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1 Purpose

This Standard defines:

- a) *the details and assurances that the LU Head of Power Engineering needs to receive, mainly in conjunction with S1538, in order that consent may be given for power equipment to be commissioned and appropriate snags cleared before new or altered power assets can be put into operational service; and*
- b) *the approach to full or partial asset handover from a project team to the LU managers responsible for: operational control, the line / depot operation and maintenance of equipment forming part of the Works and advises the responsible LU Head of Power Engineering that project requirements have been met and that post-handover requirements are in place.*

Note: The QICC provides certain verification activities as required by S1538, however it is not intended to fully discharge all the requirements of S1538.

Further guidance concerning this standard can be found in G1900.

2 Scope

2.1 General Scope

- 2.1.1** This Standard applies to Power equipment, systems and assets for which the LU Head of Power Engineering is accountable.

Note: Assets associated with power that may form part of Works such as Civil, Premises and Fire are to be checked via the competent authorities. However, use of the QICC form and process may be used to indicate assurance from these bodies.

- 2.1.2** When work involves non-power assets but requires the Commissioning of a supply from a power asset, such as a low voltage ac power supply from a LU substation, this QICC standard shall be applied to the work.
- 2.1.3** This Standard shall be applied, with reference to 2.1 above, for all Works on the LU power system.
- 2.1.4** This Standard is not applicable to the hand-back of assets that have been withdrawn from service during non-traffic hours or for maintenance i.e. no material change has been made to the asset in question.

3 Requirements

3.1 General

- 3.1.1** The means by which the purpose of this standard will be met is through the systematic completion of the Quality Inspection Completion Certificate (QICC). The certificate shall be completed and signed at key stages in the process by the responsible parties.
- 3.1.2** The QICC forms which shall be used are enclosed in the Attachments to this document.
- 3.1.3** Completion of the QICC is a sequential process which requires the Supplier responsible for a package of Works to provide assurance to LU at various points in the completion of the Works. The QICC provides LU's Head of Power Engineering and others within LU with the minimum assurances required as power assets are Commissioned into service. It does not replace the responsibility of a Supplier to ensure that equipment is correctly designed, installed and commissioned prior to being put into service.

Note: The QICC form attached to this document is colour coded to highlight the Parts of the form which are completed by the Supplier to provide assurance to LU (blue), the Parts where LU accepts the Supplier's assurance (yellow) and the independent quality inspections undertaken by LU's Assurance Manager (green).

It is not usual for the LU Managers receiving assurance from the Supplier to have personally checked the Works on site prior to signing a QICC form, except where novel equipment may be concerned. LU Managers instead have a reliance on the quality inspection process and subsequent report or snagging list to provide 'eyes and ear's' on the ground.

- 3.1.4** The LU Supplier shall liaise with LU Managers receiving assurance early in the Works to explain the nature and design of the works and to agree at an early stage in the process what information, training and other deliverables are adequate for each LU area identified on the QICC form. These agreed lists shall be contained in the data pack.
- 3.1.5** The LU Project Manager tasked with acting as the LU client for the Works shall liaise with the Supplier and the LU receivers of assurance to ensure that there is early agreement over the information, training and deliverables required for each LU area identified on the QICC form.
- 3.1.6** The LU Power Supply Manager shall advise the Supplier what information and training are required for operational control.
- 3.1.7** The LU Line / Depot Operations Manager shall advise the Supplier what information and training are required for line or depot operations staff.
- 3.1.8** The LU Maintainer shall advise the Supplier what information, training, spares etc. are required for maintenance.
- 3.1.9** The QICC requirements, process and forms shall be met in full, except where agreement in writing has been reached in advance with the LU Head of Power Engineering.
- 3.1.10** Each QICC and MWCC shall be allocated a unique reference number. QICC and MWCC reference numbers shall be obtained from the LU Assurance Manager.
- 3.1.11** Where parts of the form require the deletion of a choice between two options for example 'IS NOT / IS SAFE and FIT FOR SERVICE', this shall be done by hand by the person responsible for signing that Part of the form at the point the form is signed.
- 3.1.12** Where a QICC form concerns work on assets which will be maintained by the LU's asset performance power group, the QICC form shall refer to the approved power method statement number or agreed work package plan.
- 3.1.13** Where the installation, Pre-commissioning and Commissioning activities are 'safety critical tasks' the Supplier shall provide the following records to LU for the Supplier's staff undertaking the activities:
 - a)** *means of identification for carrying out 'safety critical tasks' in line with LU standard S1548; and*
 - b)** *record or accurate summary of the record to establish that the individual is competent and fit in line with the ROGS Regulations and LU standard S1548.*

3.2 Minor Works Completion Certificate (MWCC)

- 3.2.1** In the case of Works that are of a minor nature e.g. relocation of small electrical installations and minor alterations to domestic type substation Works; a Minor Works Completion Certificate (MWCC) may be utilised as an alternative to the QICC, subject to prior written agreement of the LU Head of Power Engineering. Any such MWCC offered for use shall be compliant with the requirements of BS 7671 Appendix 6.

However, where new equipments are installed and they are subject to LU standards, the QICC requirements shall be met in full.

3.2.2 The basis for use of an MWCC shall be subject to all the following criteria being satisfied:

- a) *Like for like replacement or relocation of minor plant or equipment;*
- b) *Work which is simple to verify by sight, inspection or test; and*
- c) *Work normally taking one shift or less to complete.*

3.2.3 Where a MWCC is used; the MWCC, together with appropriate service sheets, work orders, inspection reports, snag list, test results (if applicable), guarantees and warranties shall be assembled into a job file. The job file shall be accepted and processed by the maintenance organisation to ensure asset records are modified accordingly.

3.3 Categorisation and Management of Snags

3.3.1 The Supplier shall create and manage a single list containing all the identified snags, the snag list. The snag list shall be identified by the QICC number and individual snags shall be given a unique number appended to the snag list number.

3.3.2 All snag lists shall be produced in the format shown in the snag list template in Appendix 7.5.

3.3.3 All snags shall be classified to reflect their potential impact on Pre-commissioning, Commissioning and putting into service, as follows:

- a) *Category A - major impact, including safety related issues that prevent the system and equipment from being Pre-commissioned and /or Commissioned;*
- b) *Category B - will prevent the system and equipment being put into service; and*
- c) *Category C - minor impact issues which could be cleared following Commissioning within defined and declared timescales.*

3.3.4 All category B snags with the exception of those which can only be cleared during final commissioning shall be cleared prior to the completion of Part 4 of the QICC

3.3.5 Where snags are disputed they shall be included in the Supplier's snag list as category B snags until agreement is reached between the Supplier and LU.

3.3.6 All outstanding items to be completed, including any conditions raised within any associated concession, shall be clearly identified on the agreed snag list and shall include details as highlighted by the quality inspections. The agreed snag list shall include categorisation of the snags indicating the date by which they shall be cleared.

3.3.7 The Supplier's snag list shall be reviewed as part of the quality inspection undertaken in Part 3 of the QICC. Once the snag list is agreed by the LU Assurance Engineer it becomes the agreed snag list.

3.3.8 Where issues are identified following the initial Part 3 inspections or by signatories to the QICC form they shall be added to the snag list, noted in the comments box on the QICC form and classified in line with 3.3.3.

3.3.9 The Supplier shall ensure that snags are only cleared when there is sufficient and appropriate evidence to do so. The Supplier shall keep records of the clearance of snags such that they can be reviewed by the LU Assurance Manager.

3.3.10 Snags are only agreed as complete once they have been evidenced to and accepted by LU.

3.4 Special Considerations when Independent Quality Inspection is not practicable

- 3.4.1** For certain types of work the nature of the work makes it impracticable to facilitate an independent quality inspection between the installation of equipment and the final commissioning of equipment.
- 3.4.2** In these cases the agreement of the Head of Power Engineering shall be sought to not undertake an independent quality inspection.
- 3.4.3** For this type of work special emphasis shall be placed on identifying the tests, checks and quality inspections which need to be undertaken during the Commissioning of equipment so as to mitigate the risk associated with the Works.
- 3.4.4** The checks, tests and inspections shall be set out in Part 8 of the QICC in advance of the work. Completion of the tests, checks and inspections during the Commissioning of the works shall be used to ensure that Works are safe and fit before they are put into service.
- 3.4.5** Where an independent quality inspection is not practicable to undertake the Supplier shall, unless agreed otherwise with the LU Project Manager, provide photographic evidence at the key points during the final Commissioning of the work and include this evidence as part of the data pack.

Note: It is particularly important to ensure that Works on traction power supplies are adequately checked prior to being made live .

3.5 Scope of QICC

- 3.5.1** The scope shall be defined such that asset Commissioning can be achieved in realistic timescales and without undue delay.

Note: Determining the scope of the QICC is critical to achieve successful consents.

- 3.5.2** The chosen scope shall be such that it shall not result in prolongation of the process and / or a failure to properly follow all the requirements of the process as a result of being too extensive.

Note: This usually involves breaking down large projects into smaller more manageable project elements.

For repetitive work within the same overall project scope, multiple QICCs could result if the QICC scope is too limited. The QICC process as illustrated and described in the Commissioning part of the QICC form and defined in 3.19 may be used in such situations by agreement with the LU Head of Power Engineering.

3.6 Supplier Works Description & Detailed Design Declaration (QICC Part 1)

- 3.6.1** The scope of Works for which the QICC applies shall be clearly defined and included within Part 1 of the QICC. This shall include a list of applicable project specifications and the identification of the sites where the Works are taking place.

Note: Care needs to be exercised when grouping works at different sites under a single QICC to ensure that implementation of a single QICC is practical.

- 3.6.2** The Supplier's Designer for the Works shall confirm, following examination of the relevant documentation and the implementation of an appropriate design review process that the detailed design for the Works is complete, has been checked and is approved.

- 3.6.3** Applicable design references shall be included.
- 3.6.4** The Supplier's Designer shall confirm following review, that the Works are suitable to progress to installation.
- 3.6.5** The Supplier's Designer shall ensure that:
- a) *the designs for the Works are compliant with the applicable Standards and Specifications (except where concessions are in place), and the requirements of the relevant contract;*
 - b) *LU has been given the opportunity to review the design; and*
 - c) *LU has 'accepted' or 'accepted except as noted' the design of the Works and all LU design review transmittal responses are included in item 2 of the data pack.*
- 3.6.6** The Supplier's Designer shall ensure that the results of the checks, approvals and compliance statements required by section 3.6 are appropriately documented.

3.7 Supplier Installation Declaration (QICC Part 2)

- 3.7.1** The Supplier's nominated senior Manager accountable for the Works shall confirm that the Works have been installed and are substantially complete in accordance with the approved design.
- 3.7.2** The Supplier's nominated senior Manager accountable for the Works shall confirm that the Works are safe and fit to progress to Quality Inspection and Pre-commissioning.
- 3.7.3** The Supplier's nominated senior Manager shall ensure the following and provide adequate supporting information:
- a) *all installation tests are complete and results documented;*
 - b) *all identified installation snags are recorded on the snag list and categorised in line with 3.3.3;*
 - c) *that all category A snags are cleared;*
 - d) *that the installed Works are compliant with applicable standards, except where concessions are in place as listed in the QICC documentation and the requirements of the relevant contract;*
 - e) *where the installation activity was a 'safety critical task' those undertaking the activity were competent and fit to undertake the work or were supervised by someone who was, in line with the ROGS Regulations and LU standard S1548; and*
 - f) *sufficient data and information to enable Quality Inspection and Pre-commissioning to proceed subject to other related checks.*
- 3.7.4** Installation tests and checks, for example bus bar resistance tests, are an essential part of the installation process and these shall be completed prior to the signature of Part 2 of the QICC.

3.8 LU Quality Inspection (QICC Part 3)

- 3.8.1** An independent check shall be undertaken by the LU Assurance Manager, or equivalent personnel with similar responsibilities, such as a quality inspector, to confirm:
- a) *that appropriate quality checks in accordance with standards and processes have been followed during the undertaking of the Works;*
 - b) *if appropriate an inspection has been undertaken at the manufacturing stage to ensure adequate quality of work. This may include witnessing of manufacture and type testing as appropriate for assurance of the Works; and*
 - c) *an inspection of the installation Works has been undertaken and that any deficiencies have been identified and classified on a snag list.*

- 3.8.2** Once the Supplier's snag list has been checked by the LU Assurance Manager as part of the Quality Inspection it becomes the agreed snag list.

Note: It is important that all parties understand the importance of these outputs as they form the basis for assurance to all parties at the various subsequent stages.

- 3.8.3** Inspection Report and agreed snag list as appropriate to demonstrate adequate technical assurance, shall be included with the information forming the QICC data pack presented to the LU receivers of assurance in subsequent Parts of the QICC.

3.9 Supplier's Pre-Commissioning Declaration (QICC Part 4)

- 3.9.1** The Supplier's Project Manager or Project Engineer accountable for the Works shall confirm that all Pre-commissioning tests have been completed satisfactorily and the results have been checked and are acceptable.
- 3.9.2** It shall also be confirmed that the Works are safe and fit for Commissioning.
- 3.9.3** The Supplier's Project Manager or Project Engineer accountable for the Works shall ensure that:
- a) *the only category B snags outstanding are those which can only be cleared at Commissioning;*
 - b) *where the Works involve substation domestic supplies all electrical inspection and test certificates to BS 7671 are complete and issued;*
 - c) *arrangements have been made to make any changes required to LU asset database including any appropriate deletions;*
 - d) *sufficient spares, special tools and equipment are with the Maintenance Manager;*
 - e) *sufficient documentation and training is in place to ensure the ongoing healthy condition and performance of the installed assets;*
 - f) *SCADA end to end testing is complete, except where it cannot take place until the Commissioning due to the nature of the Works;*
 - g) *the protection study for the equipment concerned is complete, reviewed and approved;*
 - h) *the QICC Part 7 checklist is in place;*
 - i) *where Pre-commissioning was a 'safety critical task' those undertaking the activity were competent and fit to undertake the work or were supervised and checked by someone who was, in line with the ROGS Regulations and LU standard S1548; and*
 - j) *sufficient data and information has been made available on site and in the data pack to enable subsequent parts of the QICC to proceed (as a minimum this shall include the final draft operation and maintenance manuals and the red line drawings).*
- 3.9.4** All Pre-commissioning tests and checks shall be completed before Part 4 of the QICC is signed, with the exception of those, which by their very nature, need to be undertaken as the equipment is Commissioned and put into service.

3.10 LU's endorsement of Pre-commissioning completion

3.10.1 The LU Project Manager who is tasked with acting as LU client for the Works shall endorse the Supplier's declaration in Part 4 of the QICC form that the Works are ready to progress to Commissioning.

3.10.2 Prior to endorsing the Supplier's declaration, the LU Project Manager shall:

- a) *check the validity of the Supplier's declaration in Part 4 of the QICC form, particularly the detailed items identified in Part 4 of the form;*
- b) *meet with the Supplier to review progress of the Works to date;*
- c) *confirm with the Supplier by annotation of Part 8 or 8A of the QICC form whether the final Commissioning works contain any safety critical elements;*
- d) *discuss and agree with the Supplier whether Part 5B and the additional Part 6 are required; and*
- e) *where the final Commissioning is a 'safety critical task', seek confirmation from the Supplier that the Supplier's Commissioning Engineer is competent and fit to undertake the work or is going to be supervised and checked by someone who is, in line with the ROGS Regulations and LU standard S1548.*

3.10.3 Where Parts 5B and / or additional 6 are not required the LU Project Manager shall annotate these parts as 'not required' at the same time as Part 4 is endorsed.

3.10.4 The LU Project Manager shall assist the LU receivers of assurance to gain the necessary assurance by liaising with the Supplier and the relevant LU managers to ensure that the Supplier has fully discharged the agreed list of adequate requirements referred to in various parts of the QICC form and that the Works are delivered in accordance with this standard.

Note: This stage of the sequential process offers the opportunity for detailed planning of the subsequent stages to be checked to enable a smooth work flow. For example, decisions on what tests or work require witnessing by LU and by whom can be taken at this stage.

3.11 LU Power Supply Manager Acceptance (QICC Part 5A)

3.11.1 Where Works include equipment for which the LU Power Supply Manager has operational control Part 5A of the QICC shall be completed.

3.11.2 The LU manager responsible for the operational control of the equipment forming part of the Works shall confirm:

- a) *that an agreed list of adequate documentation and training has been received / is in place;*
- b) *that operational control can be undertaken safely following satisfactory completion of all appropriate Commissioning checks; and*
- c) *responsibility for the future operational control of the equipment following satisfactory completion of all appropriate Commissioning checks.*

3.12 LU Line / Depot Operations Manager Acceptance (QICC Part 5B)

- 3.12.1** Where equipment is operated by line or depot operations staff, for example some traction and depot switches, the manager responsible for this activity shall complete Part 5B of the QICC.
- 3.12.2** The LU manager responsible for the operation of the equipment forming part of the Works by line or depot operations staff shall confirm:
- a) *that an agreed list of adequate line / depot operation documentation and training has been received / is in place;*
 - b) *that operation by line / depot staff can be undertaken safely following satisfactory completion of all appropriate Commissioning checks; and*
 - c) *responsibility for the future operation of the equipment by line / depot operation staff following satisfactory completion of all appropriate Commissioning checks.*
- 3.12.3** The Supplier shall discuss and agree the applicability of Part 5B with the LU Project Manager.

3.13 LU Maintainer Acceptance (QICC Part 6)

- 3.13.1** The LU Maintainer of the equipment forming part of the Works shall confirm:
- a) *that an agreed list of adequate maintenance documentation and training has been received / is in place;*
 - b) *that changes required to the LU asset database including deletions have been made;*
 - c) *that an agreed list of adequate spares, special tools and equipment have been provided;*
 - d) *that maintenance (including local operation) can be undertaken safely following satisfactory completion of all appropriate Commissioning checks; and*
 - e) *responsibility for the future maintenance (including local operation) of the equipment forming part of the Works following satisfactory completion of all appropriate Commissioning checks.*
- 3.13.2** At asset boundaries where two maintainers are responsible for equipment associated with the Works, separate Part 6 forms shall be completed. In these circumstances the comments box shall be used to identify the two sets of equipment.

Note: A typical example is where an LVAC cable is to be commissioned onto a spare circuit on an LVAC switchboard within a substation. The cable and downstream equipment may be electrical and mechanical assets and the substation switchboard switchfuse the maintenance responsibility of another group. Clearly the need is to make sure the assets can safely be brought into service and so it is important that the QICC covers the intended downstream changes and the appropriate detail at the interface.

- 3.13.3** The Supplier shall discuss and agree the applicability of an additional Part 6 form with the LU Project Manager.

3.14 LU Head of Power Engineering Acceptance (QICC Part 7)

- 3.14.1** The LU Head of Power Engineering shall be assured that the assets are suitable for final Commissioning and putting into operational use.
- 3.14.2** In accepting the QICC Part 7, the LU Head of Power Engineering is confirming from the information provided that he is sufficiently assured to allow the asset to be put into service following satisfactory completion of all appropriate Commissioning checks.

3.14.3 The nature of the sample assurance checks undertaken by the LU Head of Power Engineering can cover, amongst other things, that:

- a) *the Works comply with applicable Standards except where Concessions have been granted;*
- b) *all necessary signatures have been obtained on the QICC form and still remain applicable; and*
- c) *a QICC Part 7 checklist has been prepared.*

3.14.4 Part 7 of the QICC form shall be signed by the Head of Power Engineering or an authorised representative.

3.15 Head of Power Engineering's Representative

3.15.1 The LU Head of Power Engineering may engage competent persons to obtain the necessary assurance.

3.15.2 The Head of Power Engineering's representative shall be formally appointed by the LU Head of Power Engineering. The representative shall have appropriate competence in accordance with the power engineer's delegated authority matrix.

3.15.3 Head of Power Engineering's representatives cannot sign on behalf of the LU Head of Power Engineering unless formally authorised in writing.

3.16 QICC Part 7 Checklist

3.16.1 The Supplier shall prepare a QICC Part 7 checklist for review by the Head of Power Engineering's representative.

3.16.2 Attachment 3 contains an example QICC Part 7 checklist. The Supplier is responsible for ensuring that the QICC Part 7 checklist used adequately reflects and deals with the nature of the Works covered by the QICC concerned, as a minimum it shall cover all the items in the example QICC Part 7 checklist in Attachment 3.

3.16.3 The example QICC Part 7 checklist in attachment 3 is not exhaustive and checklists shall be developed by the Supplier on a case by case basis in consultation with the Head of Power Engineering's representative.

3.16.4 The Supplier's nominated Project Manager or Project Engineer shall confirm completion of the QICC Part 7 checklist.

3.16.5 Head of Power Engineering's representatives shall formally indicate the completion of their review through signing the QICC Part 7 Checklist.

3.16.6 The completed QICC Part 7 checklist shall be included in the QICC data pack.

3.17 Conditional Acceptance

3.17.1 The LU Head of Power Engineering's acceptance can be conditional upon clearance of specific snags and is always subject to successful completion of the final Commissioning tests and outstanding issues, such as category B snags being adequately completed. Conditional acceptance may be required to enable the contractor to proceed while an issue is resolved. This may arise from time to time through the assurance process and the contractor is required to act reasonably at all times to resolve such issues.

3.18 Supplier Commissioning Declaration (QICC Parts 8 and 8A)

3.18.1 Prior to undertaking the final Commissioning of equipment, the Supplier shall review the nature and number of category B snags to ensure that those outstanding when the final Commissioning is undertaken, can be cleared during the final Commissioning.

3.18.2 The original QICC form, the data pack, the test dossier and drawings shall all be available on site while the final Commissioning takes place.

- 3.18.3** The Supplier's Commissioning Engineer shall ensure that Part 8 / 8A of the QICC sets out the tests and appropriate test procedures which will be used to Commission the equipment detailed in Part 1.
- 3.18.4** The Supplier's Commissioning Engineer responsible for the Works shall undertake all necessary commissioning checks and tests and upon successful completion of these checks and tests shall arrange to put the equipment into operational service.
- 3.18.5** Before putting equipment into service the Supplier's responsible Commissioning Engineer must satisfy themselves that the equipment concerned is safe and fit to go into service. If there is any doubt over the condition of the equipment the Commissioning Engineer must discuss the situation with LU Shift Supply Engineer prior to putting the equipment into service.
- 3.18.6** The Supplier's Commissioning Engineer shall complete the declaration elements of Part 8 and 8A of the QICC by hand at the point the Commissioning is completed to record the outcome of the Commissioning.
- 3.18.7** The Supplier's Commissioning Engineer shall confirm that the final Commissioning has been completed through the satisfactory completion of all the necessary Commissioning tests in line with the method statement.
- 3.18.8** Following the satisfactory completion of the Commissioning tests, the Supplier's Commissioning Engineer shall confirm that all the equipment IS SAFE and FIT FOR SERVICE and that it has entered operational service.
- 3.18.9** Where the final Commissioning is a 'safety critical task';
- a) *the Supplier's Commissioning Engineer or the individual supervising and checking the Commissioning shall confirm that they have been assessed as competent and fit, in line with the ROGS Regulations and LU standard S1548; and*
 - b) *Part 8 or 8A shall be signed by the individual who is competent and fit, in line with the ROGS Regulations and LU standard S1548.*
- 3.18.10** The Supplier's Commissioning Engineer shall ensure that the Commissioning test sheets are completed during the Commissioning and that they are included within the test dossier as a final deliverable.
- 3.18.11** The Supplier's Commissioning Engineer shall ensure that:
- a) *any appropriate Part 8A forms have been completed and are attached to the Part 8;*
 - b) *all remaining category B snags have been cleared;*
 - c) *any additional category C snags that have been identified during the final Commissioning are listed on the QICC form and on the snag list;*
 - d) *any safety risk mitigation measures that have been put in place as part of the final Commissioning are listed;*
 - e) *any departures from the final protection settings as detailed in the approved protection setting study have been attached to the Part 8 / 8A. Where departures from the approved protection setting study are used, they shall be discussed and agreed with the SSE prior to their use. Details of all deviations from the approved setting report shall be provided to LU within 5 working days; and*
 - f) *any further incomplete Works are listed.*