test its associated tools and procedures.	May 1
Condition 5 – Market Design – performance of IMO-Administered markets "bid to bill"			
C5.1	Evidence from MRSO of "bid to bill" performance in the following areas was outstanding at the last report: • Dispatch scheduling undertaken according to market rule timelines • Participants able to respond to dispatch instructions according to market rule timelines • Publication of operational load forecasts according to market rule timelines	All these functions were exercised on a daily basis during the last phase of MRSO and have been exercised on a daily basis during PEV. Changes to dispatch processes during PEV improved participants ability to respond to dispatch instructions. The CODR entry criteria for timely dispatch of instructions, response by market participants (OPGI) and publication of load forecasts are all being met.	Complete

Cross reference to version 1 of report	**Issue as at December 17, 2001**	**Status as at March 27, 2002**	**Latest expected resolution date**
C5.2	Evidence from system performance testing of ”bid to bill” performance in the following areas was outstanding at the last report: • Bids and offers can be submitted • Participants able to access metering data • Issuing of preliminary settlement statement according to market rule timelines • Issuing of final settlement statement according to market rule timelines	Performance monitoring of all systems during PEV has been completed.	May 1
C5.3	Evidence from CODR of “bid to bill” performance was outstanding for all criterion at the last report.	This will remain outstanding until the completion of CODR. See Appendix E for a list of the criterion that will be monitored.	May 1

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
C5.4	Evidence from UODR of "bid to bill" performance in the following areas that was omitted from the last report: • Bids and offers can be submitted • Publication of preliminary market prices according to market rule timelines • Publication of final market prices according to market rule timelines • Market start-up, suspension and restart • Participant suspension and re-entry	The following evidence from the UODR testing undertaken early last year was omitted from the previous report in error and is included here for the sake of completeness. • Bids and offers can be submitted: Proven during UODR criterion #4 • Publication of preliminary/final market prices: This functionality was previously deferred by the Board. The provisional prices published with the market schedule are used for all settlement calculations. • Market suspension and resumption procedures may be required when the IMO determines that an event has substantially impaired the ability to operate according to the Market Rules. These procedures were never planned to be tested during UODR and will be tested during CODR. • Participant suspension and re-entry was never planned to be tested in UODR and will be tested in CODR if the need arises.	Complete

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
Condition 6 – Legal framework			
C6.1	Ministerial approval of the in service market rules	Minister approved market rules support the IMO's program of structured market testing, including Production Environment Validation (PEV) and the Coupled Operational Dry Run (CODR). If, during CODR, the need for additional market rule amendments is identified, these amendments will be submitted to the Minister so that the amendments can be made to meet the market commencement date of May 1, 2002. We have an agreement with MEST that any rule amendments identified during CODR will be made by the Minister on an expedited basis in time for market commencement.	April 15 for rule amendments passed by IMO Board since Baseline 7.0. May 1 for any further rule amendments identified during CODR
C6.2	Posting of final amendments to market manuals on the IMO web site	Up to date versions of all of these market documents are due to be posted on the IMO web site on March 28. If required, further updates will be issued in April.	May 1
C6.3	Not used		
C6.4	Confidentiality agreement for dispute resolution	Agreement is under draft.	May 1
C6.5	Electronic authentication (PKI) agreement	Finalised and circulated to all participants for signature. All participants who have entered the Production Environment Validation environment have signed the agreement. Any further participants who wish to enter CODR will be required to sign the agreement before doing so.	Complete
C6.6	Not used		
C6.7	Participant network agreement	Agreement is being finalised.	May 1
C6.8	Transmission operating agreement	Agreement reached, awaiting signature.	April 1

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
C6.9	Interconnection agreement - New York Power Authority	Approved, signed and effective on termination of current agreement.	Complete
C6.10	Interconnection agreement – Niagara Mohawk	Ready for signature. Awaiting resolution between Hydro One and OPG on the ownership of the Beck radial interties. Should a timely resolution not be reached, interim agreements to temporarily use the current interconnection agreement have been developed and will be implemented.	May 1
C6.11	Interconnection agreement – TransEnergie (Hydro Quebec)	Agreement will be finalised on April 5. Should any issues arise preventing signature for May 1 interim arrangements to temporarily use the current interconnection agreement have been developed and will be implemented.	May 1
C6.12	Interconnection agreement – International Transmission Company Detroit Edison	Agreement will be finalised on March 28. Some likelihood exists that Detroit Edison and Consumers Power will not resolve their outstanding differences, thereby interfering with the timely termination of the existing interconnection agreement. If such a delay occurs then the interim arrangements to temporarily use the current interconnection agreement that have been developed will be implemented.	May 1
C6.13	Interconnection agreement – Minnesota	Approved, signed and effective on termination of current agreement.	Complete
C6.14	Interconnection agreement - Manitoba	Approved, signed and effective on termination of current agreement.	Complete
C6.15	Reference not used		
C6.16	Operating reserve bid cap	Signed by IMO, awaiting signature by OPGI.	May 1
C6.17	Ancillary services	Final price for AGC to be negotiated with OPGI or interim price to be used. Agreements for black start and voltage control and reactive support are signed and ready for implementation.	April 1

Cross reference to version 1 of report	Issue as at December 17, 2001	Status as at March 27, 2002	Latest expected resolution date
Condition 7 – System Adequacy			
C7.0	December 18-Month Outlook	The IMO will be issuing an updated 18-month Outlook shortly. During the Outlook period, the IMO forecasts show that Ontario's available generation exceeds projected demands. Over this period, approximately 3,000 MW of additional generation resources are expected to either return to service or be placed in service for the first time - thereby enhancing the reliability of the Ontario electricity system. During the first half of the Outlook there are periods when Ontario's available reserves are forecast to be between 2,000 and 2,500 MW. These reserves are below the IMO's required planning reserve levels, but do not account for additional resources from outside Ontario that are expected to be available. Reserves are planning buffers identified to address circumstances that cannot be accurately predicted such as weather variations and unscheduled maintenance. The IMO anticipates that the Ontario market will be effective in attracting additional resources to provide adequate reliability. However, there will likely be restrictions on planned maintenance to maintain reserve levels. Outside of these periods, available reserves are forecast to exceed requirements. Over the 18-month period under study, accounting for the availability of regional supply, the Northeast Power Coordinating Council resource adequacy criteria are met.	

- End of section –

Appendix A – CODR Readiness Criteria

The table below summarises the achievement of the CODR readiness criteria established and agreed with the Market Commissioning Task Force (a representative body of participants established by the IMO to advise on market commissioning activities). Further information on each of the criteria, how it was measured, who measured it and the status is available if required.

	Criteria	**Status**
1.	CODR Entry/Exit (Success) Criteria approved by IMO Board	Complete –
2.	CODR Plan endorsed by MCTF	Complete –
3.	CODR Suspension & Abort plan endorsed by MCTF	Complete –
4.	Successful completion of Uncoupled ODR	Complete –
5.	Process established to quickly effect rules changes to address requirements discovered during CODR	Complete –
6.	Required Meter Service Providers ready to fulfill obligations as per market rules	On track
7.	Call success rate for revenue meters meets industry standard	Complete –
8.	Dispute resolution is functional	Complete –
9.	IMO Readiness confirmed	On track
10.	Market-in-service baseline is established	On track
11.	All required participants are clearly identified as either authorized, or being addressed by contingency arrangements	Complete –
12.	All required facilities have been clearly identified as either registered, or being addressed by contingency arrangements	Complete –
13.	All required meters and delivery points have been clearly identified as either registered, or being addressed by contingency arrangements	Complete –
14.	All required participants have successfully completed ability tests (or are being addressed by contingency arrangements)	Complete -
15.	All required participants have obtained and successfully used production PKI security (or are being addressed by contingency arrangements)	On track

	Criteria	Status
16.	Contingency procedures are defined, authorized and implemented to enable settlement and invoicing for all classes of participants	Complete –
17.	The MCTF has been consulted for opinions on participant readiness for CODR	Complete –
18.	Procedures in place for interconnected operation not covered by market rules and renegotiated interconnection agreements	Refer to items C6.9-14 in section 7.
19.	Energy management system (EMS) is available, and meets or exceeds performance standards required for CODR entry	Complete –
20.	MIS system has adequate capacity for production	Complete –
21.	Back-up operation centre is operational	Complete, but refer to items C4.1 in section 7.
22.	Dispatch systems and procedures maintain adequate control (meet or exceed performance standards required for CODR entry)	Complete –
23.	Accuracy of average hourly day-ahead load forecast within standard	Complete –
24.	Dispatch accuracy has been demonstrated	Complete –
25.	Metering Validation and Estimation processing	Complete –
26.	Market start-up, suspension and resumption procedures are functional	Refer to item C5.3 in section 7.
27.	Participant suspension and re-entry procedures are functional	Refer to item C1.8 in section 7.
28.	Required transmitters ready to fulfill obligations as per market rules.	Complete –

- End of section -

Appendix B – Application of contingency arrangements

Currently, it is projected that it will be necessary to estimate some or all meter registration or delivery point data for:

- two distributors
- seven wholesale consumers; and
- three generators.

These estimates will have a relatively minor impact on the overall settlement results for a particular participant.

In addition, it is projected that it will be necessary for some or all delivery points to remain with the host distributor for:

- three distributors
- twelve wholesale consumers, and
- three generators.

For six of these participants, only some of their delivery points will remain with the host. For the remaining twelve, all of their delivery points will remain with the host. Despite the need for its delivery points to remain with its host, one participant has been accommodated in the IMO-Administered Markets through the use of Physical Allocation Data.

It should be noted that the above projections might change prior to the market commencement date. Also, it will be necessary to estimate administrative-type data for a number of other participants that are under contingency arrangements; however those estimates will not have an impact on the settlement results.

In addition to the above actions, many participants will not have completed other authorisation, facility and registration activities specified in the market rules, and therefore will be liable to non-compliance penalties.

- End of section –

Appendix C – Participant readiness

In assessing participant readiness, consideration has been given to the number of participants that are compliant today, the actions underway to move non-compliant entities into compliance before market commencement, and the availability of practical contingency arrangements. The information available to the IMO indicates that there is sufficient participant readiness to commence CODR on April 1, 2002 and for a viable market opening on May 1, 2002. The Market Commissioning Task Force has confirmed this assessment.

In total we have applications from 262 participants, however only 247 will be entering the market on Day 1. The reasons why the remaining 15 participants are not ready fall into one of the four following categories:

- participants who were late applying for registration;
- embedded participants with insufficient delivery point and/or totalization table data;
- embedded participants who are not ready for other reasons; or
- participants that are not directly-connected and did not take part in or complete Ability Testing.

Of the 247 participants, there are 94 LDC's (of which 59 are direct and 35 are embedded) and 90 wholesale consumers (of which 73 are direct and 17 embedded). The progress of the 247 is summarised in the text below and presented in detail in the subsequent table. As of March 26, 2002:

- 237 participants have successfully completed Ability Testing. Nine directly-connected participants have not completed Ability Testing and therefore penalties may apply.
- 236 participants have submitted digital certificate agreements (PKI) and of these 213 have received and activated their certificates.
- 76% of Participants have submitted emergency preparedness plans.185 participants have signed and returned their participation agreement.
- 227 participants have completed prudential forms (1044). The IMO has issued 220 Schedule A forms back to the participants. The due date for receipt of Schedule B forms is March 22 and, to date, we have received back 77.
- The IMO has complete facility information for: 111 of the 150 Metered Market Participants with facilities connected to the IMO Controlled Grid, and for 45 of the 53 Metered Market Participants with embedded facilities.
- There are 2,116 delivery points to be set up for the market. Of these 86% are signed off by the MSP.
- Completion of meter registration is largely dependent upon the outcome of requested market rule exemptions, which will be addressed by the IMO independent directors in April.

- 53% of Participants have submitted System Restoration Plans.

Other milestone activities are indicated below, the data in the table reflects information available at March 26, 2002. It should be noted that the column titled "Applicable participants for Day 1" now reflects only those participants ready to enter the market on May 1, 2002 i.e. the 247. It does not include those participants who will enter after stability period or have put their application on hold.

	MILESTONE	MILESTONE DATE	Applicable participants for Day 1	COMPLIANT		NON-COMPLIANT: ONLY SANCTIONS APPLY		NON-COMPLIANT: CONTINGENCY ARRANGEMENTS REQUIRED	
	AUTHORIZATION REQUIREMENTS (all participants)								
1	Conditional Authorization Received	Oct. 26, 2001	247	231	94%	N/A		16	6%
		Connected	152	140	92%	N/A		12	8%
		Embedded	54	54	100%	N/A		0	0%
		Non Facilities	41	37	90%	N/A		4	10%
2	Ability Test Complete	Mar. 15, 2002	247	237	96%	10	4%	N/A	
		Connected	152	143	94%	9	6%	N/A	
		Embedded	54	53	98%	1	2%	N/A	
		Non Facilities	41	41	100%	0	0%	N/A	
3	Digital Certificates: Activation Data created (Production)	Jan 15, 2002	247	236	96%	N/A		11	4%
		Connected	152	144	95%	N/A		8	5%
		Embedded	54	54	100%	N/A		0	0%
		Non Facilities	41	38	93%	N/A		3	7%
4	Emergency Preparedness Plan Reviewed	Nov. 16, 2001	247	187	76%	60	24%	N/A	
		Connected	152	112	74%	40	26%	N/A	
		Embedded	54	42	78%	12	22%	N/A	
		Non Facilities	41	33	80%	8	20%	N/A	
5	Participation Agreement Signed	Jan 15, 2002	247	185	75%	62	25%	N/A	
		Connected	152	109	72%	43	28%	N/A	
		Embedded	54	46	85%	8	15%	N/A	
		Non Facilities	41	30	85%	11	27%	N/A	
6	OEB License Received	before market open	247	165	67%	82	33%	N/A	
		Connected	152	102	67%	50	33%	N/A	
		Embedded	54	38	70%	16	30%	N/A	
		Non Facilities	41	25	61%	16	39%	N/A	
7	Prudential Support Information (updated Form 1044)	Jan.23, 2002	247	227	92%	N/A		20	8%
		Connected	152	139	91%	N/A		13	9%
		Embedded	54	52	96%	N/A		2	4%
		Non Facilities	41	36	88%	N/A		5	12%
8	Prudential Support Information Schedule B	Mar 22, 2002	247	77	31%	N/A		170	69%
		Connected	152	41	27%	N/A		111	73%
		Embedded	54	23	43%	N/A		31	57%
		Non Facilities	41	13	32%	N/A		28	68%
	FACILITIES REQUIREMENTS (metered participants only)								
9	Facility Information Sent	Sept. 14, 2001	203	156	77%	N/A		47	23%
		Connected	150	111	74%	N/A		39	26%
		Embedded	53	45	85%	N/A		8	15%
10	Delivery Point Relationship Documents Signed	Nov. 16, 2001	203	141	69%	N/A		62	31%
		Connected	150	95	63%	N/A		55	37%
		Embedded	53	46	87%	N/A		7	13%
11	Meter Registration Complete	Nov. 16, 2001	203	0	0%	174	86%	29	14%
		Connected	150	0	0%	133	89%	17	11%
		Embedded	53	0	0%	41	77%	12	23%
12	Emergency Restoration Plan Reviewed	Nov. 16, 2001	97	51	53%	46	47%	N/A	
13	Connection Agreement: Draft Schedule D submitted	Dec. 14, 2001	155	81	52%	74	48%	N/A	
		Connected	146	79	54%	67	46%	N/A	
		Embedded	9	2	22%	7	78%	N/A	

- End of section -

Appendix D – Update of section covering reliability of operations

The following text is a complete update of section 10 of version 1 of the market readiness report submitted to MoEST on December 17, 2001. This has been included due to the critical importance of reliability of operations.

This update shows that further comfort has been gained across all the previously identified areas, although additional confirmation during CODR is required. Intertie scheduling could not be exercised in a test environment and remains to be verified in CODR.

A significant accountability of the IMO is to direct the operation and maintain the reliability of the IMO-controlled grid and also to ensure that activities within the Ontario control area do not adversely impact its neighbouring interconnections. The ability to carry out this accountability is the culmination of the successful implementation and integration of rules, agreements, systems, processes and people. This is true of not just the IMO but involves the cooperation of all market participants. While the effectiveness of these various components has been demonstrated through various stages of individual and combined testing, these elements can only be brought together completely during the final stage of integrated testing. Listed below are the areas of demonstration and the IMO's current assessment.

- Energy Management System-related reliability and Back-up Operating Center readiness. The Energy Management System serves as the IMO's primary source of operational information and is the platform for commercial activity within the IMO-administered market place. A high level of sustained reliability is required to ensure effective operation of the power system and the market. Although both design and preventative measures have been undertaken there always exists a remote possibility that the main IMO control center could be rendered unavailable. To ensure the effects on both the IMO-administered markets and the IMO-controlled grid are minimized, a back-up operating centre must be in a state of ongoing readiness.

Assessment: The new Energy Management System is in continuous use as part of PEV and is performing reliably. Performance of the EMS/MIS systems availability was measured during the period March 11 and 22, 2002 and achieved its CODR target. Dispatch accuracy of the DSO was also successfully demonstrated during the measurement period. The backup operating center is in service and has been exercised with respect to managing operations in today's environment. Fail over / Fall back / Fall forward testing, which tests the ability to switch from the primary to the back-up site, was completed in March and a report has been prepared by IT&I which concludes that this functionality was effectively demonstrated. (C4.1).

- Control performance. The NERC based Control Performance Standard (CPS) and Disturbance Control Standard (DCS) define a standard of minimum control performance. Each control area is to have the best performance above this minimum that can be achieved within the bounds of reasonable economic and physical limitations.

Assessment: The new Automatic Generation Control is in continuous use in PEV and performing as expected. Testing of AGC on a variety of generating resources has been successfully conducted during PEV with no degradation of CPS performance. Through MRSO and PEV, CPS2 performance was not at historical levels, but exceeded industry standards. No DCS incidences were experienced during this period. Effective Control Performance for the new market will have to be measured and confirmed during CODR (C4.2).

- Operating reserve. Capacity in excess of that required to meet the anticipated requirements for energy must be available to meet unforeseen contingencies and for load forecast uncertainties. To meet this obligation the IMO must procure sufficient 10 minute operating reserve and 30 minute operating reserve. The IMO must also ensure that reliability policies for local area supplies are addressed as per the market rules.

Assessment: During PEV, this has not yet been effectively exercised due to the open concept of the bidding strategies and limitations of only one market participant involved. Tools and procedures to demonstrate effective management of Operating Reserve requirements will be tested during CODR. (C4.2).

- Outage scheduling. The IMO must be able to review and assess the impact of maintenance outages scheduled within the Ontario control area. This process will allow the IMO to engage in outage scheduling activities such as advance approve, approve, prioritize, publish, deny, defer, exempt, revoke or recall outages that could have an impact on the reliability of the IMO-controlled grid.

Assessment: The outage scheduling tools and processes have been successfully tested and are fully operational. Timeliness of outage scheduling processes will be measured as a part of the CODR success criteria

- Communications. To allow the IMO to direct the operations and maintain the reliability of the IMO-controlled grid, communications between the IMO, Market Participants and other entities (e.g. neighbouring control areas) must be consistent, efficient and effective at all times.

Assessment: Effective communication between the IMO and various parties is demonstrated daily as part of our ongoing operational obligations today. Communication requirements are articulated in the market rules, market manuals, operating agreements and interconnection agreements. The new communication protocols were used successfully in a recent restoration plan exercise. Effectiveness of some additional communication content, practices and parties will be demonstrated in CODR (C4.2). No Change.

- Ancillary services. The IMO must operate the IMO-administered markets to ensure that sufficient ancillary services, such as automatic generation control, voltage support and black start capability are procured to meet the variations of the integrated power system.

Assessment: Ensuring sufficient ancillary services is an everyday activity for the IMO today. The new contractual mechanisms to procure these services are nearly finalized and will be exercised during CODR. (C4.3).

- Operating security limits. The IMO must have in place an adequate set of operating security limits such that the IMO-controlled grid can be operated within power system transfer capabilities in accordance with defined criteria to ensure system reliability is maintained.

Assessment: Operating Security Limits are in regular use today. The new market tools and processes being exercised throughout PEV and 5 minute automated dispatch have not had a detrimental affect on our ability to manage within Operating Security Limits.

- Emergency preparedness: As dictated by the market rules and also by industry standards the IMO has the responsibility to coordinate and manage activities surrounding emergency preparedness within the Ontario electricity sector. This includes establishing planning criteria, and reviewing market participant plans and coordinating the execution of drills and exercises with the involvement of the Ministry of Energy, Science and Technology and Emergency Measures Ontario.

Assessment: The IMO's Emergency Preparedness Plan and the Ontario Power System Restoration Plan were filed with the Ministry of Energy, Science and Technology in June 2000. The first simulated exercise of the Restoration Plan was successfully conducted on November 28, 2001. No change.

- Load forecast uncertainty. To ensure adequate energy, capacity, transmission and related ancillary services are available, the IMO must forecast and publish conditions within the IMO administered markets on an ongoing basis. These forecasts must be detailed, timely and accurate to allow market participants the opportunity to meet the reliability needs of the marketplace.

Assessment: The IMO forecasts future load expectations today. The tools and processes for publishing forecasts were demonstrated through PEV and during the CODR entry criteria measurement period, forecast accuracy exceeded current targets. The response by market participants to these forecasts will be demonstrated in CODR (C4.2).

- Intertie scheduling. Intertie practices form an integral part of the IMO's administered markets. Associated activities include; imports, exports, segregated mode of operation, inadvertent management and downstream settlement functions

Assessment: Until market opening, by law, only OPGI is allowed to hold title to imports and exports. As such the IMO processes surrounding intertie scheduling have not been extensively tested. During CODR, limited activities will be undertaken to allow the IMO to test its associated tools and procedures (C4.4).

- End of section -

Appendix E – "Bid to bill" performance criteria to be assessed during CODR

Criterion	CODR Success Criteria
Bids and offers can be submitted	#4
Pre-dispatch schedule produced according to market rule timelines	#4
Real time schedule timeliness according to market rule timelines	#5
Provisional market schedule and prices published according to market rule timelines	#6
Dispatch instructions issued according to market rule timelines	#7
Dispatch scheduling undertaken according to market rule timelines	#8
Participants able to respond to dispatch instructions according to market rule timelines	#19
Participants able to access metering data	Already proven during retail feeds and PEV.
Publication of preliminary market prices according to market rule timelines	Not applicable – deferred
Publication of final market prices according to market rule timelines	Not applicable – deferred
Issuing of preliminary settlement statement according to market rule timelines	#9
Issuing of final settlement statement according to market rule timelines	#10
Issuing of invoices (both physical and financial markets) according to market rule timelines	#11
Publication of operational load forecasts according to market rule timelines	#12
Completion of operational security assessments according to market rule timelines	#13
Market start-up, suspension and restart - The IMO may be required to suspend and later resume the operation of all or part of the market if an event has occurred that substantially impairs the ability to operate according to the Market Rules.	Market Suspension and Resumption processes will be tested in CODR

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