Deliverability Test Process for the Long-Term Request for Proposals (LT1 RFP)

June 16, 2023

Version 2.3

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1. Introduction

The Deliverability Test described in this document applies to projects being considered for submission into the IESO's first Request for Proposals for the Procurement of Long-Term Electricity Reliability Services (LT1 RFP).

This procurement is intended to acquire new capacity to meet Ontario's resource adequacy needs starting as early as 2027. Primary drivers for this need include broad economic growth, business investment and increasing electrification across the province.

For example, the IESO projects Ontario will see more than 1.5 million light electric vehicles on the road by 2030. Pockets of demand, such as large industrial loads, are also emerging in different regions.

The IESO must ensure that resources are located where the injection of electricity to the grid from new generation capacity, and withdrawals from the grid in the case of *electricity storage facilities,* can be accommodated and the new capacity is able to meet province wide reliability needs. To ensure this, applicants planning to submit Proposals in the LT1 RFP will be required to participate in the Deliverability Test process and only projects that receive a test result of "Deliverable" or "Deliverable but Competing" will be able to participate in the LT1 RFP.

This document describes the processes, methodologies, inputs, assumptions, roles and responsibilities associated with the Deliverability Test, as well as an explanation of Deliverability Test results. It is intended to ensure that the Deliverability Test is performed in a clear and consistent manner and to maintain the fairness and integrity of associated procurement processes.

In addition, this document presents results and lessons learned from Deliverability Testing for the IESO's Expedited Long-Term RFP (E-LT1 RFP) and Same-Technology Upgrades Solicitation. This includes identifying areas of the province where potential projects seeking to participate in the LT1 RFP should not seek to connect, as they would currently fail their Deliverability Test. This information is provided to help inform applicants' project connection siting for the purpose of participation in the LT1 RFP.

While projects submitted to the LT1 RFP in those identified areas would fail the Deliverability Test for the LT1 RFP, this may not be the case for future procurements. An unprecedented number of transmission projects, including upgrades and reinforcement efforts, are underway in Ontario and are in various stages of development, particularly in the north, the southwest and in major centres such as Ottawa and Toronto. These transmission projects will help improve the deliverability of resources located in those identified areas for future procurements. Furthermore, additional transmission infrastructure will also be needed to support decarbonization efforts, as outlined in the IESO's Pathways to Decarbonization report, released last year, which will also help improve deliverability in those identified areas.

Terms in italics have the meaning ascribed in the *Market Rules*. Capitalized terms not defined herein have the meaning ascribed in the IESO Request for Qualifications for the Procurement of Long-Term Electricity Reliability Services (LT1 RFQ), and the LT1 RFP.

1.1 Limited Scope of the Deliverability Test

The Deliverability Test described in this document is specific to the upcoming LT1 RFP procurement process. The Deliverability Test assesses the ability of a project, as a capacity resource, to deliver the intended reliability-based service during a commitment period or contract term. It will not consider potential transmission congestion or other market parameters outside the demand periods defined in the testing parameters. Thus, a project that receives a result of "Deliverable" under a Deliverability Test may still encounter situations where their output is curtailed or otherwise constrained due to transmission congestion.

The Deliverability Test does not replace or impact any of the connection assessments that are necessary for project connection and required under applicable regulations, these being:

- System Impact Assessment (SIA) and Customer Impact Assessment for *transmission system* connected projects (CIA-TX); and
- Connection Impact Assessment for *distribution system* connected projects (CIA-DX).

Receiving a result of "Deliverable" in a Deliverability Test does not imply that the project will pass the connection assessment and approval process, or that connection costs or connection in-service dates will be within any specific range or estimate.

For clarity, the Deliverability Test does not evaluate the technical solution to connect a proposed project. Applicants are encouraged to discuss that aspect with applicable *transmitters* and Local Distribution Companies (LDCs) prior to submitting requests for the Deliverability Test.

1.2 Inclusion of all Deliverability Tests related information to this document

For the Deliverability Test carried out for the E-LT1 RFP and Same-Technology Upgrades Solicitation, guidance was provided in three separate documents: the 2022 Deliverability Test Process for IESO Acquisition Mechanisms (Deliverability Guidance Document); Locational Considerations for New Resources (Locational Considerations and Circuits to Avoid); and Locational Preference Breakdown.

The link for the documents above are found below:

Locational Considerations and Circuits to Avoid

ELT-1 Deliverability Test Guidance Document

For the LT1 Deliverability Test in respect of the LT1 RFP, the IESO has included all relevant information in this document.

2. Deliverability Test

2.1 Deliverability Test Concept

The Deliverability Test was developed to support IESO resource acquisition mechanisms that are being deployed in order to meet Ontario's emerging resource adequacy needs. The Deliverability Test helps the IESO to ensure that new capacity is located where the *transmission system* and *distribution systems* can accommodate the injections of electricity and transfer it to load centres to meet province-wide resources needs. Thus, the Deliverability Test will assess the impact of the resource/project on all the paths along the way.

In the case of *electricity storage facilities,* the Deliverability Test will also assess whether extra demand for electricity resulting from the charging cycle can be supplied.

The Deliverability Test will be carried out and results provided to applicants before the Proposal Submission Deadline for the LT1 RFP, in order to allow the IESO to only evaluate Proposals in respect of projects deemed "Deliverable" or "Deliverable but Competing".

All projects submitted into the Deliverability Test, that are located in in the same region or Zone(s) and that have a material impact on the same inter-area or inter-zonal transmission network paths, will be tested simultaneously in order to evaluate the combined effects on the system, if all the proposed projects were to connect. As an example, all projects proposing to connect in the West Zone will be tested together. Furthermore, the Deliverability Test will consider peak demand periods in both summer and winter seasons.

The output of the Deliverability Test that will be provided to test applicants will be a simple designation of one of the following three statuses, to help inform decision making regarding the viability of potential projects:

- "Deliverable": No currently known deliverability concerns.
- "Not Deliverable": Deliverability concerns on *distribution systems* and/or *transmission systems* based on currently established assumptions.
- "Deliverable but Competing": Multiple resources proposed in the same deliverability area or paths in *distribution systems* and/or *transmission systems*, where the total combined capacity is higher than their capability.

Proposals receiving "Deliverable" or "Deliverable but Competing" results will be able to satisfy the applicable mandatory requirement in the LT1 RFP in relation to the Deliverability Test.

In the case of projects deemed "Not Deliverable", the IESO will not be providing recommendations as to what changes in connection, location, size or other technical modifications would be required to make the proposed project deliverable.

In the case of projects deemed "Deliverable but Competing", additional deliverability testing will be carried out during the evaluation phase of the RFP. This additional testing is not covered in this document but will be reflected in the LT1 RFP. It is expected that the methodology used for

additional testing will follow the principles included in this Guidance Document, with potential updates of the assumptions to include the latest information available at the time of testing.

2.2 Applicants Eligible for the Deliverability Test

A Person that is (i) a Qualified Applicant under the LT1 RFQ, or a Person Controlled by a Qualified Applicant, or ii) an Eligible Expansion Counterparty, are eligible to submit their projects for deliverability testing for the LT1 RFP.

It should be noted that the results of previous deliverability testing will not be accepted by the IESO for the purpose of LT1 RFP Proposal Submission, including instances where a project from the E-LT1 RFP was previously found to be "Deliverable". Applicants that intend to participate in LT1 RFP must participate in the new Deliverability Test process for the LT1 RFP and will have to submit a new test request form as described in this document.

2.3 Roles and Responsibilities

The Deliverability Test process will be led by the IESO in collaboration with *transmitters* and LDCs. The following is an overview of roles and responsibilities of these parties in this process:

- LDCs are responsible for the Deliverability Test considerations in their service territory, and can use any test method they choose, which can be unique to each LDC.
- *Transmitters* are responsible for completing the short circuit test for the transmission network, and the method used.
- The IESO is not responsible for variation in the assessment processes adopted by the LDCs and *transmitters* involved in implementing their portion of Deliverability Test.
- The IESO is responsible for performing the Deliverability Test at the bulk *transmission system* level, as described in this document.
- The IESO is responsible for determining the final Deliverability Test results for each project under consideration.

For example, an LDC will assess if a project connecting to a *distribution system* is deliverable up to a Transformer Station (TS) or a *transmission system* connected Distribution Station (DS). An LDC, working with the owners of the relevant assets, will also assess if the transformers at the TS and the transmission connected DS have sufficient capacity. Further to this, the IESO will test if there is capacity on the transmission circuit(s) that the TS or DS connects to, and through the bulk *transmission system* paths to electricity load centres.

When new generation capacity is connected, it will increase the short circuit level in *distribution systems* and *transmission systems*. Hence, the Deliverability Test will also check whether the increased short circuit levels are within equipment capability. LDCs, working with the owners of the relevant assets, will check the short circuit impact to the *distribution system,* and *transmitters* will check the short circuit impact to the *transmission system*.

Thus, each Deliverability Test will include numerous components. The specific components that are applicable to a project will depend on where the proposed connection point is in the electricity system.

In order for a project to obtain a "Deliverable" or "Deliverable but Competing" result, a project has to pass all applicable tests.

2.4 Eligible Transmission and Distribution System Facilities for Connection

While there may be new resources deployed on the electricity system, that are being planned or that may be installed with possible in-service dates prior to the in-service date of an applicant's proposed project, such as new transmission lines or new distribution feeders, a Deliverability Test application may only propose connections to existing and operating *transmission system* or *distribution system* facilities.

2.5 Transmission Circuits Not Allowed for Connection

For the purposes of the Deliverability Test for the LT1 RFP, any proposed connections to the following transmission circuits will be deemed "Not Deliverable":

1. All 500 kV circuits:

   500 kV circuits are critical to security of the Ontario electricity system. Connecting projects to these circuits increases the chances of a contingency that removes these critical circuits from service and could make it more difficult to maintain the circuits due to the increased co-ordination that would be required.

2. The set of 230 kV circuits that comprise part of critical transmission interfaces:

   a. Flow East Towards Toronto (FETT): R14T, R17T, R19TH, R21TH, E8V, E9V
   b. Buchanan London Input (BLIP): D4W, D5W, M31W, M32W, M33W
   c. Flow North (FN): D5H
   d. Queenston Flow West (QFW): Q25BM, Q23BM, Q24HM, Q29HM, Q30M, Q26M, Q35M
   e. East West Tie (EWT): W21M, W22M, W35M, W36M
   f. Flow into Ottawa (FIO): L24A

   Connection to these critical interface circuits can materially unbalance the transfer path and lead to limitations on the transfer capability of the entire path.

3. All interconnection circuits:

   a. Ontario-Manitoba: K21W, K22W, SK1
   b. Ontario-Minnesota: F3M
   c. Ontario-Michigan: B3N, L51D, L4D, J5D
   d. Ontario-New York: PA301, PA302, PA27, BP76, L33P, L34P, L46
   e. Ontario-Quebec: B31L, B5D, D5A, A41T, A42T, P33C, H9A, X2Y, H4Z, D4Z

   Connection to interconnection circuits can lead to penalizing the transfer capability with neighbouring entities.

2.6 Locational Preferences and Rated Criteria

In the E-LT1 RFP, the IESO assigned Rated Criteria Points to projects proposing to connect in a number of areas in the province, such as the West of Chatham area (in the West Zone) and east of the Flow East Towards Toronto (FETT) Interface. The preference for capacity to be located in these areas reflected the IESO's desire to meet local reliability needs, in addition to province wide system needs. These Rated Criteria Points were successful in driving a sufficiently high level of interest in the targeted areas for the E-LT1 RFP and Same-Technology Upgrades Solicitation and, as such, the IESO does not see a need to continue to provide rated points in those areas.

As a result, the IESO will be eliminating locational Rated Criteria Points from the LT1 RFP, shifting the focus to meeting only province wide system needs. Local reliability needs will guide how location is valued in the IESO's future procurements and, as a result, the treatment of location will vary from procurement to procurement.

2.7 Project Variations Allowed at Deliverability Test Submission

The IESO recognizes that test applicants may be considering more than one connection point and more than one size (capacity) for a given project. As such, Deliverability Test applicants can submit up to 3 variations on these two parameters for the Deliverability Test for each proposed Long-Term Reliability Project. Deliverability Test applicants can therefore include variations on both connection point and capacity.

It is important to note that an applicant will be required to maintain the same connection point from their Deliverability Test application in their LT1 RFP Proposal submission. In order to avoid a situation where a connection configuration turns out to be infeasible, impractical or the cost too high, applicants are encouraged to have discussions with *transmitters* and LDCs prior to making a submission into the Deliverability Test. The IESO will not be commenting on the feasibility of the project's connection arrangement as part of the Deliverability Test.

Applicants are required to indicate the priority sequence among submitted test variations. The IESO will attempt to provide results for all three, but, if time does not permit, the IESO may not provide results for other variations once a "Deliverable" result is obtained.

2.8 Valid Information for the Deliverability Test

Deliverability test applicants should note that they are responsible for providing valid, clear and concise information for use in the Deliverability Test. As the first step in the Deliverability Test process, the IESO, LDCs and *transmitters* will review the information provided by applicants.

Valid information is critical in carrying out the Deliverability Test. If errors or omissions in the data are identified, the IESO may issue clarifications requests to applicants to correct the information provided before proceeding with the Deliverability Test. Applications may be disqualified if the errors or omissions cannot be corrected within the opportunity provided. Additional information related to the validation of submitted data is included in Section 7.1.

The IESO will only issue two clarifications requests to each project, in order to maintain timelines. This means that applicants that require more than two rounds of clarifications for a particular project, or those that do not respond to request for clarifications in the time allotted, will see their project

removed from further deliverability testing and as such will not be able to submit a Proposal for said project into the LT1 RFP.

The IESO is not responsible for correcting information during the clarification process. Thus, early consultation with *transmitters* and LDCs is strongly encouraged.

2.9 Deliverability Test Result Explanation

For a project to obtain a "Deliverable" result, it has to pass all applicable tests included under the Deliverability Test, including those under the IESO's purview and those conducted by LDCs and transmitters. A project will be deemed "Not Deliverable" if it fails any of the tests.

If the test result for a given project is "Not Deliverable" or "Deliverable but Competing", the IESO will identify one of the following reasons for this status:

- Distribution system limitation;
- Transmission system limitation;
- Transmission short circuit limitation.

3. Deliverability Testing and the LT1 RFP Procurement Process

The Deliverability Test described herein will apply to the tests required for eligibility in the LT1 RFP. In order to conduct deliverability testing, the IESO will request that applicants provide the information requested in the Deliverability Test Input Data form that pertains to the LT1 RFP, including the following:

- Project location (optional, if known);
- Connection information, including GPS coordinates of the connection point, name of transmitter etc.
- Project output information, including maximum summer and winter continuous net output (MW), combined total nameplate ratings (in MVA)
    - Note: the higher of the maximum summer and winter continuous net output (MW) values provided in the Deliverability Test Input Data form will form the basis of the Maximum Contract Capacity value in the LT1 RFP
- Resource type: inverter based or synchronous

Applications to the Deliverability Test must be in the form of a single Deliverability Test Input Data form submitted for each individual Long-Term Reliability Project. Each Qualified Applicant (together with any Person(s) Controlled by such Qualified Applicant) may submit up to a maximum of 10 Deliverability Test Input Data forms. A project that is identified as contingent on the results of the E-LT1 RFP, as further described in Section 3.1.1, will not be included in the 10 project limit. Each Eligible Expansion Counterparty may submit 1 Deliverability Test Input Data form for each Eligible Existing Facility.

3.1 Eligibility for Deliverability Testing

A submission into the Deliverability must be for a Long-Term Reliability Project that meets the mandatory requirements set out in s. 4.2(b) of the LT1 RFP, including being registered under the *Market Rules*, and being able to deliver a continuous amount of Electricity on a dispatchable basis to a connection point on a Distribution System or Transmission System for at least four consecutive hours during Qualifying Hours.

The eligibility requirements for applicants seeking a Deliverability Test prior to Proposal submission for the LT1 RFP are listed in section 2.2

3.1.1 Deliverability Testing for E-LT1 RFP Storage Category 2 Proposals

In response to stakeholder feedback that more time was required between the release of Deliverability Test results and the Proposal Submission Deadline, for potential applicants to consider the viability of their proposed projects and to conduct engagement with communities and municipalities, the IESO has accelerated the Deliverability Test Submission Deadline to June, with results expected by September 2023.

In order to accommodate these timelines, the Deliverability Test Submission Deadline identified below (June 23, 2023) occurs while the evaluation of E-LT1 RFP Storage Category 2 Proposals is ongoing.

As some Deliverability Test applicants may have proposals that are still being evaluated under the E-LT1 RFP, the deliverability process will seek to account for this.

In the Deliverability Test Input Data form, applicants will be asked to identify whether their test submission is contingent on the success of an existing proposal under the E-LT1 RFP. If so, the applicant will be asked for the Unique Project ID of the project being evaluated under the E-LT1 RFP. Where the project submitted into the LT1 RFP Deliverability Test is the same as one being evaluated under the E-LT1 RFP, the IESO will remove the LT1 RFP Deliverability Test submission from further testing where the applicable proposal is successful under the E-LT1 RFP. Such applications will not be counted towards the maximum 10 projects per a Qualified Applicant.

Where the project submitted into the LT1 RFP Deliverability Test is different from one being evaluated under the E-LT1 RFP, the Deliverability Test applicant may indicate on their Deliverability Test Input form that they would like the IESO to remove their application from further consideration if the identified project is successful in the E-LT1 RFP. If the applicant indicates that they would like their application removed, the IESO will remove the project from deliverability testing should it be successful in the E-LT1 RFP, or will continue with deliverability testing if the Proposal is not successful.

Applicants are reminded that limiting the number of projects for which the IESO conducts Deliverability Testing is likely to lead to less results of "Deliverable but Competing". As such, applicants are encouraged to utilize the contingency option where appropriate.

3.2 Deliverability Tests and Connection Assessments

All projects proposing to connect to the Ontario electricity grid must apply for a connection assessment as part of the connection assessment and approval process. Transmission connection assessments will include an SIA carried out by the IESO and a CIA-TX carried out by a *transmitter*. Distribution connection assessments will include a CIA-DX carried out by an LDC. A distribution connected project that is ≥ 10 MW also requires an SIA and a CIA-TX.

These assessments examine the equipment that is proposed to be connected and verify that it will meet the requirements of the *Market Rules,* Transmission System Code and/or Distribution System Code, and that the manner in which the facility is connected would not result in an adverse impact on system reliability or to connected customers.

On the transmission side, an SIA does not assess whether or not the electricity moving to/from the proposed project can be delivered, because when it can't be delivered, the assumption in an SIA is

that the facility will be constrained off. This is the reason that a project which may have already obtained an SIA and/or a CIA-TX cannot be deemed to be "Deliverable" for the purposes of IESO procurements without first applying for a Deliverability Test. In addition, a completed SIA does not reserve connection capacity. As stated previously, before deciding on siting a project, applicants should have preliminary discussions with their *transmitters* or LDC.

Similarly, on the distribution side, a project that has already obtained a CIA-DX will not be deemed to be "Deliverable" without going through the Deliverability Test.

Applicants are precluded from applying for a CIA-DX for *distribution system* connected projects until the conclusion of the Deliverability Test for the LT1 RFP. For clarity, projects submitted for a Deliverability Test for the LT1 RFP must rescind any current CIA-DXs related to project of interest for the LT1 RFP. The IESO will work with LDCs in order to verify that this has been completed. Should this requirement not be met, those projects will not be included in the Deliverability Test for the LT1 RFP, and hence, would not be eligible for the LT1 RFP.

After the Deliverability Test for the LT1 RFP is concluded, projects that obtained "Deliverable" results and that propose to connect to a *distribution system* may apply for a CIA-DX.

Those projects that obtained a "Deliverable but Competing" result, where the reason for this status, as noted in Section 2.9, is not related to a *distribution system* limitation, may also apply for a CIA-DX.

Similar to the requirement under the E-LT1 RFP, since CIA-DXs reserve capacity on the *distribution system*, it is expected that applicants (and contracted facility expansion applicants) that are not offered contracts through the LT1 RFP will be required to rescind any CIA-DXs associated with the projects submitted. The IESO is proposing that the return of Proposal Security submitted as part of the LT1 RFP will be tied to an applicant rescinding any CIA-DX for an unsuccessful project.

The IESO strongly recommends that potential applicants proposing *transmission system* projects or ≥ 10 MW *distribution system* projects delay their SIA applications until the results of the LT1 RFP are announced. If an applicant chooses to apply for an SIA, it is important to note that the SIA may need to be updated or restarted after the results of the LT1 RFP are announced, as an SIA completed earlier would not have included all successful projects as firm projects (and as noted above, a completed SIA does not reserve connection capacity).

4. Deliverability Test Schedule

Below is a proposed schedule which is intended to allow for additional time between the announcement of the Deliverability Test results and the deadline for Proposal submission.

The timeline for this process is largely dependent on the number and type of applications received. Nevertheless, the IESO will make every effort to meet the proposed schedule.

An advancement of the Deliverability Assessment Submission deadline to June 23, 2023 is necessary to provide the Deliverability Test results by September 18, 2023.

LT1 RFP	Proposed Dates
Deliverability Test Submission Deadline	June 23, 2023
Deliverability Test Results Expected	September 18, 2023

5. Deliverability Test Methods and Assumptions

The following sets out the primary assumptions to be used by the IESO in carrying out the Deliverability Test for the LT1 RFP. The IESO is responsible for establishing the methods and assumptions used in the parts of the Deliverability Test under its purview, as further described in section 2.3, subject to the parameters set out in this document and any applicable standards, codes or other regulatory instruments.

LDCs are responsible for the Deliverability Test methods and assumptions in their service territory, and can use any test method they choose, which can be unique to each LDC.

Transmitters are responsible for completing the short circuit test for the transmission network, and the method and assumptions that are used to perform the short circuit test.

5.1 System Base Cases

The IESO will use six sets of system base cases for the LT1 RFP Deliverability Test. These sets will each contain winter and summer cases.

1. Northern Ontario (Northwest and Northeast zones)
2. Western Ontario (West Zone)
3. Southwestern Ontario (Southwest and Bruce zones)
4. Niagara area (Niagara Zone)
5. Central Ontario (Toronto and Essa Zones)
6. Eastern Ontario (East and Ottawa Zones)

5.2 Demand Levels Considered

Newly acquired capacity needs to be deliverable not only during normal weather peak demand periods but also during extreme weather peak demand periods. Thus, the tests will consider zonal demand levels associated with extreme weather and normal weather conditions. The demand forecast levels for extreme weather and normal weather for 2027 from the latest available Annual Planning Outlook (APO) forecast will be used.

A third set of demand levels will be used to test the ability of the local electricity system to supply the charging demand of *electricity storage facilities*. With the expectation of the need for daily charging and discharging cycle on a peak demand day, the IESO will assume that charging can occur anytime during the 16-hour period outside the 8-hour peak demand periods. The average of the zonal demand levels of those 16-hours on the system wide peak winter and summer day will be used for the test. The hourly, extreme weather demand forecast for 2027 will be used to determine the levels for the test, for winter and summer.

5.3 Output of Existing Generation for Two Peak Demand Levels

This section describes the output from existing generation including those confirmed for in-service by 2027 that the IESO will use as assumptions in the Deliverability Test. For dispatchable resources that are not fuel limited such as gas or nuclear generation, the test will be done at their maximum summer and winter continuous ratings. For the other types of resources, the considerations are as follows:

- Hydroelectric generation can technically operate at 90% of their output at system peak if needed. However, as hydroelectric generation is a fuel limited resource, the test will assume winter and summer capacity levels that reflect their normal operation at system peak conditions.
- For wind and solar generation, the output level not exceeded more than 10% of the time during the 8 peak hours in January and July will be used, for the winter and summer tests, respectively. For the West Zone, this results in wind generation output of 43% and 91% for the summer and the winter tests, respectively.

5.4 Output of Existing Generation for Electricity Storage Facility Charging Test

The existing generation within the test area will be set to the following conditions for testing the ability of the power system to charge *electricity storage facilities*:

- Hydroelectric generation at zero for peaking units but run-of-the river units at normal operating levels.
- Nuclear generation at maximum output.
- For wind generation, historical data was used to determine the level to be used for the tests. Wind generation level available 90% of the time during the off-peak hours will be used. For the West Zone, this results in wind generation output of 1% and 4% for the summer and the winter tests, respectively.
- Fossil fuelled generation will be set at half of their maximum output to reflect the situation that not all such local generation may be required to run at their maximum outputs.
- Solar generation at zero output.
- Other local generation at maximum output.

5.5 Output for New Resources Being Tested

The Deliverability Test for LT1 RFP projects will be carried out at maximum continuous rating levels indicated in the Deliverability Test Input Data form. This also applies to *electricity storage facilities*. At the system peak periods, the expected operating mode of *electricity storage facilities* is the full generation mode.

For the charging demand test for *electricity storage facilities*, 50% of the maximum continuous rating levels will be used. *Electricity storage facilities* have 16 hour periods where the charging could occur and charging demand can be much less than the maximum continuous rating in generation mode. The 50% level is thought to be a reasonable level for the test.

Eligible Expansion applicants will be required to submit their existing maximum continuous rating as well as the incremental capacity associated with an expansion to an existing contracted facility.

The maximum continuous ratings to be entered in the Deliverability Test Input Data form are as follows:

- Winter maximum continuous rating: the output at 10°C in southern Ontario and 5°C in northern Ontario in MW.
- Summer maximum continuous rating: the output at 35°C in MW.

5.6 System Dynamics

The electricity system is dynamic and subject to change during a Deliverability Test process. For fairness and consistency, test assumptions (other than those set out in this document) will be established just before the technical tests for each Deliverability Test are initiated and they will remain unchanged throughout the tests.

6. Results from the E-LT1 RFP and Same Technology Upgrades Solicitation Preliminary Deliverability Test

This section describes the learnings from deliverability testing that was required for submissions into the E-LT1 RFP and Same Technology Upgrades Solicitation. On November 30, 2022, the IESO released the results of the deliverability testing for submission into the E-LT1 RFP and the Same Technology Upgrades Solicitation. Potential Applicants that were planning to submit proposals in the procurement and the solicitation were required to participate in this process. Only projects that received a test result of "Deliverable" or "Deliverable but Competing" were eligible to make a submission under the E-LT1 RFP and Same Technology Upgrades Solicitation.

The results summarized below do not apply to deliverability testing carried out in the evaluation phase of the E-LT1 RFP and the Same Technology Upgrades Solicitation, or to the results of these acquisition mechanisms.

6.1 Summary

The following is a general summary of the applications received for deliverability testing and their results.

While the E-LT1 RFP bifurcated Proposals into the Non-Storage and Storage Categories, applications for deliverability testing were only requested to identify whether proposed projects were Eligible Expansions or New Builds.

	Upgrades Solicitation	E-LT 1 RFP Eligible Expansions	E-LT1 RFP New Build
Total Incremental Maximum Continuous Summer Rating (MW)	490	2,863	20,940
Number of Test Requests	12	26	150
Number of Applicants	9	22	27

Same Technology Upgrades Solicitation

- All 12 test requests were found to be "Deliverable" or "Deliverable but Competing".

E-LT1 RFP – Eligible Expansions

- 1,453 MW of 2,863 MW were "Deliverable" or "Deliverable but Competing".
- 11 out 26 requests were "Not Deliverable".

E-LT1 RFP - New Builds

- 12,939 MW of the 20,941 MW were Deliverable or Deliverable but Competing.
- 43 out 150 requests were Not Deliverable

6.2 Deliverability Testing Results

The results of deliverability testing are influenced by the location of the proposed project in the province, the specific connection point on a given circuit and the connection choice (multiple circuit connection or a direct connection to a switching station or a transformer station) etc. Details on the deliverability testing process and assumptions for the E-LT1 RFP and Same Technology Upgrades Solicitation can be found in Deliverability Guidance Document dated August 18, 2022.

6.3 Test Results by Zones

The following provides observations on three specific zones, related to delivering incremental Electricity to where it is needed in Ontario.

6.3.1 Northwest Zone

There is a transmission limitation within the Northeast Zone from the Wawa Transformer Station (TS) towards the Sudbury area, which resulted in proposed resources located in the Northwest Zone being deemed "Not Deliverable".

The system upgrades that are included in the **Northeast Bulk Plan** and recommended to be implemented between 2029 and 2030 will help improve the deliverability of resources located in the Northwest Zone by addressing this constraint. Once this constraint is addressed, it should be noted that there are downstream transmission constraints between Sudbury and Barrie that will also limit the amount of deliverable capacity in northern Ontario. The upgrades in the Northeast Bulk Plan were not assumed to be in service in the deliverability testing completed for E-LT1 RFP and Same Technology Upgrades Solicitation. The IESO has decided to continue to assume that they are not available for LT1. This assumption will be revisited for subsequent procurements.

Thus, proposals for generation projects in northwest Ontario will continue to be not deliverable in the LT1 RFP.

6.3.2 Northeast Zone

The transmission limitation within the Northeast Zone eastbound from Wawa TS towards the Sudbury area, referred to above, has also resulted in proposed resources in the Sault Ste. Marie/Algoma area to be deemed "Not Deliverable".

The system upgrades that are included in the **Northeast Bulk Plan** and recommended to be implemented between 2029 and 2030 will help improve the deliverability of resources located in the Northwest Zone by addressing this constraint. Once this constraint is addressed, it should be noted that there are downstream transmission constraints between Sudbury and Barrie that will also limit

the amount of deliverable capacity in northern Ontario. The upgrades in the Northeast Bulk Plan were not assumed to be in service in the Deliverability Tests completed for E-LT1 RFP and Same Technology Upgrades Solicitation. The IESO will continue to assume that they are not available for LT1. This assumption will be revisited for subsequent procurements.

Thus, proposals for generation projects in the Sault Ste. Marie/Algoma area will continue to be not deliverable in the LT1 RFP.

Furthermore, there is a transmission limitation from Hunta towards the Sudbury area, and from Hunta towards the Dymond area, which resulted in proposed resources located in the north of Timmins and Kirkland Lake areas being deemed "Not Deliverable".

Finally, there may be areas in Northeast Zone where projects can be delivered to the Sudbury area. However, as mentioned earlier, there is limited transfer capacity from Sudbury to Barrie that could restrict such projects towards obtaining "Deliverable" or "Deliverable but Competing" results.

6.3.3 West Zone

E-LT1 RFP submissions that were included in deliverability testing showed a high interest in the development of projects in the West Zone, given locational preferences established by rated criteria in the procurement. While helping to meet local reliability, there is a limit to the capacity of new resources that can be added in the west of Chatham area that will also contribute to meeting system-wide needs. This limitation results from limited transmission capacity to transfer excess supply capacity located west of Chatham to other load centres in Ontario.

The high level of interest seen in the E-LT1 RFP could now severely limit opportunities for LT1 RFP projects to be deemed "Deliverable" or "Deliverable but Competing" in the area west of Chatham.

There is a multi-stage transmission plan for the West Zone that will alleviate the constraints noted above. The details can be found in **The West of London Bulk Planning Report.** The projects included in this transmission plan that are expected to be in-service by 2028 were assumed to be available for the purpose of deliverability testing carried out for the E-LT1 RFP and Same Technology Upgrades Solicitation. The same assumption will be maintained in the LT1 RFP. The other transmission projects recommended in this transmission plan will be assumed to be available for deliverability testing for future procurements.

6.4 Short Circuit Considerations

When new resources are added to the system, they increase the short circuit fault levels that circuit breakers on the *transmission system* and *distribution system* need to interrupt. The increased short circuit levels need to be within the rating of the existing *transmission system* and *distribution system* equipment. The following are highlights of the restrictions observed in the E-LT1 RFP and Same Technology Upgrades Solicitation deliverability testing and the actions taken. **The IESO has sent a letter on this subject on March 13, 2023**.

Some projects proposing to connect to the distribution system failed the short circuit tests carried by the LDCs. Short-circuit limitations at distribution level are normally identified and addressed by applicable LDCs.

6.4.1 Lambton area

The equipment limitations at Lambton TS would not have allowed new resources to connect in the area. In order to facilitate locating new resources in the area, the IESO decided to use operational measures which involve splitting the Lambton TS bus, when required. This allowed some projects in the area to be "Deliverable" or "Deliverable but Competing". This assumption will continue to be used in the LT1 RFP Deliverability Test.

6.4.2 Windsor area

Existing equipment limitations at Keith TS would not have allowed new resources to connect in the area. However, the IESO and Hydro One agreed that by advancing the planned sustainment work at Keith TS, it would be possible to address the limitations by 2025 and improve the situation. As such this did not restrict projects from connecting in the Windsor area in the Deliverability Tests completed for E-LT1 RFP and Same Technology Upgrades Solicitation. This assumption will continue to be used in the LT1 RFP Deliverability Test.

6.4.3 Chatham area

Equipment limitations at Chatham TS have resulted in some projects being deemed "Not Deliverable". Hydro One and the IESO will consider solutions and the business case for implementing a solution. However, given limited timing this situation will not change for the LT1 RFP Deliverability Test.

6.4.4 Western part of Greater Toronto Area

The equipment limitations at Trafalgar TS have resulted in many Proposals and Submissions in the western part of the Greater Toronto Area to be deemed "Not Deliverable" in the ELT-1 Deliverability Tests. Hydro One and the IESO have since explored potential solutions including operational measures to address the issue and are now comfortable a solution could be in place before 2027. Hence, the deliverability testing for LT1 will assume that this constraint has been addressed, potentially allowing some projects to get a result of "Deliverable" or "Deliverable but Competing".

6.4.5 Hearn TS area

The equipment limitations at Hearn TS have resulted in Proposals and Submissions for the area to be deemed "Not Deliverable" for E-LT1 deliverability testing. However, an operational measure will be used to allow some projects to obtain "Deliverable" or "Deliverable but Competing" results in the LT1 Deliverability Test.

7. Quality of Application Data for the Preliminary Deliverability Test

7.1 2022 Deliverability Testing Lessons Learned

As set out in the **Deliverability Guidance Document dated August 18, 2022**, applicants that sought to obtain a Deliverability Test result were responsible for providing relevant information in the Deliverability Test Input Data form, so that the IESO could complete its testing process accurately and in the time proposed. The IESO received 188 applications for the Deliverability Test process and of those, 90 project applications required corrections or clarifications, based on the reviews of the information provided by the IESO, LDCs and *transmitters*. Many applications required multiple rounds of clarifications in order to ensure that the IESO could proceed with testing.

These clarifications added significant challenges in maintaining stringent procurement milestones and deliverability testing schedules. Applicants seeking to obtain Deliverability Test results for the LT1 RFP will need to ensure that input data provided is clear and accurate.

The IESO will consider more stringent process requirements to limit the number of clarifications required to ensure that input data is clear and accurate.

7.2 Recommendation for future Deliverability Tests

The IESO strongly encourages applicants work more closely with relevant *transmitters* and/or LDCs before submitting Deliverability Test requests for subsequent procurements, including the LT1 RFP. Obtaining accurate information from relevant third parties (LDCs and *transmitters)* would avoid the need for clarifications. The errors in application for deliverability testing under the E-LT1 RFP and Same Technology Upgrades Solicitation included the following:

- Incorrect feeder name and/or station name for a *distribution system* connected project;
- Incorrect LDC name for a given project address;
- Incorrect circuit name for a *transmission system* connected project;
- Incorrect station names for a project directly connecting to a *transmission system* TS or switching station (SS); and
- Ambiguous information for project proposing to connect to multiple transmission circuits.

Additionally, the following issues required clarifications:

- Incomplete Deliverability Test Input Data forms which were missing the required information;
- Incorrect GPS coordinates or GPS coordinates which did not match the specified circuit; and
- GPS coordinates submitted in an incorrect format.

Clear and correct data and information will help to reduce the time and resources needed to perform the Deliverability Test and will allow more time to be allocated to the next stages required for completing the proposed projects.

8. Deliverability Test Input Data Form

A new updated Deliverability Test Input Data form has been released. This form includes numerous improvements reflecting the lessons learned.

Some highlights are as follows:

- Ability to indicate connection choices that include both *transmission system* and *distribution system* connection for a given project;
- Better way to describe details of a multiple circuit or multiple feeder connection;
- Highlighted cells to indicate the required information as choices are made; and
- More comprehensive instruction sheet.

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