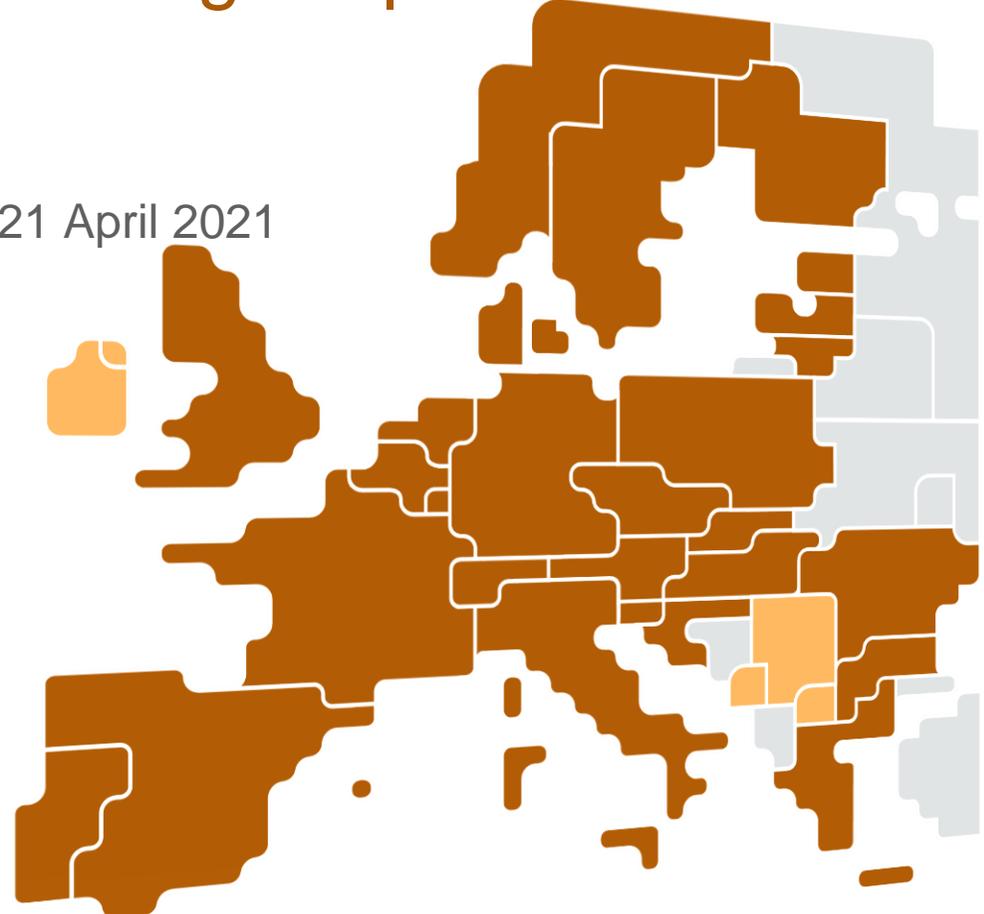




# MARI project monitoring & update

Electricity Balancing  
Stakeholder Group meeting, 21 April 2021





### SUBJECT

- |   |   |
|---|---|
|   | <b>Project overview</b>   |
| 1 | <ul style="list-style-type: none"><li>• Project planning</li><li>• Project status and milestones</li><li>• Work Streams</li></ul> |
|   | <b>Project Management</b>   |
| 2 | <ul style="list-style-type: none"><li>• Governance</li><li>• Risks</li></ul>  |
|   | <b>Outlook</b>  |
| 3 | <ul style="list-style-type: none"><li>• AOBs</li></ul>  |
|   | <b>Appendix</b>   |
|   | <ul style="list-style-type: none"><li>• Abbreviation list</li></ul>   |



# 1. MARI Project Overview

## Project status and milestones



### MARI program dashboard

18/02/2021

#### ACTIVITIES ONGOING

- TSO agreements: IPR agreement for the Libra software with TERRE TSOs
- Platform specification: change management
- Hosting & Connectivity: ECP network solution
- IT development: V2 design in process, V3 preparation & planning
- TSO Testing: UAT V1 started
- Operational testing & TSO accession: IOP V1 preparation
- Operational readiness: Operational Handbook V1
- Transparency reporting: Implementation planning
- TSO-TSO invoicing: specification of requirements

#### mFRR IF & Stakeholder mgt



#### Accession roadmap



#### TSO agreements



#### Platform specification



#### Hosting & Connectivity



#### IT development



#### ACTIVITIES TO BE LAUNCHED

- Accession roadmap: 2nd update in April 2021
- Hosting & Connectivity: -
- IT development: Detailed design MARI Libra V3
- TSO Testing: Preparing next test phases (UAT V1, IOP)
- Operational testing & TSO accession: IOP test plan, planning.
- Operational readiness: Preparation of operational documents (initial versions), go-live preparation.
- Transparency reporting: Technical upgrade, implementation of mFRR requirements
- TSO-TSO invoicing: implementation of solution

#### TSO testing



#### IOP testing & TSO accession



#### Operational readiness



#### Transparency reporting



#### TSO-TSO invoicing



#### IMPORTANT MEETINGS / MILESTONES

- Q1: EBCG/IG meeting (09/04/2021)
- S1: Stakeholder Workshop (date to be confirmed)
- 24 April 2021: 3rd Update Accession Roadmap

#### MAIN ACHIEVEMENTS (this period)

- FAT V1 finished & UAT V1 started
- Installation of hosted environments
- TIA: appointed TSO for signing on behalf of all TSOs

#### MAIN ISSUES (this period)

- 1 Insufficient resources to staff & lead implementation tasks

#### MAIN RISKS (foreseen)

- 1 Delays in testing of platform due to COVID-19 (mitigation currently assessed)

(see also risk report)

# 1. MARI Project Overview

## Work Streams – 1/4



 Topic up for clarification, elaboration, discussion today's meeting → see next slides  
Important upcoming milestones are in bold

|                                  | Milestone                              | Past and Future Milestones   | Status   | Explanation  |
|----------------------------------|--|--|--|--|
| mFRR IF & Stakeholder Management | 13/7/2020<br>9/3/2020<br>24/1/2020     | <ul style="list-style-type: none"><li>• First Stakeholder Workshop</li><li>• First IG meeting</li><li>• mFRR IF approved</li><li>• <b>1st Amendment of All TSOs' proposal (mFRR IF)</b></li></ul>  | <ul style="list-style-type: none"><li>• Closed</li><li>• Closed</li><li>• Closed</li><li>• In Progress</li></ul> | ACER decision mFRR IF published.<br>Stakeholder Workshops are to be held 1x per year<br>IG meetings are to be held 4x per year |
| Entity designation               | 24/07/2020                             | <ul style="list-style-type: none"><li>• Entity designation AOF</li></ul>   | <ul style="list-style-type: none"><li>• Closed</li><li>• In Progress</li></ul>                                   | MARI TSOs have confirmed the entity designation for the MARI platform by 24 July 2020.   |
| Accession roadmap                | 24/04/2020<br>24/10/2020<br>24/04/2021 | <ul style="list-style-type: none"><li>• Accession roadmap first version published 24/4/2020</li><li>• Accession roadmap first update published 13/11/2020</li><li>• <b>Second update</b></li></ul> | <ul style="list-style-type: none"><li>• Closed</li><li>• Closed</li><li>• In Progress</li></ul>                  | Accession roadmap will be updated twice a year.  |

# 1. MARI Project Overview

## Work Streams – 2/4



 Topic up for clarification, elaboration, discussion today's meeting → see next slides  
Important upcoming milestones are in bold

|                        | Milestone               | Past and Future Milestones  | Status                    | Explanation   |
|------------------------|-------------------------|---|---------------------------|---|
| TSO agreements         | 20/05/2020              | • TSOs approve contractual framework  | • Closed                  | TSOs have completed the signature process on the contractual framework encompassing all the necessary agreements for the establishment and operation of the balancing platforms, including MARI. All signatures have been received.   |
|                        | 01/07/2020              | • EIF TSO agreements, all signatures received                                       | • Closed                  |   |
|                        | TBC (2021)              | • <b>IPR agreement LIBRA</b>  | • In progress             |   |
|                        | TBC (2021)              | • <b>MARI Platform Support &amp; Maintenance agreement</b>                          | • Open                    |   |
| Platform specification | 01/07/2020              | • Specify all detailed functions of the platform and underlying design concepts     | • Closed                  | Completed with the delivery of Requirements catalogue V3.1<br>Feasibility demonstrated via Proof of Concept by IT providers, completed during the "Initial Study of the MARI Change Request on LIBRA"<br>TWG to deliver RC procedures |
|                        | 01/07/2020              | • Validate the feasibility to add the MARI required functions to the LIBRA software | • Closed                  |   |
|                        | 17/02/2021              | • AOF - Bid Structure and Linkage<br>• Requirement Change Management                | • Closed<br>• In progress |   |
|                        | 9/12/2020<br>TBC<br>TBC | • Pre-go live<br>• Parallel run<br>• Post-go live                                   |                           |   |

# 1. MARI Project Overview

## Work Streams – 3/4



 Topic up for clarification, elaboration, discussion today's meeting → see next slides  
Important upcoming milestones are in bold

|                              | Milestone  | Past and Future Milestones                      | Status        | Explanation  |
|------------------------------|------------|---|---------------|--|
| Hosting & Connectivity       | 30/06/2020 | • Hosting Requirements Catalogue approved       | • Closed      | Deliver the hosting environments and the (real-time) connectivity & communications required for the testing and operation of the MARI AOF  |
|                              | 18/12/2020 | • Hosting for FAT/UAT ready                     | • Closed      |  |
|                              | 01/02/2021 | • V1 installed and ready for testing            | • Closed      |  |
|                              |            | • <b>Ready for IOPs after each MARI version</b> | • Open        |  |
|                              | 03/05/2021 | • <b>V1</b>                                     | • Open        |  |
|                              | 04/10/2021 | • <b>V2</b>                                     | • Open        |  |
|                              | 28/02/2022 | • <b>V3</b>                                     | • Open        |  |
|                              | 28/02/2022 | • PROD server ready for GL qualification        | • Open        |  |
| Implementation Guide         | End 2020   | • <b>Deliver Implementation Guide to TSOs</b>   | • Closed      | Published on <a href="#">ENTSO-E EDI library*</a>  |
| IT development & FAT testing | 01/04/2020 | • Start of Initial Study                        | • Closed      | TSOs have finalized the detailed technical and functional study into the IT implementation of the mFRR requirements and will develop the MARI solution in 3 versions, branching off from LIBRA v6.1 (latest release for TERRE) |
|                              | 01/07/2020 | • Start of Design & Develop V1                  | • Closed      |  |
|                              | 15/03/2021 | • Approval of V1                                | • Closed      |  |
|                              | 02/11/2020 | • <b>Start of Design &amp; Develop V2</b>       | • In progress |  |
|                              | 02/08/2021 | • <b>Approval of V2</b>                         | • Open        |  |
|                              | 29/03/2021 | • Start of Design & Develop V3                  | • Open        |  |
|                              | 01/01/2022 | • Approval of V3                                | • Open        |  |
| TSO Testing                  | 01/08/2020 | • Start of testing preparations                 | • In progress | UAT V1 has started and is being tested by Testing Taskforce.   |
|                              | End 2020   | • Procurement of test support                   | • In progress |  |
|                              | Early 2021 | • Readiness for TSO testing                     | • In progress |  |
|                              | 15/03/2021 | • Start of UAT V1                               | • In progress |  |
|                              | 30/04/2021 | • <b>Approval of UAT V1</b>                     | • Open        |  |
|                              | 01/08/2021 | • Start of UAT V2                               | • Open        |  |
|                              | 30/09/2021 | • Approval of UAT V2                            | • Open        |  |
|                              | 01/01/2022 | • Start of UAT V3                               | • Open        |  |
|                              | 28/02/2022 | • Approval of UAT V3                            | • Open        |  |

# 1. MARI Project Overview

## Work Streams – 4/4



 Topic up for clarification, elaboration, discussion today's meeting → see next slides  
Important upcoming milestones are in bold

|   | Milestone   | Past and Future Milestones   | Status   | Explanation   |
|---|---|--|--|---|
| Operational testing & TSO connectivity            | Q1/Q2 2021<br>03/05/2021<br>04/10/2021<br>28/02/2022      | <ul style="list-style-type: none"> <li>• <b>Prepare IOP testing</b></li> <li>• <b>Start of IOP test on V1</b></li> <li>• IOP test on V2</li> <li>• IOP test on V3</li> <li>• Approval of IOP testing</li> </ul>  | <ul style="list-style-type: none"> <li>• Open</li> <li>• Open</li> <li>• Open</li> <li>• Open</li> <li>• Open</li> </ul>               | Test of the communication between the MARI platform and all connected systems. These include all TSO interfaces as well as the interface to the transparency platform and the invoicing agent.  |
| Operational readiness (incl. go-live preparation) | 01/07/2020<br><br>Q1 2021<br><br>Q3/Q4 2021<br>24/06/2022 | <ul style="list-style-type: none"> <li>• <b>Start of preparing operational documentation</b></li> <li>• <b>Delivery of Operational Handbook V1</b></li> <li>• Approve Go Live Criteria</li> <li>• Confirm operational readiness based on Go Live Criteria</li> </ul> | <ul style="list-style-type: none"> <li>• In progress</li> <li>• In progress (first version)</li> <li>• Open</li> <li>• Open</li> </ul> | Operational readiness will be confirmed with the fulfilment of the Go Live requirements, including successful completion of Interoperability testing (IOP)..  |
| Transparency reporting                            | Q4 2020<br><br>Q1 2021<br>Q2 2022<br>24/07/2022           | <ul style="list-style-type: none"> <li>• Agreement on the requirements for MARI</li> <li>• Start of development</li> <li>• Start of testing</li> <li>• Operational readiness</li> </ul>  | <ul style="list-style-type: none"> <li>• Closed</li> <li>• Open</li> <li>• Open</li> <li>• Open</li> </ul>                             | ENTSO-E is responsible for the Transparency Platform, the TSOs for publishing data on the platform. The ENTSO-E MC (MIT) is in lead of facilitating a process to agree with the balancing projects a timely adaption of the TP. The TP requirements for mFRR reporting are clear and validated. |
| TSO – TSO Invoicing                               | Nov 2020<br><br>Jan 2021                                  | <ul style="list-style-type: none"> <li>• Agreement on the requirements for MARI</li> <li>• Task allocation / procurement</li> </ul>  | <ul style="list-style-type: none"> <li>• Closed</li> <li>• In progress</li> </ul>  | TSOs consider to cooperate on a cross platform solution in order to take out potential synergies. The requirements mFRR TSOs are clear and validated.   |

## 2. MARI Project Management

### Governance



- The Manually Activated Reserves Initiative ('MARI') is the implementation project endorsed by all TSOs through ENTSO-E's Market Committee on 7 September 2017 to establish the European platform for the exchange of balancing energy from frequency restoration reserves with manual activation, i. e. the 'mFRR-Platform' pursuant to Article 20 of the EB Regulation.
- The accession of the TSO of Bulgaria (ESO) as a member and Creos (the TSO of Luxemburg) as non-operational member of MARI is completed as of July 1, 2020
- The TSO of Montenegro (CGES) has been sent the Accession Letters of the MARI agreements in order to become observer.
- All MARI member TSOs (countries) are:



| Country        | TSO                    | 2020 |    | 2021 |    |    |    | 2022 |    |    |    | 2023 |    |
|----------------|------------------------|------|----|------|----|----|----|------|----|----|----|------|----|
|                |                        | Q3   | Q4 | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 |
| Germany        | 50Hz                   |      |    |      |    |    |    |      |    |    |    |      |    |
| Greece         | ADMIE                  |      |    |      |    |    |    |      |    |    |    |      |    |
| Germany        | Amprion                |      |    |      |    |    |    |      |    |    |    |      |    |
| Austria        | APG                    |      |    |      |    |    |    |      |    |    |    |      |    |
| Latvia         | AST <sup>1</sup>       |      |    |      |    |    |    |      |    |    |    |      |    |
| Czech republic | CEPS                   |      |    |      |    |    |    |      |    |    |    |      |    |
| Estonia        | ELERING <sup>1</sup>   |      |    |      |    |    |    |      |    |    |    |      |    |
| Slovenia       | ELES                   |      |    |      |    |    |    |      |    |    |    |      |    |
| Belgium        | Elia                   |      |    |      |    |    |    |      |    |    |    |      |    |
| Denmark        | Energinet <sup>2</sup> |      |    |      |    |    |    |      |    |    |    |      |    |
| Bulgaria       | ESO                    |      |    |      |    |    |    |      |    |    |    |      |    |
| Finland        | Fingrid <sup>2</sup>   |      |    |      |    |    |    |      |    |    |    |      |    |
| Croatia        | HOPS                   |      |    |      |    |    |    |      |    |    |    |      |    |
| Lithuania      | LITGRID <sup>1</sup>   |      |    |      |    |    |    |      |    |    |    |      |    |
| Hungary        | MAVIR <sup>1</sup>     |      |    |      |    |    |    |      |    |    |    |      |    |
| United Kindom  | National Grid          |      |    |      |    |    |    |      |    |    |    |      |    |
| Poland         | PSE                    |      |    |      |    |    |    |      |    |    |    |      |    |
| Spain          | REE                    |      |    |      |    |    |    |      |    |    |    |      |    |
| Portugal       | REN                    |      |    |      |    |    |    |      |    |    |    |      |    |
| France         | RTE                    |      |    |      |    |    |    |      |    |    |    |      |    |
| Slovakia       | SEPS <sup>4</sup>      |      |    |      |    |    |    |      |    |    |    |      |    |
| Norway         | Statnett <sup>2</sup>  |      |    |      |    |    |    |      |    |    |    |      |    |
| Sweden         | SVK <sup>2</sup>       |      |    |      |    |    |    |      |    |    |    |      |    |
| Switzerland    | Swissgrid              |      |    |      |    |    |    |      |    |    |    |      |    |
| Netherlands    | TenneT BV              |      |    |      |    |    |    |      |    |    |    |      |    |
| Germany        | TenneT Gmbh            |      |    |      |    |    |    |      |    |    |    |      |    |
| Italy          | Terna                  |      |    |      |    |    |    |      |    |    |    |      |    |
| Romania        | Transelectrica         |      |    |      |    |    |    |      |    |    |    |      |    |
| Germany        | TransnetBW             |      |    |      |    |    |    |      |    |    |    |      |    |

|  |              |   |
|--|--------------|---|
| <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>     | 5.4.(b)(i)   | National terms and conditions development                   |
| <span style="background-color: lightgreen; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> | 5.4.(b)(i)   | National terms and conditions entry into force              |
| <span style="background-color: green; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>      | 5.4.(b)(iii) | Interoperability tests between TSO and mFRR-Platform        |
| <span style="background-color: darkgreen; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>  | 5.4.(b)(iv)  | TSO connection to mFRR-platform / Go-live                   |
| <span style="background-color: red; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>        | 5.4.(b)(vii) | EBGL Article 62 Derogation considered / requested / granted |

Last updated on 09/10/2020 – published 13/11/2020

## 2. MARI Project Overview

### Risk report



| Risk   | Status | Measures  |
|--|--------|---|
| <b>mFRR IF &amp; Stakeholder Management</b> <ul style="list-style-type: none"> <li>ACER decision on multiple entities/TSO entities and TSOs litigation at EU Court taking place in // to platform realization.</li> <li>United Kingdom/NG ESO – uncertainty on the participation of NG ESO due to the lack of provisions on electricity balancing in the Trade Agreement of March 2021.</li> </ul> |        | <ul style="list-style-type: none"> <li>Implementation project remains focused on mFRR IF while bearing mind the ongoing litigation.</li> </ul>  |
| <b>Accession roadmap</b> <ul style="list-style-type: none"> <li>Local readiness of some TSOs for (IOP) testing delayed, impact on accession to be determined.</li> </ul>   |        | <ul style="list-style-type: none"> <li>Establish regular reporting about process and status of local implementations.</li> </ul>  |
| <b>Platform Specification</b> <ul style="list-style-type: none"> <li>Scope creep/change requests: change requests due to progressive insights during IT development.</li> <li>COVID impacting vendor resources for platform development</li> </ul>   | <br>   | <ul style="list-style-type: none"> <li>Involve experienced Change Control Adviser to verify the IT implementation against the requirements and manage the change request process, securing that omissions and faults are identified as early as possible and verifying the impact of changed requirements to the IT development.</li> </ul> |
| <b>Hosting &amp; Connectivity</b> <ul style="list-style-type: none"> <li>COVID impacting delivery and installation of hardware</li> </ul>  |        |   |
| <b>TSO testing</b> <ul style="list-style-type: none"> <li>Algorithm quality &amp; performance – designed algorithm might not fulfill requirements and/or operational use</li> </ul>  |        | <ul style="list-style-type: none"> <li>Several testing waves and go-live waves with clear entry and exit criteria are to be defined. Furthermore, operational experiences from TERRE and additional studies are to be assessed on applicability to the MARI platform.</li> </ul>  |
| <b>Operational readiness</b> <ul style="list-style-type: none"> <li>Potential interdependencies in the go-live planning between different projects and TSOs</li> </ul>   |        | <ul style="list-style-type: none"> <li>Strong PMT attention to integrate all cross-platform activities and manage the overall resource plan. Regular alignment between Project PMTs (MARI, PICASSO/IGCC, TERRE) to align technical, IT and business activities.</li> </ul>  |
| <b>Transparency reporting</b> <ul style="list-style-type: none"> <li>Technical feasibility (real-time data, large volume, high frequency) – dependency on architectural upgrade</li> <li>Resources (ENTSO-E, IT providers) impacting timely delivery</li> </ul>  |        | <ul style="list-style-type: none"> <li>Joined TF of ENTSO-E and platform representatives to monitor and guide the implementation activities</li> </ul>  |

Probability: What is the chance the risk occurs?  
Impact: What is the impact when the risk occurs?

- Likely to occur, if it occurs impact is severe
- Quite likely to occur, if it occurs impact is manageable
- Not likely to happen, if it occurs impact is low

## 3. Outlook

### AOBs



### AOBs

- ....



| Abbreviation | Term  |
|--------------|---|
| aFFR         | automatic Frequency Restoration Reserve               |
| AOF          | Activation Optimization Module                        |
| ATC          | Available Transmission Capacity                       |
| BRP          | Balancing Responsible Party                           |
| BSP          | Balancing Service Provider                            |
| CACM GL      | Capacity Allocation & Congestion Management Guideline |
| CBCL         | Cross-Border Capacity Limit                           |
| CBMP         | Cross-Border Marginal Price                           |
| CMM          | Capacity Management Module                            |
| CMOL         | Common Merit Order List                               |
| CSP          | Common Service Provider                               |
| CZC          | Cross-Zonal Capacity                                  |
| DA           | Direct Activation                                     |
| DFR          | Desired Flow Range                                    |
| EB GL        | Electricity Balancing Guideline                       |
| ECP          | Energy Communication Platform                         |
| FAT          | Factory Acceptance Test                               |
| GCT          | Gate Closure Time                                     |
| GUI          | Graphical User Interface                              |



| Abbreviation | Term                                 |
|--------------|--------------------------------------|
| GV           | Guaranteed Volume                    |
| HVDC         | High Voltage Direct Current          |
| IF           | Implementation Framework             |
| IOP          | Interoperability Phase               |
| IPR          | Intellectual Property Rights         |
| ISP          | Imbalance Settlement Period          |
| ITWG         | IT Working Group                     |
| KPI          | Key Performance Indicator            |
| LMOL         | Local Merit Order List               |
| LWG          | Legal Working Group                  |
| mFFR         | manual Frequency Restoration Reserve |
| MTU          | Market Time Unit                     |
| NPL          | Net Position Limit                   |
| OWG          | Operational Working Group            |
| PCN          | Physical Communication Network       |
| PMT          | Project Management Team              |
| RC           | Requirement Catalogue                |
| SA           | Scheduled Activation                 |
| SOGL         | System Operational Guideline         |



| Abbreviation | Term  |
|--------------|---|
| TIA          | TSO Invoicing Agent   |
| TP           | Transparency Platform (in the context of data publication platform) /<br>Technical Profile (in the context of type of allocation constraints) |
| TTF          | Testing Task Force  |
| TTRF         | Time To Restore Frequency   |
| TWG          | Technical Working Group   |
| UAB          | Unforeseeable Accepted Bid  |
| UAT          | User Acceptance Test  |
| URdB         | Unforeseeable Rejected fully divisible Bid  |
| URiB         | Unforeseeable Rejected indivisible Bid  |
| XB           | Cross-border  |