iCAROS information session – OPA and SA contracts

iCAROS = Integrated Coordination of Assets for Redispatching and Operational Security

JHIE

TAT QA

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Agenda

- 1. Introduction
- 2. Outage planning agent
 - Outage planning process
- 3. Scheduling agent
 - Scheduling process
 - Redispatching process



The Coordination and Congestion Management of system relevant assets of grid users, new way of working : the iCAROS project



Integrated Coordination of Assets for Redispatching and Operational Security



How?

The implementation of a new state of the art design & a new contractual framework for the coordination and congestion management of system relevant assets of grid users (GU)

The **System Operation Guideline (SOGL)** sets minimum system security, operational planning and frequency management standards to ensure safe and coordinated system operation across Europe.

The **Clean Energy Package (CEP)** is a set of rules aimed to update the European energy policy framework in order to facilitate the transition away from fossil fuels towards cleaner energy and to deliver on the EU's Paris Agreement commitments for reducing greenhouse gas emissions.

The Electricity Balancing Guideline (EBGL) regulation lays down the rules for the integration of balancing markets in Europe, with the objectives of enhancing Europe's security of supply.

iCAROS – Processes in scope



Process	Ensured by	Description
Outage Planning	Outage Planning Agent (OPA)	Provision of availability statuses and active power restrictions Available (A) Unavailable (U) Forced Outage (FO)
		Provision of active power schedules
		00.00 00.15 23.30 23.45
Scheduling		Schedule (MW) -45,1 -42,2 -45,1 -42,2
	Scheduling Agent (SA)	Provision and activation of redispatching bids (active power upwards and downwards)
		Delivery point(s) DP1
Provision and activation		ID RD001
or energy for Redispatching		Bid price 50 € / MWh
		(max) Bid volume 100 MW

iCAROS terminology

Technical Unit (TU): Device or aggregation of devices connected directly or indirectly to the synchronous electrical network that produces and/or consumes electricity.

Technical Facility (TF): Complete set of Technical Unit(s) which are operationally linked and which, combined together in one or several operating modes, can consume or generate electricity on its own.

Operating Mode (OM): Any subset of Technical Units, being part of the same Technical Facility, that can generate or consume electricity on its own.

Delivery Point (DP)

- By default, the Delivery Points are defined at the level of the Technical Units
- For a Technical Facility (sPGM) composed of several Technical Units, the Delivery Point can exceptionally be defined at the level of the TF if the conditions listed below are simultaneously fulfilled:
 - All Technical Units of the TF can only be operated simultaneously;
 - All Technical Units of the TF are linked to the same Access Point



		Concept used for
	TF	Defining the obligation to participate to services
-	OM	Submission of Redispatching bids (combination of DP belonging to the same TF)
	DP	Submission of availability statuses and schedules

iCAROS terminology - Examples

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Point B3

1) A wind park A which is a Power Park Module (PPM) whose primary energy source is wind* **Technical Facility A** Elia Grid = Technical Unit A



Point B2

Delivery Point A 3 . . .

*Specific configuration is possible in case multiple BRPs are designated

3) A wind park which is a Power Park Module (PPM) whose primary energy source is wind and a solar park which is a PPM whose primary energy source is sun connected behind the same access point to Elia Grid

Point B1



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Outage Planning Agent



Outage Planning Agent

Who ? Outage Planning Agent

- By default BRP responsible for the injection at Access Point level
- If required by the Elia Grid User (requiring opt-out arrangement with the BRP):
 - Elia Grid User itself
 - A third party designated by the Elia Grid User

What ?

- Providing information concerning the planned or forced unavailability of Technical Facilities
 - Availability statuses as defined in the SOGL
 - Active power capacity restrictions, i.e., technical restrictions impacting the structural Pmax



New

* While existing in SOGL, the FO status is introduced to be in line with Transparency Regulation that requires a specific distinction between planned and unplanned unavailabilities



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Type of Technical Facility	Mandatory	Voluntary
sPGM/PPM connected to Elia grid or to a CDS connected to Elia grid with a maximum power larger than or equal to 25 MW	Х	
sPGM/PPM connected to Elia grid or to a CDS connected to Elia grid with a maximum power lower than 25 MW but larger or equal to 1 MW		X**
Demand facilities connected to TSO grid		X**

* Go-live of the phase 1 of iCAROS project **According to the same rules applicable for units larger than or equal to 25 MW



Outage planning process – Evolution as of February 2024

Outage planning process – Availability Plan



- After the Ready-to-run procedure, the **provision of an availability plan** by the OPA is required.
- The availability plan consists of providing to Elia, on a **quarter-hour basis** for all delivery points for day D:
 - An availability status (A, U, T or FO)
 - A corresponding maximum power available (Pmax_avail)

		00.00	00.15	00.30	00.45	01.00	23:00	23.15	23.30	23.45
	Availability plan status	А	А	U	U	U	 т	т	т	А
OPA	P _{max, avail} (MW)	100	100	0	0	0	20	50	80	100

Forced Outage

- Unplanned unavailability of a delivery point has to be indicated by a Forced Outage status
- Partial unplanned unavailability of a delivery point has to be indicated with a Forced Outage status and a Pmax_avail larger than 0 MW

 \mathcal{V}

Outage planning Process – Availability Plan



• At the end of Ready-to-run process (Thursday W-1 at 18:00), a **quarter-hourly availability plan** is **automatically generated** by Elia for each DP from the information provided through the Ready-to-run procedure by the OPA



• After the automatic translation, the availability plan must be **kept up-to-date by the OPA**

Changes reques	ted by OPA	Conditions
Initial status	Updated status	
A	U	Validation by Elia is required
U	А	validation by Ella is required
A/U	Т	Valid test plan is submitted and approved by Elia before submission of T status
A/U	FO	Automatic validation
		<u>Ye TX X</u>



Scheduling Agent



Scheduling Agent



Who ? Scheduling Agent

• **BRP** responsible for the injection at Access Point level

What ?

1. Providing schedules of active power injection/offtake

		00.00	00.15	00.30	 23.15	23.30	23.45
SA	Schedule	-45,1	-42,2	-43,5	-12,3	-5,4	0

2. Provision and activation of redispatching bids (active power upwards and downwards)

Delivery point(s)	DP1
ID	RD001
Direction	Upwards
Bid price	50 € / MWh
(max) Bid volume	100 MW
(max) Bid volume	100 MW

Participation to scheduling and redispatching – February 2024



Type of Technical Facility	Mandatory	Voluntary	Exempted
sPGM/PPM connected to Elia grid or to a CDS connected to Elia grid with a maximum power larger than or equal to 25 MW	Х		
sPGM/PPM connected to Elia grid or to a CDS connected to Elia grid with a maximum power lower than 25 MW but larger or equal to 1 MW		Х*	
Demand facilities connected to TSO grid			Х

*According to the same rules applicable for units larger than or equal to 25 MW



Scheduling Process



Scheduling Process



Submission of **first schedule** for Day D at D-1 15:00 and **intraday schedule** continuous updates possible until Redispatching Gate Closure Time (RD GCT)





Quarter-hourly

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• SA must inform ELIA without delay of any schedule modification for quarter-hour in the permitted periods.



Scheduling process - Updates of schedules

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- Schedule for a given DP and redispatching energy bid(s) including this DP must always be aligned
- Schedule update induces redispatching energy bid update and inversely (within 15 min)



 If the schedule and the redispatching energy bids are not updated within the requested timing and a grid security risk occurs for which Elia needs to activate one of these RD Energy Bids New



→ ELIA shall revert the validation of the updated schedule, reestablishing the previous validated schedule

Coordinability Levels of Technical Facilities





Examples:

Type of technical facility	Direction	Coordinability Level
	Upward	С
Gas Turbine	Downward	С
	Upward	NC
wind power park	Downward	С

The coordinability level of a technical facility is always determined based on a discussion between the SA and Elia (KAM Energy).



Return to schedule (RTS)

Submission of	Undates of schodulos	Return to schedule
schedules	opuates of schedules	request

19:00

10.00

19:00

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Return to schedule

- 1. Applicable to a specific DP or all DPs in an electrical zone
- 2. DP must react only if active power injection/offtake is deviating from the schedule in the direction of the medium of high CRI defined in the zone
- 3. RTS is only sent to DPs linked to technical facilities that are **coordinable in the direction allowing a return to the schedule**
- 4. Applicable to the quarter-hour following the quarter-hour in which the request was sent by Elia and all following quarter-hours for which the RD GCT has passed

Example: A **return to schedule** is requested in an electrical zone with a **CRI medium or high in the downward direction**



→ DP's power injection goes to/above the schedule

RT measurement

Expected reaction

Legend

Schedule

➔ No reaction needed due to deviation from the schedule in the opposite direction of the CRI

➔ No RTS received due to the coordinability of the TF

Return to Schedule - Compliancy control

New

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- The respect of the last valid Schedule will be verified ex-post, according to the following rules:
 - 1. The last valid schedule will only be controlled when Elia explicitly asked the unit to return to the schedule
 - 2. A Schedule will be considered as non correctly respected as soon as the **ex-post measurement deviates from the last valid schedule** (in the direction of the congestion risk) for at least one quarter-hour impacted by the RTS
 - 3. Elia considers a tolerance in the control for the quarter-hour following the quarter-hour in which the request was sent. This tolerance corresponds to 50% of the deviation from the schedule during the quarter-hour in which the return to schedule request was sent by Elia.
- Example for a return to schedule applied in a zone with a high CRI in the downward direction:



Compliant Return to schedule

Non - Compliant Return to schedule

Return to Schedule - Penalty

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Each non-compliant return to schedule* will be penalized based on:

 1. The energy corresponding to the difference between the schedule and the actual active power injection/offtake in the direction of the CRI

 Schedule – actual
 Energy corresponded



Quarter-hour	Schedule – actual injection (MW) in direction of CRI	Energy corresponding to this difference (MWh)
QH0	60	15
QH1	20	5
QH2	10	2,5
QH3	0	0

- 2. The price applied per quarter-hour for the penalty corresponds to the maximum between:
 - Imbalance price of the qh

New

• Average of the day-ahead power auction market price of the last 6 complete months

0	v		
Quarter-hour	Imbalance price (€/MWh)	Average of DA price(€/MWh – For July 2022)	Penalty (€)
QH0	150	200,93	/
QH1	150	200,93	5 x 200,93= 1004,25
QH2	250	200,93	2,5 x 250= 625
QH3	300	200,93	0



Redispatching (RD) Process



Redispatching Process – Main evolutions



Explicit cost-based bidding for Redispatching (RD) Energy bids

		As is	As of February 2024
Redispatching submission process		Implicit bidding	Explicit bidding
Remuneration	DA redispatching	Cost-based prices	
	ID redispatching	Free prices	Cost-based prices
Activation control		/	Based on the difference between the requested energy and the supplied energy



RD submission process – Explicit RD Bidding Characteristics



Submission of explicit RD Energy Bids

- First submission before D-1 3pm
- RD energy bids should be kept up-to-date by the SA
- In accordance with the RD energy bid manual
- Main redispatching energy bids characteristics are aligned with the mFRR bid characteristics

	Energy bid characteristics			
	Bid ID			
	List of DP			
	Direction: Upward or Downward activation			
	Bid price (€/MWh)			
Characteristics	Bid volume (MW)			
aligned with	Minimum bid volume (indivisible volume) (MW)			
ini kik design	Part of exclusive group: exclusive group ID			
	Part of parent/child relation ("multipart bids"):			
	Parent/child group ID			
	Quarter-hour linking (Conditional linking): ID(s) of linked bids in qh(t-1) or qh(t-2)			
	Full Activation Time (min)			
Redispatching	Maximum Activation Time (min)			
Only	Minimum Activation time (min)			



RD submission process – Explicit RD Bidding Characteristics



- Three additional bid characteristics are available for the Scheduling Agent to better reflect the specificities of redispatching
- Full Activation Time (FAT) that allows bidding flexibility with an activation time longer than 12,5 min
- Maximum Activation Time (MAT) that allows bidding flexibility that can only be activated during a limited period of time. This characteristic is particularly useful for energy limited units.
- Minimum Activation Time (MIT) allowing bidding flexibility that needs to be activated during a minimum period of time for technical reasons (limited to start-up case and based on technical justification)

	Energy bid characteristics
	Bid ID
	List of DP
	Direction: Upward or Downward activation
	Bid price (€/MWh)
Characteristics aligned with mFRR design	Bid volume (MW)
	Minimum bid volume (indivisible volume) (MW)
	Part of exclusive group: exclusive group ID
	Part of parent/child relation ("multipart bids"):
	Parent/child group ID
	Quarter-hour linking (Conditional linking): ID(s) of linked
	bids in qh(t-1) or qh(t-2)
	Full Activation Time (min)
Redispatching only	Maximum Activation Time (min)
	Minimum Activation time (min)

Deviation of by-default values need to be agreed with the Elia KAM energy at signature of the contract

RD activation process

Elia can request two types of Redispatching activations to solve an operational security risk

- Scheduled redispatching activation
 - **RD activation** requested **ahead** of real-time (e.g. up to one to two hours before real-time).
- Direct redispatching activation*
 - RD activation requested in real-time and to be executed directly



- The RD energy bid activation profiles have been aligned with the activation profile used for mFRR energy bids
- Consequence: Alignment with the shortest Full Activation Time (FAT) from mFRR: 12,5 min (default FAT for RD bid)

*Only valid for iCAROS phase 1 : the extension of this concept units with a maximal power lower than 25 MW will be assessed during the preparation of iCAROS phase 2

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Remuneration of RD activations

Remuneration (€) = RD energy requested x RD energy bid price

- RD energy requested
 - Is the energy requested by Elia for a RD scheduled or direct activation
 - In case of **direct activation**, a prorata approach is used to compute the requested energy of the first qh

RD Requested $\times \frac{15 - \Delta t}{15}$

Where Δt = difference in time [min] between the moment of the Direct Activation request and the last moment a Scheduled Activation could have been requested

• RD energy bid price

- Reflects the costs for activating the flexibility and therefore is reasonable, directly related to the activation, and demonstrable
- Is based on a **cost formula proposed by the SA** and challenged/approved by Elia at the signature of the T&C SA
 - Elia can, in agreement with the CREG, request a revision of the formula if cost-reflective conditions are not respected
 - The cost formula can be adapted based on mutual agreement between SA and Elia

BRP perimeter correction

- Elia will continue correcting the perimeter of the BRP with the value of the requested energy (Redispatching Energy requested) as
 of February 2024 given the SA = BRP in this implementation phase.
- Block approach is used for BRP perimeter correction:

	Scheduled A	Activation	Direct Activation		
Quarter -hour	RD Requested [MW]	Energy in BRP perimeter [MWh]	RD Requested [MW]	Energy in BRP perimeter [MWh]	
QH_2	0	0	0	0	
QH _1	0	0	0	0	
QH_0	60	15	60	15	
QH ₁	60	15	60	15	

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Activation control

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- 1. All the RD energy bid activations are controlled
- 2. The activation of RD energy bids are controlled **at 'Operating Mode' level** given that RD energy bid submission is also at this level
- 3. The activation control is based on the Redispatching Energy to be supplied

RD Energy to be supplied = **RD Energy** requested except in case of ramping up/down :

- For the first quarter-hour of an activation
- Between consecutive quarter-hours if due to Elia's request where RD Energy to be supplied = 90 % of RD Energy requested
- 4. A RD Energy Bid activation are considered as **non-compliant** as soon as

RD activation	Non compliant if	
Upward	$RD \ Energy_{to \ be \ supplied} - RD \ Energy_{supplied} > 0$	
Downward	RD Energy to be supplied - RD Energy supplied < 0	

Where **RD Energy** supplied = $\frac{1}{4}x$ (Schedule – Active power measured)

Activation control examples

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Example 1: Request of activation of a 50 MW upward RD bid on a power unit (one DP) from QH2 to QH5

				_			
	07/11/2022	Qh1	Qh2	Qh3	Qh4	Qh5	Qh6
	Schedule (MW)	-20	-20	-20	-10	-10	-30
\bigcirc	RD energy to be supplied (MWh)*	/	12.5	12.5	12.5	12.5	/
TF = TU = DP	Active power measured (MW)	-20	-70	-80	-40	-60	-32

07/11/2022 Qh1 Qh2 Qh3 Qh4 Qh5 Qh6 **RD** energy supplied 12,5 15 7,5 12,5 (MWh) RD energy to be supplied-RD energy 0 -2,5 5 0 supplied (MWh) Qh 4 is non compliant

* Assuming RD energy to be supplied = RD energy requested

Example 2: Request of activation of a 20 MW downward RD bid from QH 1 to QH6 on the OM GT+ST

Comparing the total RD energy supplied and the RD energy to be supplied on OM level, QH3 and 5 are non compliant

Penalty

New

Each non-compliant redispatching activation leads to the application of a penalty based on

• the **redispatching energy missing** identified during the activation control

 $RD Energy_{missing} = |RD Energy_{to be supplied} - RD Energy_{supplied}|$

• A **penalty price** composed of two elements:

- A minimum penalty equals to [0,25x RD energy bid price]
- An additional penalty* to discourage any gaming equals to |imbalance price RD energy bid price| only applicable if:

RD activation	Applicable if
Upward	Imbalance price < RD Energy Bid price
Downward	Imbalance price > RD Energy Bid price

*This approach shall be re-evaluated when an effective split of roles and responsibilities between the SA and the BRP will be introduced and, in particular, if the mechanism for the BRP perimeter correction evolves in the future.

Penalty example

Risk of gaming is discouraged as the benefits from the arbitration are neutralized

Cancellation of a RD activation

- ELIA can fully cancel a previously requested scheduled activation of a RD energy bid until the minimum time between the last moment to request a scheduled activation respecting the FAT of the first RD energy bid of the scheduled activation and the RD GCT of the first bid of the activation
- The scheduled activation of a RD energy bid is only not remunerated if the cancellation is done **before D-1 10 PM**

Note : the cancellation of a Scheduled redispatching activation is a needed option for **exceptional circumstances** implying large unexpected changes in the grid. However, this option **shouldn't be used frequently** by Elia as RD bids are typically activated once the need is confirmed.

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Coherency control between data provided by OPA and SA

Coherency control between				Passan
Data 1	from	Data 2	from	Reason
Availability status	OPA	Schedule	SA	The availability status given by the OPA has to be coherent with the schedule provided by the SA i.e. a non-zero schedule cannot be provided while the status of the Technical Unit is set to unavailable by the OPA.
Availability status	OPA	RD Energy Bids	SA	This control ensures that the provision of at least one RD energy bid by the SA is coherent with the availability status given by the OPA

Penalties in case of incoherency

- Applies to **both SA and OPA**
- Applies per day containing one or more incoherencies (200€/day)
- Not applied for the first 3 incoherent days per year (tolerance)

Note : in case a incoherency is detected by Elia, SA and OPA are notified and can correct the information before RD GCT of the concerned quarter-hour(s)

Comments and questions on presented information regarding outage planning, scheduling and redispatching processes as of February 2024 can be sent to your KAM energy:

Amandine Leroux: Amandine.Leroux@elia.be Arno Motté: Arno.Motte@elia.be

