

Business Process

BP_SO_3.2 Issue Dispatch Instructions

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1 ASSUMPTIONS

Assumptions made during the design of this process include:

- This is an all-island business process, meaning the same process will be used across both jurisdictions on the island, Ireland and Northern Ireland. It can be conducted by the relevant team in either Dublin or Belfast;
- The following business processes address all requirements, including roles, tools, and activities that will enable the TSOs to achieve scheduling objectives; and
- All required systems, including MMS and EDIL are in place. They offer all required functionalities to support business needs.

2 PROCESS REFERENCES

2.1 RELATED RULES REFERENCES

The following table provides references to the documents that govern the design of this business process.

Document Title	Relevant Section	Description
SONI Grid Code	SDC1 Scheduling and Dispatch Code No. 1 & 2	The SONI Grid Code sets out the principles governing SONI's relationship with users and technical standards to be complied with by SONI and users. The Code specifies procedures for planning, connecting to and operating the transmission system during both normal and exceptional circumstances.
EirGrid Grid Code	SDC1 Scheduling and Dispatch Code No. 1 & 2	The EirGrid Grid Code sets out the principles governing EirGrid's relationship with users and technical standards to be complied with by SONI and users. The Code specifies procedures for planning, connecting to and operating the transmission system during both normal and exceptional circumstances.
SEM-15-065	System Operation in the I-SEM	Sets out high level guidance related to the scheduling and dispatch process

2.2 RELATED DOCUMENTS

The following table provides a list of documents that are related to this business process.

Document Title	Relationship	Description
Balancing Market Principles Statement	Information	A guide to scheduling and dispatch under the Revised Single Electricity Market Arrangements which includes descriptions of LTS, RTC and RTD.
MMS User Guide	System guide	MMS OUI User Guide.
BP_SO_10.1 Perform Long Term & Short Term Scheduling	Input/ trigger into this process	The scheduling runs covered by these processes will provide an advisory schedule of dispatch instructions which will be reviewed and issued as appropriate as part of this dispatch process.

BP_SO_3.4 Dispatch Wind Units via EMS	Related process	Process document covers the dispatch of priority wind units via EMS, whilst the process discussed in this document deals with all generator units and non-priority dispatchable wind that are dispatched via EDIL. This is explained further in Section 4 of this document.
BP_SO_3.3 Fail min/fail sync process	Related process	Following the dispatch of instructions some units may fail to sync as per instruction and subsequent instructions may be required to correct EDIL.

3 PROCESS CONTEXT

3.1 BUSINESS MODEL RELATIONSHIP

The 'Issue Dispatch Instructions' process sits within the 'Dispatch' process group within the Systems Operator processes. Dispatch is the process of issuing instructions to units to synchronise, de-synchronise or adjust MW output to satisfy system security, priority dispatch requirements and balance supply and demand in real-time. In general dispatch instructions are issued after Balancing Market gate closure although synchronisation instructions will often need to be taken before to account for unit notification times. Given the final PNs and the actual status of units, the dispatch process modifies the output of units in accordance with inc/dec offers to ensure system balance while meeting all the security constraints and maximising the output from priority units.

The scheduling processes provide unit commitment and de-commitment advice to enable the system to be securely dispatched are a key input into this process. The Perform Long Term and Short Term Scheduling processes will generate indicative schedules which will then be refined and implemented in the dispatch process.

3.2 BACKGROUND AND SCOPE

Background

The I-SEM design provides for mandatory participation of market participants in the TSOs' scheduling and dispatch process which spans the intraday and balancing market timeframes. The SEM Committee Energy Trading Arrangements (ETA) decision paper (SEM-15-065) contains a number of guiding principles related to this scheduling and dispatch process:

- Insofar as it is possible, the *ex-ante* markets should be left to resolve the energy supply/demand balance.
- The TSOs should not take any action prior to [*Balancing Market*] gate closure unless it is for reasons of system security e.g. reserves, for priority dispatch or for other statutory requirements.
- Costs for constraint [non-energy] actions are economically incurred.
- Minimise the cost of balancing the system given the PNs at [*Balancing Market*] gate closure.

In addition there are a number of related requirements in both the I-SEM HLD (SEM-14-085a) and ETA decision papers that impact on the scheduling & dispatch process:

- Participation in the *ex-ante* markets is not mandatory,
- Only dispatchable generation and dispatchable demand is required to submit PNs (i.e. wind and non dispatchable demand will not be required to submit PNs),
- PNs will be partially delinked. This means that PNs only have to be linked to *ex ante* trades at gate closure (i.e. FPN should reflect traded volumes). Prior to gate closure, a participant's PN submission should be its best estimate of its FPN (i.e. should reflect their expected final *ex ante* trades).

- In addition to reflecting the expected or actual ex ante traded volumes, PNs should at all times represent the participant's best estimate of its intended level of generation and/or consumption.

Whilst the I-SEM design represents many new requirements it also maintains some existing ones - it does not change obligations on the TSOs with respect to system security, the treatment of priority dispatch or other statutory requirements arising from the Network Codes. Thus the scheduling and dispatch process must balance all of these objectives. Specifically the scheduling element must be continuous to incorporate the changing market information into the dispatch process.

At the core of the TSOs' scheduling and dispatch process are the Security Constrained Unit Commitment (SCUC) and Security Constrained Economic Dispatch (SCED) tools which are replacing the existing Reserve Constrained Unit Commitment (RCUC) tool. These tools take inputs from market participants (such as PNs, bids and offers) and TSO data such as forecasts and models of constraints and determine schedules (plans) that feed dispatch decisions issued to market participants.

Scope

The 'Issue Dispatch Instructions' process covers the dispatch of generator units, wind units that have nominated to be 'dispatchable' & DSUs that submit Physical Notifications via EDIL, it does not cover the dispatch of wind units from the Energy Management System (EMS) which are covered within the 'Dispatch Wind Units' process. In I-SEM, wind units will be able to nominate themselves as 'dispatchable' or 'non-dispatchable' as part of the registration process. This requirement is primarily driven by the need to allow wind units become 'price makers' rather than 'price takers'. By registering as 'dispatchable', the TSO will be able issue MW set-point instructions to that unit via EDIL, therefore in the I-SEM the 'Issue Dispatch Instructions' process will cover both traditional generator units, DSUs and wind farms that have registered as 'dispatchable'.

The key inputs and triggers for this process are the scheduling runs which the SCUC/ SCED (Security Constrained Unit Commitment/ Security Constrained Economic Dispatch) system will generate. The 'Perform Long Term and Short Term Scheduling' process document provides further detail on how the scheduling runs operate and feed into this process. The 3 scheduling runs, Long Term Scheduling (LTS), Real Time Commitment (RTC) and Real Time Dispatch (RTD), will feed the dispatch process on an almost continuous basis in I-SEM:

1. The LTS run will update the Long Term Current Operating Plan and create recommended sync or desync instructions for units with long notification times
2. Every 15 minutes the RTC run will update the Near Time Current Operating Plan and create recommended sync or desync instructions for units with short notification times
3. Every 5 minutes the RTD run will update the Real Time Current Operating Plan and create advisory dispatch MW instructions

In all cases the recommended instructions will be issued to the Resource Dispatch (RD) function within the SCUC/ SCED system where the User will be able to review and if required amend the instructions before they are issued to EDIL. Once instructions have been reviewed and approved in RD, they will be issued directly from EDIL to the relevant units. Note all Dispatch Instructions types will be able to be issued manually by the Real Time User from EDIL also, however this should only be done in specific circumstance, for example:

1. A unit has suddenly tripped and immediate action is required to ensure demand/ supply balance
2. Resource Dispatch function in MMS has failed and cannot issue instructions to EDIL

4 PROCESS OBJECTIVE

There are multiple documents setting out rules and obligations relating to the scheduling and dispatch process covering system security, priority dispatch, economic objectives and other statutory requirements. Some of these documents are list below however a more comprehensive list can be found in the Balancing

Market Principles Statement published by the TSOs (document to be developed in 2017, insert link once available):

- European Network Codes
- EirGrid and SONI Transmission Licence
- EirGrid and SONI Grid Code SDC1 Scheduling and Dispatch Code No.1
- EirGrid and SONI Grid Code SDC2 Scheduling and Dispatch Code No.2
- Various SEMC decisions

5 ROLES AND RESPONSIBILITIES

5.1.1 REAL TIME

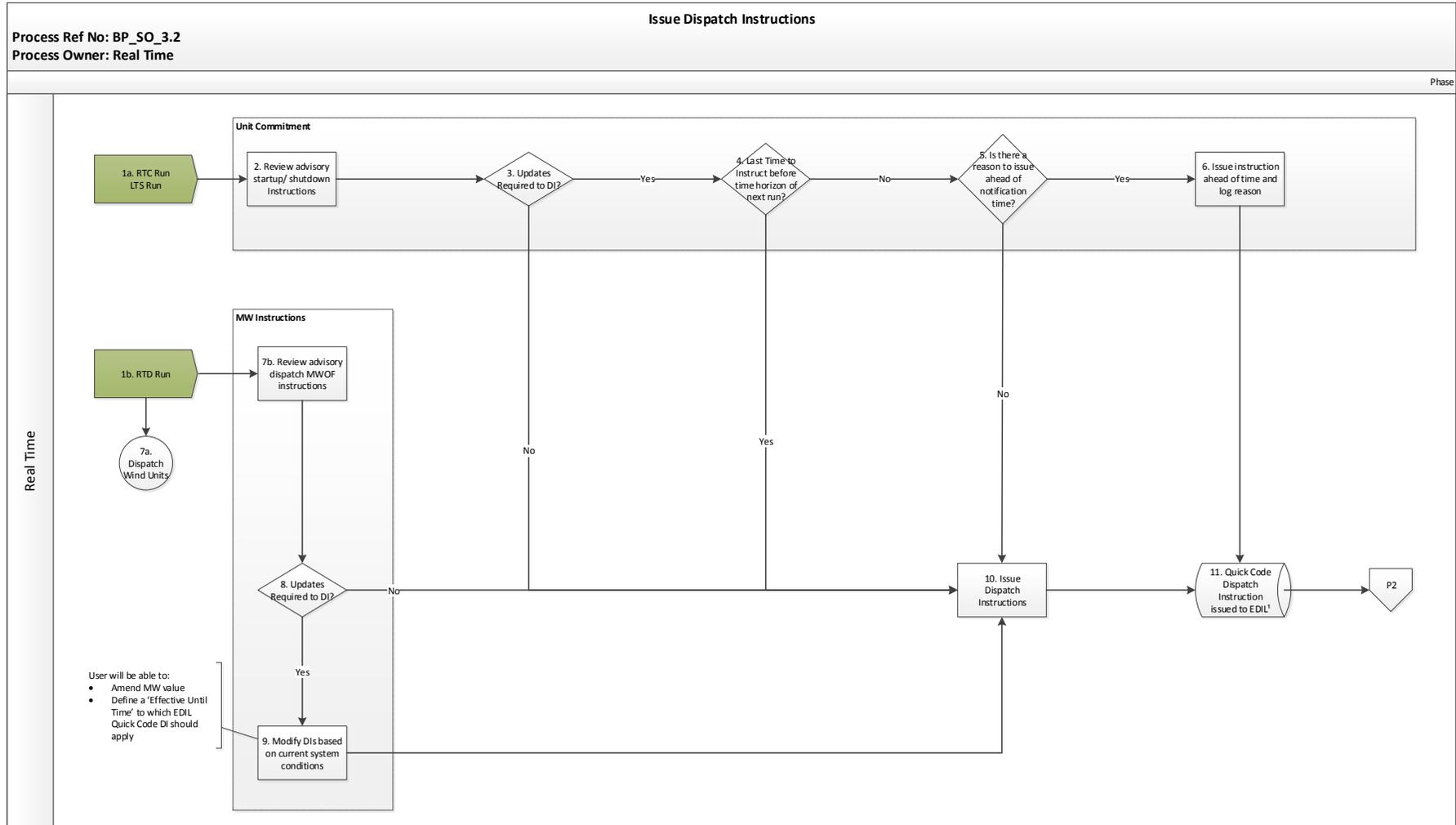
The following table provides a summary of the obligations of Real Time relating to Issue Dispatch Instructions:

Team Name	Responsibility in relation to process	Timeline Associated
Real Time (Process Owner)	<ul style="list-style-type: none"> • Manage the dispatch of all instructions to dispatchable generator units and DSUs, this will essentially involve reviewing all instructions that are issued to the Resource Dispatch function and deciding on whether they can be approved and issued to EDIL for onward communication to the units 	<p>This will be a continuous process which will need to be managed 24 hours a day, 7 days a week, year round. The following runs will provide indicative dispatch advice to be reviewed in the Resource Dispatch function:</p> <ul style="list-style-type: none"> • LTS • RTC (run every 15 minutes) • RTD (run every 5 minutes)

6 PROCESS DESCRIPTION

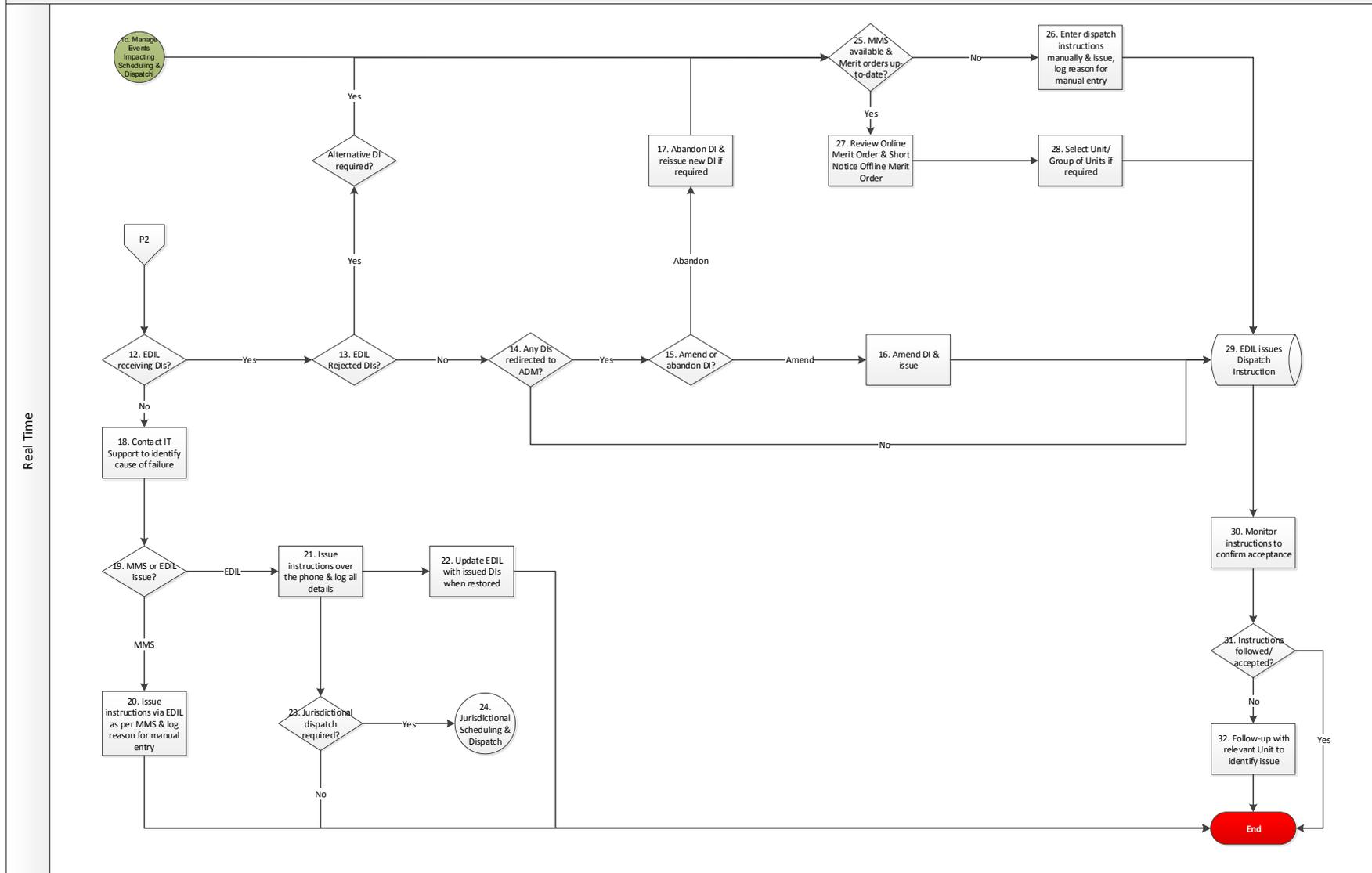
6.1 LEVEL 3 PROCESS

6.1.1 PROCESS MAP



Issue Dispatch Instructions

Phase



6.1.2 PROCESS STEPS

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
1a	Trigger: RTC Run, LTS Run	The trigger for this process is any of the scheduling runs, the RTC and LTS runs will generate advisory startup and shutdown (sync/desync) instructions in the advisory schedule. Go to step 2 following this step.	Real Time User	Advisory sync/ desync Instructions	Continuous (24hr)	SCUC/SCED (MMS)
1b	Trigger: RTD Run	The trigger for this process is any of the scheduling runs, the RTD will generate advisory MWOFF instructions in the advisory schedule. Go to step 7 following this step.	Real Time User	Advisory MWOFF instructions	Continuous (24hr) – every 5 minutes	SCUC/SCED (MMS)
1c	Trigger: Manage Events Impacting Scheduling & Dispatch (see page 2 of map)	The other potential trigger for this process is the 'Manage Events Impacting Scheduling & Dispatch' process, which deals with unplanned or unforeseen events which impact scheduling and dispatch and may require immediate corrective actions to be taken. If this process has been the trigger, go to step 24. This trigger will be less common and only as a result of such an event. For more details please refer to the Manage Events Impacting Scheduling & Dispatch process and process document.	Real Time User	N/A	As required	Various
2	Review recommended start-up/ shutdown Instructions	The LTS and RTC run will generate recommended start-up (sync)/ shutdown (desync) instructions. The LTS will produce advisory sync/desync	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/Frequency	System
		<p>events for long-term units and the RTC for short-term units. The User will be able to review and assess if these are appropriate or need amending. Following this step, go to step 3.</p> <p>Note any sync instructions should correspond to the notification time of the units.</p>				
3	Updates required to Dispatch Instructions?	<p>Once instructions have been reviewed the Operator decides whether any updates to the dispatch instructions are required.</p> <p>If yes, go to step 4. If no, go to step 10.</p>	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
4	Last Time to Instruct before time horizon of next run?	<p>Is Last Time to Instruct before the time horizon of next run?</p> <p>If yes go to step 10. If no, go to step 5.</p>	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
5	Is there a reason to issue ahead of notification time?	<p>Is there a reason to issue the instruction ahead of notification time? For example a Unit may have requested slightly longer notification time after they have experienced a significant trip or coming back on after an outage.</p> <p>If yes go to step 6. If no, go to step 10.</p>	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
6	Issue instruction ahead of time and log reason	<p>Issue instruction ahead of time and log reason for doing so in the All Island Control Centre Log.</p> <p>Following this step, go to step 11.</p>	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS) & All Island Control Centre Log
7a	Dispatch Wind Units	The RTD run will determine instructions for wind units, they will be managed via the 'Dispatch	Real Time User	Wind Units instructed	Continuous (24hr)	EMS

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
		Priority Wind Units' process and not via this process.				
7b	Review recommended dispatch MWOFF instructions	The RTD also generates recommended dispatch MW instructions, the Operator will review these to ensure they are appropriate and that they should be issued.	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
8	Updates required to Dispatch Instructions?	Once instructions have been reviewed the Operator decides whether any updates to the dispatch instructions are required. If yes, go to step 9. If no, go to step 10.	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
9	Modify Dispatch Instructions based on current system conditions	There may be updates required to the dispatch MW instructions that have been issued to the Resource Dispatch from the various scheduling runs. The Operator will have to assess the current system conditions to determine whether the dispatch instructions are still valid. The Real Time User will be able to modify the MW value and the 'Effective Until Time (T)'; the User should not define the 'Effective Until Time' beyond the end of the Trading Day for which the Day Ahead Market has closed.	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
10	Issue Dispatch Instructions	Once Operator is satisfied that dispatch instructions should be issued to relevant units, they will approve them in the Resource Dispatch function in MMS which will result in RD automatically issuing them to EDIL.	Real Time User		Continuous (24hr)	Resource Dispatch (MMS)
11	Quick Code Dispatch	This is an automated system step - once	N/A – systems	Quick Code DIs	Continuous (24hr)	Resource

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/Frequency	System
	Instruction issued to EDIL	approved in RD in MMS the system will automatically issue the instructions to EDIL.	step	received in EDIL		Dispatch (MMS)
12	EDIL receiving DIs?	<p>In the event that there is a problem and EDIL is not receiving dispatch instructions, go to step 18.</p> <p>If there is no issue and EDIL is receiving DIs go to step 13.</p> <p>The user will be able to identify if there is an issue by reviewing the statuses in the 'DI Logs' in MMS. There are 2 logs:</p> <ol style="list-style-type: none"> 1. DI Log- Quick Code- MMS sent: this log will update when an DI has been issued from MMS to EDIL 2. DI Log – Physical DIs - EDIL Sent: this log will update when an DI has been issued from EDIL to a unit 	Real Time User	N/A	As required	N/A
13	EDIL rejected DIs?	<p>When dispatch instructions are sent to EDIL, EDIL will perform a validation step to ensure that all instructions are valid and can be issued to units.</p> <p>If instructions are rejected (yes) go to step 20, if not go to step 14.</p>	Real Time User	N/A	Continuous (24hr)	N/A
14	Any DIs redirected to ADM?	As part of the validation of instructions EDIL may direct DIs to the ADM (Auto Dispatch Management) area in EDIL for the user to review the instructions before they can be issued.	Real Time User	N/A	Continuous (24hr)	EDIL
15	Amend or abandon DI?	For dispatch instructions redirected to ADM the user will be able to either amend or abandon the	Real Time User	N/A	Continuous (24hr)	EDIL

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/Frequency	System
		instruction. If the user wants to amend the instruction go to step 16. If they have to abandon it go to step 17.				
16	Amend DI & issue	Amend the dispatch instruction in EDIL and reissue.	Real Time User	N/A	As required	EDIL
17	Abandon DI & reissue new DI if required	Abandon DI & reissue new DI if required.	Real Time User	N/A	As required	EDIL
18	Contact IT Support to identify cause of failure	If certain that EDIL is not receiving instructions after checking the ADM, the next step is to contact IT support to understand if there is an issue with MMS or EDIL.	Real Time User	N/A	As required	N/A
19	MMS or EDIL issue?	If it is an issue with MMS go to step 20. If it is an issue with EDIL go to step 21.	Real Time User	N/A	As required	N/A
20	Issue instructions via EDIL as per MMS & log reason for manual entry	If the problem is with MMS, issue the instructions manually via EDIL as per MMS instruction & log reason reason for manual entry.	Real Time User	N/A	As required	EDIL & All Island Control Centre Log
21	Issue instructions over the phone & log all details	If EDIL has failed and instructions cannot be communicated as a result, the User should contact the relevant units via the phone and provide instructions over the phone. If Users have resorted to this method, they need to log everything they have dispatched via the phone with the reason being logged in the All Island Control Centre Log. The MMS DI Log can be used to assist the logging of failed DIs.	Real Time User	N/A	As required	All Island Control Centre Log

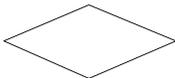
#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/Frequency	System
22	Update EDIL with issued DIs when restored	Real Time user must update EDIL with all DIs that have been issued over the phone while EDIL has been down. The Real Time user should refer to EDIL ADM which may contain the historical DIs created during the EDIL failure.	Real Time User	N/A	As required	EDIL
23	Jurisdictional dispatch required?	If there is an EDIL outage, the Control Centre will need to consider if jurisdictional dispatch is required, if the outage was going to be for some time. If yes go to step 23, if no the process ends and no further action is required.	Real Time User	N/A	As required	N/A
24	Jurisdictional Scheduling & Dispatch	This will trigger the Jurisdictional Scheduling & Dispatch process.	Real Time User	N/A	As required	N/A
25	MMS available & Merit orders up-to-date?	If another or alternative dispatch instruction is required, the user should firstly try identify an DI via MMS using the Merit Orders. If MMS is available & Merit Orders up-to-date, go to step 26. If not go to step 25.	Real Time User	N/A	As required	N/A
26	Enter dispatch instructions manually & issue, log reason for manual entry	The Real Time User may be required to enter dispatch instructions manually in EDIL and issue them as the event which has occurred may require some immediate action which would require the Real Time User to deviate from the schedules. If this occurs the Real Time User must log the event and reason for the manual entry in the All Island Control Centre Log. Following this step, go to step 21.	Real Time User	Dispatch Instructions issued	As required	EDIL & All Island Control Centre Log

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/Frequency	System
27	Review Online Merit Order & Short Notice Merit Order	If amendments need to be made to the dispatch instructions or new instructions generated to accommodate changes in system demand, the User should review the Online Merit Order and the Short Notice Merit Order to determine the next recommended action. The Online Merit Order will show the Operator price stacks based on inc/dec costs and availability for the current time. The 'Short Notice Offline Merit Order' will provide a view of the inc/dec costs and availability from offline generator units and demand-side units that can deliver MW within a certain timeframe. The list will be sorted based on the cost per MWh, taking into account Inc/Dec break points with the lowest cost first.	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
28	Select Unit/ Group of Units if required	The User can select a unit or group of units from either list, once selected the associated Quick Code Dispatch Instructions will be generated.	Real Time User	N/A	Continuous (24hr)	Resource Dispatch (MMS)
29	EDIL issues Quick Code Dispatch Instruction	This is an automated system step - if there are no issues with the dispatch instructions once they are received and validated in EDIL or if there has been an issue and the error/failure has been corrected, EDIL will automatically issue them to the relevant recipients.	N/A – systems step	Quick Code Dis issued to units	Continuous (24hr)	EDIL
30	Monitor instructions to confirm acceptance	Once the dispatch instructions have been issued, the Operator should monitoring the progress of units following their relevant dispatch instructions to ensure that they are able to meet them and dispatching accordingly.	Real Time User	N/A	Continuous (24hr)	EDIL

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
31	Instructions followed/ accepted?	If dispatch instructions are not being followed or accepted go to step 31. If they are being followed, no further action is required and the process ends.	Real Time User	N/A	Continuous (24hr)	EDIL
32	Follow-up with relevant Unit to identify issue	If units are not following or accepting their dispatch instructions, the Operator must follow-up directly with the relevant unit and identify what the issue is.	Real Time User	N/A	Continuous (24hr)	EDIL

7 APPENDICES

7.1 PROCESS FLOWCHART KEY

FLOWCHART KEY	
 Trigger	Trigger
	Process step
	Process decision / question
	Reference to another process
	Another business process to be implemented following current step (current step is a trigger for another process)
 End	Process end
	System (automatic step)