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# Communicating with the IESO

## - Transmitters

IESO Training

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## **AN IESO MARKETPLACE TRAINING PUBLICATION**

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# 1. Introduction

Effective communication is the most important tool the IESO has in maintaining the reliability of the IESO-controlled grid<sup>1</sup> and operating the markets. Information exchange is key.

Although the IESO receives thousands of bits of data every few seconds, there are many situations that only Market Participants (MPs) can see. The MPs information can alert the IESO about, or confirm the seriousness of, a situation and can help the IESO make the right decision as quickly as possible. Examples of this type of information include local electrical storms, grass fires, high winds, and ice build- up on structures. It is also essential for the IESO to be informed about circumstances that have the potential to impact the future operation of an MP's facilities.

This guide covers:

- Timelines and reasons for these timelines
- Communication principles and protocols
- Communication requirements during normal and abnormal operating states
- How the IESO and Market Participants communicate in real-time

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<sup>1</sup> In this document, 'grid' means the IESO-controlled grid. 'Markets' means the IESO-administered markets.

## 2. Communications Timelines

Events on the power system happen quickly. When there is an unexpected event on the power system (a 'contingency'), the system is not as strong as it was before the event. The IESO needs to re-prepare, i.e., get ready to face the next event as soon as possible.

The longer the system spends time in a degraded state, the more vulnerable it is to the effects of another contingency. Often, contingencies take place during severe weather, so the likelihood of another event is higher than normal.

### 2.1 Reliability standards

Reliability standards require the IESO to re-prepare the system within 30 minutes during normal conditions and within 15 minutes during high-risk conditions, such as an electrical storm. In these short periods, the IESO must gather information from MPs, make a plan and execute it. As the user of this guide can see, timely communication from the involved MPs is key if the IESO is to meet required re-preparation times and minimize exposure to this increased risk.

### 2.2 The Market Participant's role

The IESO may direct an MP to take an action 'promptly' or 'immediately'. When the IESO uses these terms, it means:

**Note:** As soon as possible, but no longer than 5 minutes after receiving direction or recognizing the need to take an action<sup>2</sup>.

The IESO will communicate this type of direction to an MP by telephone.

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<sup>2</sup> As outlined in the Market Rules: Chapter 5, Section 1.2.5

## 3. Communications Principles and Protocols

The IESO's goal is to facilitate open, timely communication. Clear communication is paramount during both normal and abnormal conditions. It is important that both the IESO and MPs understand all communications.

Because of unconscious editing, technical term misunderstanding, or technical problems, the receiver (whether the IESO or an MP) must repeat the message back to the sender to ensure that the message has been received and is understood correctly.

### 3.1 Guidelines

- Avoid using first names on a conference call - address individuals by station or site name.
- Be concise and precise - provide only the information that is related to the purpose of the call.
- Give complete attention to the call.
- To avoid any misunderstandings, use official industry operating terminology.
- Avoid using jargon that may only be understood within the MP's own company – Please refer to [Market Manual 7.6: Glossary of Standard Operating Terminology](#) for a list of approved operating terms.
- An MP needs to identify their company and the location they are calling from. (Some participants have more than one location.)
- Avoid discussions about real-time price, market conditions, and other confidential/sensitive information

### 3.2 Where to find communications protocols

Communication protocols with the IESO are in the market rules and market manuals:

- [Market Manual 7.1](#) contains much of the material covered in this guide
- [Market Manual 7.6](#) lists approved operating terms

## 4. Communicating During a Normal Operating State

### 4.1 Normal operating conditions

The grid is in a normal operating state when the IESO has:

- Fair weather conditions
- No security limits or thermal limits being exceeded
- Sufficient energy and capacity to meet the forecast demand
- No emerging reliability concerns within Ontario or in neighbouring jurisdictions that could affect our area

The grid is in the normal operating state most of the time.

### 4.2 The MP's communication paths

During normal operating conditions an MP has two communication paths, which they use according to the circumstances:

There are things that the MP must communicate directly to the IESO, such as:

- Planned equipment and/or auxiliaries outages, tests or outage extensions
- Approvals to switch equipment in and out of service (planned switching, planned periods of unavailability of equipment, expected return to service times from outages, etc.)
- Performing any transformer manual tap changes Planned operation of any breakers that parallel the grid
- Any event information that could potentially jeopardize grid or equipment reliability

Typically, according to connection and operating agreements, the MP communicates with their customers about things such as:

- Coordinating switching
- Outage timing requirements and work protection
- Operating control of elements contained in a common switchyard, etc.

The IESO may also be involved in some of these discussions.

These communication protocols are set out as minimums. MPs are encouraged to contact the IESO whenever they have something relevant to communicate.

Often an MP is the only one who knows of a situation. Prompt communication to the IESO can help avert an event that would otherwise adversely affect the grid.

## 5. Communicating During an Abnormal Operating State

### 5.1 Abnormal operating conditions

An abnormal operating state exists any time the IESO is not in a normal condition, including when:

- The IESO declares an emergency, or
- The IESO declares a high-risk operating state, or
- After a contingency (i.e., an unexpected event on the power system)

### 5.2 Who to communicate with

In abnormal operating conditions, such as after a contingency, the IESO is an MP's first point of contact.

The IESO will assess, co-ordinate and direct the restoration of equipment when it is safe to do so, conferencing in all involved parties.

### 5.3 When to call the IESO

Under the following abnormal conditions, the MP must call the IESO immediately. These are specific cases, but any indication that something abnormal is going on should prompt the MP to call.

The MP should call the IESO immediately if experiencing:

- Automatic operations of any grid-connected circuit breakers
- Degradation of system, auxiliary or control equipment, such as:
  - Transformers and the MP's alarms
  - Circuit breaker problems or alarms
  - DC supply system problems
  - Protection and communication system problems
- Degradation of switchyard auxiliary equipment (e.g., compressors or compressed air system problems that can cause circuit breakers to fail to operate and create a 'stuck breaker' situation)
- Operation of power system auxiliaries:
  - Special protection systems
  - Under-frequency protection of one or more UFLS relays
- Any indication of a power system event, such as:



- Oscillations of real or reactive power
- Voltage declines  $\geq 10\%$
- Operation of disturbance recorders, etc.
- An automatic loss of reactive capability or resources:
  - $\geq 15$  MVARs, if it is south of Barrie
  - $\geq 10$  MVARs, if it is north of Barrie
- Any factors that may affect the operation of the grid (e.g., inclement weather, forest fires, sabotage, or directions from civil authorities, etc.)
- When frequency drops below 59.8 Hz

## 5.4 Communicating with the IESO during a Contingency

### Who to call

- Call the IESO control room operator promptly when a grid disturbance occurs, and provide information on the cause (if known) and effect of the contingency on the MP's facility and equipment.
- The IESO will conference the MP as necessary with all affected parties. During phone conferencing, please remain on the line until the IESO ends the call. The MP's information is important to the IESO in building the plan for recovery to normal operation.

### What to say

Whether the MP speaks with the IESO operator or are re-directed to a voice mailbox<sup>4</sup>, the IESO needs key information from the MP:

- Identify the caller's full name
- Identify the MP's company and facility location
- Identify the reason for the call
- Have key information available (as outlined below)

## 5.5 Multi-party Communications

Due to the integrated nature of the power system, there are many situations where the IESO needs to speak with a number of different participants at the same time via conference call.

As an involved party, it is essential that the MP remains on the line while these discussions take place. Failure to do so may delay restoration or prevent resolution of the operating problem.

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<sup>4</sup> Market Participants may be directed to a voice mailbox only during large scale or wide spread disturbances

## **The information the MP should provide**

- Time of the event
- Status of the stations/lines involved in the event and related equipment
- What the MP observed – were there any indications prior to the trip that something was happening on the grid
- If the MP has any indication of likely cause
- Any protection annunciations received
- Any concerns about returning equipment to service
- Other urgent equipment, safety, or environmental concerns

## **What to leave on the IESO's voice mail**

The IESO telephone system prioritizes calls during disturbances. When this happens, an MP's call may be re-directed to voice mail:

- It is important to leave all relevant information on the recording. The IESO will return the MP's call as soon as possible. Please note that due to the volume of calls the IESO receives during disturbances, unless the MP's conditions change, one phone message is sufficient.
- An MP can elevate themselves in the IESO phone queue if they have urgent information concerning public safety, danger to the environment, or risk of equipment damage.

The MP's message should include:

- The MP's identity, company and facility location
- The reason for the MP's call
- Information on the cause or impact of the disturbance and the status of the MP's equipment

Be prepared for the IESO's follow-up call.

## **Next steps**

The IESO will use all available information from an MP and other affected participants to build a plan for recovery to restore the system to normal operation as soon as possible:

- Follow the IESO's directions to restore equipment
- Resume normal operation when the IESO confirms it is safe to do so
- Call the IESO if an MP knows of any post-event issues that may affect the grid or the markets or if the MP discovers anything that could help reveal the cause of the disturbance

The MP's information is a very important part of building the IESO's restoration plan. It is important that the IESO is able to communicate with every participant on a circuit before re-energizing that circuit.

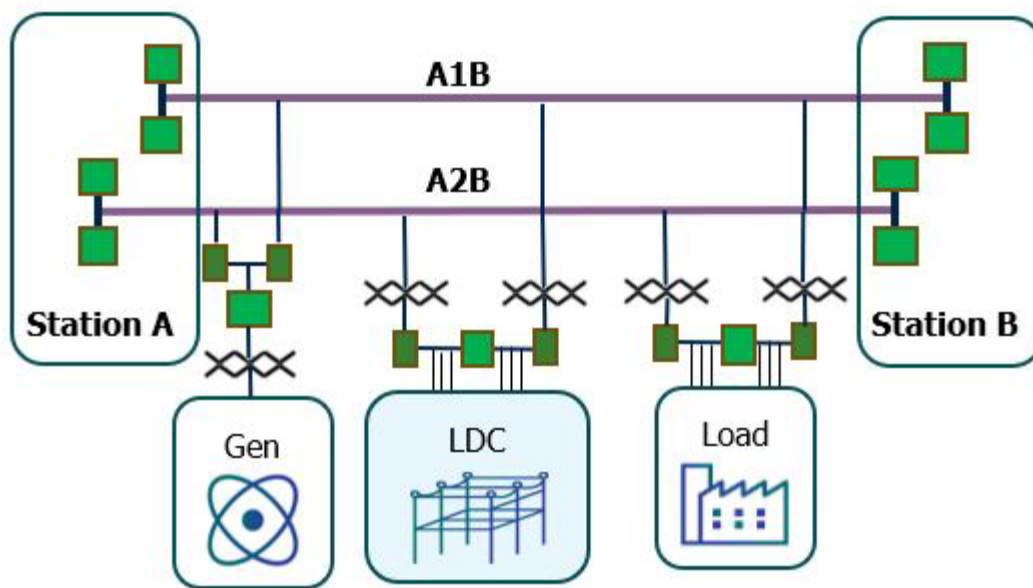
If the IESO cannot speak with an MP, restoration may be delayed. That is why it is important that the MP's contact numbers are up to date in the IESO registration database. If the MP's information is not up-to- date, contact their Business Advisor and update the information in [Online IESO](#). An Applicant Representative of the registered organization(s) can add or remove contact roles in Online IESO. To update contact roles, please refer to [Step By Step For Adding a Contact Role](#) document.

## 5.6 Post-contingency communications

The information an MP provides is very important for system reliability. Post contingency, the IESO needs to know:

- **Equipment status or concerns:** Has the MP's equipment been forced out of service for a long period? Does the MP have any concerns about equipment damage?
- **System status:** Does the MP have any voltage or thermal concerns? Has the MP noticed any abnormal frequency excursions? Has the MP suffered any load loss?
- What annunciations can the MP provides to the IESO – such as relay protection sealed-in? This can help the IESO piece together the cause of an event.
- Has the MP had any operation of any special protection schemes or system auxiliaries (e.g., underfrequency load shedding)?
- Does the MP have any urgent environmental concerns that could become a major disaster?
- Indications of fault severity (if the MP has digital fault recorders installed within their operation, communicating this information is very important, e.g., how did the MP's equipment respond during this disturbance, etc.)
- The MP's assessment of return to service of their equipment and any potential causes, if they are known.
- Any information relevant to the security of the grid or concerns before a restoration attempt is made, e.g., equipment limitations, environmental conditions, etc.
- If the contingency involves other market participants' equipment - the IESO will discuss with all parties before a restoration attempt (this is why it is important for the IESO's facility registration database to have an MP's up-to- date contact information)

### Example – loss of instantaneous protection.



Example - loss of instantaneous protection

Assume that this portion of the grid loses instantaneous protection. Regardless of the extent, the MP must call the IESO immediately. In this case, the grid is exposed to more risk because of the extended time that a fault might remain on the power system.

#### What should the MP do

- Call the IESO control room operator promptly and follow the same steps as for a contingency
- However, during this situation, it is important to emphasize the key facts among the numerous alarms the MP may have (e.g., loss of instantaneous protection on lines A1B and A2B)
- Provide the IESO with any additional information about the MP's plan and timeline to rectify the equipment malfunction

#### Next steps

- The IESO will use all available information and direct the switching to remove the circuit from service if this is an area that is impactful to the IESO's neighbours – refer to [Market Manual 7: Part 7.4 IESO-Controlled Grid Operating Policies](#).
- The MP needs to let the IESO know promptly of any changes that affect status of the protection system.

## 6. IESO-initiated Communications

There are circumstances when the IESO may call an MP to do something during normal or abnormal conditions.

Calling is the IESO's most common means of communication. the IESO does not physically operate equipment, rather the IESO directs the operation of the IESO- controlled grid. It is through telephone communication with the MP, the participant, that the IESO gets things done.

The IESO initiates communication that could include:

### **During normal operating states**

- Directing the MP to execute an action
- Equipment outages or de-rates
- Requesting equipment or system information

### **Advisory Notices:**

- System advisories
- Major change advisories
- Grid material changes (refer to Market Manual 7.2 available on [the IESO Rules and Manuals web page](#), for details on material changes)

### **The IESO's actions could include:**

- Directing the MP to execute an action, or
- Requesting a load reduction or a 3% or 5% voltage reduction

During these times, prompt response to the IESO's requests is important. Although it does not happen often, the IESO may request an MP to remove equipment from service immediately.

## 7. Skill Check

### 7.1 Questions

1. An MP has called the IESO immediately after receiving numerous transformer station alarms caused by a transmission circuit trip. From the list below, select the information that the MP needs to communicate to the IESO about this incident.
  - a) Whether the MP still has instantaneous protection for the equipment, buses and transmission lines.
  - b) A brief explanation, exact time, what the MP observed and if they have any indication of the likely cause of the event.
  - c) Any concerns about returning the MP's equipment to service.
  - d) Report all the alarms to ensure nothing is missed.
  - e) Fax the IESO a copy of the disturbance recorder's sequence of events list.
  
2. An MP receives an alarm indicating a station circuit breaker air system problem. The MP plans to dispatch personnel who is near the station to investigate. From the list of actions below, select the correct one.
  - a) Wait until the MP's field personnel reports full details of the problem before informing the IESO.
  - b) Call the IESO immediately with a brief description of the event.
  - c) Give the MP's field personnel 30 minutes to report. If they have not contacted the MP by then, call the IESO.
  - d) Wait a while – this is a known problem that clears itself in minutes.
  
3. One of the MP's customers has called them to inform about a grass fire that has developed under a 230 kV transmission line corridor and that fire fighters are already on the way. Is this something the MP needs to communicate to the IESO?
  - a) Yes
  - b) No

4. One of an MP's transformer station's DC supply systems generate a general alarm. The DC system is fully duplicated. From the communication response list below, select the correct answer.
- a) No need to call the IESO since the DC system is fully duplicated.
  - b) Call the IESO immediately so the IESO can collectively discuss a reliability mitigation plan.
  - c) General alarms usually indicate minor problems – call the IESO only if the MP finds it to be a problem that has the potential to reduce grid reliability.
5. From the list of events below, pick all the ones that an MP needs to report to the IESO immediately:
- a) Planned equipment outages or auxiliaries' outages, tests or outage extensions.
  - b) Planned operation of any breakers that parallel the grid.
  - c) Any automatic loss of reactive power capability or resources <10 MVARs if the MP is located north of Barrie.
  - d) Any factors that may affect the operation of the grid (e.g., inclement weather, forest fires, sabotage, directions from civil authorities, etc.).
  - e) Any indication of a power system event (e.g., oscillations of real or reactive power, voltage declines  $\geq 10\%$ , any operation of disturbance recorders, etc.)
6. An MP's monitoring system records a system frequency oscillation. The MP is not sure if this is a real situation since they have not received any other unusual alarms. From the list below, choose the correct response.
- a) Call the IESO control room operator immediately and report the information – frequency oscillations often signify larger system problems. The IESO can also use telemetry to confirm the situation.
  - b) Since there are no other alarms to cross-reference this event, it must not be real – no need to call the IESO.
  - c) Wait at least 10 minutes to allow for frequency correction. Often, frequency oscillation events correct themselves.
7. The IESO calls the MP during a busy day to request an urgent circuit removal to clear a limit exceedance. From the list below, select the correct response.
- a) Repeat the request to confirm, and execute the action promptly.
  - b) Because it is a busy day, the MP asks to call the IESO back as soon as they complete another task.

- c) Repeat the request to confirm, then wait to execute the action until receiving approval from the MP's supervisor who is attending a meeting.
- d) Repeat the request to confirm, then inform all connected customers before removing the circuit from service.



## 7.2 Answers

1. An MP has called the IESO immediately after receiving numerous transformer station alarms caused by a transmission circuit trip. From the list below, select the information that the MP needs to communicate to the IESO about this incident.
  - a) **Whether the MP still has instantaneous protection for the equipment, buses and transmission lines. ✓**
  - b) **A brief explanation, exact time, what the MP observed and if they have any indication of the likely cause of the event. ✓**
  - c) **Any concerns about returning the MP's equipment to service. ✓**
  - d) Report all the alarms to ensure nothing is missed.
  - e) Fax the IESO a copy of the disturbance recorder's sequence of events list.
2. An MP receives an alarm indicating a station circuit breaker air system problem. The MP plans to dispatch personnel who are near the station to investigate. From the list of actions below, select the correct one.
  - a) Wait until the MP's field personnel report full details of the problem before informing the IESO.
  - b) **Call the IESO immediately with a brief description of the event. ✓**
  - c) Give the MP's field personnel 30 minutes to report. If they have not contacted the MP by then, call the IESO.
  - d) Wait a while – this is a known problem that clears itself in minutes.
3. One of the MP's customers has called them to inform about a grass fire that has developed under a 230 kV transmission line corridor and that fire fighters are already on the way. Is this something the MP needs to communicate to the IESO?
  - a) **Yes ✓**
  - b) No
4. One of the MP's transformer station's DC supply systems generate a general alarm. The DC system is fully duplicated. From the communication response list below, select the correct answer.
  - a) No need to call the IESO since the DC system is fully duplicated.
  - b) **Call the IESO immediately so the IESO can collectively discuss a reliability mitigation plan. ✓**

- c) General alarms usually indicate minor problems – call the IESO only if the MP finds it to be a problem that has the potential to reduce grid reliability.
5. From the list of events below, pick all the ones that an MP needs to report to the IESO immediately:
- a) **Planned equipment outages or auxiliaries' outages, tests or outage extensions. ✓**
  - b) **Planned operation of any breakers that parallel the grid. ✓**
  - c) Any automatic loss of reactive power capability or resources <10 MVARs if the MP is located north of Barrie.
  - d) **Any factors that may affect the operation of the grid (e.g., inclement, weather,**
  - e) **forest fires, sabotage, directions from civil authorities, etc.). ✓**
  - f) **Any indication of a power system event (e.g., oscillations of real or reactive power, voltage declines  $\geq 10\%$ , any operation of disturbance recorders, etc.) ✓**
6. An MP's monitoring system records a system frequency oscillation. The MP is not sure if this is a real situation since they have not received any other unusual alarms. From the list below, choose the correct response.
- a) **Call the IESO control room operator immediately and report the information – frequency oscillations often signify larger system problems. The IESO can also use telemetry to confirm the situation. ✓**
  - b) Since there are no other alarms to cross-reference this event, it must not be real – no need to call the IESO.
  - c) Wait at least 10 minutes to allow for frequency correction. Often, frequency oscillation events correct themselves.
7. The IESO calls an MP during a busy day to request an urgent circuit removal to clear a limit exceedance. From the list below, select the correct response.
- d) **Repeat the request to confirm, and execute the action promptly. ✓**
  - e) Because it is a busy day, the MP asks to call the IESO back as soon as the MP completes another task.
  - f) Repeat the request to confirm, then wait to execute the action until receiving approval from the MP's supervisor who is attending a meeting.
  - g) Repeat the request to confirm, then inform all connected customers before removing the circuit from service.

## 8. Summary

In summary:

- MPs are encouraged to contact the IESO any time they have something relevant to advise
- MPs' timely communication during normal and abnormal conditions allows for more options
- Be aware of the types of situations that require an MP to call the IESO
- An MP's participation in conference calls is an important part of a prompt recovery plan
- Provide the IESO with key information following contingent events
- The IESO may request an MP to initiate a control action during abnormal operating conditions

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