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Market Renewal Program: Market Participant Testing

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Agenda

- Preparation for Testing
- Test Phases
- New and Updated Schema, Sample, and Help Files for IESO Reports

What should you do to prepare for Testing?

- Review and update your organization's contact roles in Online IESO Sandbox.
- Review client and browser compatibility requirements noted in the Participant Technical Reference Manual (note: MRP is not introducing any changes to this).
- Send an email to market.renewal@ieso.ca to indicate your intention to participate in testing.
- Sign the *Form of Acknowledgement and Undertaking* to obtain access to qTest.
- Register new Sandbox API accounts and IP addresses 2 weeks before starting Connectivity Testing.
- Submit Cascade Group and Forebay registration data if you own a hydroelectric resource.
- Review and implement system changes on your end based on the API Technical Specifications for MIM and Dispatch Services, and the IESO Charge Types and Equations List.

What is qTest? (1 of 2)

- Used for test case management, defect logging, and reporting on the progress of market participant testing of IESO systems beginning next year.
- Market Participants will be able to:
 - view test cases created by IESO that they can execute during connectivity testing and market trials
 - export test cases to be used offline by other testers within their organization
 - record the execution and test results of test cases created by the IESO
 - document and capture the results of market participant exploratory testing

What is qTest? (2 of 2)

- Market Participants will be able to (continued):
 - update the status of each test step that was executed and provide additional information to IESO (i.e. comments, screenshots)
 - report issues and/or unexpected behavior for a particular test step
 - identify which test cases can be re-executed when known or reported defects have been fixed
- qTest allows for easier test management for participants and IESO, and visibility of market participant testing progress and where additional assistance may be needed

Registration and Setup of qTest Accounts

- Registration and setup of qTest accounts will begin in November 2023.
- Market Participants will need to send an email to market.renewal@ieso.ca to indicate that they will participate in MRP Sandbox testing next year. This email can only be sent by a known user to the IESO (i.e. Applicant Representative, Authorized Representative, Rights Administrator, or Primary Contact). In return, they will receive a *Form of Acknowledgement and Undertaking* that their organization must sign in order to grant their users access to qTest.

Registration and Setup of qTest Accounts

- Market Participants can attach a schedule to the *Form of Acknowledgement and Undertaking* if they anticipate to have more than 3 qTest users.
- The Applicant Representative, Authorized Representative, Rights Administrator, or Primary Contact can sign the *Form of Acknowledgement and Undertaking*.
- Submit the completed and signed *Form of Acknowledgement and Undertaking* to customer.relations@ieso.ca.
- Access will only be granted to registered contacts from your organization.
- qTest will be accessed via the IESO Gateway using your Production account.

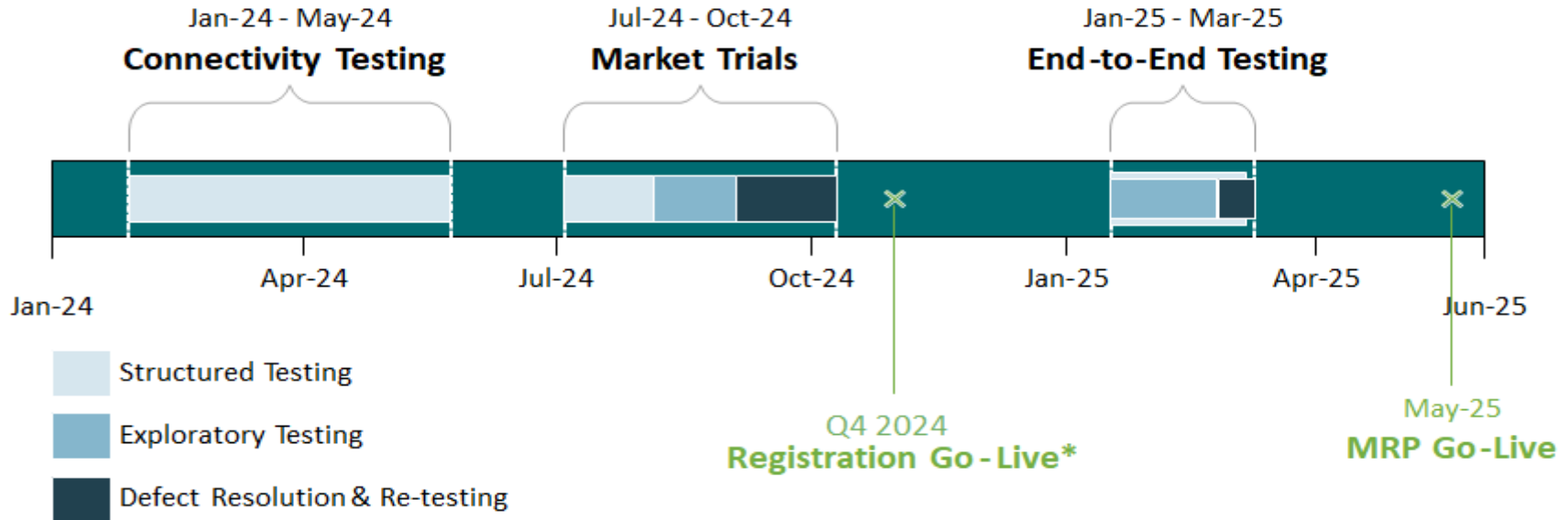
Registering New API Accounts for Testing

- The Rights Administrator will need to log into Online IESO Sandbox and register new API accounts and IP addresses that will be used for testing in the Sandbox environment for the impacted tools.
- The normal processing time for updating an IP address is 10 business days.
- The Rights Administrator will need to register the IP addresses 2 weeks prior to the time Market Participants plan to perform Connectivity Testing.
- If Market Participants are using an existing API account or IP address that has already been whitelisted, no registration action is required.

Collection of Registration data for Hydroelectric Generators prior to Market Trials

- Hydroelectric Generators are requested to submit Cascade Group, Forebay Name, Forebay Sequence ID, and Time Lag (optional) data for their resources to support Market Trials.
- Impacted Market Participants are asked to submit the Cascade Group and Forebay registration information for their resources by end of April 2024.
- Impacted Market Participants will be notified in late October 2023 along with instructions on how to provide this data to the IESO.

Testing Timeline



***Registration Go-Live:** Market Participants' new MRP market registration data that has been submitted will be available to view and change in the Production Online IESO tool. New parameters will not be used by downstream systems until MRP Go-Live.

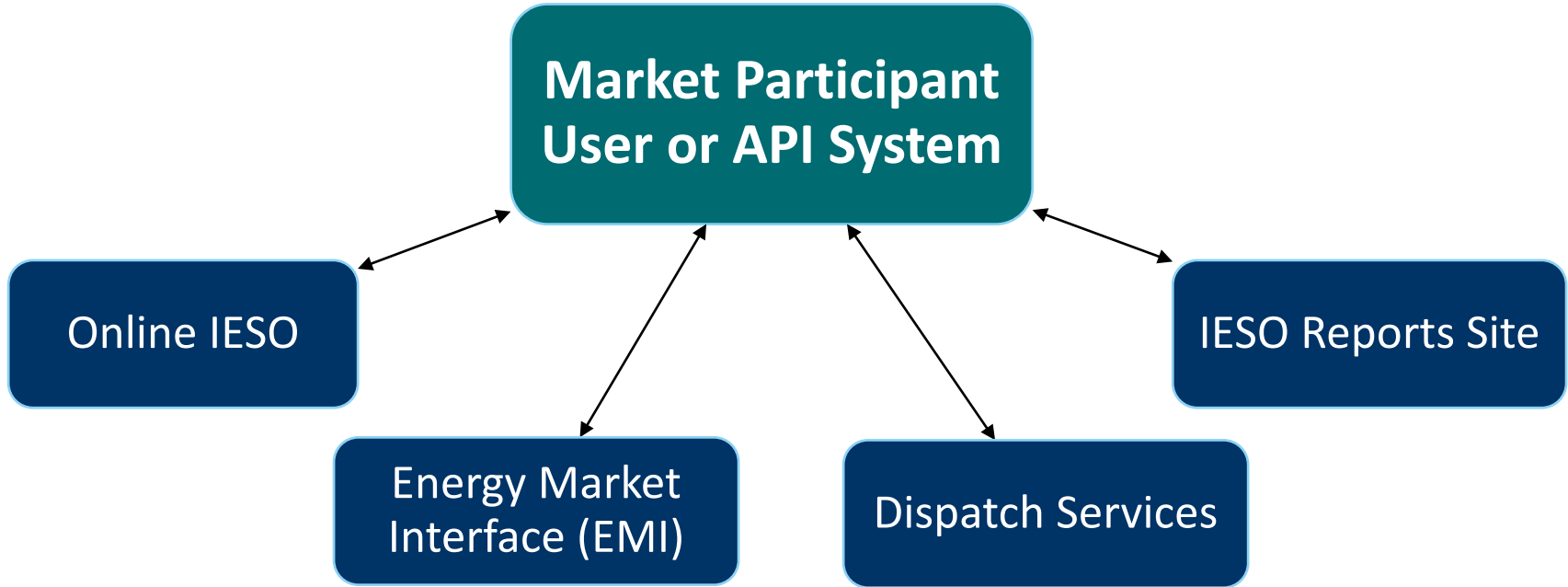
Setup of Test Phases

- Market Participants will be able to view test cases in qTest prior to the beginning of each test phase.
- The IESO will host a kick-off meeting before Connectivity Testing, Market Trials, and End-to-End Testing.
- Market Participants can use qTest to submit their test results to the IESO during each test phase.
- Market Participants will be notified if or when defects are resolved and which test cases they can re-execute.
- Sandbox systems will be available 24/7. Any issues or questions submitted by Market Participants will be addressed during business hours (Monday-Friday from 9AM-5PM).
- The IESO will host a wrap-up meeting at the end of each test phase.

Connectivity Testing

- **Objective:** Ensure that Market Participants are able to access the tools that will be used during testing.
 - Confirm that all test user accounts are assigned to a current user of a market participant organization and have the correct contact roles associated to their account
 - Confirm that the test API accounts have the correct IP addresses that have been whitelisted by the IESO and that the correct contact roles have been associated to the account
 - Confirm all IESO-MP communications channels are functioning

Connectivity Testing



Connectivity Testing

Market Participants will be able to test to confirm that users (via the graphical user interface (GUI)) and/or API systems can access the following applications in the Sandbox environment:

Application Name	New or Existing	URL
Online IESO	Existing	https://gateway-sbx.ieso.ca
Energy Market Interface (EMI) (via GUI)	New	https://gateway-sbx.ieso.ca
Energy Market Interface (EMI) (via API)	New	https://webservices-sandboxmrp.ieso.ca/emim
Dispatch Services (via GUI)	New	https://gateway-sbx.ieso.ca
Dispatch Services (via API)	New	https://webservices-sandboxmrp.ieso.ca/dispatches
IESO Reports Site (via GUI)	Existing	http://reports-sandbox.ieso.ca/
IESO Reports Site (via API)	Existing	https://reports-sandbox.ieso.ca/api/v1.1/

MIM Web Services Toolkit and MWT Guide

- The MIM Web Services Toolkit (MWT) will be available in December 2023 for Market Participants to test that their API program can successfully connect and function with the EMI Sandbox application through web services.
- The tool can be used to query, submit, and/or delete bids and offers in EMI Sandbox.
- The tool is intended for testing purposes only.

Market Trials

Objective: Market Participants are able to confirm individual tools and interfaces are functioning as intended such as:

- Submitting bids and offers in the EMI GUI and through MIM web services
- Receive dispatch instructions
- Receive new and updated IESO Reports

Market Trials

Online IESO (Registration Forms and Parameters)

- Market Participants will be able to access and submit the following registration forms in Online IEO Sandbox as part of their exploratory testing if desired:
 - Registering as a Virtual Trader
 - Registering as a Price Responsive Load
 - Registering Market Control Entities for market participants and resources
 - Updating Reference Levels and Reference Quantities
 - Entering/Updating new registration parameters for hydroelectric and NQS resources
 - Updating Prudential Support

Market Trials

Online IESO (Registration Forms and Parameters)

- The IESO will post training materials and conduct a demo to outline the changes being made to the registration forms in Online IESO.
- In preparation for Registration Go-Live, the IESO will perform data migration of Market Participant registration data into the new MRP registration fields.
- Market Participants will have at least 5 months to review their registration data in the Online IESO Production system prior to the MRP Go-Live.
- The IESO will test the internal workflows to process registration forms prior to market trials.

Market Trials

Phase 1: EMI

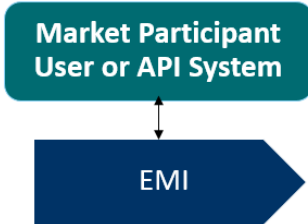
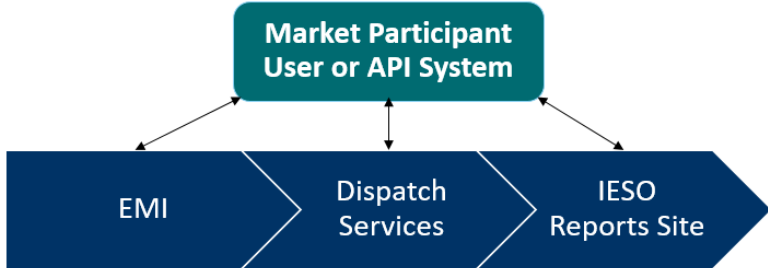
- Market Participants will be able to submit bids and offers in the GUI and through MIM web services from mid-July 2024 to mid-September 2024.
- Testing includes being able to submit new, update, and cancel dispatch data parameters.
- Updated tool guides for MIM will be available in Q2 2024.

Market Trials

Phase 2: Dispatch Services and IESO Reports

- Testing of Dispatch Services and IESO Reports will run from mid-September 2024 to mid-October 2024.
- Dispatch Services and IESO Reports Site will be connected to the EMI system.
- Testing includes being able to receive dispatch instructions, and new and updated reports for MRP.
- Market Participants will need to re-submit bids and offers in EMI for this phase.
- Updated tool guides for Dispatch Services will be available in Q2 2024.

Integration of Systems During Market Trials

Market Trials Phase	Integration of Systems
Phase 1: EMI	 <pre>graph TD; A[Market Participant User or API System] <--> B[EMI]</pre>
Phase 2: Dispatch Services and IESO Reports Site	 <pre>graph TD; A[Market Participant User or API System] <--> B[EMI]; A <--> C[Dispatch Services]; A <--> D[IESO Reports Site]</pre>

End-to-End Testing

Objective: To provide an opportunity for Market Participants to confirm their ability to execute key business processes and systems that are changing as a result of Market Renewal.

- Participants will be able to test the full cycle of processes that start with the submission of bids and offers in day-ahead through to receipt of dispatch instructions.
- Test cases will be structured to provide high level instructions to Market Participants to execute activities in the market.
- Participants will also be able to perform exploratory testing during this time.

End-to-End Testing

- Settlement statements will be produced but are subject to limitations:
 - Telemetry and revenue meter data will be assumed to be consistent with the dispatch instructions
 - Only preliminary settlement statements will be produced during end-to-end testing
 - Charge types generated will be dependent on how participants bid/offer in the test scenario and therefore desired outcomes may not materialize (e.g. cannot guarantee mitigation would occur)

Sandbox Setup during End-to-End Testing

- All Sandbox systems in scope are connected.
- The IESO will pre-populate the testing environment with existing Market Participant registration data.
- In order to provide Market Participants the opportunity to participate in a wide range of scenarios, the IESO will simulate certain market conditions in the tools during end-to-end testing. Conditions will change on a weekly basis.

Sandbox Setup during End-to-End Testing

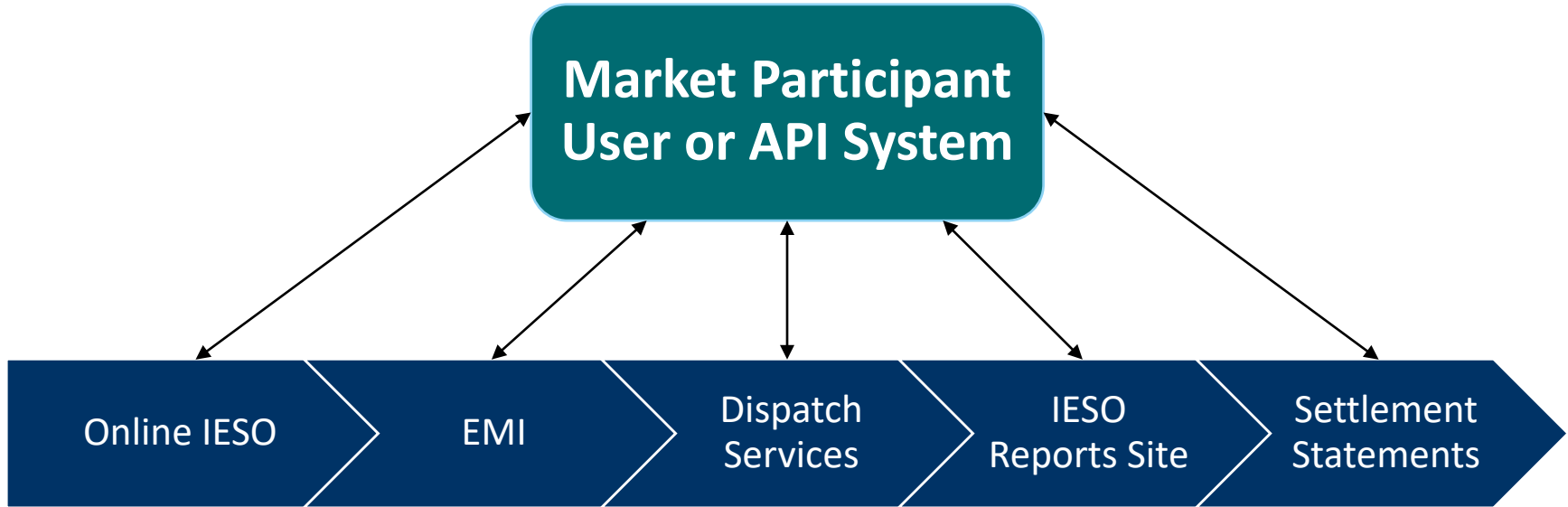
The Sandbox environment will include, but not be limited to the following:

- Demand will be created based on set market conditions.
- Certain limits and constraints will be applied to satisfy specific test scenarios.
- Mock data for reference levels and reference quantities will be provided for those Market Participants who are still undergoing reference consultations.
- Mock standing dispatch data will be provided for Market Participants that will not submit dispatch data in Sandbox.
- Mock registration parameters and dispatch data parameters will be created for specific participation types to support their testing (i.e. NQS).

Sandbox Setup during End-to-End Testing

- Hydroelectric resources that do not identify themselves as part of a cascade group will be treated as an independent resource.
- Testing outcomes will reflect all of the Market Participants' transactions in the Sandbox environment and any information populated from the Production environment.

Integration of Systems During End-to-End Testing



Market Trials vs End-to-End Testing

	Market Trials	End-to-End Testing
Objective	Confirm individual tools and interfaces are functioning as intended such as: <ul style="list-style-type: none">• Submitting bids and offers in the GUI and through the MP's API system• Receive dispatch instructions in the GUI and through the MP's API system• Download new and updated IESO Reports from the GUI and MP's API System	To provide an opportunity for Market Participants to confirm their ability to execute key business processes and systems that are changing as a result of Market Renewal as a whole
Integration of systems	Phase 1: EMI Phase 2: EMI, Dispatch Services, and IESO Reports Site	All systems in scope will be integrated.

Market Trials vs End-to-End Testing

	Market Trials	End-to-End Testing
Processes that can be tested	Phase 1: <ul style="list-style-type: none">• dispatch data submission Phase 2: <ul style="list-style-type: none">• dispatch data submission• receipt of dispatch instructions• commitment to a schedule	Full cycle from submission of bids and offers in day-ahead to receipt of dispatch instructions.
Sandbox Environment Setup	A standard set of market conditions will be applied throughout market trials.	A set of market conditions and constraints will be applied and updated weekly to simulate changing conditions in the Sandbox environment.

Generic Sample Settlement Statements

- The *IESO Charge Types and Equations List* is available on the Market Renewal webpage.
- The *Format Specifications for Settlement Statement Files and Data Files* will be released in Q2 2024.
- Market Participants will be able to download generic sample settlement statements and data files from the IESO's website in Q4 2024 to support their development and testing needs.
- Generic sample statement and data files will include all new and updated charge types listed in the *IESO Charge Types and Equations List*.

New and Updated MRP Reports

- Sample, schema, and help files for both public and confidential reports will be available on the Technical Reference Materials section of the MRP Readiness webpage.
- The schema, sample, and help files for all new and updated reports will be published in four batches: **Q3 2023, Q4 2023, Q1 2024, and Q2 2024.**
- Market Participants are recommended to download these reports, and confirm that the structural changes in these files can be accepted by your internal processes and systems before MRP Go-Live.

Batch 1 Reports Delivered in Q3 2023

#	Report Group	Report Name
1	Day-Ahead Pricing	Day-Ahead Constraints Shadow Prices
2	DAM Scheduling & OR	Day-Ahead Virtual Transactions (Total)
3	Real-time Pricing	Real-Time Constraints Shadow Prices
4	Real-Time Scheduling & OR	Dispatch Advisory
5	Real-Time Scheduling & OR	Real-time Operating Reserve Dispatch
6	Real-Time Scheduling & OR	Real-time Energy Dispatch
7	Real-Time Scheduling & OR	Real-Time Energy and Operating Reserve Dispatch
8	Real-Time Scheduling & OR	5-Minute Operating Reserve Schedule
9	Real-Time Scheduling & OR	5-Minute Energy Schedule
10	Real-Time Scheduling & OR	5-Minute Energy and Operating Reserve Schedule

New and Updated MRP Reports

- Approximately 20 reports will be posted at the end of Q4 2023.
- Each MRP report will have a schema, sample, and help file.
- The detailed list of new and updated MRP reports can be found on the IESO's Market Renewal webpage.
- The scheduled delivery of each report is subject to change. Reports that are confirmed to be in each batch will be announced in future communications.

Thank You

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