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# QA Checks Methodology

## QA Check Methodology for Option Data

1. To ensure the quality and accuracy of the option data submitted by the Transmission Owners (TOs) in the System Requirements Form (SRF) tool, also known as the data handover tool, NESO follows a comprehensive quality assurance (QA) methodology. The SRF tool is an online portal for data entry. The QA checks are performed on different parts of the submission, as described below which supplement the data checking on inputting to the SRF tool. The SRF parts are further described in Appendix C whereas this annex concentrates on describing the QA checks.
2. NESO also checks the option submissions against the design requirements that reflect the maturity level. These are summarised in the Options Development annex.

### Part A – Requirement

1. NESO creates the three stages of SRF part A to send to the TOs to indicate future network needs. The network needs are derived from the future energy scenarios (FES) data. The FES data is processed to produce Security & Quality of Supply Standard (SQSS) boundary requirements, percentile boundary power flows and a heatmap of expected boundary constraints based in boundary capacity deficit. Before processing the FES data, it is checked for completeness and errors such as incorrect zone allocation or erroneous numerical values. Once processed, the boundary requirements are checked and compared against previous years requirements to identify any inconsistencies. Any inconsistencies are investigated back to the calculation methods and FES data.
2. Before releasing the SRF part A sections, they are reviewed within NESO. Once shared with the TOs, comments and questions are welcomed in return.

### Part B – Proposed Options (Technical Description)

1. As part of the quality assurance (QA) checks, NESO thoroughly reviews the options details provided by the TOs in the Part B section of the SRF tool. NESO checks the descriptive text and diagrams provided by the TOs to ensure consistency and completeness of equipment requirements and against any other documents the TOs submit to NESO. NESO may raise queries to the TOs if there are any concerns or doubts regarding the completeness of the technical descriptions. The TOs are then responsible for providing clarifications and addressing any queries raised by NESO.
2. NESO reviews the EISDs (Earliest In-Service Dates) submitted by the TOs. NESO examines the submitted EISDs, specifically looking for any changes from one year to the next in cases where a reinforcement option has been previously submitted. To facilitate the review, NESO also compares the EISDs among similar reinforcement options. This comparison helps identify any discrepancies or inconsistencies in the EISDs and ensures that they align with

any overall project plan information received by NESO. NESO uses challenge and review meetings to raise any queries or concerns about EISDs.

3. In addition, NESO distinguishes between new submissions and old submissions. For old submissions, NESO compares the current submission with any appropriate previous ones to identify any differences. Also, option name, option maturity level (stage), option previous recommendations, enabling works details, and environmental information must be filled in this part by TO which NESO reviews. Once all queries are resolved, the Part B submission is marked as final, and this finalised Part B data is used for other processes.
4. By conducting these thorough QA checks on the Part B submissions, NESO ensures that the technical descriptions are complete, and consistent. This helps maintain the integrity of the overall assessment process and facilitates informed decision-making regarding the options.

## Part C – Outages

1. NESO reviews the SRF Part C - outages requirements to verify that the TOs have adequately recorded the impact of network outages on the system. Consistency checks are made between years where the data is available. The checking process compares schemes of similar types for consistency to highlight any unusual or lengthy requirements. NESO uses challenge and review meetings to raise and discuss queries. It should be noted that reinforcement options will have only high-level outages requirements known at the point at the tCSNP2 Refresh process runs so its focus is on major long-lasting outages requirements that interact.

## Part D – Boundary Capabilities

1. In the Part D section of the SRF tool, the TOs submit boundary capability data of each option for relevant study years. This includes providing boundary capacity data for all relevant combinations of options in various boundaries. NESO uses this data to study the transfer capability uplift in all boundaries provided by that option. There are certain “rules” for some options that needs to be followed while conducting the boundary studies.
2. The rules form the basis of some checks and are:
  - “Mutually Exclusive,” which means that Option A cannot be taken together with Option B during the boundary calculations.
  - “Must Follow” which indicates that Option A must follow Option B during the boundary calculations.

- "Must Happen together" which requires Option A to be present with Option B in the boundary calculations.
3. Using a spreadsheet workbook, NESO takes additional quality assurance measures to complement the validations performed by the SRF. The workbook includes various features to enhance the quality and accuracy of the data as detailed below.
- Basic Stats: The workbook calculates basic statistical measures such as minimum, maximum, average, and range. These statistics help identify any unexpected or potentially inaccurate values within the data, allowing for quick detection and resolution of anomalies.
  - Capability Comparison: The workbook enables the comparison of capabilities over time. This feature helps identify any unexpected or potentially inaccurate values by highlighting inconsistencies or significant changes in capability values between different study years.
  - Missing Parent Path: The workbook identifies combinations with missing parent paths. This validation ensures that all combinations are properly linked and connected within the dataset, preventing any missing or disconnected paths.
  - Duplicate Options: The workbook identifies combinations where the same option occurs more than once. This helps detect any duplicate entries, ensuring data integrity and avoiding redundancy.
  - Duplicate Paths: The workbook highlights duplicate paths within the dataset. This validation ensures that each path is unique and avoids any duplication or confusion in the data.
  - Consistency Check: The workbook identifies combinations that appear in one study year but not in another. This check ensures data consistency and helps determine the usability of capabilities for specific options based on their EISD.
  - Percentage Change: The workbook calculates the percentage change between different study years. This feature helps identify any unexpected or potentially inaccurate values by highlighting significant changes in capability values over time.
  - Rule Compliance: The workbook includes checks to confirm that combinations comply with the defined rules. This double-checking against the SRF ensures that the data aligns with the required guidelines and specifications.

- Reinforcement Inventory: The workbook maintains an inventory of reinforcements contained in the Part D data. This enables validation and cross-checking of key data, ensuring consistency and accuracy throughout the dataset.
  - Analysis and Reporting: The workbook provides analysis and reporting capabilities for reinforcements, including their capabilities and other relevant information such as affected boundaries. This allows for a comprehensive overview of the reinforcement data, facilitating informed decision-making and further validation.
4. NESO reviews the results of these validations and will raise a query with the relevant TO(s) for any data is not or does not comply with the rules. NESO will also seek confirmation from the TO(s) that certain data is correct, for instance for values that are outside of an expected reasonable range. These queries are logged and tracked until a satisfactory response is received, and which may lead to Part D data being removed or updated.
  5. Where Part D data is updated as a matter of course throughout the assessment, or as a result of the data validations, changes to Part D data are tracked and subject to change control processes. The full revised Part D dataset is then re-validated according to all checks described above.

## Part E – Option Cost

1. NESO applies the following QA methodology to ensure the accuracy and quality of the option cost data submitted in Part E of the SRF tool. The QA process involves several steps. First, NESO utilises both the Part E data (total cost) and Part B data (technical description) to conduct the QA check. This step ensures that the cost breakdown aligns with the technical description and that all necessary components are accounted for.
2. NESO then proceeds to check if the submitted option has undergone QA in previous assessments. If the option has been previously assessed and there are no discrepancies, and if the option's cost was approved in the previous assessment, it will be approved again. For options that have not been assessed previously, NESO compares the costs submitted by the TOs against its own cost guidelines and checks for consistency among similar options within the TO's portfolio. NESO applies different cost error bands (25% - 50%) based on justification and performs further checks accordingly. If the costs fall within the applicable cost error band and are consistent with other options, NESO sets the option costs as approved and includes them in the economic process. However, if the costs are outside the band or lack consistency, NESO challenges the TO for further explanation. The TO provides additional information to resolve the query, and NESO revises its cost estimation accordingly. If an agreement cannot be reached, NESO may escalate the matter within its management and decide whether to include or omit the option from the economic analysis.

3. Throughout the QA process, NESO maintains the cost information for future consistency checks. It is assumed that the TOs' cost submissions include cost of enabling works, although exceptions may be discussed on a case-by-case basis. This ensures the reliability and validity of the total cost data used in the NOA process.

## Part F – Publication

1. NESO will check for consistency of the publication information and raise any queries with the TOs.

## Challenge and review meetings

1. NESO and TOs hold regular challenge and review in the weeks up to when the TOs submit the SRF data and for a few weeks afterwards. The meeting includes but is not limited to the following agenda items:
  - Technical and diagram checks including cross-checking against other documents.
  - Earliest In-Service Dates (EISDs).
  - Maturity levels.
  - Queries relating to other SRF parts, notably D – Boundary capabilities and E – Option costs.
  - Any whole system considerations and future proofing of the reinforcement option.