

# BiTraDER

**Test Plan**

**Document ID PDL026**

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**Version: 0.2**

**Date: 24 November 2024**



## 1. Document Control

### 1.1 Change History

Version	Status	Date	Author(s)	Description of Change
0.1	Draft	14/08/2024	Richard Noakes	Initial Draft
0.2	Final	24/11/2024	Richard Noakes	Added test results and screen shots

### 1.2 Reviewers

The people that will be active in the evolution of this document (authoring, reviewing, approving, verifying) are listed in the table below along with an auditable record of these document management activities. In addition, their RASCI Assignment (Responsible, Accountable, Supportive, Consulted and Informed) is listed;

Name	Role	Activity	RASCI
Chris Greenfield	Project Manager	Review/Approve	Accountable
Richard Noakes	BiTraDER Solution Architect	Author	Responsible
Kundan Karadia	BiTraDER software engineer	Review	Consult
Emilis Srage	Electron	Review	Consult
Phil Woolger	Cantium Technical Architect	Review	Consult

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## 2. BiTraDER solution overview

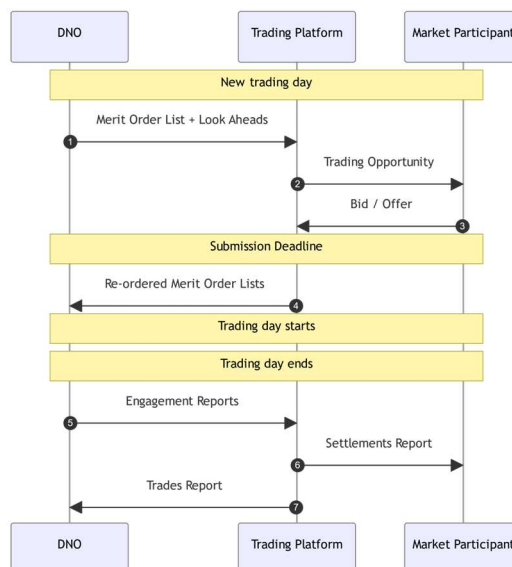
### 2.1 BiTraDER project overview

The BiTraDER Innovation Project is building and trialling a brand new and highly innovative flexibility market allowing Distributed Energy Resources (DERs) connected to the distribution network to trade their curtailment obligations bilaterally.

To ensure that Electricity North West Limited (ENWL) are facilitating and enabling the market, but not directly participating, the trading platform is completely independent of the Distribution Network Operator (DNO). A third-party provider, Electron, will be hosting the trading platform and presenting information provided from ENWL’s Active Network Management (ANM) system as and when constraints are forecast.

1. The ANM system has ‘Look ahead’ functionality to forecast potential constraints. Based on network topology and outage plans, the ANM system creates a list of connected DERs such as flexible service providers along with flexible connection customers that will be curtailed or called on, to resolve each constraint. The ANM system also contains the merit order list (MOL) of all curtailable assets within the ENWL network. Both the look ahead and MOL are transferred to the Electron trading platform from the ANM system.
2. The Electron trading platform presents customers with the look ahead and MOL during a window within the day ahead period and facilitates trading based on agreed trading rules. Trading is completed and the re-traded MOL is transferred back into the ANM system, in time for each trade period the next day.
3. The ANM system receives the re-traded MOL and should a constraint occur, dispatches instructions based on the revised order. This will be via SCADA where applicable, or, in future, by other means (e.g. an Application Programming Interface (API) or similar) for all other participating customers.

A summary of the information flows is provided in the diagram below.



## 2.2 BiTraDER Project Test Phasing

The project has two distinct test phases as follows:

*Project Test Phase 1* – Simulation trials starting in October 24:

Where customers will access the Electron trading platform to trade simulated constraints using fabricated assets. This will require a fully functional trading platform, but the customer’s physical assets and the electrical network will be simulated.

The simulation trials will run ten scenarios. The trade window for each scenario will open for 2 hours at the day ahead stage with the actual trade period occurring the next day. After the trade has taken place, a Teams meeting will be held to discuss the outcomes. This will start in October 24 and complete eight months later. Each scenario will generate 10 to 20 messages.

*Project Test Phase 2* – Live trials in 2025:

Where live customer assets and the live electrical network will be active, but the look ahead curtailment events will be generated through ANM manipulation. This is currently out of scope for this stage of the project.

## 3. Simulation Trials Test approach

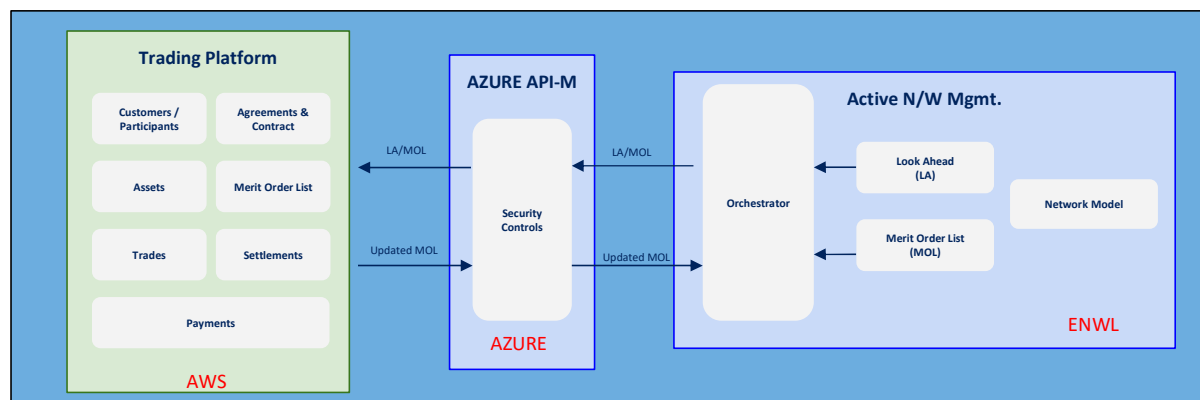
### 3.1 Simulation trials solution

It was decided to focus the solution build for the simulation trials on the following aspects of the future trading platform:

- End user customer experience interacting with the trading platform.
- Price discovery: so that the customers understand how the trading benefits will be realised.
- Managing the trading timelines.

This led to the conclusion that the simulation trials did not need to integrate with the live ANM system. So, the curtailment that leads to the trading activities will be simulated, along with the DER assets that are traded.

This resulted in the decision to create a simulation trials orchestrator component that managed the flow of information between ANM and the trading platform. This is shown in the solution diagram below.



The simulation trials explore a set of ten network curtailment and asset scenarios and each of these scenarios are created as a spreadsheet containing the appropriate look ahead and MOL messages.

For each of the scenarios the orchestrator submits the relevant look ahead/MOL message, and this is sent to ENWL's API Management server in AZURE called API-M. The role of API-M in the simulation trials is to provide a set of security controls to the solution. This includes authentication and access control and message payload validation.

Once the look ahead/MOL message is received by the trading platform, the information is used to set up the trading opportunity for customers to trade.

Customers will undertake their trading, specific to the scenario at that moment and the resultant updated MOL is sent back to the orchestrator via API-M. The orchestrator will then present the result of the trade and then for certain scenarios, a manual update of the curtailment index will be performed to create the MOL for the next scenario.

This is repeated over several months until all the scenarios are complete.

## 3.2 Simulation Trials test phases

The test approach for simulation trials has been to build and test functionality incrementally as follows:

- *Simulation trials phase 1* – Unit test of the point-to-point message interface between the orchestrator and the trading platform, via API-M. A look ahead/MOL is sent to the trading platform via API-M and the identical MOL is returned. This completed successfully.
- *Simulation trials phase 2* – Extend the scope of the testing to include a dummy trade executed on the trading platform that returns an updated MOL back to the orchestrator. This completed successfully.
- *Simulation trials phase 3* – Test the full set of end-to-end scenarios planned for the simulation trials. This completed successfully.

This test plan covers the Phase 3 testing of the simulation trials.

## 4. Simulation Trials Testing Overview

The ENWL IT team are responsible for three key streams of work: project delivery, small change and production support.

### 4.1 Testing Objectives

The objectives of testing can be summarised as:

- To confirm that the orchestrator creates the expected look ahead and MOL message payloads for each scenario and that the message is successfully submitted to the trading platform via API-M.
- To confirm that the trading platform returns the expected updated MOL via API-M in response to the look ahead and initial MOL.
- To ensure that the orchestrator reports the correct completion status of each of the simulation trials scenarios.

## 4.2 Testing Inputs

The inputs to the testing are spreadsheets that contain the look ahead and MOL for each of the ten scenarios. The scenarios are grouped into five groups. Each group contains scenarios that are linked sequentially or have some characteristics that are similar.

## 4.3 Simulation Trials Phase 3 Integration Testing

### 4.3.1 Overview

The simulation trials phase 3 testing will consist of the testing of ten different scenarios. These ten scenarios have been developed as the scenarios that will be run during the simulation trials phase of the BiTraDER project starting in October 24.

Each scenario will consist of 2 messages as follows:

1. *ANM orchestrator to trading platform* – Look ahead message plus MOL
2. *Trading platform to ANM orchestrator* – Updated MOL post trade execution

The ten scenarios will be grouped into five groups as follows:

*Group 1* – scenarios 1,3 (scenario 2 not required due to changes to scope)

*Group 2* – scenarios 4,5,6,7

*Group 3* – scenarios 8,9

*Group 4* – not required due to changes to scope

*Group 5* – scenario 11, 12

The scenarios in group 2 will be linked in a way that the outcome from the first scenario (updated MOL and curtailment index) will be input into the next scenario and so on until the last scenario in the group is complete.

## 5. Simulation Trials Scenarios

### 5.1 Group 1 Scenario 1

The following input data will be submitted to the trading platform for scenario 1. This scenario will be executed by opening the scenarios list and opening scenario 1 button on the orchestrator Graphical User Interface (GUI).

Then perform the following:

1. Click the *Post MOL to BiTraDER* button
2. Perform the trade on the BitraDER platform
3. Click the *Get MOL from BiTraDER* button

## Test Capability – Test Strategy (Testing, V0.2, November 2024)

### Message 1 – Scenario 1 look ahead

Group 1 Constraint 1 - Occurs as expected		Location - Keswick Primary HV Feeder					
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_A1	Asset_1
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_A2	Asset_2
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_A3	Asset_3
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_A4	Asset_4
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_A5	Asset_5
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_Agg1	Aggregate_1
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_Agg2	Aggregate_2
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_Agg3	Aggregate_3
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_Agg4	Aggregate_4
1728050400	04/10/2024 14:00	10/05/2024 08:00	C1	2000	kW	G1_Agg5	Aggregate_5

### Message 1 – Scenario 1 MOL

Group 1 Constraint 1 - Simple import constraint												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible	Contract ID	BITraDER Registered	BITraDER Traded
04/10/2024 14:00	G1_A1	1	ConstrainedDemand	0	kW	700	1200	Asset_1	Buyer	A1_Buyer	Flag Set	Flag Not Set
04/10/2024 14:00	G1_A2	2	ConstrainedDemand	0	kW	500	500	Asset_2	Buyer	A2_Buyer	Flag Set	Flag Not Set
04/10/2024 14:00	G1_A3	3	ConstrainedDemand	0	kW	200	1200	Asset_3	Buyer	A3_Buyer	Flag Set	Flag Not Set
04/10/2024 14:00	G1_A4	4	ConstrainedDemand	0	kW	400	400	Asset_4	Buyer	A4_Buyer	Flag Set	Flag Not Set
04/10/2024 14:00	G1_A5	5	ConstrainedDemand	0	kW	200	200	Asset_5	Buyer	A5_Buyer	Flag Set	Flag Not Set
04/10/2024 14:00	G1_Agg1	6	FlexibleOutputChange	0	kW	600	0	Aggregate_1	Seller	Agg1_Seller	Flag Set	Flag Not Set
04/10/2024 14:00	G1_Agg2	7	FlexibleOutputChange	0	kW	500	0	Aggregate_2	Seller	Agg2_Seller	Flag Set	Flag Not Set
04/10/2024 14:00	G1_Agg3	8	FlexibleOutputChange	0	kW	0	200	Aggregate_3	Seller	Agg3_Seller	Flag Set	Flag Not Set
04/10/2024 14:00	G1_Agg4	9	FlexibleOutputChange	0	kW	0	500	Aggregate_4	Seller	Agg4_Seller	Flag Set	Flag Not Set
04/10/2024 14:00	G1_Agg5	10	FlexibleOutputChange	0	kW	200	0	Aggregate_5	Seller	Agg5_Seller	Flag Set	Flag Not Set

### Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 09:00 and 09:30.
- The status of Scenario 1 on the orchestrator admin screen is changed from “Started” to “Completed”.

## 5.2 Group 1 Scenario 3

The following input data will be submitted to the trading platform for scenario 3. This scenario will be executed by opening the scenarios list and opening scenario 3 button on the orchestrator (GUI).

Then perform the following:

- Click the **Post MOL to BiTraDER** button
- Perform the trade on the BitraDER platform
- Click the **Get MOL from BiTraDER** button



# Test Capability – Test Strategy (Testing, V0.2, November 2024)

## Message 1 – Scenario 3 look ahead

Group 1 Constraint 3 - Occurs as expected		Location - Keswick Primary HV Feeder					
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_A1	Asset_1
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_A2	Asset_2
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_A3	Asset_3
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_A4	Asset_4
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_A5	Asset_5
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_Agg1	Aggregate_1
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_Agg2	Aggregate_2
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_Agg3	Aggregate_3
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_Agg4	Aggregate_4
1733148000	02/12/2024 14:00	12/02/2024 04:00:00	C3	-3500	kW	G1_Agg5	Aggregate_5
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_A1	Asset_1
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_A2	Asset_2
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_A3	Asset_3
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_A4	Asset_4
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_A5	Asset_5
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_Agg1	Aggregate_1
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_Agg2	Aggregate_2
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_Agg3	Aggregate_3
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_Agg4	Aggregate_4
1733148000	02/12/2024 14:00	12/02/2024 05:00:00	C3	-3500	kW	G1_Agg5	Aggregate_5
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_A1	Asset_1
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_A2	Asset_2
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_A3	Asset_3
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_A4	Asset_4
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_A5	Asset_5
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_Agg1	Aggregate_1
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_Agg2	Aggregate_2
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_Agg3	Aggregate_3
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_Agg4	Aggregate_4
1733148000	02/12/2024 14:00	12/02/2024 06:00:00	C3	-3500	kW	G1_Agg5	Aggregate_5
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_A1	Asset_1
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_A2	Asset_2
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_A3	Asset_3
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_A4	Asset_4
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_A5	Asset_5
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_Agg1	Aggregate_1
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_Agg2	Aggregate_2
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_Agg3	Aggregate_3
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_Agg4	Aggregate_4
1733148000	02/12/2024 14:00	12/02/2024 07:00:00	C3	-3500	kW	G1_Agg5	Aggregate_5

## Message 1 – Scenario 3 MOL

Group 1 Constraint 3 - Simple export constraint													
Original MOL sent to Trading Platform from Orchestrator													
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible	Service	Contract ID	BITraDER Registered	BITraDER Traded
02/12/2024 14:00	G1_Agg1	1	ConstrainedGeneration	0	kW	600	1200	Aggregate_1	Buyer	Agg1_Buyer	Agg1_Buyer	Flag Set	Flag Not Set
02/12/2024 14:00	G1_Agg2	2	ConstrainedGeneration	0	kW	500	1000	Aggregate_2	Buyer	Agg2_Buyer	Agg2_Buyer	Flag Set	Flag Not Set
02/12/2024 14:00	G1_Agg3	3	ConstrainedGeneration	0	kW	100	200	Aggregate_3	Buyer	Agg3_Buyer	Agg3_Buyer	Flag Set	Flag Not Set
02/12/2024 14:00	G1_Agg4	4	ConstrainedGeneration	0	kW	500	500	Aggregate_4	Buyer	Agg4_Buyer	Agg4_Buyer	Flag Set	Flag Not Set
02/12/2024 14:00	G1_Agg5	5	ConstrainedGeneration	0	kW	200	900	Aggregate_5	Buyer	Agg5_Buyer	Agg5_Buyer	Flag Set	Flag Not Set
02/12/2024 14:00	G1_A1	6	FlexibleOutputChange	0	kW	0	1200	Asset_1	Seller	A1_Seller	A1_Seller	Flag Set	Flag Not Set
02/12/2024 14:00	G1_A2	7	FlexibleOutputChange	0	kW	0	500	Asset_2	Seller	A2_Seller	A2_Seller	Flag Set	Flag Not Set
02/12/2024 14:00	G1_A3	8	FlexibleOutputChange	0	kW	0	1200	Asset_3	Seller	A3_Seller	A3_Seller	Flag Set	Flag Not Set
02/12/2024 14:00	G1_A4	9	FlexibleOutputChange	0	kW	0	400	Asset_4	Seller	A4_Seller	A4_Seller	Flag Set	Flag Not Set
02/12/2024 14:00	G1_A5	10	FlexibleOutputChange	0	kW	0	200	Asset_5	Seller	A5_Seller	A5_Seller	Flag Set	Flag Not Set

### Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 09:00 and 09:30.
- The status of scenario 3 on the orchestrator admin screen is changed from “Started” to “Completed”

## 5.3 Group 2 Scenario 4

The following input data will be submitted to the trading platform for scenario 4. This scenario will be executed by opening the scenarios list and opening scenario 4 button on the orchestrator GUI.

Then perform the following:

- Click the **Post MOL to BiTraDER** button

Test Capability – Test Strategy (Testing, V0.2, November 2024)

2. Perform the trade on the BitraDER platform
3. Click the *Get MOL from BiTraDER* button

Message 1 – Scenario 4 look ahead

Group 2 Constraint 4 - Occurs as expected		Location - Egremont Primary Transformer Incomer					
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_A6	Asset_6
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_A7	Asset_7
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_A8	Asset_8
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_A9	Asset_9
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_A10	Asset_10
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_Agg6	Aggregate_6
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_Agg7	Aggregate_7
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_Agg8	Aggregate_8
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_Agg9	Aggregate_9
1733148000	02/12/2024 14:00	12/02/2024 13:00:00	C4	5000	kW	G2_Agg10	Aggregate_10

Message 1 – Scenario 4 MOL

Group 2 Constraint 4 - Severe weather causes demand constraint												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible Service	Contract ID	BITraDER Registered Asset Flag	BITraDER Traded Asset Flag
16/12/2024 14:00	G2_A9	1	ConstrainedDemand	0	kW	1200	1200	Asset_9	Buyer	A9_Buyer	Flag Set	Flag Not Set
16/12/2024 14:00	G2_A8	2	FlexibleOutputChange	-700	kW	700	0	Asset_8	Flexible Service	A8_Flex	N/A	N/A
16/12/2024 14:00	G2_A7	3	FlexibleOutputChange	-800	kW	800	0	Asset_7	Flexible Service	A7_Flex	N/A	N/A
16/12/2024 14:00	G2_A10	4	ConstrainedDemand	600	kW	1300	600	Asset_10	Buyer	A10_Buyer	Flag Set	Flag Not Set
16/12/2024 14:00	G2_A6	5	FlexibleOutputChange	-500	kW	1500	0	Asset_6	Flexible Service	A6_Flex	N/A	N/A
16/12/2024 14:00	G2_A7	6	ConstrainedDemand	0	kW	800	800	Asset_7	Buyer	A7_Buyer	Flag Set	Flag Not Set
16/12/2024 14:00	G2_A6	7	ConstrainedDemand	500	kW	1500	1500	Asset_6	Buyer	A6_Buyer	Flag Set	Flag Not Set
16/12/2024 14:00	G2_A10	8	ConstrainedDemand	0	kW	1300	600	Asset_10	Buyer	A10_Buyer_2	Flag Set	Flag Not Set
16/12/2024 14:00	G2_Agg9	9	FlexibleOutputChange	0	kW	700	0	Aggregate_9	Seller	Agg9_Seller	Flag Set	Flag Not Set
16/12/2024 14:00	G2_Agg8	10	FlexibleOutputChange	0	kW	1300	0	Aggregate_8	Seller	Agg8_Seller	Flag Set	Flag Not Set
16/12/2024 14:00	G2_Agg7	11	FlexibleOutputChange	0	kW	1300	0	Aggregate_7	Seller	Agg7_Seller	Flag Set	Flag Not Set
16/12/2024 14:00	G2_Agg6	12	FlexibleOutputChange	0	kW	700	0	Aggregate_6	Seller	Agg6_Seller	Flag Set	Flag Not Set
16/12/2024 14:00	G2_Agg10	13	FlexibleOutputChange	0	kW	1000	0	Aggregate_10	Seller	Agg10_Seller	Flag Set	Flag Not Set

Expected results:

4. An updated MOL (Message 2) is returned from the trading platform
5. The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 09:00 and 09:30.
6. The status of Scenario 4 on the orchestrator admin screen is changed from “Started” to “Completed”

### 5.4 Group 2 Scenario 5

The following input data will be submitted to the trading platform for scenario 5. Scenario 5 will be executed by opening the scenarios list and opening scenario 5 button on the orchestrator GUI. In scenario 5 check the MOL is the changed MOL from scenario 4.

This scenario will take the scenario 5 look ahead and submit to the trading platform together with the updated MOL from scenario 4.

Then perform the following:

1. Click the *Post MOL to BiTraDER* button
2. Perform the trade on the BitraDER platform
3. Click the *Get MOL from BiTraDER* button

Test Capability – Test Strategy (Testing, V0.2, November 2024)

Message 1 – Scenario 5 look ahead

Group 2 Constraint 5 - Less than expected							
Location - Egremont Primary Transformer In comer							
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_A6	Asset_6
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_A7	Asset_7
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_A8	Asset_8
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_A9	Asset_9
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_A10	Asset_10
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_Agg6	Aggregate_6
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_Agg7	Aggregate_7
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_Agg8	Aggregate_8
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_Agg9	Aggregate_9
1754357600	16/12/2024 14:00	12/17/2024 09:00:00	C5	5000	KW	G2_Agg10	Aggregate_10
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_A6	Asset_6
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_A7	Asset_7
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_A8	Asset_8
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_A9	Asset_9
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_A10	Asset_10
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_Agg6	Aggregate_6
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_Agg7	Aggregate_7
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_Agg8	Aggregate_8
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_Agg9	Aggregate_9
1754357600	16/12/2024 14:00	12/17/2024 09:30:00	C5	5000	KW	G2_Agg10	Aggregate_10
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_A6	Asset_6
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_A7	Asset_7
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_A8	Asset_8
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_A9	Asset_9
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_A10	Asset_10
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_Agg6	Aggregate_6
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_Agg7	Aggregate_7
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_Agg8	Aggregate_8
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_Agg9	Aggregate_9
1754357600	16/12/2024 14:00	12/17/2024 10:00:00	C5	5000	KW	G2_Agg10	Aggregate_10
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_A6	Asset_6
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_A7	Asset_7
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_A8	Asset_8
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_A9	Asset_9
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_A10	Asset_10
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_Agg6	Aggregate_6
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_Agg7	Aggregate_7
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_Agg8	Aggregate_8
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_Agg9	Aggregate_9
1754357600	16/12/2024 14:00	12/17/2024 10:30:00	C5	5000	KW	G2_Agg10	Aggregate_10
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_A6	Asset_6
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_A7	Asset_7
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_A8	Asset_8
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_A9	Asset_9
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_A10	Asset_10
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_Agg6	Aggregate_6
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_Agg7	Aggregate_7
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_Agg8	Aggregate_8
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_Agg9	Aggregate_9
1754357600	16/12/2024 14:00	12/17/2024 11:00:00	C5	5000	KW	G2_Agg10	Aggregate_10
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_A6	Asset_6
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_A7	Asset_7
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_A8	Asset_8
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_A9	Asset_9
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_A10	Asset_10
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_Agg6	Aggregate_6
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_Agg7	Aggregate_7
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_Agg8	Aggregate_8
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_Agg9	Aggregate_9
1754357600	16/12/2024 14:00	12/17/2024 11:30:00	C5	5000	KW	G2_Agg10	Aggregate_10

Message 1 – Scenario 5 MOL

Group 2 Constraint 5 - Severe weather causes demand constraint with curtailment index update												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MIC (kW)	Resource Name	Buyer/Seller/Flexible Service	Contract ID	BITrader Registered Asset Flag	BITrader Traded Asset Flag
20/01/2025 14:00	G2_A9	Curtailment Index Update	ConstrainedDemand	0	kW	1200	1200	Asset_9	Buyer	A9_Buyer	Flag Set	Flag Not Set
20/01/2025 14:00	G2_A8	Curtailment Index Update	FlexibleOutputChange	-700	kW	700	0	Asset_8	Flexible Service	A8_Flex	N/A	N/A
20/01/2025 14:00	G2_A7	Curtailment Index Update	FlexibleOutputChange	-800	kW	800	0	Asset_7	Flexible Service	A7_Flex	N/A	N/A
20/01/2025 14:00	G2_A10	Curtailment Index Update	ConstrainedDemand	650	kW	1300	600	Asset_10	Buyer	A10_Buyer	Flag Set	Flag Not Set
20/01/2025 14:00	G2_A6	Curtailment Index Update	FlexibleOutputChange	-500	kW	1500	0	Asset_6	Flexible Service	A6_Flex	N/A	N/A
20/01/2025 14:00	G2_A7	Curtailment Index Update	ConstrainedDemand	0	kW	800	800	Asset_7	Buyer	A7_Buyer	Flag Set	Flag Not Set
20/01/2025 14:00	G2_A6	Curtailment Index Update	ConstrainedDemand	500	kW	1500	1500	Asset_6	Buyer	A6_Buyer	Flag Set	Flag Not Set
20/01/2025 14:00	G2_A10	Curtailment Index Update	ConstrainedDemand	0	kW	1300	600	Asset_10	Buyer	A10_Buyer_2	Flag Set	Flag Not Set
20/01/2025 14:00	G2_Agg8	tbc	FlexibleOutputChange	0	kW	700	0	Aggregate_8	Seller	Agg8_Seller	Flag Set	Flag Not Set
20/01/2025 14:00	G2_Agg8	tbc	FlexibleOutputChange	0	kW	1300	0	Aggregate_8	Seller	Agg8_Seller	Flag Set	Flag Not Set
20/01/2025 14:00	G2_Agg7	tbc	FlexibleOutputChange	0	kW	1300	0	Aggregate_7	Seller	Agg7_Seller	Flag Set	Flag Not Set
20/01/2025 14:00	G2_Agg6	tbc	FlexibleOutputChange	0	kW	700	0	Aggregate_6	Seller	Agg6_Seller	Flag Set	Flag Not Set
20/01/2025 14:00	G2_Agg10	tbc	FlexibleOutputChange	0	kW	1000	0	Aggregate_10	Seller	Agg10_Seller	Flag Set	Flag Not Set

Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 08:00 and 13:00.

- The status of Scenario 5 on the orchestrator admin screen is changed from “Started” to “Completed”

### 5.5 Group 2 Scenario 6

The following input data will be submitted to the trading platform for scenario 6. Scenario 6 will be executed by opening the scenarios list and opening scenario 6 button on the orchestrator GUI. In scenario 6 check the MOL is the changed MOL from scenario 5.

This scenario will take the scenario 6 look ahead and submit to the trading platform together with the updated MOL from scenario 5.

Then perform the following:

- Click the *Post MOL to BiTraDER* button
- Perform the trade on the BitraDER platform
- Click the *Get MOL from BiTraDER* button

#### Message 1 – Scenario 6 look ahead

Group 2 Constraint 6 - More than expected		Location - Egremont Primary Transformer Incomer						
Look Ahead sent to Trading Platform from Orchestrator								
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_A6	Asset_6	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_A7	Asset_7	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_A8	Asset_8	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_A9	Asset_9	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_A10	Asset_10	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_Agg6	Aggregate_6	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_Agg7	Aggregate_7	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_Agg8	Aggregate_8	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_Agg9	Aggregate_9	
1738591200	03/02/2025 14:00	02/04/2025 04:00:00:00	C6	-4600	kW	G2_Agg10	Aggregate_10	

#### Message 1 – Scenario 6 MOL

Group 2 Constraint 6 - Severe weather causes generation constraint												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible	Contract ID	BITraDER Registered	BITraDER Traded
03/02/2025 14:00	G2_Agg9	1	ConstrainedGeneration	950	kW	700	1700	Aggregate_9	Buyer	Agg9_Buyer	Flag Set	Flag Not Set
03/02/2025 14:00	G2_Agg7	2	FlexibleOutputChange	600	kW	0	1400	Aggregate_7	Flexible Service	Agg7_Flex	N/A	N/A
03/02/2025 14:00	G2_Agg6	3	FlexibleOutputChange	200	kW	0	500	Aggregate_6	Flexible Service	Agg6_Flex	N/A	N/A
03/02/2025 14:00	G2_Agg10	4	ConstrainedGeneration	0	kW	1000	500	Aggregate_10	Buyer	Agg10_Buyer	Flag Set	Flag Not Set
03/02/2025 14:00	G2_Agg8	5	FlexibleOutputChange	500	kW	0	1000	Aggregate_8	Flexible Service	Agg8_Flex	N/A	N/A
03/02/2025 14:00	G2_Agg7	6	ConstrainedGeneration	400	kW	1300	1400	Aggregate_7	Buyer	Agg7_Buyer	Flag Set	Flag Not Set
03/02/2025 14:00	G2_Agg6	7	ConstrainedGeneration	100	kW	700	500	Aggregate_6	Buyer	Agg6_Buyer	Flag Set	Flag Not Set
03/02/2025 14:00	G2_Agg8	8	ConstrainedGeneration	0	kW	1300	1000	Aggregate_8	Buyer	Agg8_Buyer	Flag Set	Flag Not Set
03/02/2025 14:00	G2_Agg9	9	ConstrainedGeneration	0	kW	700	1700	Aggregate_9	Buyer	Agg9_Buyer_2	Flag Set	Flag Not Set
03/02/2025 14:00	G2_A10	10	FlexibleOutputChange	0	kW	0	600	Asset_10	Seller	A10_Seller	Flag Set	Flag Not Set
03/02/2025 14:00	G2_A9	11	FlexibleOutputChange	0	kW	1200	0	Asset_9	Seller	A9_Seller	Flag Set	Flag Not Set
03/02/2025 14:00	G2_A8	12	FlexibleOutputChange	0	kW	0	500	Asset_8	Seller	A8_Seller	Flag Set	Flag Not Set
03/02/2025 14:00	G2_A7	13	FlexibleOutputChange	0	kW	800	0	Asset_7	Seller	A7_Seller	Flag Set	Flag Not Set
03/02/2025 14:00	G2_A6	14	FlexibleOutputChange	0	kW	0	1500	Asset_6	Seller	A6_Seller	Flag Set	Flag Not Set

Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 04:00 and 04:30.
- The status of scenario 6 on the orchestrator admin screen is changed from “Started” to “Completed”

### 5.6 Group 2 scenario 7

The following input data will be submitted to the trading platform for scenario 7. Scenario 7 will be executed by opening the scenarios list and opening scenario 7 button on the orchestrator GUI. In scenario 7 check the MOL is the changed MOL from scenario 6.

Test Capability – Test Strategy (Testing, V0.2, November 2024)

This scenario will take the scenario 7 look ahead and submit to the trading platform together with the updated MOL from scenario 6.

Then perform the following:

1. Click the **Post MOL to BiTraDER** button
2. Perform the trade on the BitraDER platform
3. Click the **Get MOL from BiTraDER** button

Message 1 – Scenario 7 look ahead

Group 2 Constraint 7 - Doesn't occur		Location - Egremont Primary Transformer Incomer					
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_A6	Asset_6
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_A7	Asset_7
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_A8	Asset_8
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_A9	Asset_9
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_A10	Asset_10
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_Agg6	Aggregate_6
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_Agg7	Aggregate_7
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_Agg8	Aggregate_8
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_Agg9	Aggregate_9
1739800800	17/02/2025 14:00	02/18/2025 07:00:00	C7	-4600	kW	G2_Agg10	Aggregate_10

Message 1 – Scenario 7 MOL

Group 2 Constraint 7 - Severe weather causes generation constraint with curtailment index update													
Original MOL sent to Trading Platform from Orchestrator													
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible Service	Contract ID	BiTraDER Registered Asset Flag	BiTraDER Traded Asset Flag	
03/02/2025 14:00	G2_Agg9	Curtailment Index Update	ConstrainedGeneration	950	kW	700	1700	Aggregate_9	Buyer	Agg9_Buyer	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_Agg7	Curtailment Index Update	FlexibleOutputChange	600	kW	0	1400	Aggregate_7	Flexible Service	Agg7_Flex	N/A	N/A	
03/02/2025 14:00	G2_Agg6	Curtailment Index Update	FlexibleOutputChange	200	kW	0	500	Aggregate_6	Flexible Service	Agg6_Flex	N/A	N/A	
03/02/2025 14:00	G2_Agg10	Curtailment Index Update	ConstrainedGeneration	0	kW	1000	500	Aggregate_10	Buyer	Agg10_Buyer	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_Agg8	Curtailment Index Update	FlexibleOutputChange	500	kW	0	1000	Aggregate_8	Flexible Service	Agg8_Flex	N/A	N/A	
03/02/2025 14:00	G2_Agg7	Curtailment Index Update	ConstrainedGeneration	400	kW	1300	1400	Aggregate_7	Buyer	Agg7_Buyer	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_Agg6	Curtailment Index Update	ConstrainedGeneration	100	kW	700	500	Aggregate_6	Buyer	Agg6_Buyer	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_Agg8	Curtailment Index Update	ConstrainedGeneration	0	kW	1300	1000	Aggregate_8	Buyer	Agg8_Buyer	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_Agg9	Curtailment Index Update	ConstrainedGeneration	0	kW	700	1700	Aggregate_9	Buyer	Agg9_Buyer_2	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_A10	10	FlexibleOutputChange	0	kW	0	600	Asset_10	Seller	A10_Seller	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_A9	11	FlexibleOutputChange	0	kW	1200	0	Asset_9	Seller	A9_Seller	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_A8	12	FlexibleOutputChange	0	kW	0	500	Asset_8	Seller	A8_Seller	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_A7	13	FlexibleOutputChange	0	kW	800	0	Asset_7	Seller	A7_Seller	Flag Set	Flag Not Set	
03/02/2025 14:00	G2_A6	14	FlexibleOutputChange	0	kW	0	1500	Asset_6	Seller	A6_Seller	Flag Set	Flag Not Set	

Expected results:

4. An updated MOL (Message 2) is returned from the trading platform
5. The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 07:00 and 07:30.
6. The status of scenario 7 on the orchestrator admin screen is changed from “Started” to “Completed”

5.7 Group 3 scenario 8

The following input data will be submitted to the trading platform for scenario 8. Scenario 8 will be executed by opening the scenarios list and opening scenario 8 button on the orchestrator GUI. In scenario 8 check the MOL is the changed MOL from scenario 7.

This scenario will take the scenario 8 lookahead and submit to the trading platform together with the updated MOL from scenario 7.

Then perform the following:

1. Click the **Post MOL to BiTraDER** button
2. Perform the trade on the BitraDER platform

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- Click the **Get MOL from BiTraDER** button

Message 1 – Scenario 8 look ahead

Group 3 Constraint 8 - Occurs mid point through trade Location - Kendal BSP							
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_A11	Asset_11
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_A12	Asset_12
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_A13	Asset_13
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_A14	Asset_14
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_A15	Asset_15
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_Agg11	Aggregate_11
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_Agg12	Aggregate_12
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_Agg13	Aggregate_13
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_Agg14	Aggregate_14
1741010400	03/03/2025 14:00	03/04/2025 06:00	C8	-10000	kW	G3_Agg15	Aggregate_15
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_A11	Asset_11
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_A12	Asset_12
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_A13	Asset_13
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_A14	Asset_14
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_A15	Asset_15
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_Agg11	Aggregate_11
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_Agg12	Aggregate_12
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_Agg13	Aggregate_13
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_Agg14	Aggregate_14
1741010400	03/03/2025 14:00	03/04/2025 07:00	C8	-10000	kW	G3_Agg15	Aggregate_15

Message 1 – Scenario 8 MOL

Group 3 Constraint 8 - ANM engage instruction to be sent mid way through the first trade period and end mid way through the second trade period													
Original MOL sent to Trading Platform from Orchestrator													
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MIC (kW)	Resource Name	Service	Buyer/Seller/Hex/bid	Contract ID	BiTraDER Registered	BiTraDER Traded
03/03/2025 14:00	G3_A12	1	ConstrainedGeneration	0	kW	3000	3000	Asset_12	Buyer	A12_Buyer	A12_Buyer	Flag Set	Flag Not Set
03/03/2025 14:00	G3_A14	2	ConstrainedGeneration	0	kW	500	2500	Asset_14	Buyer	A14_Buyer	A14_Buyer	Flag Set	Flag Not Set
03/03/2025 14:00	G3_A13	3	ConstrainedGeneration	0	kW	2500	2500	Asset_13	Buyer	A13_Buyer	A13_Buyer	Flag Set	Flag Not Set
03/03/2025 14:00	G3_A11	4	ConstrainedGeneration	0	kW	700	500	Asset_11	Buyer	A11_Buyer	A11_Buyer	Flag Set	Flag Not Set
03/03/2025 14:00	G3_A15	5	ConstrainedGeneration	0	kW	1300	1500	Asset_15	Buyer	A15_Buyer	A15_Buyer	Flag Set	Flag Not Set
03/03/2025 14:00	G3_Agg12	6	FlexibleOutputChange	0	kW	800	0	Aggregate_12	Seller	Agg12_Seller	Agg12_Seller	Flag Set	Flag Not Set
03/03/2025 14:00	G3_Agg14	7	FlexibleOutputChange	0	kW	2000	0	Aggregate_14	Seller	Agg14_Seller	Agg14_Seller	Flag Set	Flag Not Set
03/03/2025 14:00	G3_Agg13	8	FlexibleOutputChange	0	kW	2000	0	Aggregate_13	Seller	Agg13_Seller	Agg13_Seller	Flag Set	Flag Not Set
03/03/2025 14:00	G3_Agg11	9	FlexibleOutputChange	0	kW	0	3000	Aggregate_11	Seller	Agg11_Seller	Agg11_Seller	Flag Set	Flag Not Set
03/03/2025 14:00	G3_Agg15	10	FlexibleOutputChange	0	kW	0	1700	Aggregate_15	Seller	Agg15_Seller	Agg15_Seller	Flag Set	Flag Not Set

Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 07:00 and 07:30.
- The status of Scenario 8 on the orchestrator admin screen is changed from “Started” to “Completed”

### 5.8 Group 3 scenario 9

The following input data will be submitted to the trading platform for scenario 9. Scenario 9 will be executed by opening the scenarios list and opening scenario 9 button on the orchestrator GUI. In scenario 9 check the MOL is the changed MOL from scenario 8.

This scenario will take the scenario 9 look ahead and submit to the trading platform together with the updated MOL from scenario 8.

Then perform the following:

- Click the **Post MOL to BiTraDER** button
- Perform the trade on the BiTraDER platform
- Click the **Get MOL from BiTraDER** button

Message 1 – Scenario 9 look ahead

Group 3 Constraint 9 - Occurs mid point through trade		Location - Kendal BSP							
Look Ahead sent to Trading Platform from Orchestrator									
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_A11	Asset_11		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_A12	Asset_12		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_A13	Asset_13		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_A14	Asset_14		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_A15	Asset_15		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_Agg11	Aggregate_11		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_Agg12	Aggregate_12		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_Agg13	Aggregate_13		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_Agg14	Aggregate_14		
1742220000	17/03/2025 14:00	03/18/2025 11:00:00	C9	8000	kW	G3_Agg15	Aggregate_15		
Look Ahead sent to Trading Platform from Orchestrator									
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_A11	Asset_11		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_A12	Asset_12		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_A13	Asset_13		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_A14	Asset_14		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_A15	Asset_15		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_Agg11	Aggregate_11		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_Agg12	Aggregate_12		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_Agg13	Aggregate_13		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_Agg14	Aggregate_14		
1742220000	17/03/2025 14:00	03/18/2025 12:00:00	C9	8000	kW	G3_Agg15	Aggregate_15		

Message 1 – Scenario 9 MOL

Group 3 Constraint 9 - ANM engage instruction to be sent mid way through the first trade period and end mid way through the second trade period												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible Service	Contract ID	BITraDER Registered Asset Flag	BITraDER Traded Asset Flag
17/03/2025 14:00	G3_Agg12	1	ConstrainedDemand	0	kW	800	0	Aggregate_12	Buyer	Agg12_Buyer	Flag Set	Flag Not Set
17/03/2025 14:00	G3_Agg14	2	ConstrainedDemand	0	kW	2000	100	Aggregate_14	Buyer	Agg14_Buyer	Flag Set	Flag Not Set
17/03/2025 14:00	G3_Agg13	3	ConstrainedDemand	0	kW	2500	500	Aggregate_13	Buyer	Agg13_Buyer	Flag Set	Flag Not Set
17/03/2025 14:00	G3_Agg11	4	ConstrainedDemand	0	kW	700	3000	Aggregate_11	Buyer	Agg11_Buyer	Flag Set	Flag Not Set
17/03/2025 14:00	G3_Agg15	5	ConstrainedDemand	0	kW	2000	1700	Aggregate_15	Buyer	Agg15_Buyer	Flag Set	Flag Not Set
17/03/2025 14:00	G3_A12	6	FlexibleOutputChange	0	kW	3000	0	Asset_12	Seller	A12_Seller	Flag Set	Flag Not Set
17/03/2025 14:00	G3_A14	7	FlexibleOutputChange	0	kW	700	0	Asset_14	Seller	A14_Seller	Flag Set	Flag Not Set
17/03/2025 14:00	G3_A13	8	FlexibleOutputChange	0	kW	2500	0	Asset_13	Seller	A13_Seller	Flag Set	Flag Not Set
17/03/2025 14:00	G3_A11	9	FlexibleOutputChange	0	kW	500	0	Asset_11	Seller	A11_Seller	Flag Set	Flag Not Set
17/03/2025 14:00	G3_A15	10	FlexibleOutputChange	0	kW	1300	0	Asset_15	Seller	A15_Seller	Flag Set	Flag Not Set

Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 07:00 and 07:30.
- The status of Scenario 9 on the orchestrator admin screen is changed from “Started” to “Completed”

### 5.9 Group 5 scenario 11

The following input data will be submitted to the trading platform for scenario 11. Scenario 11 will be executed by opening the scenarios list and opening scenario 11 button on the orchestrator GUI. In scenario 11 check the MOL is the scenario 11 MOL.

This scenario will take the scenario 11 look ahead and submit to the trading platform together with the scenario 11 MOL.

Then perform the following:

- Click the **Post MOL to BiTraDER** button
- Perform the trade on the BiTraDER platform
- Click the **Get MOL from BiTraDER** button

## Test Capability – Test Strategy (Testing, V0.2, November 2024)

### Message 1 – Scenario 11 look ahead

Group 5 Constraint 11 - Doesn't occur		Location - Stainburn & Siddick BSPs					
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G4_A16	Asset_16
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G4_A17	Asset_17
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G4_A18	Asset_18
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G4_A19	Asset_19
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G4_A20	Asset_20
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G3_Agg16	Aggregate_16
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G3_Agg17	Aggregate_17
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G3_Agg18	Aggregate_18
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G3_Agg19	Aggregate_19
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11	18000	kW	G3_Agg20	Aggregate_20

Group 5 Constraint 11.2 - As expected (sellers get curtailed)		Location - Stainburn & Siddick BSPs					
Look Ahead sent to Trading Platform from Orchestrator							
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11.1	2000	kW	G3_A17	Asset_17
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11.1	2000	kW	G3_A19	Asset_19
1744034400	07/04/2025 14:00	04/08/2025 10:00	C11.1	2000	kW	G3_Agg20	Aggregate_20

### Message 1 – Scenario 11 MOL

Group 5 Constraint 11 - Noted constraints (sellers get curtailed)												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (kW)	MEC (kW)	Resource Name	Buyer/Seller/Flexible	Contract ID	BiTraDER Registered Asset Flag	BiTraDER Traded Asset Flag
07/04/2025 14:00	G4_A16	1	ConstrainedDemand	0	kW	1500	0	Asset_16	Buyer	A16_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G4_A18	2	ConstrainedDemand	0	kW	3500	0	Asset_18	Buyer	A18_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G4_A20	3	ConstrainedDemand	0	kW	5000	5000	Asset_20	Buyer	A20_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G3_Agg16	4	ConstrainedDemand	0	kW	2000	6000	Aggregate_16	Buyer	Agg16_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G3_Agg17	5	ConstrainedDemand	0	kW	2000	3000	Aggregate_17	Buyer	Agg17_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G3_Agg18	6	ConstrainedDemand	0	kW	3000	3000	Aggregate_18	Buyer	Agg18_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G3_Agg19	7	ConstrainedDemand	0	kW	1000	1000	Aggregate_19	Buyer	Agg19_Buyer	Flag Set	Flag Not Set
07/04/2025 14:00	G4_A17	8	FlexibleOutputChange	0	kW	0	0	Asset_17	Seller	A17_Seller	Flag Set	Flag Not Set
07/04/2025 14:00	G4_A19	9	FlexibleOutputChange	0	kW	4000	0	Asset_19	Seller	A19_Seller	Flag Set	Flag Not Set
07/04/2025 14:00	G3_Agg20	10	FlexibleOutputChange	0	kW	4000	0	Aggregate_20	Seller	Agg20_Seller	Flag Set	Flag Not Set

### Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 07:00 and 07:30.
- The status of Scenario 11 on the orchestrator admin screen is changed from “Started” to “Completed”

## 5.10 Group 5 scenario 12

The following input data will be submitted to the trading platform for scenario 12. Scenario 12 will be executed by opening the scenarios list and opening scenario 12 button on the orchestrator GUI. In scenario 12 check the MOL is the scenario 12 MOL.

This scenario will take the scenario 12 look ahead and submit to the trading platform together with the scenario 12 MOL.

Then perform the following:

- Click the **Post MOL to BiTraDER** button
- Perform the trade on the BiTraDER platform
- Click the **Get MOL from BiTraDER** button



Message 1 – Scenario 12 look ahead

Group 5 Constraint 12 - Doesn't occur		Location - Stainburn & Siddick BSps						
Look Ahead sent to Trading Platform from Orchestrator								
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G4_A16	Asset_16	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G4_A17	Asset_17	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G4_A18	Asset_18	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G4_A19	Asset_19	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G4_A20	Asset_20	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G3_Agg16	Aggregate_16	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G3_Agg17	Aggregate_17	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G3_Agg18	Aggregate_18	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G3_Agg19	Aggregate_19	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12	-16000	KW	G3_Agg20	Aggregate_20	

Group 5 Constraint 12.2 - Occurs as expected (buyers get curtailed)								
Look Ahead sent to Trading Platform from Orchestrator								
Seconds 1970	Timestamp	Period	Constraint ID	Constraint Size	Units	Resource ID	Resource Name	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12.2	-5000	KW	G4_A20	Asset_20	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12.2	-5000	KW	G3_Agg16	Aggregate_16	
1744639200	14/04/2025 14:00	04/15/2025 12:00:00	C12.2	-5000	KW	G3_Agg17	Aggregate_17	

Message 1 – Scenario 12 MOL

Group 5 Constraint 12 - Noted constraints (buyers get curtailed)												
Original MOL sent to Trading Platform from Orchestrator												
Timestamp	Contract ID (Resource ID)	Order	Contract Operation Type	Value	Units	MIC (KW)	MEC (KW)	Resource Name	Buyer/Seller/Flexible	Contract ID	BITraDER Registered	BITraDER Traded
14/04/2025 14:00	G4_A20	1	ConstrainedGeneration	0	KW	5000	5000	Asset_20	Buyer	A20_Buyer	Flag Set	Flag Not Set
14/04/2025 14:00	G3_Agg16	2	ConstrainedGeneration	0	KW	2000	5000	Aggregate_16	Buyer	Agg16_Buyer	Flag Set	Flag Not Set
14/04/2025 14:00	G3_Agg17	3	ConstrainedGeneration	0	KW	5000	5000	Aggregate_17	Buyer	Agg17_Buyer	Flag Set	Flag Not Set
14/04/2025 14:00	G4_A16	4	FlexibleOutputChange	0	KW	1500	0	Asset_16	Seller	A16_Seller	Flag Set	Flag Not Set
14/04/2025 14:00	G4_A17	5	FlexibleOutputChange	0	KW	0	5000	Asset_17	Seller	A17_Seller	Flag Set	Flag Not Set
14/04/2025 14:00	G4_A18	6	FlexibleOutputChange	0	KW	0	3000	Asset_18	Seller	A18_Seller	Flag Set	Flag Not Set
14/04/2025 14:00	G4_A19	7	FlexibleOutputChange	0	KW	0	4000	Asset_19	Seller	A19_Seller	Flag Set	Flag Not Set
14/04/2025 14:00	G3_Agg18	8	FlexibleOutputChange	0	KW	0	3000	Aggregate_18	Seller	Agg18_Seller	Flag Set	Flag Not Set
14/04/2025 14:00	G3_Agg19	9	FlexibleOutputChange	0	KW	0	1000	Aggregate_19	Seller	Agg19_Seller	Flag Set	Flag Not Set
14/04/2025 14:00	G3_Agg20	10	FlexibleOutputChange	0	KW	0	4000	Aggregate_20	Seller	Agg20_Seller	Flag Set	Flag Not Set

Expected results:

- An updated MOL (Message 2) is returned from the trading platform
- The orchestrator MOL is updated with the changed values in the returned MOL, for the constraint between 07:00 and 07:30.
- The status of Scenario 12 on the orchestrator admin screen is changed from “Started” to “Completed”

## 6. Security Testing

Security testing involves testing the systems to uncover security vulnerabilities. This will require testing a variety of attack vectors. It should include:

- Validation of the login fields.
- Password strength criteria.
- Password lockout criteria.

This is performed to discover whether the login system can be forced into permitting unauthorised access. It will also ensure that the authorisation model provided for each system can be set up and will function as required.

Additional aspects of Security Testing that may be applied include:

- A Code Review for security vulnerabilities.
- Penetration Testing.
- Ethical Hacking.
- Non-Prod environments prior to decommissioning superseded Prod infrastructure.

## 7. Overview of Entry & Exit Criteria

Prior to commencing a test phase, pre-defined entry criteria must be met. Exit criteria must also be met prior to handover of a system/application to the subsequent test phase.

### 7.1 Entry Criteria

An entry criterion is a set of decision making guidelines that are used to determine whether a system under test is ready to enter a phase of testing. Each testing phase will have its own defined entry criteria. As the system progresses through the phases of testing, the entry criterion tends to become more rigorous.

### 7.2 When an Entry Criterion is not met

When a defined entry criterion is not met for a testing phase the testing activity cannot commence and the acceptance of a system into the testing phase will be rejected. In this case an issue should be raised to the test manager and the IT project lead.

There may be instances where an entry criterion needs to deviate from what has been defined in the test strategy or test plan. In this case, the change should be approved by the test manager and the IT project lead. Any variation should be noted in the test phase exit report.

### 7.3 Exit Criteria

The exit criteria are a set of decision-making guidelines that are used to determine whether a system under test is ready to exit a phase of testing. Each testing phase will have its own defined exit criteria. When the exit criteria have been satisfied, the system under test is either considered to be ready to move onto the next testing phase or it is ready for release into production.

Once considered ready to move into the next testing phase, a test phase exit report is completed. Any deviations from the planned testing or the entry/exit criteria should be captured in this document.

### 7.4 When an Exit Criterion is not met

When a defined exit criterion is not met for a testing phase the testing activity cannot be completed and can therefore not proceed into the subsequent testing phase. In this case an issue should be raised to the test manager and the IT project lead.

There may be instances where the exit criterion needs to deviate from what has been defined in the test strategy or test plan. In this case, the change should be approved by the test manager and the IT project lead. Any variation should be noted in the test phase exit report.

## 8. Simulation Trials Testing – Test Results

### 8.1 Introduction

This section provides a summary of the test results that were completed by the end of October 2024, prior to the commencement of the simulation trials in October 2024.

## 8.2 Group 1 Scenario 1

The following screenshot is the MOL list sent to the BiTraDER platform for scenario 1:

**BiTrader Orchestrator**

COPY SCENARIO MOL to MOL | POST MOL to BiTrader | GET MOL from BiTrader | COPY BITRADER MOL to MOL | CALC Engagement | CALC Curtailment

**Scenario 1: Group 1 Constraint 1**

Scenario MOL | LookAhead | BiTrader\_MOL | MOL | Engagements

Order	Contract Id	Resource Id	Resource Name	Operation Type	Value	Value Units	MIC kW	MEC_KW	Activity	Traded	Registered	Curtailment Index
04/10/2024 14:00:00												
1	A1_Buyer	G1_A1	Asset_1	ConstrainedDemand	0	kW	700	1200	Buyer	False	True	
2	A2_Buyer	G1_A2	Asset_2	ConstrainedDemand	0	kW	500	500	Buyer	False	True	
3	A3_Buyer	G1_A3	Asset_3	ConstrainedDemand	0	kW	200	1200	Buyer	False	True	
4	A4_Buyer	G1_A4	Asset_4	ConstrainedDemand	0	kW	400	400	Buyer	False	True	
5	A5_Buyer	G1_A5	Asset_5	ConstrainedDemand	0	kW	200	200	Buyer	False	True	
6	Agg_Seller_1	G1_Agg1	Aggregate_1	FlexibleOutputChange	0	kW	600	0	Seller	False	True	
7	Agg_Seller_2	G1_Agg2	Aggregate_2	FlexibleOutputChange	0	kW	500	0	Seller	False	True	
8	Agg_Seller_3	G1_Agg3	Aggregate_3	FlexibleOutputChange	0	kW	0	200	Seller	False	True	
9	Agg_Seller_4	G1_Agg4	Aggregate_4	FlexibleOutputChange	0	kW	0	500	Seller	False	True	
10	Agg_Seller_5	G1_Agg5	Aggregate_5	FlexibleOutputChange	0	kW	200	0	Seller	False	True	

The following screenshot is the look ahead sent in Scenario 1:

**BiTrader Orchestra**

COPY SCENARIO MOL to MOL | POST MOL to BiTrader | GET MOL from BiTrader | COPY BITRADER MOL to MOL | CALC Engagement | CALC Curtailment

**Scenario 1: Group 1 Constraint 1**

Scenario MOL | LookAhead | BiTrader\_MOL | MOL | Engagements

period	constraint_id	constraint_size	constraint_size_units	resource_id	resource_name
26/07/2024 08:00					
C1	2000	kW	G1_A1	Asset_1	
C1	2000	kW	G1_A2	Asset_2	
C1	2000	kW	G1_A3	Asset_3	
C1	2000	kW	G1_A4	Asset_4	
C1	2000	kW	G1_A5	Asset_5	
C1	2000	kW	G1_Agg1	Aggregate_1	
C1	2000	kW	G1_Agg2	Aggregate_2	
C1	2000	kW	G1_Agg3	Aggregate_3	
C1	2000	kW	G1_Agg4	Aggregate_4	
C1	2000	kW	G1_Agg5	Aggregate_5	

The following screenshot is the Trader MOL received from the BiTraDER trading platform for scenario 1:

**BiTrader Orchestrator**

COPY SCENARIO MOL to MOL | POST MOL to BiTrader | GET MOL from BiTrader | COPY BITRADER MOL to MOL | CALC Engagement | CALC Curtailment

**Scenario 1: Group 1 Constraint 1**

Scenario MOL | LookAhead | BiTrader\_MOL | MOL | Engagements

Recvd Time	Recvd Timestamp	Scenario	Order	Contract Id	Resource Id	Resource Name	Operation Type	Value	Value Units	MIC kW	MEC_kW	Activity	Traded	Registered
2024-10-18T08:00:00+01:00														
2024-10-17 21:08:45	1729195725	1	1	Agg_Seller_1	G1_Agg1	Aggregate_1	FlexibleOutputChange	-600	kW	600	0	Seller	true	true
2024-10-17 21:08:45	1729195725	1	2	Agg_Seller_2	G1_Agg2	Aggregate_2	FlexibleOutputChange	-500	kW	500	0	Seller	true	true
2024-10-17 21:08:45	1729195725	1	3	A1_Buyer	G1_A1	Asset_1	ConstrainedDemand	600	kW	700	1200	Buyer	true	true
2024-10-17 21:08:45	1729195725	1	4	A2_Buyer	G1_A2	Asset_2	ConstrainedDemand	500	kW	500	500	Buyer	true	true
2024-10-17 21:08:45	1729195725	1	5	A3_Buyer	G1_A3	Asset_3	ConstrainedDemand	0	kW	200	1200	Buyer	false	true
2024-10-17 21:08:45	1729195725	1	6	A4_Buyer	G1_A4	Asset_4	ConstrainedDemand	0	kW	400	400	Buyer	false	true
2024-10-17 21:08:45	1729195725	1	7	A5_Buyer	G1_A5	Asset_5	ConstrainedDemand	0	kW	200	200	Buyer	false	true
2024-10-17 21:08:45	1729195725	1	8	A1_Buyer-2-2024-10-18	G1_A1	Asset_1	ConstrainedDemand	0	kW	700	1200	Buyer	true	true
2024-10-17 21:08:45	1729195725	1	9	A2_Buyer-2-2024-10-18	G1_A2	Asset_2	ConstrainedDemand	0	kW	500	500	Buyer	true	true
2024-10-17 21:08:45	1729195725	1	10	Agg_seller_3	G1_Agg3	Aggregate_3	FlexibleOutputChange	0	kW	0	200	Seller	false	true
2024-10-17 21:08:45	1729195725	1	11	Agg_Seller_4	G1_Agg4	Aggregate_4	FlexibleOutputChange	0	kW	0	500	Seller	false	true
2024-10-17 21:08:45	1729195725	1	12	Agg_Seller_5	G1_Agg5	Aggregate_5	FlexibleOutputChange	0	kW	200	0	Seller	false	true

### 8.3 Group 2 Scenario 4

The following screenshot is the MOL list sent to the BiTraDER platform for scenario 4:

**BiTrader Orchestrator**

Scenario 4: Group 2 Constraint 4

Order	Contract Id	Resource Id	Resource Name	Operation Type	Value	Value Units	MIC kW	MEC_KW	Activity	Traded	Registered	Curtailment Index
1	A9_Buyer	G2_A9	Asset_9	ConstrainedDemand	0	kW	1200	1200	Buyer	False	True	
2	A8_Flex	G2_A8	Asset_8	FlexibleOutputChange	-700	kW	700	0	Flexible Service	False	True	
3	A7_Flex	G2_A7	Asset_7	FlexibleOutputChange	-400	kW	800	0	Flexible Service	False	True	
4	A10_Buyer	G2_A10	Asset_10	ConstrainedDemand	650	kW	1300	600	Buyer	False	True	
5	A6_Flex	G2_A6	Asset_6	FlexibleOutputChange	-500	kW	1500	0	Flexible Service	False	True	
6	A7_Buyer	G2_A7	Asset_7	ConstrainedDemand	0	kW	800	800	Buyer	False	True	
7	A6_Buyer	G2_A6	Asset_6	ConstrainedDemand	500	kW	1500	1500	Buyer	False	True	
8	A10_Buyer_2	G2_A10	Asset_10	ConstrainedDemand	0	kW	1300	600	Buyer	False	True	
9	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	0	kW	700	0	Seller	False	True	
10	Agg8_Seller	G2_Agg8	Aggregate_8	FlexibleOutputChange	0	kW	1300	0	Seller	False	True	
11	Agg7_Seller	G2_Agg7	Aggregate_7	FlexibleOutputChange	0	kW	1300	0	Seller	False	True	
12	Agg6_Seller	G2_Agg6	Aggregate_6	FlexibleOutputChange	0	kW	700	0	Seller	False	True	
13	Agg10_Seller	G2_Agg10	Aggregate_10	FlexibleOutputChange	0	kW	1000	0	Seller	False	True	

The following screenshot is the look ahead sent in Scenario 4:

**BiTrader Orchestrator**

Scenario 4: Group 2 Constraint 4

constraint_id	constraint_size	constraint_size_units	resource_id	resource_name
C4	5000	kW	G2_A6	Asset_6
C4	5000	kW	G2_A7	Asset_7
C4	5000	kW	G2_A8	Asset_8
C4	5000	kW	G2_A9	Asset_9
C4	5000	kW	G2_A10	Asset_10
C4	5000	kW	G2_Agg6	Aggregate_6
C4	5000	kW	G2_Agg7	Aggregate_7
C4	5000	kW	G2_Agg8	Aggregate_8
C4	5000	kW	G2_Agg9	Aggregate_9
C4	5000	kW	G2_Agg10	Aggregate_10

The following screenshot is the trader MOL received from the BiTraDER trading platform for scenario 4:

**BiTrader Orchestrator**

Scenario 4: Group 2 Constraint 4

Recv Time	Recv Timestamp	Scenario	Order	Contract Id	Resource Id	Resource Name	Operation Type	Value	Value Units	MIC kW	MEC_KW	Activity	Traded	Registered
2024-11-07 17:20:06	1731000006	4	13	Agg10_Seller	G2_Agg10	Aggregate_10	FlexibleOutputChange	0	kW	1000	0	Seller	false	true
2024-11-07 17:20:06	1731000006	4	1	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	-700	kW	700	0	Seller	true	true
2024-11-07 17:20:06	1731000006	4	2	Agg10_Seller	G2_Agg10	Aggregate_10	FlexibleOutputChange	-300	kW	1000	0	Seller	true	true
2024-11-07 17:20:06	1731000006	4	3	Agg7_Seller	G2_Agg7	Aggregate_7	FlexibleOutputChange	-550	kW	1300	0	Seller	true	true
2024-11-07 17:20:06	1731000006	4	4	A9_Buyer	G2_A9	Asset_9	ConstrainedDemand	0	kW	1200	1200	Buyer	false	false
2024-11-07 17:20:06	1731000006	4	5	A8_Flex	G2_A8	Asset_8	FlexibleOutputChange	-700	kW	700	0	NotApplicable	false	false
2024-11-07 17:20:06	1731000006	4	6	A7_Flex	G2_A7	Asset_7	FlexibleOutputChange	-400	kW	800	0	NotApplicable	false	true
2024-11-07 17:20:06	1731000006	4	7	A10_Buyer	G2_A10	Asset_10	ConstrainedDemand	1300	kW	1300	600	Buyer	true	true
2024-11-07 17:20:06	1731000006	4	8	A6_Flex	G2_A6	Asset_6	FlexibleOutputChange	-500	kW	1500	0	NotApplicable	false	true
2024-11-07 17:20:06	1731000006	4	9	A7_Buyer	G2_A7	Asset_7	ConstrainedDemand	400	kW	800	800	Buyer	true	true
2024-11-07 17:20:06	1731000006	4	10	A6_Buyer	G2_A6	Asset_6	ConstrainedDemand	1000	kW	1500	1500	Buyer	true	true
2024-11-07 17:20:06	1731000006	4	11	A10_Buyer_2	G2_A10	Asset_10	ConstrainedDemand	650	kW	1300	600	Buyer	false	true
2024-11-07 17:20:06	1731000006	4	12	A10_Buyer-2-2024-11-08	G2_A10	Asset_10	ConstrainedDemand	0	kW	1300	600	Buyer	true	true
2024-11-07 17:20:06	1731000006	4	13	A7_Buyer-2-2024-11-08	G2_A7	Asset_7	ConstrainedDemand	0	kW	800	800	Buyer	true	true
2024-11-07 17:20:06	1731000006	4	14	A6_Buyer-2-2024-11-08	G2_A6	Asset_6	ConstrainedDemand	500	kW	1500	1500	Buyer	true	true
2024-11-07 17:20:06	1731000006	4	15	Agg8_Seller	G2_Agg8	Aggregate_8	FlexibleOutputChange	0	kW	1300	0	Seller	false	false
2024-11-07 17:20:06	1731000006	4	16	Agg6_Seller	G2_Agg6	Aggregate_6	FlexibleOutputChange	0	kW	700	0	Seller	false	false

### 8.4 Group 2 Scenario 5

The following screenshot is the MOL list sent to the BiTraDER platform for scenario 5:

### BiTrader Orchestrator

COPY SCENARIO MOL to MOL | POST MOL to BiTrader | GET MOL from BiTrader | COPY BITRADER MOL to MOL | CALC Engagement | CALC Curtailment

#### Scenario 5: Group 2 Constraint 5

Scenario MOL | LookAhead | BiTrader\_MOL | MOL | Engagements

Timestamp	Scenario	Order	Contract Id	Resource Id	Resource Name	Operation Type	Value	Value Units	MIC kW	MEC kW	Activity	Traded	Registered
1731929002		13	A8_Flex	G2_A8	Asset_8	FlexibleOutputChange	-700	kW	700	0	Flexible Service	False	False
2024-11-12 15:10:15													
1731424215		1	A6_Flex	G2_A6	Asset_6	FlexibleOutputChange	-500	kW	1500	0	Flexible Service	False	False
1731424215		2	A7_Flex	G2_A7	Asset_7	FlexibleOutputChange	-400	kW	800	0	Flexible Service	False	False
1731424215		3	A8_Flex	G2_A8	Asset_8	FlexibleOutputChange	-700	kW	700	0	Flexible Service	False	False
1731424215		4	A6_Buyer	G2_A6	Asset_6	ConstrainedDemand	500	kW	1500	1500	Buyer	False	False
1731424215		5	A7_Buyer	G2_A7	Asset_7	ConstrainedDemand	0	kW	800	800	Buyer	False	False
1731424215		6	A10_Buyer	G2_A10	Asset_10	ConstrainedDemand	650	kW	1300	600	Buyer	False	False
1731424215		7	A9_Buyer	G2_A9	Asset_9	ConstrainedDemand	0	kW	1200	1200	Buyer	False	False
1731424215		8	A10_Buyer_2	G2_A10	Asset_10	ConstrainedDemand	0	kW	1300	600	Buyer	False	False
1731424215		9	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	0	kW	700	0	Seller	False	False
1731424215		10	Agg7_Seller	G2_Agg7	Aggregate_7	FlexibleOutputChange	0	kW	1300	0	Seller	False	False
1731424215		11	Agg10_Seller	G2_Agg10	Aggregate_10	FlexibleOutputChange	0	kW	1000	0	Seller	False	False
1731424215		12	Agg6_Seller	G2_Agg6	Aggregate_6	FlexibleOutputChange	0	kW	700	0	Seller	False	False
1731424215		13	Agg8_Seller	G2_Agg8	Aggregate_8	FlexibleOutputChange	0	kW	1300	0	Seller	False	False

The following screenshot is the look ahead sent for scenario 5 between 08:00 and 09:00:

COPY SCENARIO MOL to MOL | POST MOL to BiTrader | GET MOL from BiTrader | COPY BITRADER MOL to MOL | CALC Engagement | CALC Curtailment

#### Scenario 5: Group 2 Constraint 5

Scenario MOL | LookAhead | BiTrader\_MOL | MOL | Engagements

constraint_id	constraint_size	constraint_size_units	resource_id	resource_name
12/11/2024 08:00				
C2	5000	kW	G2_A6	Asset_6
C5	5000	kW	G2_A7	Asset_7
C5	5000	kW	G2_A8	Asset_8
C5	5000	kW	G2_A9	Asset_9
C2	5000	kW	G2_A10	Asset_10
C5	5000	kW	G2_Agg6	Aggregate_6
C5	5000	kW	G2_Agg7	Aggregate_7
C5	5000	kW	G2_Agg8	Aggregate_8
C5	5000	kW	G2_Agg9	Aggregate_9
C5	5000	kW	G2_Agg10	Aggregate_10
12/11/2024 09:00				
C2	5000	kW	G2_A6	Asset_6
C5	5000	kW	G2_A7	Asset_7
C5	5000	kW	G2_A8	Asset_8
C5	5000	kW	G2_A9	Asset_9
C2	5000	kW	G2_A10	Asset_10
C5	5000	kW	G2_Agg6	Aggregate_6
C5	5000	kW	G2_Agg7	Aggregate_7
C5	5000	kW	G2_Agg8	Aggregate_8
C5	5000	kW	G2_Agg9	Aggregate_9
C5	5000	kW	G2_Agg10	Aggregate_10

The following screenshot is of the traded MOL received from the BiTraDER trading platform:

COPY SCENARIO MOL to MOL | POST MOL to BiTrader | GET MOL from BiTrader | COPY BITRADER MOL to MOL | CALC Engagement | CALC Curtailment

#### Scenario 5: Group 2 Constraint 5

Scenario MOL | LookAhead | BiTrader\_MOL | MOL | Engagements

Recv Time	Recv Timestamp	Scenario	Order	Contract Id	Resource Id	Resource Name	Operation Type	Value	Value Units	MIC kW	MEC kW	Activity	Traded	Registered
2024-11-18 10:38:22	1731926302	5	12	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	0	kW	1300	0	Seller	false	false
2024-11-18 10:38:22	1731926302	5	13	Agg8_Seller	G2_Agg8	Aggregate_8	FlexibleOutputChange	0	kW	1300	0	Seller	false	false
2024-11-13T08:00:00+00:00														
2024-11-18 10:38:22	1731926302	5	1	Agg10_Seller	G2_Agg10	Aggregate_10	FlexibleOutputChange	-500	kW	1000	0	Seller	true	true
2024-11-18 10:38:22	1731926302	5	2	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	-700	kW	700	0	Seller	true	true
2024-11-18 10:38:22	1731926302	5	3	Agg7_Seller	G2_Agg7	Aggregate_7	FlexibleOutputChange	-350	kW	1300	0	Seller	true	true
2024-11-18 10:38:22	1731926302	5	4	A6_Flex	G2_A6	Asset_6	FlexibleOutputChange	-500	kW	1500	0	NotApplicable	false	true
2024-11-18 10:38:22	1731926302	5	5	A7_Flex	G2_A7	Asset_7	FlexibleOutputChange	-400	kW	800	0	NotApplicable	false	true
2024-11-18 10:38:22	1731926302	5	6	A8_Flex	G2_A8	Asset_8	FlexibleOutputChange	-700	kW	700	0	NotApplicable	false	true
2024-11-18 10:38:22	1731926302	5	7	A6_Buyer	G2_A6	Asset_6	ConstrainedDemand	1000	kW	1500	1500	Buyer	true	true
2024-11-18 10:38:22	1731926302	5	8	A7_Buyer	G2_A7	Asset_7	ConstrainedDemand	400	kW	800	800	Buyer	true	true
2024-11-18 10:38:22	1731926302	5	9	A10_Buyer	G2_A10	Asset_10	ConstrainedDemand	1300	kW	1300	600	Buyer	true	true
2024-11-18 10:38:22	1731926302	5	10	A9_Buyer	G2_A9	Asset_9	ConstrainedDemand	0	kW	1200	1200	Buyer	false	false
2024-11-18 10:38:22	1731926302	5	11	A10_Buyer_2	G2_A10	Asset_10	ConstrainedDemand	650	kW	1300	600	Buyer	false	false
2024-11-18 10:38:22	1731926302	5	12	A10_Buyer-2-2024-11-13	G2_A10	Asset_10	ConstrainedDemand	0	kW	1300	600	Buyer	true	true
2024-11-18 10:38:22	1731926302	5	13	A7_Buyer-2-2024-11-13	G2_A7	Asset_7	ConstrainedDemand	0	kW	800	800	Buyer	true	true
2024-11-18 10:38:22	1731926302	5	14	A6_Buyer-2-2024-11-13	G2_A6	Asset_6	ConstrainedDemand	500	kW	1500	1500	Buyer	true	true
2024-11-18 10:38:22	1731926302	5	15	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	0	kW	700	0	Seller	false	false
2024-11-18 10:38:22	1731926302	5	16	Agg8_Seller	G2_Agg8	Aggregate_8	FlexibleOutputChange	0	kW	1300	0	Seller	false	false
2024-11-13T08:30:00+00:00														
2024-11-18 10:38:22	1731926302	5	1	Agg10_Seller	G2_Agg10	Aggregate_10	FlexibleOutputChange	-500	kW	1000	0	Seller	true	true
2024-11-18 10:38:22	1731926302	5	2	Agg9_Seller	G2_Agg9	Aggregate_9	FlexibleOutputChange	-700	kW	700	0	Seller	true	true
2024-11-18 10:38:22	1731926302	5	3	Agg7_Seller	G2_Agg7	Aggregate_7	FlexibleOutputChange	-350	kW	1300	0	Seller	true	true
2024-11-18 10:38:22	1731926302	5	4	A6_Flex	G2_A6	Asset_6	FlexibleOutputChange	-500	kW	1500	0	NotApplicable	false	true