BP_SO_11.2 Cross Border Balancing Trading between EirGrid / SONI and NGESO

Business Process

Version 2 - 01/07/2024

EirGrid GROUP

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Contents

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 process addresses all requirements, including roles, tools, and activities that will enable the TSO to achieve its objectives;
- All required systems, including MMS and ICMP are in place. They offer all required functionalities to support business needs; and
- System security issues identified ahead of real time should be managed through the routine scheduling and dispatch process and resolved ahead of real time to reduce the dependency on cross border actions.

2. Process references

2.1. Related rules references

The following table provides a list of documents that govern the design of this business process for any of the SEM-GB interconnectors (Moyle, EWIC and Greenlink).

Document Title	Description
Interconnector Operating Protocol	The protocol operates as a common point of reference for the interconnector owner, EirGrid/SONI and NGESO in relation to the operation of the Interconnector, covering the following areas; outage planning, day ahead user data and transfer programme agreement, real time operation and post event review and general management.
Balancing and Ancillary Services Agreement	The agreement details the provision of commercial ancillary services across the Interconnector including cross border balancing and emergency assistance prices.

2.2. Related documents

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

Document Title	Relationship	Description
BP_SO_11.1 Calculation of CBB Trade Price & Volumes	Related Process	Prices and volumes for CBB actions are calculated and are used for determining trades and for settlement purposes.
BP_SO_11.3 Interconnector Emergency Actions	Related Process	There are emergency actions that can be initiated by either TSO that will alter the physical flow on the interconnector in real time.
Methodology for determining System	Information	Describes the methodology on how actions are flagged for the purpose of imbalance pricing.

Operator and Non-Marginal Flags		
Balancing Market Principles Statement	Information	Public guide to the scheduling and dispatch process.

3. Process context

3.1. Business model relationship

The 'Trading' process group details the mechanisms available to EirGrid, SONI and NGESO to exchange energy across any of the SEM-GB interconnectors (Moyle, EWIC and Greenlink). The arrangements are similar for all of them in accordance with the operating agreements between the Interconnector Owners and the TSOs, and any differences are captured in the relevant process steps.

Cross border actions used close to real time allow the TSOs to exchange energy across the interconnectors. This process group covers determining prices and volumes for these exchanges and their delivery. This document covers cross border balancing actions and the provision of frequency services. For further details on emergency assistance and instructions refer to BP_SO_11.3 Interconnector Emergency Actions. Settlement of these services is outside the scope of this group.

3.2. Background and scope

There are a number of services or actions available to EirGrid/SONI and NGESO to exchange flows across any of the SEM-GB interconnectors, including:

- Coordinated Third Party Trading (CTPT)
- Cross Border Balancing (CBB)
- Emergency Assistance (EA)
- Emergency Instruction (EI)
- Frequency Response
- Reactive Power
- Interconnector Runback (Moyle only)
- Black Start Service (EWIC only)

The above services are collectively referred to as Cross Border Actions.

EirGrid and SONI may need to alter the Interconnector Reference Program (ICRP) calculated based on Ex Ante Market auction results to maintain system security. Similarly NGESO may also request a change to the ICRP.

The following table summarises the key cross border actions available on the different SEM-GB interconnectors and their pricing and availability:

	Cross Border Action	Pricing	Update to Pricing	Availability	Update to Availability
1	**Cross Border Balancing (CBB)**	Up to 8 x P/Q pairs blocks in each direction	Daily by 17:00 D-1 Update up to 2 hours ahead of real time	200 MW in each direction	Any time, 0 MW equals withdrawl of service
2	**High / Low Frequency Services (HF/LF) (EWIC and Moyle)**	CBB price capped by EA Price	Annual review	Max response across both EWIC and Moyle +/- 150 MW	Annual review, availability of service in real time
3	**LFSM (Greenlink)**	-	-	Max response 200 MW	As required
4	**Emergency Assistance (EA)**	EA Price	Annual review	EWIC: Up to 150 MW Moyle: Up to 200 MW Greenlink: Up to 150 MW	Annual review, withdrawal of service in real time
5	**Emergency Instruction (EI)**	Settled post event		Always available and at most to 0 MW (no change in transfer direction)	

Scope

Cross Border Balancing:

Note that utilisation of the CBB service will not normally be scheduled by EirGrid/SONI, i.e. scheduling of trades under the CBB service will normally be disabled in the MMS. The following sections describe how the service would be utilised if scheduling of trades was enabled in the MMS or in the event of a trade being required to reflect automatic triggering of frequency response.

CBB is available from 2-2.5 hours ahead of real time and may be used to manage system security issues, priority dispatch or energy balancing that arise in that timeframe. At least 30 minutes notice should be given to the start of the requested trade. The maximum volumes available for CBB are as defined in the relevant Interconnector Operating Protocol (IOP) for each interconnector. The profile must always start and finish on an existing firm ICRP, be for a period when prices are fixed and use the normal operational ramp limit. Once a CBB trade has been agreed the updated Interconnector Reference Program (ICRP) can only be undone via an Emergency Assistance.

MMS may be used to identify a need for CBB trading. Based on prices entered in the scheduling system the MMS varies the initial ICRP. The result is a series of spot MW values proposed in MMS which are sent to Interconnector Management Platform (ICMP) for conversion into an updated ICRP to achieve the desired spot MW values. The operator reviews the proposed trade in ICMP. All trades are reviewed and agreed in ICMP including those proposed by NGESO.

For each confirmed trade in ICMP a non-marginal flag is assigned to the trade for each 5 minute imbalance pricing period. The trade will be excluded (no flag will be applied) from the imbalance pricing calculation if the ICRP equals the maximum NTC (in either direction) for that interconnector or is ramping up or down for the full five minute period. Otherwise, all trade volumes and associated prices as per above table are

included in imbalance pricing. Pricing information submitted by the TSOs is also sent to MMS for this purpose.

Frequency Response: Assumed available unless specifically withdrawn in Real Time. A subsequent communication is required to re-enable it. Starts at time of relay operation or frequency deviation above or below a defined point and continues for the whole duration of the provision of response, or if triggered by frequency in GB there is a maximum of 30 minutes delivery of the service before ramping back to original ICRP. All high frequency and low frequency events should be entered in ICMP within 30 mins of relay operation, where practical for inclusion in imbalance pricing. It is treated the same as CBB trades.

4. Process objective

The objective of this Business Process is to meet the obligations related to interconnector trading instructions set out in the Interconnector Operating Protocols.

5. Roles and responsibilities

5.1. NCC/CHCC

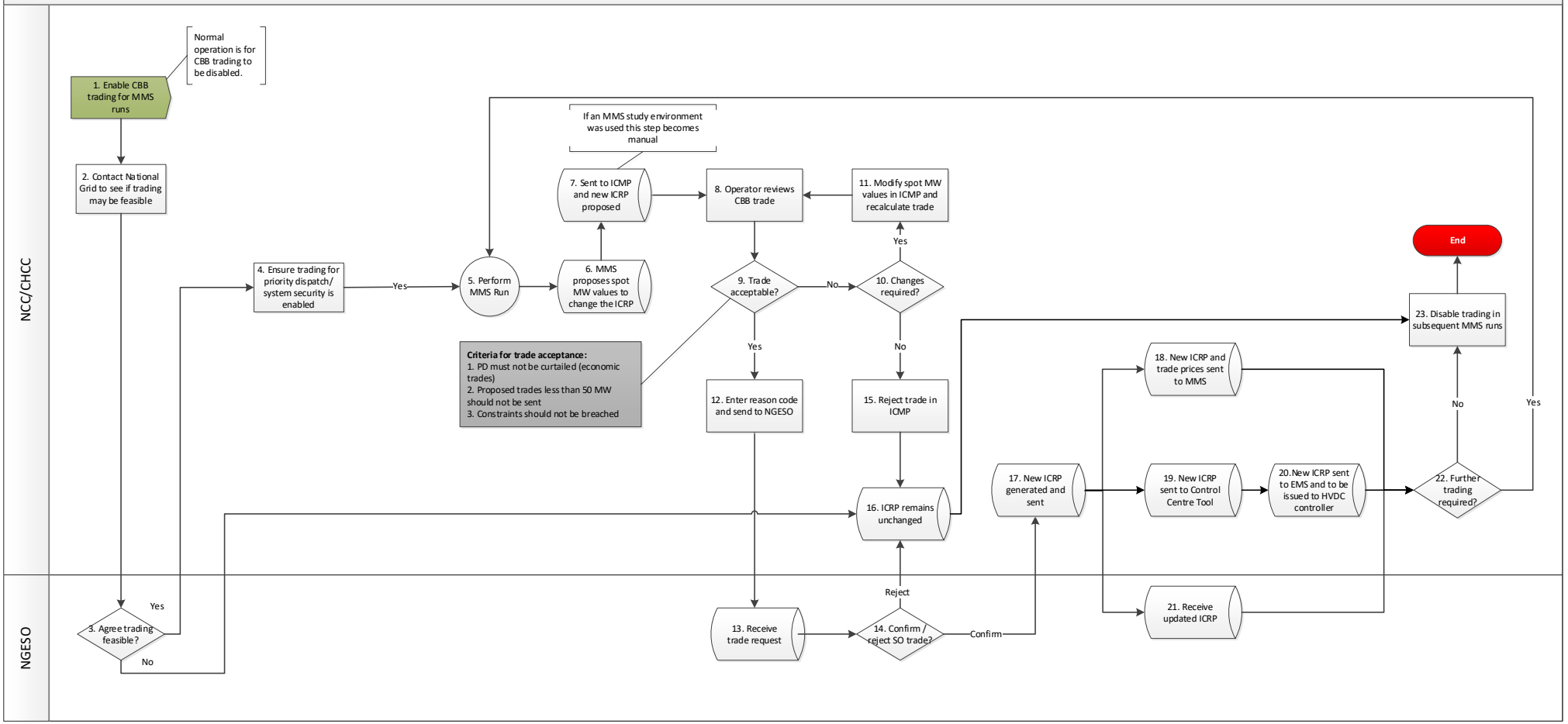
The following table provides a summary of the obligations of NCC/CHCC relating to CBB Trading:

Function	Responsibility in relation to process	Timeline Associated
NCC/CHCC	• Initiate CBB trading with NGESO if required and ensure all trades are correctly entered in the systems for imbalance pricing and for scheduling.	• As required
	• Review NGESO's request for CBB trading and approve any trades entered in the systems for imbalance pricing and scheduling.	• Following receipt of trade request from NGESO.
	• Ensure all frequency response trades are correctly reflected in the systems for returning the interconnector to schedule and for inclusion in imbalance pricing.	• If frequency response is of short duration, then it is ignored in the settlement systems. If the frequency response is of a longer duration, it is settled later by the Settlement team.

6. Process description

6.1. Process map – EirGrid / SONI initiated CBB trading

EirGrid or SONI Initiated CBB Trading
Process Ref No: BP_SO_11.2a
Process Owner: NCC/CHCC



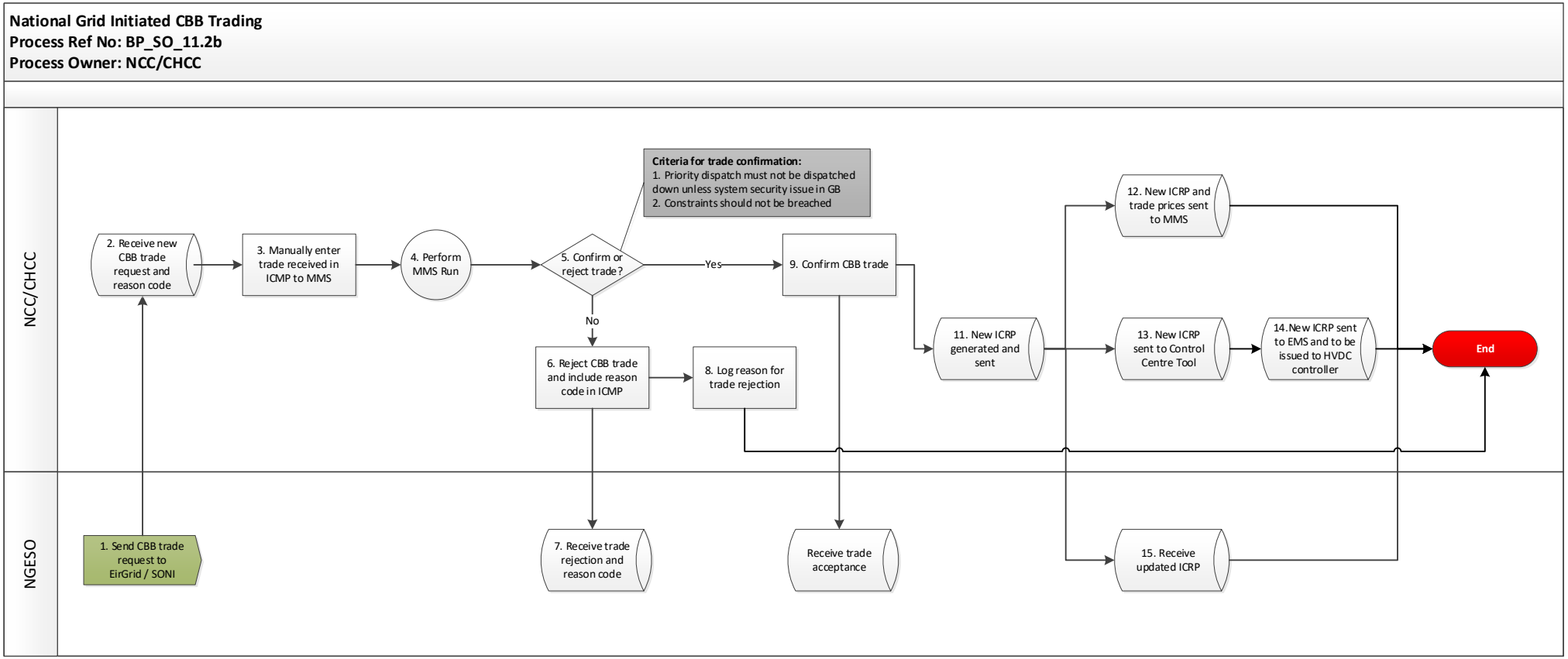
6.2. Process steps - EirGrid / SONI initiated CBB trading

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
1	Enable CBB trading for MMS runs	This is the trigger for this process. **Note: Normal operation is for CBB trading to be disabled.**	NCC/CHCC	N/A	As required	MMS
2	Contact NGESO to see if trading may be feasible	Phone NGESO to see if any trading is feasible on both interconnectors.	NCC/CHCC	Phone call	As required	Phone
3	Agree trading feasible?	Determine if trading is feasible on one or both interconnectors. *If yes, go to Step 4.* *If no, go to End.*	NGESO	Decision	As required	Phone
4	Ensure trading for priority dispatch/system security is enabled	Ensure trading for priority dispatch/system security is enabled in the MMS	NCC/CHCC	N/A	As required	MMS
5	Perform MMS Run	A MMS run should be initiated (if not done automatically) with trading enabled	Real Time	Indicative operations schedule	As required	MMS
6	MMS proposes spot MW values to change the ICRP	The MMS run varies the ICRP by proposing spot MW value changes to it on a decremental 'priority dispatch' price.	System Step	Spot MW values	Automatically following Step 7, an MMS run is expected to take several minutes to run.	MMS
7	Sent to ICMP and new ICRP proposed	The spot MW values proposed from MMS are converted to a new ICRP using the operational ramp limit in the system. Note: If the spot MW values to alter the ICRP are proposed in an offline or study environment then this becomes a manual step to get the values from MMS to ICMP.	System Step	Proposed trade	As required	ICMP

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
8	Operator reviews CBB trade	Review the proposed trade	NCC/CHCC	N/A	As required	ICMP
9	Trade acceptable?	Is the trade acceptable? **Criteria for trade acceptance:** 1. Priority Dispatch must not be curtailed 2. Proposed trades less than 50 MW should not be sent 3. Constraints should not be breached *If no, go to Step 10.* *If yes, go to Step 12.*	NCC/CHCC	Decision	As required	ICMP
10	Changes required?	If the trade is not acceptable, are there changes required? *If yes, go to Step 11.* *If no, go to Step 17.*	NCC/CHCC	Decision	As required	ICMP
11	Modify spot MW values in ICMP and recalculate trade	If the trade is not acceptable the operator can manually edit the trade until it is acceptable and a new ICRP is generated. *Proceed to step 10.*	NCC/CHCC	N/A	As required	ICMP
12	Enter reason code and send to NGESO	Enter the reason code in the system and send the proposed trade. One of the following reason codes should be used: **CBB Priority** **CBB Security**	NCC/CHCC	Proposed trade	As required	ICMP
13	Receive trade request	The proposed trade request including reason code is received.	NGESO	Trade request	As required	ICMP

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
14	Confirm / reject SO trade?	Confirm or reject the proposed trade request? *If rejected, go to Step 16.* *If confirmed, go to step 17.*	NGESO	Trade confirmation or rejection	As required	ICMP
15	Reject trade in ICMP	If no changes are required then the trade should be rejected in the system.	NCC/CHCC	Trade rejection	As required	ICMP
16	ICRP remains unchanged	Once a proposed trade is rejected in ICMP there is no change to the ICRP and the trade does not proceed. *Proceed to Step 24.*	System Step	N/A	As required	ICMP
17	New ICRP generated and sent	Following approval of trade by NGESO, a new ICRP is automatically generated and sent.	System Step	New ICRP	As required	ICMP
18	New ICRP and trade prices sent to MMS	New ICRP and trade prices sent to MMS for inclusion in scheduling, imbalance pricing & reporting.	System step	New ICRP	As required.	MMS
19	New ICRP sent to Control Centre Tool	New ICRP sent to Control Centre Tool for control of the interconnector.	System step	New ICRP	As required.	Control Centre Tool
20	New ICRP sent to EMS and to be issued to HVDC controller	New ICRP sent to EMS and to be issued to HVDC controller	System step	New ICRP	As required	EMS
21	Receive updated ICRP	New ICRP sent to NGESO for information.NGESO	System step	New ICRP	As required.	ICMP (or NGESO's equivalent system)
22	Further trading required?	Is further trading required? *If no, proceed to step 23.* *If yes, proceed to step 7.*	NCC/CHCC	Decision	As required	N/A
23	Disable trading in subsequent MMS runs.	If trading is not feasible or no further trading is required it should be disabled in subsequent MMS runs.	Real Time	N/A	As required	MMS

6.3. Process map – NGESO initiated CBB trading



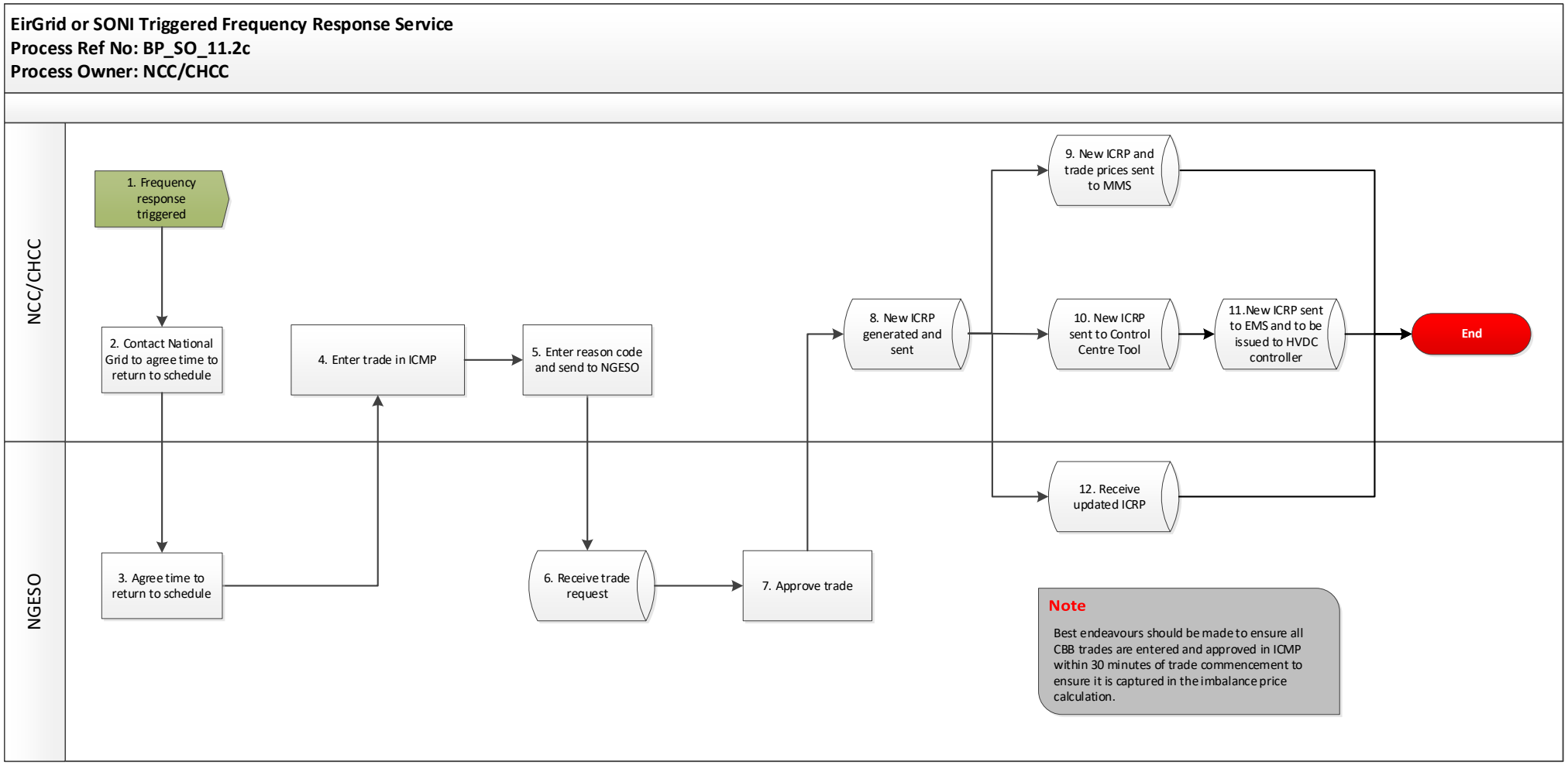
6.4. Process steps - NGESO initiated CBB trading

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
1	Send CBB trade request to EirGrid / SONI	This is the trigger for this process.	NGESO	Trade request	As required	ICMP
2	Receive new CBB trade request and reason code	Operator receives notification of a new trade request in the system.	NCC/CHCC	N/A	As required	ICMP
3	Manually enter trade received in ICMP to MMS	The requested trade should be manually copied in to MMS.	NCC/CHCC	N/A	As required	ICMP - MMS
4	Perform MMS Run	A MMS run should be initiated (with EirGrid / SONI trading disabled) in an offline study environment.	NCC/CHCC	Indicative operations schedule	Some mins after step 3	MMS
5	Confirm or reject trade?	The output of the MMS run should be examined to determine if proposed trade should be confirmed or rejected. If the trade results in priority dispatch dispatch down or breach of any system constraints then it should be rejected. If the trade is for system security in GB then priority dispatch dispatch down in both Ireland and Northern Ireland is acceptable. *If the trade is rejected, go to Step 6.* *If the trade is confirmed, go to Step 9.*	NCC/CHCC	Decision	As required	N/A

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
6	Reject CBB trade include reason code in ICMP	One of the following reasons should be used when rejecting a trade: **System Security** **Inconsistency with the ICRP** **Inconsistency with declared parameters** **Miscellaneous**	NCC/CHCC	Trade rejection	As required	ICMP
7	Receive trade rejection and reason code	The proposed trade rejection including reason code is received.	System Step	Notification	As required	ICMP
8	Log reason for trade rejection	The reason for rejecting the trade should be clearly logged for future IOP discussions. *There are no further steps.*	NCC/CHCC	Log entry	As required	All-island Control Centre Log
9	Confirm CBB trade	If the trade is ok to proceed then it should be confirmed in the system.	NCC/CHCC	Proposed trade	As required	ICMP
10	Receive trade acceptance	Receive trade acceptance	System Step	Notification	As required	ICMP
11	New ICRP generated and sent	Following approval of trade by NGESO, a new ICRP is automatically generated and sent.	System Step	New ICRP	As required	ICMP
12	New ICRP and trade prices sent to MMS	New ICRP and trade prices sent to MMS for inclusion in scheduling, imbalance pricing & reporting.	System step	New ICRP	As required	MMS
13	New ICRP sent to Control Centre Tool	New ICRP sent to Control Centre Tool for control of the interconnector.	System step	New ICRP	As required	Control Centre Tool
14	New ICRP sent to EMS and to be issued to HVDC controller	New ICRP sent to EMS and to be issued to HVDC controller	System step	New ICRP	As required	EMS

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
15	Receive updated ICRP	New ICRP sent to NGESO for information.	System step	New ICRP	As required	ICMP (or NGESO's equivalent system)

6.5. Process map – EirGrid / SONI triggered frequency response

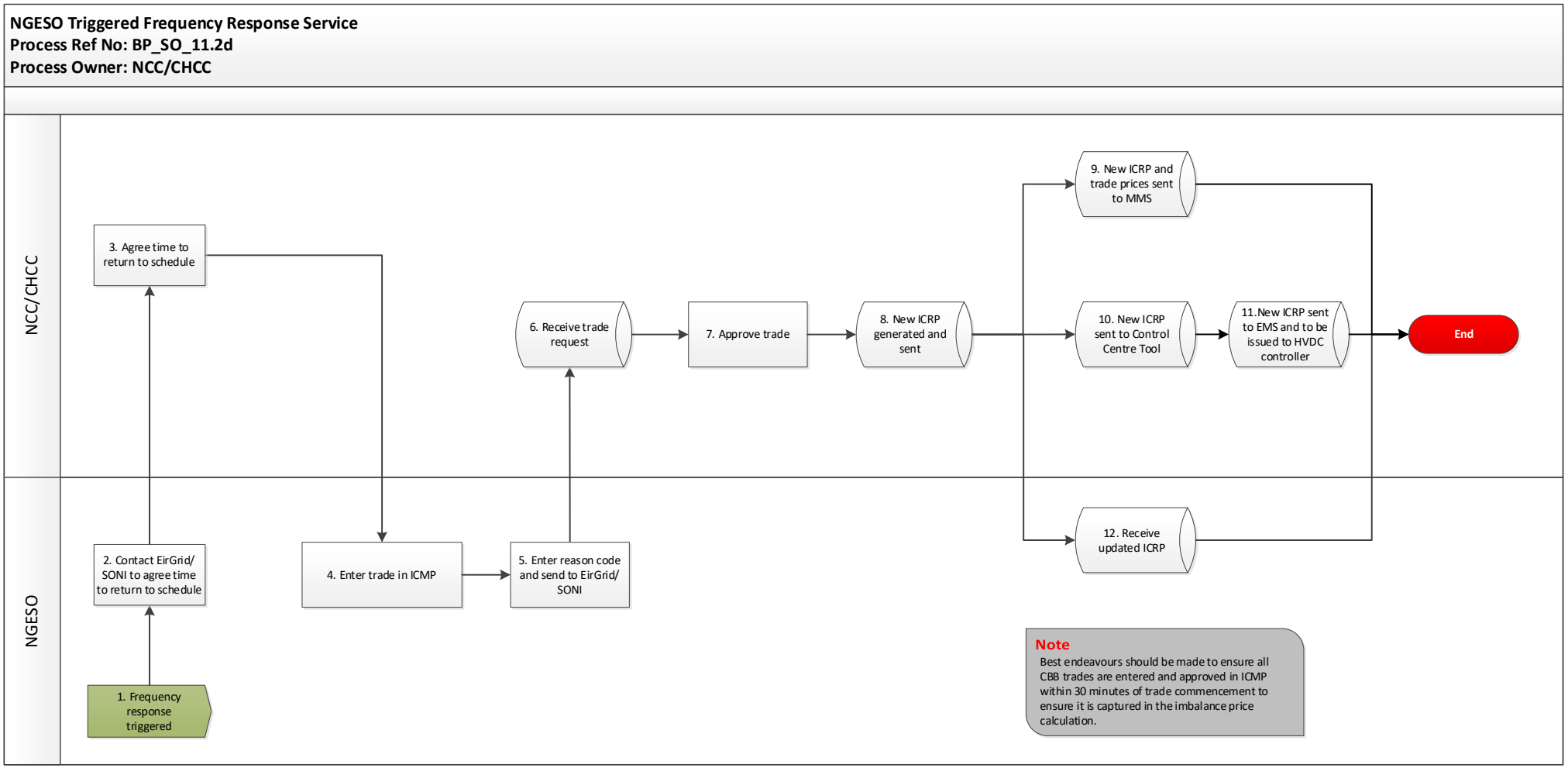


6.6. Process steps - EirGrid / SONI triggered frequency response

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
1	Frequency response triggered	This is the trigger for this process.	Automatic	Frequency triggered trade	As required	EMS
2	Contact NGESO to agree time to return to schedule	Contact NGESO to agree time to return to schedule.	NCC/CHCC	Phone call	As required	Phone
3	Agree time to return to schedule	Agree with NCC/CHCC Operator the time to return the interconnector to the market schedule / ICRP.	NGESO	Time	As required	Phone
4	Enter trade in ICMP	Enter trade in ICMP. Start time equal to time response triggered and end time as agreed with NGESO. *Note: Best endeavours should be made to ensure all CBB trades are entered and approved in ICMP within 30 minutes of trade commencement to ensure it is captured in the imbalance price calculation.*	NCC/CHCC	Proposed trade	Within 30 minutes of trade start time	ICMP
5	Enter reason code and send to NGESO	Enter applicable reason code 'HF trip' or 'LF trip' and send to NGESO.	NCC/CHCC	Trade sent	As required	ICMP
6	Receive trade request	Receive trade request agreeing time to return the interconnector to schedule.	System Step	Trade request	As required	ICMP
7	Approve trade	Approve trade in the system.	NGESO	Trade approval	As required	ICMP
8	New ICRP generated and sent	Following approval of trade by NGESO, a new ICRP is automatically generated and sent.	System Step	New ICRP	As required	ICMP

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
9	New ICRP and trade prices sent to MMS	New ICRP and trade prices sent to MMS for inclusion in scheduling, imbalance pricing & reporting.	System step	New ICRP	As required	MMS
10	New ICRP sent to Control Centre Tool	New ICRP sent to Control Centre Tool for control of the interconnector.	System step	New ICRP	As required	Control Centre Tool
11	New ICRP sent to EMS and to be issued to HVDC controller	New ICRP sent to EMS and to be issued to HVDC controller	System step	New ICRP	As required	EMS
12	Receive updated ICRP	New ICRP sent to NGESO for information.	System step	New ICRP	As required.	ICMP (or NGESO's equivalent system)

6.7. Process map – NGESO triggered frequency response



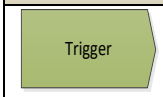
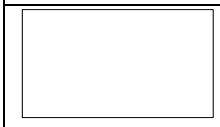
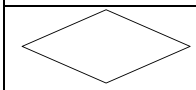
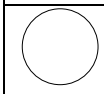
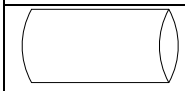
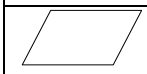
6.8. Process steps – NGESO triggered frequency response

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
1	Frequency response triggered	This is the trigger for this process.	Automatic	Frequency triggered trade	As required	EMS
2	Contact EirGrid / SONI to agree time to return to schedule	Contact EirGrid / SONI to agree time to return to schedule.	NGESO	Phone call	As required	Phone
3	Agree time to return to schedule	Agree with NCC/CHCC Operator the time to return the interconnector to the market schedule / ICRP.	NGESO	Time	As required	Phone
4	Enter trade in ICMP	Enter trade in ICMP. Start time equal to time response triggered and end time as agreed with NGESO. *Note: Best endeavours should be made to ensure all CBB trades are entered and approved in ICMP within 30 minutes of trade commencement to ensure it is captured in the imbalance price calculation.*	NGESO	Proposed trade	Within 30 minutes of trade start time	ICMP
5	Enter reason code and send to EirGrid / SONI	Enter applicable reason code 'HF trip' or 'LF trip' and send to EirGrid / SONI.	NGESO	Trade sent	As required	ICMP
6	Receive trade request	Receive trade request agreeing time to return the interconnector to schedule.	System Step	Trade request	As required	ICMP
7	Approve trade	Approve trade in the system.	NCC/CHCC	Trade approval	As required	ICMP
8	New ICRP generated and sent	Following approval of trade by NGESO, a new ICRP is automatically generated and sent.	System Step	New ICRP	As required	ICMP

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
9	New ICRP and trade prices sent to MMS	New ICRP and trade prices sent to MMS for inclusion in scheduling, imbalance pricing & reporting.	System step	New ICRP	As required	MMS
10	New ICRP sent to Control Centre Tool	New ICRP sent to Control Centre Tool for control of the interconnector.	System step	New ICRP	As required	Control Centre Tool
11	New ICRP sent to EMS and to be issued to HVDC controller	New ICRP sent to EMS and to be issued to HVDC controller.	System step	New ICRP	As required	EMS
12	Receive updated ICRP	New ICRP sent to NGESO for information.	System step	New ICRP	As required.	ICMP (or NGESO's equivalent system)

7. Appendices

7.1. Process flowchart key

FLOWCHART KEY	
	Trigger
	Process step
	Process decision / question
	Reference to another process
	Process end
	System
	Data