

Business Process

BP_SO_11.2 Cross Border Balancing Trading between EirGrid / SONI and National Grid Electricity Transmission

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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 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.

| Document Title | Relevant Section | Description |
|--|---|--|
| Moyle Interconnector Operating Protocol | <ul style="list-style-type: none">• Chapter 8 MI Instructions• Appendix K MI CBB Service | The protocol operates as a common point of reference for Moyle, SONI and NGET in relation to the operation of the Moyle 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. |
| EWIC Interconnector Operating Protocol | <ul style="list-style-type: none">• Chapter 8 EWIC Instructions• Appendix L EWIC CBB Service | The protocol operates as a common point of reference for EIDAC, EirGrid and NGET in relation to the operation of the EWIC 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. |
| EWIC Balancing and Ancillary Services Agreement | <ul style="list-style-type: none">• Clause 6 Cross Border Balancing | The agreement details the provision of commercial ancillary services across the East West Interconnector including cross border balancing. |
| Moyle Balancing and Ancillary Services Agreement | <ul style="list-style-type: none">• Clause 6 Cross Border Balancing | The agreement details the provision of commercial ancillary services across the Moyle Interconnector including cross border balancing. |

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. |
| MMS User Guide for System Operations | System Guide | Includes detailed procedures on how to implement process steps in MMS. |
| ICMP User Guide for System Operations | System Guide | Includes detailed procedures on how to implement process steps in ICMP and also steps for manual entry of CBB trades. |
| Methodology for determining System Operator and Non- Marginal Flags | Information | Appendix N of the Trading and Settlement Code requires the TSO to publish a methodology on how actions are flagged for the purpose of imbalance pricing. |
| 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 National Grid Electricity Transmission plc (NGET) to exchange energy across the Moyle and EWIC interconnectors. The arrangements are similar for both Moyle and EWIC in accordance with the operating agreements between the TSOs, and any differences are captured in the relevant process steps.

Cross border actions used close to real time (less than two and a half hours before delivery) 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 high and low 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

Background

There are a number of services or actions collectively referred to as Cross-Zonal Actions available to EirGrid/SONI and NGET to exchange flows across the EWIC and Moyle interconnectors, including:

- Coordinated Third-Party Trading (CTPT)
- Cross Border Balancing (CBB)
- Emergency Assistance (EA)
- Emergency Instruction (EI)
- Frequency Deviation Cross-Zonal Flow

EirGrid and SONI may need to alter the Interconnector Reference Program (ICRP) calculated based on Day-Ahead Market (DAM) and Intra-Day Market (IDA) auction results to maintain system security. Similarly National Grid Electricity Transmission plc (NGET) may also request a change to the ICRP. Section 3.4.6 of the Balancing Market Principles Statement summarises the key cross-zonal actions available on both Moyle and EWIC interconnectors.

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 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 in the relevant Real Time Commitment (RTC) scheduling run. Based on prices entered in the scheduling system the MMS varies the operating limits on the ICRP. The result is a series of spot MW values proposed in MMS which are sent to Interconnector Management Platform (ICMP) for conversion in to 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 NGET.

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 via fax in Real Time. A subsequent fax is required to re-enable it. Starts at time of relay operation or frequency deviation above or below at defined point and continues for the whole duration of the provision of response, or if triggered by frequency in GB a maximum of 30 minutes 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 following obligations under the Interconnector Operating Protocols, namely:

- 1) EWIC Interconnector Operating Protocol, Chapter 8 EWIC Instructions
- 2) Moyle Interconnector Operating Protocol, Chapter 8 MI Instructions

5.1.1 REAL TIME

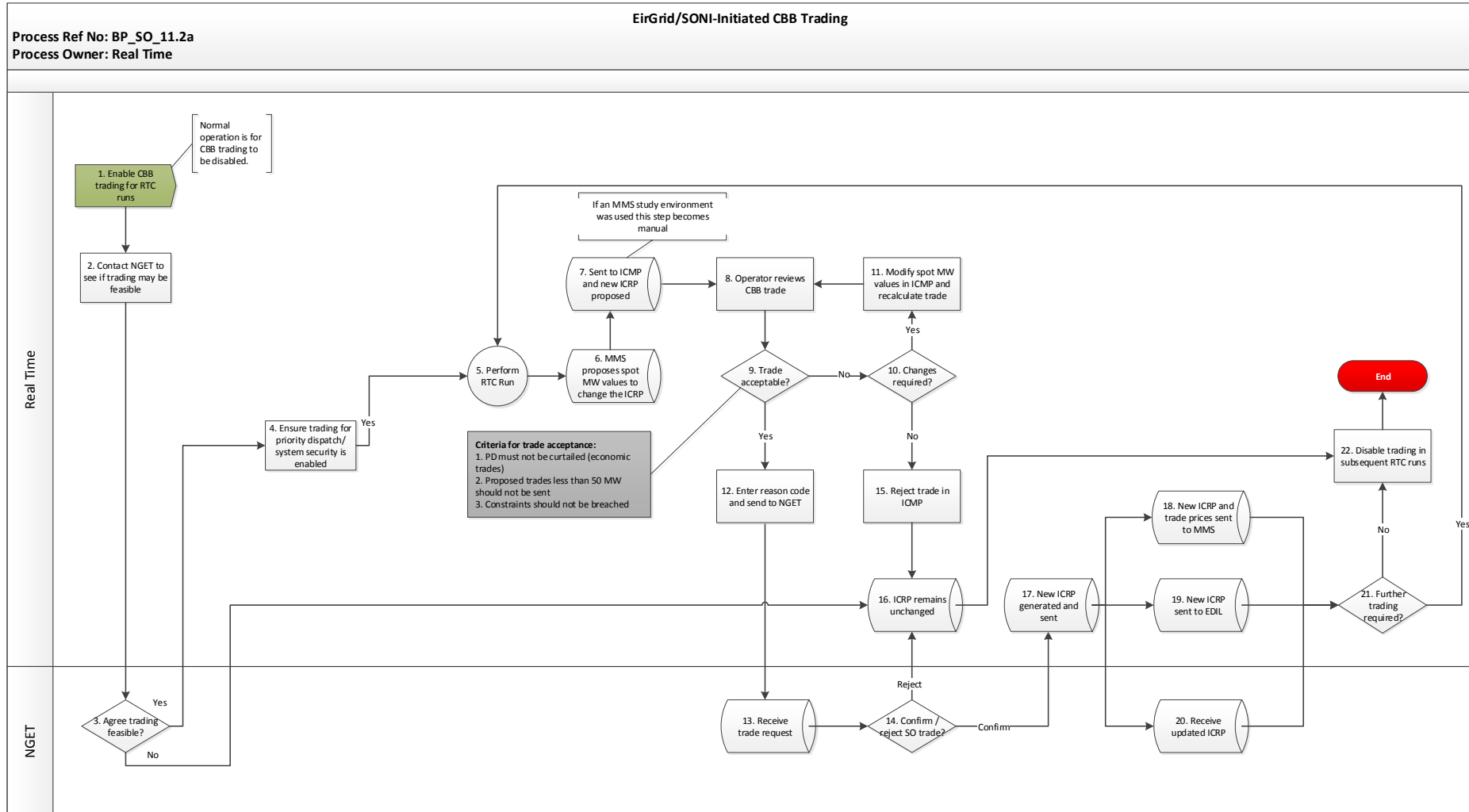
The following table provides a summary of the obligations of the Real Time team relating to CBB Trading:

| Function | Responsibility in relation to process | Timeline Associated |
|-----------|--|--|
| Real Time | <ul style="list-style-type: none"> Initiate CBB trading with NGET if required and ensure all trades are correctly entered in the systems for imbalance pricing and for scheduling. | <ul style="list-style-type: none"> As required |
| | <ul style="list-style-type: none"> Review NGET's request for CBB trading and approve any trades entered in the systems for imbalance pricing and scheduling. | <ul style="list-style-type: none"> Following receipt of trade request from NGET. |
| | <ul style="list-style-type: none"> Ensure all frequency response trades are correctly reflected in the systems for returning the interconnector to schedule and for inclusion in imbalance pricing. | <ul style="list-style-type: none"> Within 30 minutes of frequency response being triggered. |

6 PROCESS DESCRIPTION

6.1 LEVEL 3 PROCESS

6.1.1 PROCESS MAP – EIRGRID/SONI-INITIATED CBB TRADING



6.1.2 PROCESS STEPS - EIRGRID/SONI-INITIATED CBB TRADING

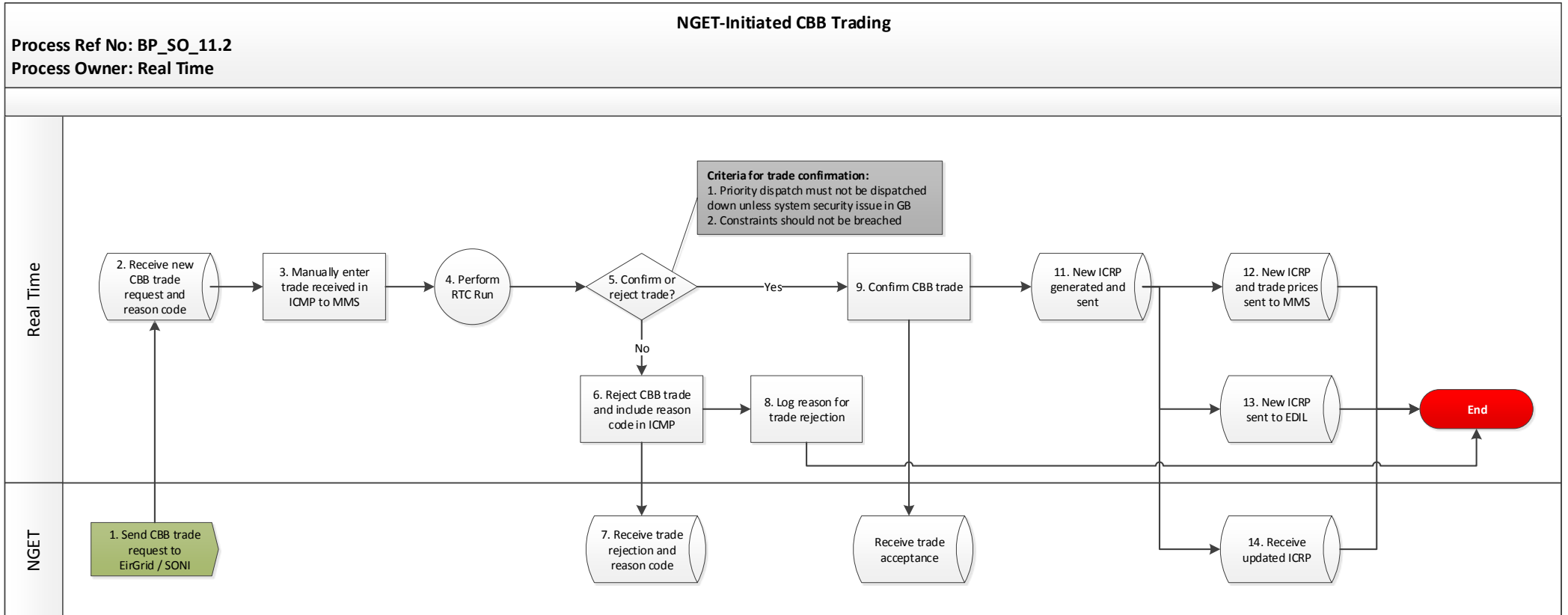
| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/ Frequency | System |
|---|---|--|------------------|--------------------------------|--|--------|
| 1 | Enable CBB trading for RTC runs | This is the trigger for this process. Note: Normal operation is for CBB trading to be disabled. | Real Time | N/A | As required | MMS |
| 2 | Contact NGET to see if trading may be feasible | Phone NGET to see if any trading is feasible on both interconnectors. | Real Time | 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. | NGET | 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 | Real Time | N/A | As required | MMS |
| 5 | Perform RTC Run | A Real Time Commitment 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 RTC 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 RTC run is expected to take 5 minutes to run. | MMS |

| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/Frequency | System |
|----|------------------------------------|---|------------------|----------------|-----------------------------|--------|
| 7 | Sent to ICMP and new ICRP proposed | <p>The spot MW values proposed from SCUC are converted to a new ICRP using the operational ramp limit in the system.</p> <p>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 SCUC to ICMP.</p> | System Step | Proposed trade | As required | ICMP |
| 8 | Operator reviews CBB trade | Review the proposed trade | Real Time | N/A | As required | ICMP |
| 9 | Trade acceptable? | <p>Is the trade acceptable?</p> <p>Criteria for trade acceptance:</p> <ol style="list-style-type: none"> 1. Priority Dispatch must not be curtailed 2. Proposed trades less than 50 MW should not be sent 3. Constraints should not be breached <p>If no, go to Step 10. If yes, go to Step 12.</p> | Real Time | Decision | As required | ICMP |
| 10 | Changes required? | <p>If the trade is not acceptable, are there changes required?</p> <p>If yes, go to Step 11. If no, go to Step 17.</p> | Real Time | Decision | As required | ICMP |

| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/ Frequency | System |
|----|---|--|------------------|---------------------------------|---------------------------------|--------|
| 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. | Real Time | N/A | As required | ICMP |
| 12 | Enter reason code and send to NGET | 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 | Real Time | Proposed trade | As required | ICMP |
| 13 | Receive trade request | The proposed trade request including reason code is received. | NGET | Trade request | As required | ICMP |
| 14 | Confirm / reject SO trade? | Confirm or reject the proposed trade request? If rejected, go to Step 16. If confirmed, go to step 17. | NGET | 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. | Real Time | 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 NGET, a new ICRP is automatically generated and | System Step | New ICRP | As required | ICMP |

| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/ Frequency | System |
|----|---|--|------------------|----------|---------------------------------|--------|
| | | sent. | | | | |
| 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 EDIL | New ICRP sent to EDIL for control of the interconnector. | System step | New ICRP | As required. | EDIL |
| 20 | Receive updated ICRP | New ICRP sent to NGET for information. | System step | New ICRP | As required. | ICMP |
| 21 | Further trading required? | Is further trading required? If no, proceed to step 24. If yes, proceed to step 7. | Real Time | Decision | As required | N/A |
| 22 | Disable trading in subsequent RTC runs. | If trading is not feasible or no further trading is required it should be disabled in subsequent RTC runs. | Real Time | N/A | As required | MMS |

6.1.3 PROCESS MAP – NATIONAL GRID ELECTRICITY TRANSMISSION PLC-INITIATED CBB TRADING



6.1.4 PROCESS STEPS - NATIONAL GRID ELECTRICITY TRANSMISSION PLC-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. | NGET | 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. | Real Time | N/A | As required | ICMP |
| 3 | Manually enter trade received in ICMP to MMS | The requested trade should be manually copied in to SCUC. | Real Time | N/A | As required | ICMP - SCUC |
| 4 | Perform RTC Run | A Real Time Commitment run should be initiated (with EirGrid / SONI trading disabled) in an offline study environment. | Real Time | Indicative operations schedule | 10 mins after step 3 | SCUC |
| 5 | Confirm or reject trade? | <p>The output of the RTC 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.</p> <p>If the trade is rejected, go to Step 6. If the trade is confirmed, go to Step 9.</p> | Real Time | 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 | Real Time | 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. | Real Time | 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. | Real Time | 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 NGET, 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 | New ICRP sent to EDIL for control of the | System step | New ICRP | As required. | EDIL |

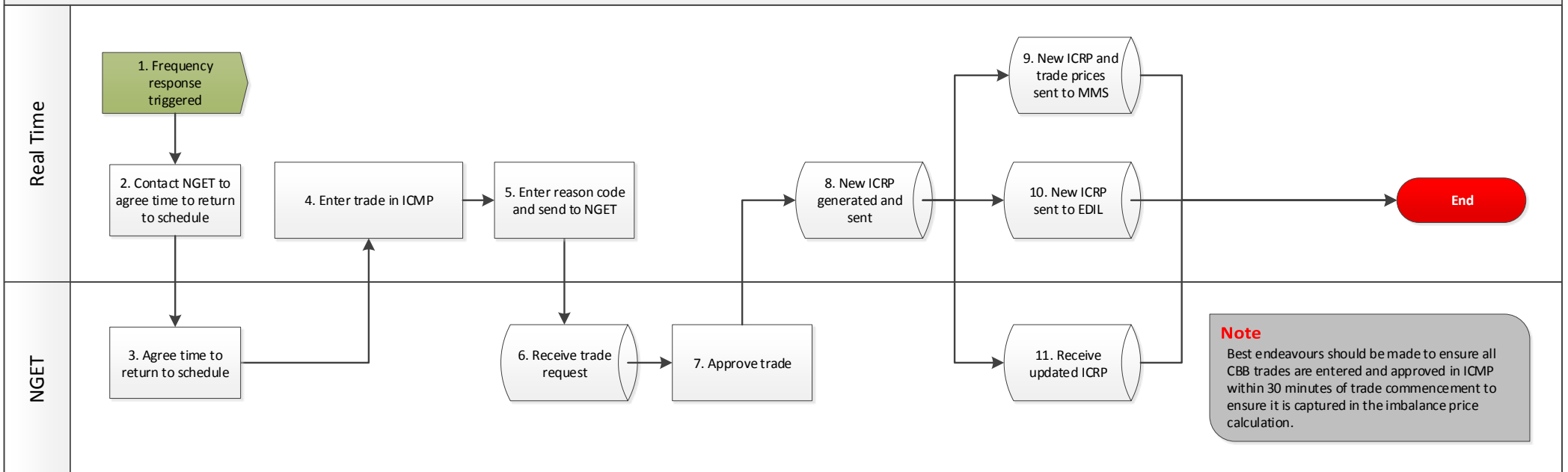
| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/ Frequency | System |
|----|----------------------|--|------------------|----------|---------------------------------|--------|
| | EDIL | interconnector. | | | | |
| 14 | Receive updated ICRP | New ICRP sent to NGET for information. | System step | New ICRP | As required. | ICMP |

6.1.5 PROCESS MAP – EIRGRID/SONI-TRIGGERED FREQUENCY RESPONSE

EirGrid/SONI-Triggered Frequency Response Service

Process Ref No: BP_SO_11.2c

Process Owner: Real Time



6.1.6 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 NGET to agree time to return to schedule | Contact NGET to agree time to return to schedule. | Real Time | Phone call | As required | Phone |
| 3 | Agree time to return to schedule | Agree with Real Time Operator the time to return the interconnector to the market schedule / ICRP. | NGET | 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 NGET. 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. | Real Time | Proposed trade | Within 30 minutes of trade start time | ICMP |
| 5 | Enter reason code and send to NGET | Enter applicable reason code 'HF trip' or 'LF trip' and send to NGET. | Real Time | 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. | NGET | Trade approval | As required | ICMP |

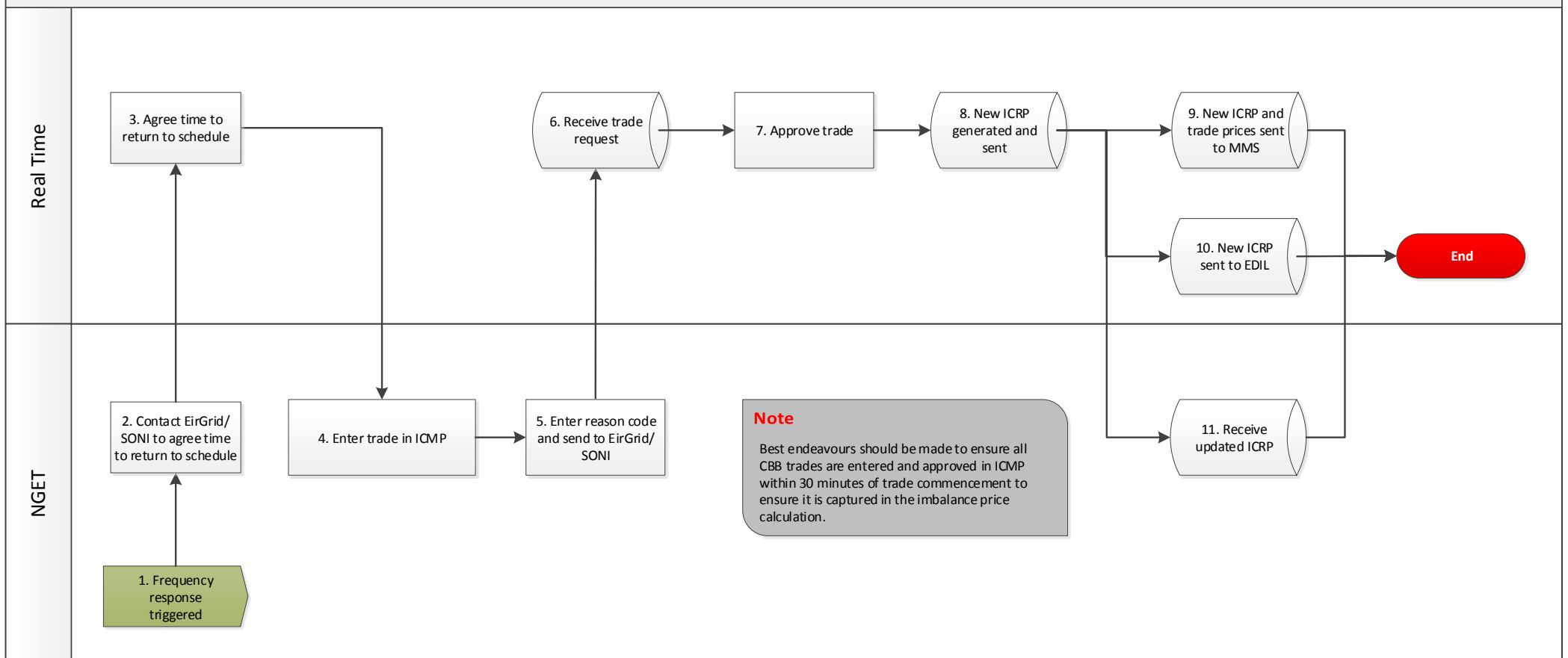
| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/ Frequency | System |
|----|---------------------------------------|---|------------------|----------|---------------------------------|--------|
| 8 | New ICRP generated and sent | Following approval of trade by NGET, a new ICRP is automatically generated and sent. | System Step | New ICRP | As required | ICMP |
| 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 EDIL | New ICRP sent to EDIL for control of the interconnector. | System step | New ICRP | As required. | EDIL |
| 11 | Receive updated ICRP | New ICRP sent to NGET for information. | System step | New ICRP | As required. | ICMP |

6.1.7 PROCESS MAP – NATIONAL GRID ELECTRICITY TRANSMISSION PLC-TRIGGERED FREQUENCY RESPONSE

NGET-Triggered Frequency Response Service

Process Ref No: BP_SO_11.2d

Process Owner: Real Time



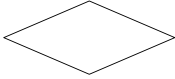





6.1.8 PROCESS STEPS – NATIONAL GRID ELECTRICITY TRANSMISSION PLC-TRIGGERED FREQUENCY RESPONSE

| # | 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. | NGET | Phone call | As required | Phone |
| 3 | Agree time to return to schedule | Agree with Real Time Operator the time to return the interconnector to the market schedule / ICRP. | NGET | 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 NGET. 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. | NGET | 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. | NGET | 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 |

| # | Step | Step Description | Responsible Role | Outputs | Indicative Timing/ Frequency | System |
|----|---------------------------------------|---|------------------|----------------|---------------------------------|--------|
| 7 | Approve trade | Approve trade in the system. | Real Time | Trade approval | As required | ICMP |
| 8 | New ICRP generated and sent | Following approval of trade by NGET, a new ICRP is automatically generated and sent. | System Step | New ICRP | As required | ICMP |
| 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 EDIL | New ICRP sent to EDIL for control of the interconnector. | System step | New ICRP | As required. | EDIL |
| 11 | Receive updated ICRP | New ICRP sent to NGET for information. | System step | New ICRP | As required. | ICMP |

7.1 PROCESS FLOWCHART KEY

| FLOWCHART KEY | |
|---|------------------------------|
|  Trigger | Trigger |
|  | Process step |
|  | Process decision / question |
|  | Reference to another process |
|  End | Process end |
|  | System (automatic step) |