Emergency Drills & Exercises

Operational Excellence

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Drill and Exercise Guide

AN IESO TRAINING PUBLICATION

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1. Purpose

This document provides guidance to market participants on how to conduct emergency drills and exercises, and describes what to expect when you participate in IESO-led drills and exercises.

2. Requirements for all Market Participants

All market participants must file emergency plans, which we review. You need to test and exercise your plans, and this document provides guidance on how to do this.

- Practice your emergency plan annually, either internally or as part of an IESO-coordinated exercise. Internal emergency response exercises will help ensure your emergency response capability is adequate. Use the planning table (see Section 5) as a checklist during exercise development and use roles as you would during IESO-coordinated exercises
- Ensure all elements of your plan are tested every three years, with the majority tested every two years. Your exercise scenarios should be varied over the three years to ensure all elements of the plan and affected parts of your organization are tested.
- Ensure every person who is part of your emergency response organization participates in at least one drill or exercise every two years.
- Review your plan annually and update your response to include any lessons learned through the exercise.
- Annually test emergency response communication systems with senior management, local government and emergency service providers. Coordinated exercises with other participants, local authorities and government agencies will help you assess your ability to communicate and coordinate with these other organizations under emergency conditions.
- Review and analyse your response to an actual emergency to identify opportunities for improvement and track your progress on necessary changes.

Restoration Plan Participants

Those of you with ‘hands-on’ control of equipment directly connected to the IESO-controlled grid are known as restoration plan participants. You need to file a restoration plan attachment with the IESO and participate in power system restoration drills and exercises.

If you are a restoration plan participant you need to participate in an IESO-coordinated integrated exercise at least once every three years. If you choose not to participate in our annual integrated exercise you must still exercise your plans annually. Many market participants have found over the years that participating in IESO-led integrated exercises provides an effective means to help meet requirements.

3. Types of Exercises

There are a number of different types of exercises that you may use depending on the objectives you are setting out to achieve. The following table describes the general characteristics of each.

<table>
<tr><th></th><th>Drill</th><th>Functional Tabletop</th><th>Full-scale Integrated Exercise</th></tr>
<tr><td>Scope of scenario</td><td>Relatively limited, focuses on procedures</td><td>Broader in scope, focuses on roles, policy and strategy</td><td>Very broad in scope, includes others outside own organization</td></tr>
<tr><td>Number of participants</td><td>Typically less than 10 individuals, usually within the same company or organization</td><td>Less than 20 individuals, includes multiple roles within an organization, or with other organizations</td><td>At least 20 and up to several hundred individuals, involves different functions within an organization and often includes multiple organizations</td></tr>
<tr><td>Facilities required</td><td>Practice using real or simulated equipment</td><td>Single room large enough for communication, without unnecessary distraction. May require separate tables to simulate different roles</td><td>Participants operate from their own production or backup locations and use real facilities and tools to the extent possible[1]. Use normal communications facilities.</td></tr>
<tr><td>Coaching</td><td>Coaching may be used, depending on learning objectives</td><td>Coaching may be used in a limited manner to keep scenario on-track</td><td>Coaching normally not used. Instead, evaluators record observations for after-action evaluation report.</td></tr>
<tr><td rowspan="2">Examples</td><td rowspan="2">Fire or evacuation drill</td><td>Business continuity exercise to emphasize roles, responsibilities, and communications within an organization</td><td>IESO-led exercise to test integrated response to a simulated large-scale electricity emergency</td></tr>
<tr><td colspan="2">IESO has conducted large-scale tabletops that include aspects of both these types of exercises.</td></tr>
</table>

[1] Note that all operations are simulated and no actions are to be taken that might adversely affect the reliable operation of the IESO-controlled grid.

4. The Roles of Exercise Participants

There are four different roles for those who take part in an exercise: Operator, Emergency Management Responder, Exercise Director, and Evaluator/Observer. You will need to decide what degree of involvement is appropriate. In some cases, it may be necessary to combine these roles for a single individual, but this should be kept to a minimum to ensure full and realistic participation.

Operator

Typically the Operator role is played by control room operators, plant production or operation staff, electrical superintendents or plant engineers who:

- Control and operate physical equipment, either real or simulated
- Communicate with other operators in real-time regarding the electrical equipment they control and impact on grid operation

Emergency Management Responder

The Emergency Management Responder is typically a person in a management role, not directly involved in operational activities. Emergency Management Responders:

- Have overall responsibility for managing the emergency and its impact on your business, outside of real-time operations
- Initiate internal emergency response by advising senior management
- Activate your emergency response infrastructure, eg. incident command process
- Mobilize resources
- Prepare information for a corporate media or public affairs spokesperson
- Communicate with municipal and other government authorities

Exercise Director

The Exercise Director helps run the exercise, and does not participate in the exercise. Exercise Directors:

- Provide exercise-related information to Operators and Emergency Management Responders
- May prompt or initiate certain actions to ensure continuity as the exercise unfolds
- Communicate regularly with other Directors throughout the exercise to ensure coordination

If you need to combine the Director role with an Operator or Emergency Management Responder role, you must ensure that:

- You can manage the workload associated with both roles
- Information received as an Exercise Director does not inappropriately influence your response in the other role

Evaluator/Observer

Evaluators and Observers do not actually participate in the exercise, but evaluate the effectiveness of those who are participating in the exercise by providing feedback to Operators, Emergency Management Responders and Exercise Directors.

5. How the IESO Plans and Conducts an Exercise

Developing an Exercise

All exercises require some degree of advance planning, and this effort can range from a few hours to several months depending on the scope of the exercise. The following outlines what is required to plan a large integrated exercise – you may scale-back some steps for smaller-scale exercises.

Planning a large-scale integrated exercise begins months in advance (Table 1 illustrates a typical timeline). Our stakeholder-represented Emergency Preparedness Task Force (EPTF) establishes an Exercise Design Team to develop the scope and objectives, including.

- Exercise date and geographic scope
- Exercise objectives
- Anticipated participants
- Participant requirements
- Cue cards that detail the scenario and prompt response

Table 1: Integrated Exercise Planning Checklist

STEP	TASK (note that some steps may occur simultaneously or overlap)	COUNTDOWN
1.	Obtain EPTF endorsement of plan at key milestones	-6 months
2.	Set Exercise objectives; decide what you need to evaluate/exercise	-5 months
3.	Define the scope of the Exercise	-5 months
4.	Establish limitation/extent of plays for the Exercise	-5 months
5.	Establish participation of market participant and government agencies	-4 months
6.	Develop performance assessment criteria (i.e., how objectives are to be met)	-4 months
7.	Put together the Exercise Design Team	-4 months
8.	Develop the scenario sequence of events	-4 months
9.	Determine limits of participant response to each action, extent of play	-4 months
10.	Develop messages, mini scenarios, data	-3 months
11.	Coordinate efforts of internal and external response organizations	-3 months
12.	Secure logistics support (people, facilities, food, paperwork, transportation)	-3 months
13.	Identify exercise directors	-3 months
14.	Develop mock-ups, props, diagrams	-3 months
15.	Complete the Exercise manual	-14 days
16.	Develop director/evaluator training and participant briefing materials	-14 days
17.	Conduct director/evaluator training	-2 days

18.	Brief participants on scope and limits of the Exercise	-1 day
19.	Inform employees, the public, the media of the Exercise, as necessary	-1 day
20.	**CONDUCT THE EXERCISE**	0
21.	Conduct post-exercise internal in-facility critique	+0
22.	Provide for Exercise critiques and responder feedback	+3 days
23.	Prepare the Exercise Evaluation report	+14 days
24.	Identify significant findings and lessons-learned and develop a corrective action plan	+1 month
25.	Revise the Emergency Plan based upon Exercise lessons learned.	+1-2 months

Directing the Exercise

The Lead Director has overall authority conducting the integrated exercise. The Lead Director along with individual participants' Directors form the Director Team. The Lead Director briefs the Team prior to the exercise. This briefing provides instructions for Directors regarding their role and details of the scenario, including:

- Schedule of events
- Director responsibilities and methods of message handling, using cue cards and other exercise aids
- Planned interventions and the criteria for unplanned interventions
- Responsibility for documenting exercise activities
- Evaluation criteria

Conducting the Exercise

The Lead Director initiates the exercise, and makes all decisions regarding the overall conduct of the integrated exercise, including cancellation. Given the substantial commitment of resources needed for a large-scale exercise, cancellation would only occur if conditions on the grid or circumstances affecting a significant number of participants were serious enough so as to threaten the viability of the exercise.

To start the exercise, the description of initiating conditions is sent to all exercise Directors. The Lead Director maintains an open conference call throughout the exercise and exercise Directors can call in anytime to seek assistance or confer with the Lead Director. Periodic, usually hourly, conference calls ensure the exercise stays on track and allows any adjustments or interventions to be coordinated amongst the participants.

Cue cards, developed in advance by the Exercise Design Team, are used to prompt actions by participants and to play out the scenario. Directors hold the cue cards and distribute them to their participants according to the master cue-card schedule. It is important these cue cards be distributed in a timely manner so that the scenario unfolds in a synchronized manner with all participants.

Participants are encouraged to play out their response as realistically as possible, using the information, tools and procedures they would normally use to respond to events.

The exercise ends when the Lead Director notifies the Director Team via conference call. The Directors in turn advise all participants that the exercise is terminated.

Evaluating the Exercise

We encourage all participants to provide feedback regarding lessons-learned. We asses the success of the exercise against the exercise objectives laid-out when the exercise was designed (see Table 2: Sample Exercise Evaluation Form). We expect participants to self-evaluate their performance.

Each participating company should develop their own evaluation report to record successes and findings. These are used in two ways. Findings that affect the IESO-controlled grid and emergency actions to maintain reliability are provided to the IESO for inclusion in our overall exercise evaluation report. More detailed findings, such as those that affect your own operation, should be reviewed and addressed as part of your own emergency plan.

Your exercise evaluation report should include findings, recommendations to mitigate the findings, and a rank that identifies the finding according to the following categories:

Observation – Finding has little direct impact on emergency response or restoration, but should be considered as an improvement to your emergency response processes

Gap – Finding had some measurable impact on timeliness of restoration or effectiveness of emergency response

Significant Gap – Finding had significant impact on timeliness of restoration or effectiveness of emergency response with significant potential to impact public safety

Table 2 provides a sample of an Evaluation Form used by the IESO.

Corrective Action Plan

Once you have determined the root cause for your findings, you should develop an action plan to address them. As a minimum, your action plan should include:

- Circumstances leading up to the event
- The event, failure or violation that occurred
- Impact on the reliability of the IESO-controlled grid and/or other participants and the effectiveness of your emergency plan
- The root cause and actions you are taking to prevent or minimize a recurrence
- A schedule for completing your action plan

Your action plan becomes part of your revised Emergency Plan, which you file with the IESO.

Table 2: Sample Exercise Evaluation Form

#	Description of Finding	Involved Parties	Recommendation	Ranking*
Emergency Response Tools and Facilities:				
1.				
2.				
3.				
Communications Facilities and Procedures:				
4.				
5.				
6.				
Operating Direction:				
7.				
8.				
9.				
Emergency Preparedness Plans and Procedures:				
10.				
11.				
12.				
Public and Media Information:				
13.				
14.				
15.				
Emergency Management (non-Operational):				

* **Observation** – Finding has little direct impact on emergency response or restoration, but should be considered as an improvement to your emergency response processes
Gap – Finding has some measurable impact on timeliness of restoration or effectiveness of emergency response
Significant Gap – Finding has a significant impact on timeliness of restoration or effectiveness of emergency response with significant potential impact on public health and safety

#	Description of Finding	Involved Parties	Recommendation	Ranking*
16.				
17.				
18.				
Exercise Planning, Scenario Adequacy and Exercise Control:				
19.				
20.				
21.				

6. IESO Reliability Training and Tabletop Drill Workshops

In addition to conducting integrated exercises, we often conduct face-to-face reliability training and tabletop drill workshops with market participants at locations across Ontario. These workshops are designed to help you understand your role in maintaining reliability and emergency response, as well as see how others coordinate their actions. These sessions also help you prepare for large-scale integrated exercises.

We encourage all market participants to attend. This is your opportunity to ensure your operating procedures and emergency plans are effective and well-coordinated with others outside your organization.

Operators and operational supervisors should find the content especially relevant, as the workshops focus on the actions and obligations of those with hands-on operational control.

Reliability Training

This interactive instructor-led reliability training is valuable to anyone wishing to better understand how their actions impact Ontario's power system reliability on a daily basis.

Topics include:

- Energy flows on the power system
- Context setting: Ontario, interconnections, IESO-controlled grid
- Reliability standards and operating states
- Communications
- Contingencies and re-preparation
- Control actions, abnormal frequency, load shedding
- Emergency Control Action List
- Outage management
- Ontario Power System Restoration Plan
- Walk-through of a generic islanding/restoration in the area, focusing on load-controlling participant actions (loads, distributors and transmitters)

Our goal is to make this session both instructive and interactive. Targeted exercises on areas such as communications and load shedding ensure you have an opportunity to relate policy and procedure to your actual operation. A number of IESO staff participate in the session to support discussions and problem-solving at each table. The key objective is to better understand the unique challenges you face in meeting your reliability obligations.

Tabletop Drill

Tabletop drill participants simulate their responses to a "realistic" electricity emergency. As well as practicing your role in the heat of battle, you share your experiences with others during the feedback session. Transmitters, distributors and industrial customers use their own procedural documents such as operating diagrams, and schedules or plans for shedding load.

The tabletop drill is held in a large conference room, with tables arranged by company or market participants (eg. industrial customers, distributors).

The Exercise Director manages the drill by providing information regarding conditions affecting the power system such as weather, equipment failure or security threats. Operators and Emergency Management Responders communicate with others and take the necessary actions.

7. History of IESO-Coordinated Drills and Exercises

The following table summarizes the IESO-led exercises involving market participants from across Ontario since 2001.

Year	Integrated Exercise	Reliability Training & Tabletop Drill Workshops
2001	Southeast Ontario 20 organizations: IESO, Ministry of Energy, 2 Generators, 1 Transmitter, 12 Distributors, 3 industrial customers	Nil
2002	Southwest Ontario 24 organizations IESO, Ministry of Energy, Emergency Management Ontario, 2 Transmitters, 3 Generators, 11 Distributors, 5 industrial customers	Nil
2003	All Northern Ontario 23 organizations: IESO, Ministry of Energy, Emergency Management Ontario, 2 Transmitters, 14 Generators, 9 Distributors, 15 industrial customers	Nil
2004	Nil. Note that the August 14, 2003 Blackout provided an unplanned opportunity to implement system restoration and emergency response.	Seven 2-day workshops: Waterloo, Sarnia, Cobourg, Toronto, Timmins, Thunder Bay, Sault Ste. Marie
2005	All Southern Ontario 60 organizations: IESO, Ministry of Energy, Emergency Management Ontario, 5 interconnected entities from outside Ontario, 2 Transmitters, 7 Generators, 25 Distributors, 16 industrial customers	Two 2-day workshops: London, Cobourg
2006	All Ontario	Four 2-day workshops: Sault Ste-Marie, Sarnia, Thunder Bay, Cobourg
2007	Nil	For Distributors and Industrial Consumers, seven 1-day reliability workshops at St. Catharines, Kitchener, Thunder Bay, Ottawa, Barrie, Oshawa and London. For Generators and Transmitters, seven 1-day reliability workshops at Nanticoke, Bruce, Thunder Bay, Lennox, Pickering, Lambton and London.

2008	All Ontario except northwest Ontario: 35 organizations including Ontario's neighbours and certain emergency management organizations. Electricity scenario drove Emergency Management Ontario's all-critical infrastructure sector tabletop exercise.	For Distributors and Industrial Consumers, two 1-day reliability workshops at Sarnia and Vaughan. For Generators and Transmitters, eight 1-day reliability workshops covering Nanticoke, Bruce, Sault Ste. Marie, Lennox, Pickering, Lambton GS, and London.
2009	Reliability Coordinator (RC) - RC to RC exercise	For Generators and Transmitters, nine 1-day reliability workshops covering Thunder Bay, Nanticoke, Cornwall, Bruce, Sault Ste. Marie, Sarnia, Darlington/Pickering, and London.
2010	Distributor/Transmitter Cold Weather Exercise RC to RC exercise	For Generators and Transmitters, six 1-day reliability workshops covering Niagara Falls, Bruce, Kingston, Sault Ste Marie, London and Darlington/Pickering.
2011	All Ontario. 50 organizations participated including Ontario's neighbouring and Northeast Power Coordinating Council's (NPCC) system reliability entities and certain Ontario emergency and communications management organizations. Electricity emergency scenario engaged all exercise participants as well as the Ministry of Energy and Emergency Management Ontario.	For Generators, Transmitters and Connected Wholesale Customers, six reliability workshops covering Sarnia, Bruce/Beck, Kingston, Sault Ste Marie, London and Darlington/Pickering.
2012	Reliability Coordinator (RC) - RC to RC exercise	For Generators, Transmitters and Connected Wholesale Customers, five reliability/restoration workshops covering Ajax, Port Elgin, Sudbury, Thunder Bay and London.

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