

TYPE REGISTERED EQUIPMENT PROCEDURAL REQUIREMENTS

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PURPOSE AND SCOPE

The purpose of this document is to define the procedural arrangements for Asset Design Development and Type Registration of equipment.

Where applicable, the document should be read in conjunction with the Technical Guidance Note relevant to the technology to be Type Registered.

Asset Design Development and Type Registration form a documented, risk managed process, which enables National Grid to verify that specified equipment purchased for use on National Grid's Electrical Transmission System complies with National Grid's Technical Specifications (TS), International Electrotechnical Commission (IEC) or other relevant specifications and is thereby deemed suitable for the intended application.

Asset Design Development is the responsibility of the Supplier and incorporates activities such as development and testing of a Solution and delivery of all necessary documentation to demonstrate strength and capability for the intended application(s) in line with National Grid requirements, based on discussions with the National Grid Type Registration Engineer as required.

Type Registration is the risk-based review of documentation provided by the Supplier/Solution Provider to demonstrate strength and capability against National Grid requirements for a Solution, which leads to the Solution being "Type Registered".

As defined in National Grid Policy document PS(T) 003 – Type Registration, National Grid policy is to register complete sub-system Solutions e.g. substation control and protection solutions, transformers, overhead line conductor and cable systems or Components where deemed appropriate. This can include protection modules.

For the purposes of Type Registration, the term Solution shall apply to;

- All primary equipment connected directly to the Electricity Transmission System
- All secondary equipment directly controlling or protecting the Electricity Transmission system
- All secondary equipment that could impact the integrity of the prime function of the primary equipment.
- All auxiliary equipment supporting the primary and secondary equipment

Items of plant or equipment that are constructed on site from raw materials and items relating to site services facilities e.g. structures, fencing, oil separators, which require site-specific application-engineering effort are outside of the scope of the Type Registration process. Where this is the case, guidance on the application and installation of such items may be obtained from reference to the relevant Technical Specifications, Technical Guidance Notes etc. For further details of equipment not subject to Type Registration/Technical Specification refer to Appendix D

A list of Solutions and equipment which require to be Type Registered, is shown in the attached Appendix A. It should be noted that the lists are not exhaustive and may be updated as and when considered appropriate by the National Grid Type Registration Engineer.

The only exception to this process is for trial Solutions following the Implementation of New Technology Policy PS(T)013.

Confirmation of Type Registration does not absolve the Supplier/Solution Provider from its responsibilities for compliance with all relevant legal and regulatory requirements. Compliance with National Grid Technical Specifications, National or International Specifications is also assumed unless specifically listed as a non-conformance.

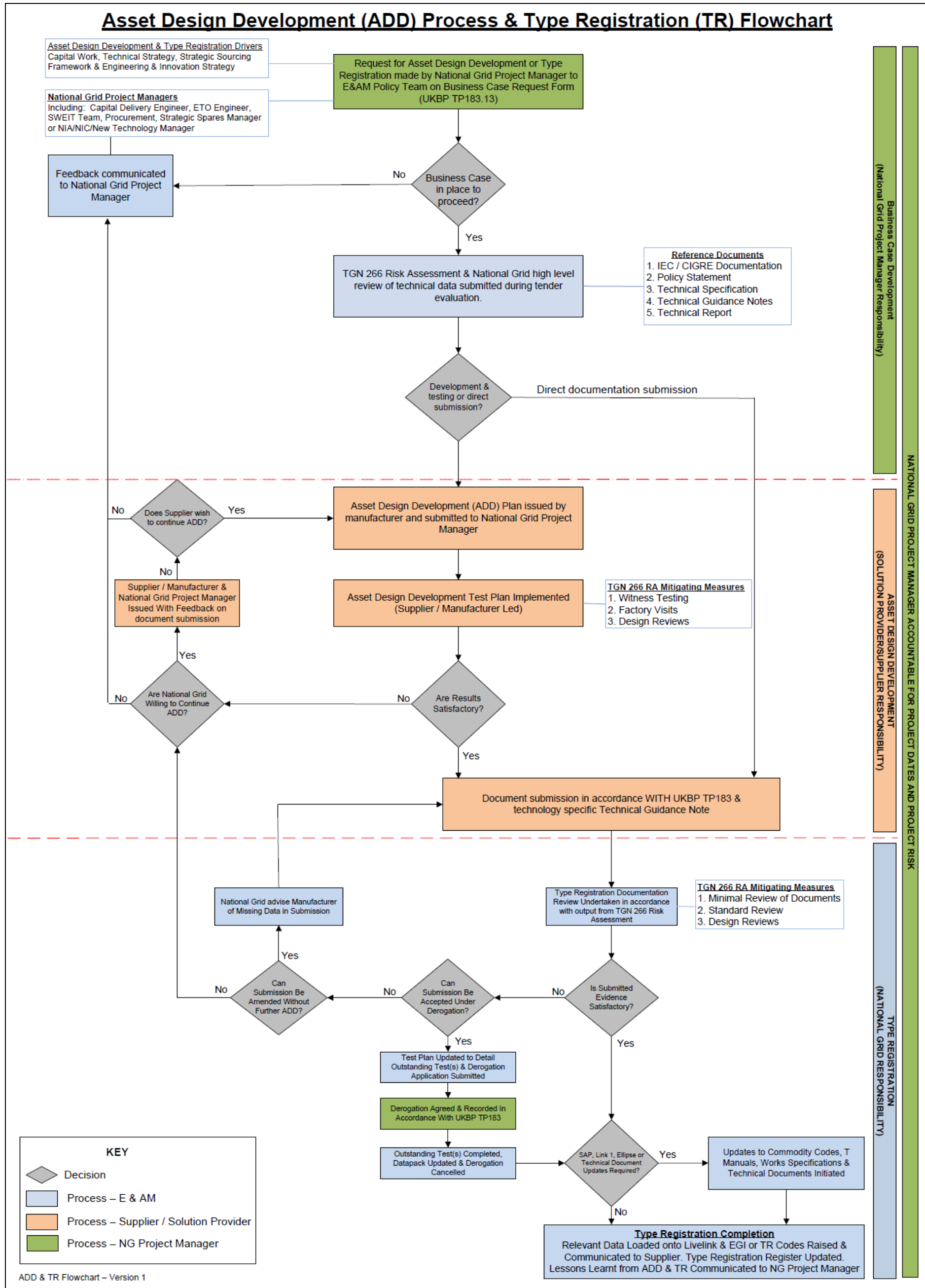


Figure 1 - Asset Design Development Process and Type Registration Flowchart

PART 1 – PROCEDURAL

1 GENERAL

National Grid shall Type Register Solutions considered as the largest functional unit, taking into account design, testing, procurement & lifetime management constraints; examples are detailed in the attached Appendix A.

Solutions and Components offered by the Supplier/Solution Provider will not be considered for Type Registration unless there is a clearly identified business need. The National Grid Project Manager shall submit a completed Type Registration Business Case Form (Form UKBP/TP 183.13) detailing the request for Type Registration to the National Grid Type Registration Engineer. The request shall be assessed by the National Grid Type Registration Engineer in accordance with Figure 1.

The basis of Type Registration is that there is confirmation by the Solution Provider that the equipment provided meets the requirements of the appropriate specification (either National Grid TS or if not available an appropriate Energy Networks Association (ENA) TS or otherwise).

During Asset Design Development, the Supplier/Solution Provider will be required to demonstrate that the “Strength and Capability” of electrical plant and equipment offered in the Solution has been properly assessed for its intended application(s) and that the Solution is suitably designed for the environment in which it is intended to operate.

For Type Registration, the Supplier/Solution Provider shall submit documentation to the National Grid Type Registration Engineer in accordance with the requirements of this document.

1.1 Testing and Test Evidence

Before committing to testing a non-type registered Solution or Component, National Grid will consider whether a suitable type registered alternative is available and whether the Solution or Component is new or so significantly different from registered Solutions that testing is required.

All tests shall be performed in appropriately accredited laboratories or test facilities, in accordance with current European, IEC, Energy Networks Association (ENA) or British Standards (BS) and Specifications where these are available. Where relevant guidance from laboratory best practice groups, such as the Short-circuit Testing Liaison (STL), exists this shall be complied with.

It is the responsibility of the Supplier/Solution Provider to demonstrate that test evidence provided has either been verified independently or completed by a person with the appropriate skills, knowledge and experience; operating to recognised procedures. National Grid reserves the right to seek independent witnessing/ validation when deemed necessary.

Test evidence in the form of type test reports and calculations shall be submitted electronically in the English language.

The acceptability of extrapolated test evidence, test evidence on alternative arrangements to those offered and calculations in lieu of testing shall be at the sole discretion of the National Grid Type Registration Engineer.

Test reports offered in support of the Type Registration submission shall;

- a) Include references to all applied standards including level of conformance
- b) Clearly and unambiguously identify the test parameters and pass/fail criteria

- c) Explicitly detail any variance of test procedure or parameter from the referenced standard(s) and associated guidance
- d) Clearly state the outcome of the test (pass/fail).
- e) Contain sufficient information to fully identify all relevant aspects of the tested Component and tested configuration
- f) Contain sufficient information to identify the condition of the Component after testing. This may include photos where appropriate.

Where the test evidence for a Solution or Component does not meet these criteria, the Supplier/Solution Provider shall make an assessment as to whether the evidence is acceptable and notify the National Grid Type Registration Engineer of any limitations or restrictions on the use of the Solution or Component.

For equipment declared as compliant with an ENA TS, then evidence of compliance through the ENA approval process will be considered.

1.2 Drawings and Manuals

The standard of drawings and manuals submitted shall be in accordance with the general requirements set out below. Specific additional requirements relating to Solutions are defined within the relevant level 2 and level 3 technical specifications.

- a) Drawings and manuals shall be in English and must be submitted in electronic format.
- b) Drawings shall be of the general arrangement type with all individual Components identified either alphabetically or numerically.
- c) A4 or A3 sizes are preferred but larger sizes may be used to improve legibility.
- d) The Component suppliers name and address shall be included and location of manufacturer if different, and where applicable, manufacturers marks to identify sub-suppliers.
- e) The drawing title box shall include the Component or assembly description and references as per the relevant BS, IEC and/or TS.
- f) One unique drawing number only shall be used for each drawing
- g) All drawings shall be dated, checked and given internal design approval to satisfy normal Quality Assurance requirements before submission to the National Grid – Type Registration Engineer.
- h) The revision status shall be shown in a separate box from the drawing number. The revision text shall detail changes made since the previous issue of the drawing.
- i) All design critical dimensions shall be shown in millimetres and shall, where applicable, conform to the relevant BS, IEC or TS. Design critical dimensions are those that are shown on the relevant BS, IEC and TS or National Grid drawing and/or those required as “Technical Data” in the relevant TS. Dimensions which are required to confirm “fit, form or function” shall be supplied together with manufacturing tolerances.
- j) The content of manuals shall include all instructions, data and specifications necessary for the installation, operation, commissioning, maintenance, service, decommissioning and disposal of the complete Solution together with each of the individual Components comprising that Solution. Any requirement to hold maintenance spares shall be included in the manuals.

2 ASSET DESIGN DEVELOPMENT PROCESS AND TYPE REGISTRATION

2.1 General

The flow chart in Figure 1 shows the high level procedure to be followed in order to achieve Type Registration, and as applicable should be read in conjunction with the Technical Guidance Note relevant to the technology.

Where required by National Grid internal processes, equipment will be allocated a unique EGI code. Where this is not the case alternative means of identification will be agreed with the National Grid Type Registration Engineer e.g. a separate Type Registration code or reference to a single drawing which fully defines the Component.

Where Asset Design Development and Type Registration are associated with a Capital Scheme, the typical relationship with TP500 and other processes is shown in Appendix B

For a new technology being trialled (offline or parallel trial) on the UK transmission system a “trial EGI code” with a T-Flag status must be assigned as stated in PS(T)013 and TGN(E) 188. In this case the Implementation of New Technology Policy applies to assess the Solution and its risks. Type Registration via this procedure shall be sought in the event of the equipment being adopted as an enduring Solution.

Equipment with the same EGI code (or other unique identifier) may be offered by the Solution Provider for use in one or more sub system Solutions. It is the responsibility of the Solution Provider to ensure that all plant and equipment is fit for purpose; however, if there is doubt as to the suitability for the particular application, guidance should be sought with the National Grid Type Registration Engineer prior to acceptance.

The National Grid Type Registration Engineer will maintain a database of plant, equipment and Solutions, which will be used to record sufficient asset data for the Solution and the individual Components to identify the equipment. This database will be kept within National Grid’s Type Registration document management system.

The Supplier/Solution Provider is required to notify the National Grid Type Registration Engineer of any changes to design, method or place of manufacture of the Solution or any of the Components used. The National Grid Type Registration Engineer shall also be notified of any modifications carried out on site to equipment. Such changes or modifications may result in the creation of a new EGI code (or other unique identifier) for the equipment. Examples of modifications that may result in the creation of a new EGI code (or other unique identifier) include, but are not limited to, the following;

- a) Spares requirements change
- b) Maintenance requirement change
- c) Component rating changes
- d) Component functionality change
- e) Component modification that affect the inter-changeability with an installed population
- f) Component numbering/identity change
- g) Significant sub-Component changes that do not change overall functionality of Component
- h) Life extension of a Component as a result of a design change
- i) Operational, Engineering and Safety Bulletin (OESB) work that may affect any of the above

Where there has been a significant modification (on a National Grid site or at manufacturer location) or change in the design of a Component part of the Solution or there has been a change in the main manufacturing process and/or location where the Solution (or part of) is

assembled or tested then the requirement for re-assessment shall be determined by the National Grid Type Registration Engineer. The National Grid Type Registration Engineer shall inform of further actions that are deemed necessary. For the purposes of assessment, the term “significant” shall mean:

- a) Changes to the functional performance
- b) Applicability of existing type tests
- c) Compatibility of parts, or
- d) Changes in equipment ownership requirements (maintenance etc).

Should a Component fail in service due to design inadequacy or generic manufacturing defect, the Type Registration status will be reviewed and the EGI code status modified to either Restricted or Withdrawn as applicable.

2.2 Request for Asset Design Development or Type Registration

Where a Solution proposed for use on the Electricity Transmission System has not been Type Registered a request for Asset Design Development and/or Type Registration shall be made by the National Grid Project Manager. The National Grid Project Manager shall submit key dates along with details of the business case/scheme to the National Grid Type Registration Engineer by completing a Type Registration Business Case Form (UKBP/TP183.13). The request shall be assessed by the National Grid Type Registration Engineer and any feedback (including risks and issues) communicated to the National Grid Project Manager.

Following acceptance of the request the National Grid Type Registration Engineer shall carry out a risk assessment to determine the level of risk mitigation required throughout the Asset Design Development and Type Registration process. The risk assessment shall follow the guidance and methodology detailed in TGN(E) 266 – Asset Design Development and Type Registration Risk Assessment Methodology. The assessment strategy will be accounting for;

- a) Failure resulting from Strength and Capability
- b) HS&E issues
- c) Technical risk
- d) Impact on other equipment
- e) Prior equipment knowledge (resulting from supplier collaborative development or PS(T)013 – Policy for the implementation of new technology)
- f) Confidence in equipment supplier
- g) Programme

Plant or equipment offered for which the Supplier/Solution Provider indicates that Type Registration cannot, will not or may not be achieved within anticipated timescales shall be Identified as a risk to the National Grid Project Manager.

2.3 Asset Design Development and Testing

Where a Solution requires Asset Design Development (design development and testing) the Supplier/Solution Provider shall prepare and agree an Asset Design Development programme with the National Grid Project Manager and National Grid Type Registration Engineer. The Supplier/Solution Provider shall manage the Asset Design Development programme and agree any changes with the National Grid Project Manager and National Grid Type Registration Engineer, stating new timescales and the reasons for the delay.

As required, the Supplier/Solution Provider should engage in discussion at the earliest opportunity with the National Grid Type Registration Engineer. Discussions shall be based upon the following;