Northern Gas Networks

NGN/PM/G/17

MANAGEMENT PROCEDURE FOR

THE MANAGEMENT OF NEW WORKS, MODIFICATIONS AND REPAIRS INCORPORATING COMMISSIONING, OPERATIONAL AND ASSET ACCEPTANCE

JULY 2014

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FOREWORD

This document was approved by NGN for use by managers, engineers and supervisors throughout Northern Gas Networks Limited (NGN).

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BRIEF HISTORY

First published as T/PR/G17 Revised and Re-issued Editorial update to reflect demerger November 2000 Revised to incorporate minor amendments Revised to incorporate T/PR/EL14 Revised to incorporate T/GN/98/01 & align to Gas Requirements Manual	January 1999 April 2001 June 2001 January 2002 May 2003 August 2004	 EPSG/T02/630 EPSG/T03/812
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Revised To Clarify Project Manager Roles & Responsibilities	DECEMBER 2009	NGN/PM/G/17
Revised to include risk assessment process	JULY 2014	NGN/PM/G/17

DISCLAIMER

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MANDATORY AND NON-MANDATORY REQUIREMENTS

In this document:

Must: indicates a mandatory requirement.

Should: indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment must be completed to show that the alternative method delivers the same, or better, level of protection.

MANAGEMENT PROCEDURE FOR THE MANAGEMENT OF NEW WORKS, MODIFICATIONS AND REPAIRS INCORPORATING COMMISSIONING, OPERATIONAL AND ASSET ACCEPTANCE

INTRODUCTION

The purpose of this Management Procedure is to provide a framework for management and control of new works, modifications and repairs on gas transmission, storage and distribution systems as defined in the scope. This Management Procedure incorporates the philosophy outlined in the Institution of Gas Engineers & Managers (IGEM) guidance document IGE/GL/5 “Plant Modification Procedures” which recommend the processes for appraising and approving modifications to a gas transmission system and its associated support systems. This Management Procedure is also based on assignment of responsibilities to nominated personnel who, where appropriate, have been trained and assessed to ensure technical competence and suitability for their roles.

Successful control of modifications to plant and equipment is essential to protect people, assets and the environment and a key element must include a procedure for authorising, planning, implementing, testing and recording of modifications. This Management procedure incorporates the philosophy of both PSSR and COMAH in that a formal procedure is in place that requires:-

- All modifications shall be Authorised
- All modifications have undergone a planned modification priority and risk assessment the results of which shall be reviewed by the NGN Asset Strategy & Integrity Manager (or Nominated Deputy).
- A system of design approval / appraisal is in place prior to implementation.
- Projects should follow the NGN Integrated Management System (IMS) NGN-MPT-IMS-01.

In emergency situations, it may be necessary to install new or modify existing plant and equipment without the prior adoption of this Management Procedure. Should this be necessary then this Management Procedure should be complied with retrospectively as a matter of urgency but must be completed within 28 days.

The Pressure Systems Safety Regulations (2000) (referred to as PSSR) are intended to reduce the risk of failure of pressurised systems. The main tool for achieving this is the examination in accordance with the Written Scheme of Examination. Where the examination identifies a situation which may lead to a dangerous occurrence, or where due to some other reason a modification needs to be carried out to the pressurised system, it is necessary to undertake the necessary modification or repair as well as possibly change the safe operating limits. Although the examination, etc. identifies the defect, it is the modification or repair which prevents a dangerous occurrence. As a result of this philosophy, the PSSR place exacting requirements on modifications and repairs.

Regulation 4 of PSSR covers the design, construction, repair and modification of pressure systems and puts a duty on all concerned to ensure that the pressure system is fit for purpose. HSE guidance on the PSSR advises that designs are independently verified and approved. To ensure compliance with the PSSR, it has been necessary to put into place robust procedures for the appraisal and approval of the design of new plant and the modification of existing plant.

Where a self-lay/third party asset is offered for adoption, compliance with the NGN/PM/G/17 process during the design process will make acceptance easier because the technical appraisals will have been carried out. The eventual User, NGN, should advise the Self-Lay Organisations of this requirement and also of the need for appraisers to be acceptable to the company. Where the company uses external service providers to undertake design appraisals, the Self Lay Organisations may consider the use of these service providers but must make their own commercial and contractual arrangements

SCOPE

This Management Procedure applies to the management and control of new works, modifications, repairs and demolition of assets utilised for the transportation, distribution and metering of gas as follows:

- Gas transportation systems, including pipelines operating above 2 bar or with slamshut protective devices set above 2.7 bar
- Design Appraisal of other plant such as below 2bar equipment and systems considered appropriate at the discretion of the User.
- Supply point metering installations with an inlet pressure above 2.0 bar
- Gas storage installations
- Pressure vessels operating above 0.5 bar and a stored energy capacity exceeding 250 bar litres
- All electrical[2], instrumentation, configurable equipment and control systems and any associated software.
    - 2 Electrical installations within non-operational buildings are excluded from the scope of these Management Procedures however it is recommended that the appropriate sections of the design process are followed.

This Management Procedure encompasses all disciplines (Mechanical, Gas Engineering, Electrical, Cathodic Protection, (Instrumentation and Control, Civil / Structural, Safety and Software) and applies to both in-house and outsourced activities.

The 'like-for-like' change of a component and minor site works are not defined as a modification and generally only Parts A & D of Appendix 3 require completion.

There are also some works which do not require any part of the formal procedures to be raised. Examples are:

1. any inspection works wholly completed under the NGN/PR/P/11 Procedures
2. superficial or minor surface corrosion
3. soft part replacements, including filter element replacement provided it is in-line with approved procedure
4. Like for like gasket replacement. To BS EN 1514 Pts 1 & 2, BS 3381 & BS 7531
5. painting or painting repairs if carried out to NGN/SP/PA/10
6. grit blasting or wire brushing operations provided it is in-line with an NGN approved standard
7. replacement and repairs to wrapping or insulation if carried out to PA/10
8. rectification of leaks associated with gaskets or soft seals
9. reaffirmation of MOP's
10. Fitting of temporary pressure or temperature gauges to existing fittings
11. Cathodic protection works not in contact with pressure containing parts if to NGN/PM/ECP/2
12. Realignment or retightening of existing stud bolts and nuts
13. Updating of pressure systems drawings or records
14. Certain LP gasholder work and modifications such as
    a. The replacement of defective rivets with an equivalent bolt, toggle bolt or similar component
    b. The reinforcement of existing wasted structural steelwork members
    c. Repairs to access stairs, ladders & platforms and hand railing
15. Replacement of E&I equipment with the same or better safety certification, function, capacity and load, such as:
    a. Relay
    b. Safe area light switch
    c. Battery

d. Cable
e. Fuse
f. Isolator
g. Temperature RTD

For E&I equipment the “like-for-like” change should be recorded on the Electrical or Instrument Like for Like Record sheet (Appendix 6) for clarity this should be used for all changes where the like for like equipment has a serial number or is hazardous area certified or change in manufacturer

PROJECT RISK RANKING

The Management procedure recognises the need to differentiate between the type and scale of modification and hence the level of design approval / appraisal that is required to be undertaken. The level of design approval / appraisal shall be determined by the result of a formal risk assessment to categorise the project type as follows:

Low Risk Project: Work covered by generic G19 or a modification that will not require a detailed design or design appraisal. The result of the risk assessment shows that the modification is a low risk and would cover modifications such as the replacement of existing identical equipment.

As the result of the formal risk assessment, which categorises the risk as low, the User or duty holder (E&I) may choose to nominate a further independent assessment by a competent person of suitable experience to confirm the category and comment on the modification as proposed, thus providing a 2nd assessment of the modification. Where appropriate the User’s representative may reclassify the modification as either Medium or High risk. There is no requirement for the User’s representative to be registered on the appraiser database but a registered appraiser may be used if appropriate.

Medium Risk Project: Any modification that involves a change to an approved design, or replacement of equipment with new equipment that may perform the same function, but may have a different manufacturer or operating characteristics e.g. an obsolete hand pump on an actuated valve or obsolete field equipment would be categorised as medium risk. Existing model design modifications and Original Equipment Manufacturer (OEM) modifications would fall in to the category of Medium Risk.

As the result of the formal risk assessment, which categorises the risk as medium, the User may choose to nominate a further independent assessment by a competent person of suitable experience to confirm the category and comment on the modification as proposed, thus providing a 2nd assessment of the modification. Where appropriate, the Users representative may reclassify the modification as either low or high risk. There is no requirement for the User’s representative to be registered on the appraiser database but a registered appraiser may be used if appropriate.

High Risk Project: A modification or project that is categorised by formal risk assessment as high risk shall have an independent formal design appraisal undertaken by approved appraisers/approvers registered on the appraiser database.

A high risk project involves complex design issues and may require a multi-discipline design input. For instance, a design of a new pipeline and pig trap installation, or the re-life of a large AGI such as an offtake, or the cut out and replacement of pressure containing pipework on the recommendations of an integrity assessment, are examples of high risk projects.

Once the **User** has accepted the category for the modification or repair as Low, Medium or High Risk, then this categorisation applies to the whole project until completion, provided that the scope of work does not change during the project.

DEFINITIONS

The definitions applying to this Management Procedure are given below

1 Responsible Persons

Competent Design Authority	The Competent Design Authority (CDA) is a body appointed by the company having responsibilities for the assessment of design organisations and appraisers and who may exercise controls within the design acceptance process
Commissioning Engineer	The Commissioning Engineer is an Engineer within the company or within an external organisation with the relevant competencies and authority to commission and put systems into use
Design Appraiser	The Appraiser is an Engineer with the relevant competencies to appraise design work in a specified discipline(s). The Appraiser must be demonstrably independent of the work to be appraised. Appraisers must be nominated through the project plan or in writing to the Project Manager. Appraisers should be on a CDA Register
Design Approver	The Design Approver is an Engineer with the relevant competencies to approve a design that meets the requirements of the contract or design brief, legislation, standards and is safe. Design Approvers must be nominated through the project plan or in writing to the Project Manager. Design Approvers should be on a CDA Register
Design Organisation	The person or organisation who undertakes the design stage of a project
Installer	The person or organisation who undertakes installation, inspection, testing and commissioning activities. The Design Organisation and the Installer may be part of the same company
Project Manager	The Manager or engineer having the responsibility for the management of the project. The Project Manager ensures that the project progresses through all of its stages from the initiation stage to the final commissioning stage, and that all of the relevant drawings, test results and paperwork are completed. The Project Manager or technically competent person must verify on site that the works have been carried out and are fully completed as per the approved design and compliant with all relevant NGN Technical Documents and Specifications. Any changes to the approved Project Manager must be agreed in writing with the User
User	The User is a person representing the Company who has responsibility for the work being constructed, modified or repaired, who grants approval for work to be undertaken. The NGN Asset Strategy & Integrity Manager, Asset Risk Management is designated to act as the “User” under this procedure. For E&I and Software this role is designated to the Lead E&I Engineer (Electrical Duty Holder as defined in the Electricity @ Work Regulations)

2 General

CDA Register	A relational database managed by the CDA holding appraisers and approvers for all disciplines registered to undertake new works and modifications on NGN‟s gas systems
G/17 Progress Database	A relational database that is used to initialise and track the various stages of the G/17 lifecycle

3 Processes and Outputs

Design Brief	The Design Brief is a descriptive statement, which outlines the project-preferred solution The Project Manager ensures that the Design Brief is produced. HAZOPs, HAZIDs and other safety assessment studies may be undertaken at this stage, and Safety Integrity Levels (SIL) allocated to the safety functions where appropriate. A Design Brief is required for all projects. The detail in the Design Brief will be relative to the size of the project
Design Approval	An Approval is a review of a design output package, numerically and quantitatively, by an Approver to establish that appropriate legislation, design codes, policies, procedures and standards have been applied, that there are no omissions within the detailed design, and that NGN's requirements have otherwise been met. It does include the responsibility to check or approve the design.
Design Appraisal	An Appraisal is a review of an approved design output package by an Appraiser to establish that appropriate codes, policies, procedures and standards have been applied, that there are no omissions within the detailed design, and that NGN's requirements have otherwise been met. It does not include the responsibility to check or approve the design, although selective checking may be carried out to prove specific aspects of the design

Approval Report	A summary of the Approver's assessment of the design output package. See examples in Appendix 4. The Approver shall produce a report of the approval, detailing all his/her comments, graded according to the following criteria: A - Integrity: comments under this category have system integrity or code compliance implications and shall be resolved within the Approval procedure. B - Design: comments under this category relate to aspects of the Design. These comments are raised to highlight an issue which the Approver considers should be addressed. C - General: comments under this category will include minor points of interest raised for information purposes. The adoption of this category of comment will be at the Project Manager's discretion. All comments should be relevant, justifiable and objective in terms of compliance with Codes, Standards, Specifications etc. This report will be signed by the Approver and issued to the Project Manager for onward transmission to the Designer.
Appraisal Report	A summary of the appraiser's assessment of the design output package. See examples in Appendix 5. The Appraiser shall produce a report of the appraisal, detailing all his/her comments, graded according to the following criteria: A - Integrity: comments under this category have system integrity or code compliance implications and shall be resolved within the Appraisal procedure. B - Design: comments under this category relate to aspects of the Design. These comments are raised to highlight an issue which the Appraiser considers should be addressed. C - General: comments under this category will include minor points of interest raised for information purposes. The adoption of this category of comment will be at the Initiator's discretion. All comments should be relevant, justifiable and objective in terms of compliance with Codes, Standards, Specifications etc. This report will be signed by the Appraiser and issued to the Project Manager for onward transmission to the Designer.

4 Discipline Definitions

Mechanical	Defined as the pressure-containing plant, equipment, pipework, etc, which form the physical pressurised system
Gas Engineering	Defined as the physical processes applied to the gas during transportation. This will include filtration, pre-heating, metering, Local Gas Treatment, pressure regulation and expansion, compression, metering, and other processes. It is not intended that it should include the physical availability of the gas supply for a particular application – this is the reserve of Asset Planning and System Operation and is not a design issue
Civil/Structural	Defined as the design and construction of all civil and structural elements which protect, support or enclose the pressure-containing elements, or their supporting equipment, to ensure that they are able safely to resist the forces to which they may be subjected, along with the suitability and capability of the soils to support such civil and structural elements without causing any detrimental effects
Electrical & Instrumentation	Defined as the design, installation, testing and commissioning of all electrical and instrumentation equipment, plant and systems which protect and support production, transmission, distribution and storage installations. All electrical work (design, installation, testing and commissioning) must comply with The Electricity at Work Regulations (1989). The Regulations cover all electrical equipment, which includes switchgear, control panels, distribution boards, electrical accessories, portable tools and equipment and cables. The Regulations apply to all electrical systems including portable generators, batteries and instruments containing or operating from a source of electricity. CONFIGURABLE DEVICES 'Where applicable for good Engineering practice include in the Design Output Pack a table documenting the design for configurable points with values/settings/results/outputs/actions, this document should will be used to validate and document compliance to the Approved and Appraised design. This table will be updated by the Commissioning Engineer to document the commissioned values/settings of the configurable points, as a record of the 'as built' configuration for maintenance use'. TELEMETRY OUTSTATIONS utilise a configurable PAK file with pre-approved standard modules, as long as the standard modules are used then the "Ulysses Build" outstation can be described as a configurable device and does not need software approval and appraisal, as long as testing and configuration is carried out as detailed by the requirements for "Configurable Devices" above

Cathodic Protection	Defined as a form of protection against corrosion utilising electrical power. Cathodic Protection is an essential component in ensuring the integrity of the gas transportation system. It is therefore intended that CP Appraisal should be included within both the mechanical and electrical appraisals, as aspects of each discipline impact upon the integrity of CP design.
Software	Defined as the design, installation, testing and commissioning of all software for electrical and instrumentation equipment, plant and systems which protect and support production, transmission, distribution and storage installations. All software contained within electrical and electrical system should be appraised by an E & I Appraiser.

COMPETENT DESIGN AUTHORITY (CDA)

Assessment
The CDA must assess the competency of Design Approvers and Appraisers in accordance with this Management Procedure

Appointment
The CDA for all disciplines defined within these Management Procedures must be a Chartered Engineer with extensive and recent relevant experience of statutory requirements, NGN operations and relevant codes of practice for equipment used by NGN. For all disciplines within this Management Procedure, the responsible NGN Director or his nominated deputy must appoint the CDA in writing. The G17 CDA register should contain the CDA's for all disciplines.

ASSESSMENT OF DESIGN ORGANISATION
Assessment and Appointment
The Design Organisation's capabilities must be assessed by the CDA. Personnel must only be considered for appointment as Design Approver when they have demonstrated the appropriate competence. A record of the assessment and any appointment must be written and made available within NGN as required.

Register
The CDA must maintain a register of Design Organisations, Approvers and Appraisers assessed and appointed by the CDA, a file of assessment reports and letters of appointment

Execution of Design Work
Personnel
The Project Manager must ensure that only Design Approvers who have been appointed and registered with the CDA for the particular discipline manage design work and approval. The Project Manager must ensure that operators of software packages for design work are trained and experienced in the use of the particular program.

Communications
Prior to commencement of the detailed design work the Design Organisation must inform the Project Manager in writing of any matters requiring resolution or clarification.

ASSESSMENT OF APPRAISERS/APPROVERS
Assessment and Appointment
The Design Appraisers and Approvers capabilities must be assessed by the CDA. Personnel must only be considered for appointment as a Design Appraiser or Approver when they have demonstrated the appropriate competency. A record of the assessment and any appointment must be written, and made available within NGN as required.

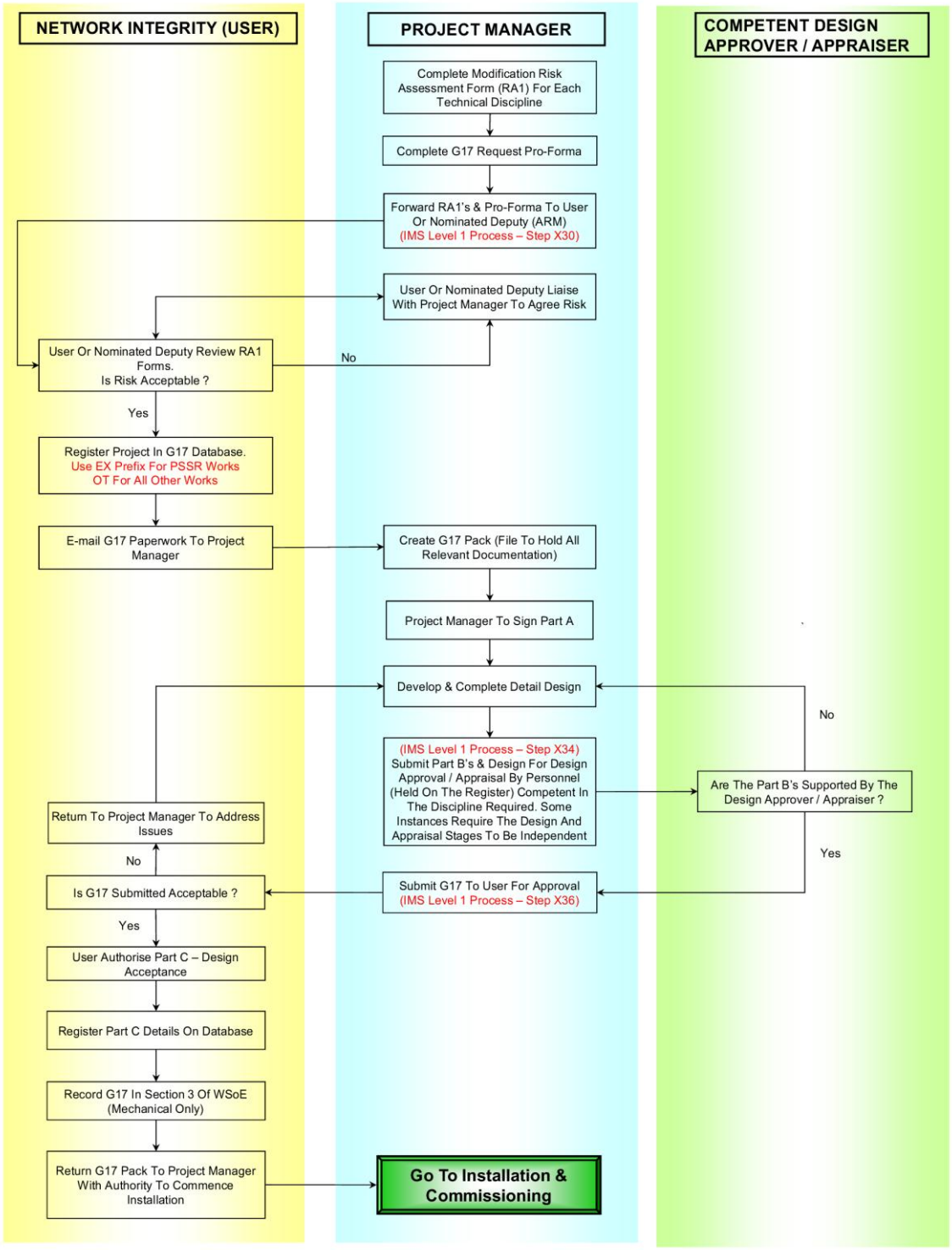
Register
The CDA must maintain a Register of assessed and appointed Design Appraisers and Approvers and a file of assessment reports and letters of appointment.

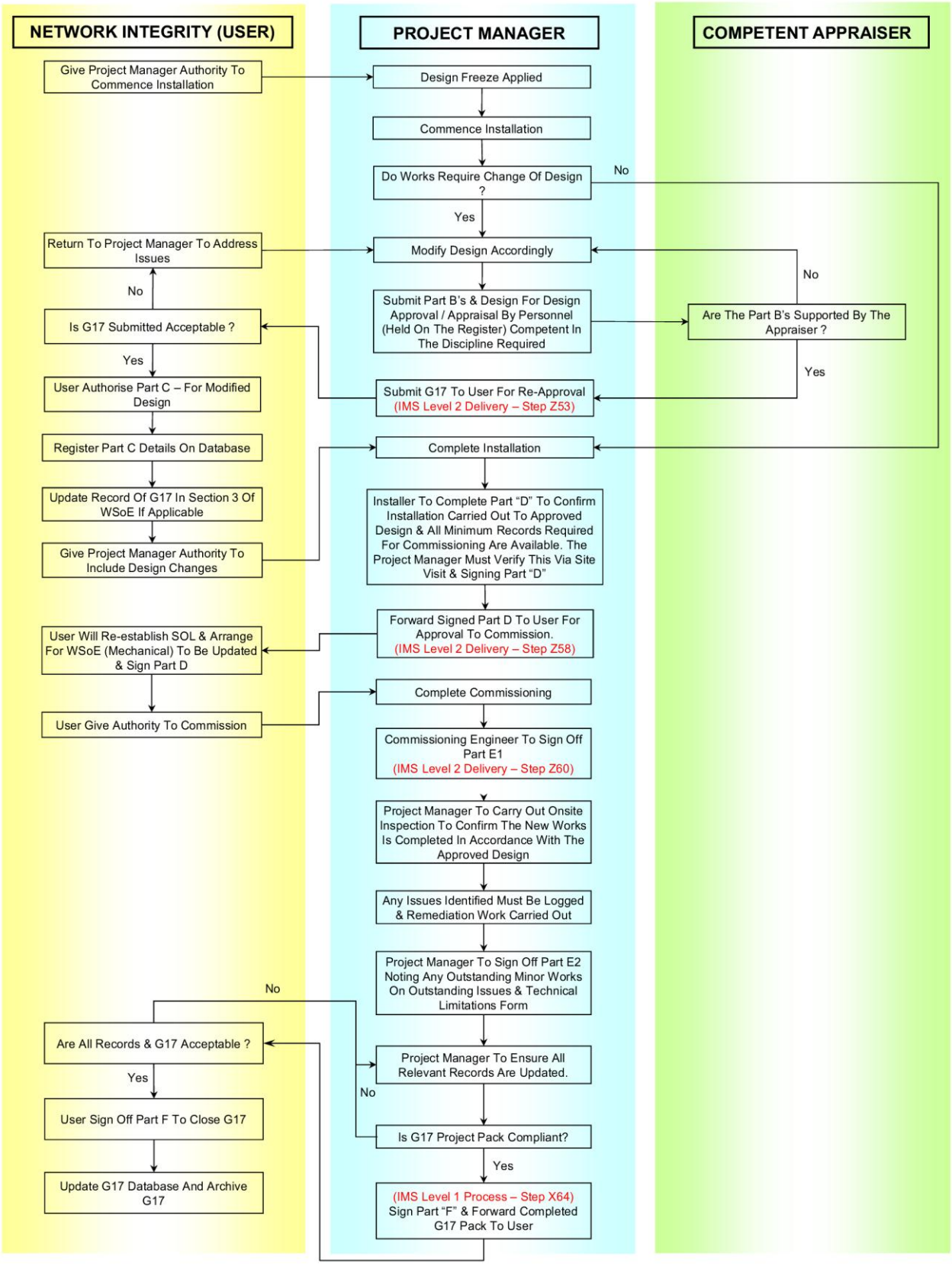
Execution of Appraisals and Approvals
The Project Manager must ensure that only Design Appraisers and Approvers, who have been appointed and registered on the database for the particular discipline, undertake the design appraisal and approval.

PROJECT CONTROL

General

There are a number of key stages in the life of a new works, modification or repair project. These key stages are shown in the following flow charts. To ensure that the project meets its overall objectives, engineering controls are required at each key stage. These controls ensure that the responsible persons agree and accept that the objective of each stage has been met. Appendix 3 contains typical forms that should be used to control the key stages of the project.




NETWORK INTEGRITY (USER)
PROJECT MANAGER
COMPETENT APPRAISER
Give Project Manager Authority To Commence Installation
Design Freeze Applied
Commence Installation
Do Works Require Change Of Design ?
No
Yes
Return To Project Manager To Address Issues
Modify Design Accordingly
No
Submit Part B's & Design For Design Approval / Appraisal By Personnel (Held On The Register) Competent In The Discipline Required
Are The Part B's Supported By The Appraiser ?
No
Is G17 Submitted Acceptable ?
Yes
Yes
User Authorise Part C – For Modified Design
Submit G17 To User For Re-Approval (IMS Level 2 Delivery – Step Z53)
Register Part C Details On Database
Complete Installation
Update Record Of G17 In Section 3 Of WSoE If Applicable
Installer To Complete Part "D" To Confirm Installation Carried Out To Approved Design & All Minimum Records Required For Commissioning Are Available. The Project Manager Must Verify This Via Site Visit & Signing Part "D"
Give Project Manager Authority To Include Design Changes
Forward Signed Part D To User For Approval To Commission. (IMS Level 2 Delivery – Step Z58)
User Will Re-establish SOL & Arrange For WSoE (Mechanical) To Be Updated & Sign Part D
Complete Commissioning
User Give Authority To Commission
Commissioning Engineer To Sign Off Part E1 (IMS Level 2 Delivery – Step Z60)
Project Manager To Carry Out Onsite Inspection To Confirm The New Works Is Completed In Accordance With The Approved Design
Any Issues Identified Must Be Logged & Remediation Work Carried Out
Project Manager To Sign Off Part E2 Noting Any Outstanding Minor Works On Outstanding Issues & Technical Limitations Form
No
Are All Records & G17 Acceptable ?
Project Manager To Ensure All Relevant Records Are Updated.
Yes
No
User Sign Off Part F To Close G17
Is G17 Project Pack Compliant?
Yes
Update G17 Database And Archive G17
(IMS Level 1 Process – Step X64) Sign Part "F" & Forward Completed G17 Pack To User

Project Key Stages

Initiation / Risk Assessment

The Project Manager shall undertake a risk assessment by answering ALL of the questions on the Modification Risk Assessment Form in Appendix 1. This is mandatory for all modifications. An assessment should be carried out for each individual discipline to determine the risk category for each discipline. The Project Manager shall also complete a G17 request Pro-Forma (Appendix 2).

The Modification Risk Assessment Form, G17 Request Pro-Forma and any supporting information should then be submitted to the User or his nominated Deputy for review. When the User accepts the risk categorisation, the project will be registered into the G17 Database, which will allocate a unique reference number and produce a G17 Paperwork Pack to be provided to the Project Manager.

The unique reference number should be used to track the documentation and project progress.

The referencing system used for NGN/PM/G/17's will be in the format WW/XX/YY/ZZZZ where:-

WW identifies the type of work and will either be EX for remedial works following a Pressure Systems Inspection or OT for all other works.

XX identifies the Network NO – NGN

YY is the year G17 raised

ZZZZ is the unique modification/repair number.

LOW RISK MODIFICATION

"Like for Like" modifications will not require a formal appraisal, however where Model Designs from NGN/PM/G19 are utilised then the pre-approved Part B Appraisals must be used. The User shall sign Part C-User Acceptance of Appendix 3, to confirm to the Project Manager the modification can proceed. The Project Manager shall retain all supporting information associated with the Risk Assessment.

Low Risk Projects shall have a suitable commissioning plan, if applicable, and where applicable the modification / asset data shall be provided by the Project Manager for update onto the asset record and work management system by the work management system team, this will be controlled by completion of Parts D to F of Appendix 3. It is essential that Part F be completed by the Project Manager and forwarded to the User, even where no records updates are required, to close out the process.

MEDIUM RISK MODIFICATION

A Medium Risk categorisation of modification shall require a formal independent design appraisal by nominated and registered G17 appraisers on the NGN G17 register.

These modifications would usually involve single discipline designs or simple multi discipline designs, the Project Manager will propose the disciplines requiring appraisal.

Note that for multi discipline designs each different design discipline must be approved by the User by signature on Part C of Appendix 3 (There will be a Part C for each discipline). The Project Manager shall retain all supporting information associated with the Risk Assessment and Modification Assessment.

Medium Risk Projects shall have a suitable commissioning plan if applicable and where applicable the modification / asset data shall be provided by the Project Manager for update on the asset record and

work management system by the work management system team, this will be controlled by completion of Parts D to F of Appendix 3. It is essential that Part F be completed by the Project Manager and forwarded to the User, even where no records updates are required, to close out the process.

HIGH RISK PROJECT

A High Risk categorisation of modification shall require both an independent design approval and appraisal by nominated and registered G17 approvers and appraisers on the NGN G17 register.

As these modifications can involve multiple designs and disciplines, the Project Manager will propose the disciplines requiring Approval and Appraisal.

Note that for multi discipline designs each different design discipline must be approved by the User by signature on Part C of Appendix 3 (There will be a Part C for each discipline). The Project Manager shall retain all supporting information associated with the Risk Assessment and Modification Assessment.

High Risk Projects shall have a suitable commissioning plan if applicable and where applicable the modification / asset data shall be provided by the Project Manager for update on the asset record and work management system by the work management system team, this will be controlled by completion of Parts D to F of Appendix 3. It is essential that Part F be completed by the Project Manager and forwarded to the User, even where no records updates are required, to close out the process.

Develop Design

The Designer must ensure that the design output package, typically the design specifications, drawings, calculations and other documentation is clearly presented. The Designer should discuss the content of the package with the Project Manager to ensure that there are no omissions and otherwise to facilitate its appraisal. A schedule of documents should, where applicable, be included within the design output package.

Design Approval (High Risk Only)

A design approval (numerically and quantitatively) should be undertaken for compliance with legislation, design codes, standards and NGN requirements. Upon completion of the design approval, the design should be formally approved prior to submission for appraisal. This design approval stage may be omitted if a pre-determined design is available e.g. for a filter or service governor. A design approval is required for larger works or for anything the User may specifically request.

Upon completion of the Design Approval, each Approver should complete the relevant Approval Report (see Appendix 4) and the part B *Design Approval form* (see Appendix 3) and categorise any comments accordingly

Design Appraisal (Medium and High Risk)

Upon completion of the detailed design stage, design output package must be forwarded to the nominated Appraisers. The Appraisers must review the drawings and other documentation within their discipline to ensure that the designs meet the required standards, and that all of the documentation required for the project is complete.

Any discrepancy identified by an Appraiser, which cannot be resolved by the Design Approver, must refer them back to the Project Manager for resolution. The Project Manager/Design Approver must address any comments made by an Appraiser and the resolution must be returned to the Appraiser for close-out.

For Major works, such as those involving the construction of new pipelines and large AGI's, then it is desirable that the Design Development & Design Approval stages are fully independent from the Appraisal. I.e. The work must not be carried out within the same company.

The User will also reserve the right to decide that for any particular project, independence of the Design and Appraisal stages are carried out as per the previous paragraph.

Upon completion of the Appraisal, each Appraiser should complete the relevant Appraisal Report (see Appendix 5) and the part B *Design Appraisal form* (see Appendix 3) and categorise any comments accordingly.

User Acceptance

The completed Part A *Initiation Form*, Part B *Design Appraisal Form,* the appraisal reports and the design output package must be submitted to the User. When the User is satisfied that all design issues have been addressed then the Part C *Design Acceptance form* must be completed and signed before the project can enter the installation stage. Note that for multi discipline designs each different design discipline must be approved by the appropriate "User" (There will be a Part C for each discipline)

See Definitions section for the appropriate User definition

The User is not giving technical approval of the modification, but confirming that appropriate appraisals have been carried out. Technical approval is the responsibility of the Design Organisation that carried out the design.

Design Freeze

Once Part C-User Acceptance, has been completed, the design is frozen and no changes shall be authorised unless the process outlined in the Design Changes section that follows has been completed.

Design Changes

The Designer shall create and manage a Design Change Control Register to record all design changes post NGN/PM/G/17 User Acceptance (i.e. Design Freeze). The Designer shall undertake a multi-discipline assessment of all design changes to determine the requirement for NGN/PM/G/17 re-approval and appraisal. The Project Manager retains responsibility for the whole G17 process and shall be informed of all design changes post NGN/PM/G/17 User Acceptance and shall consult the Design Co-ordinator on any design changes that do not require a NGN/PM/G/17 re-approval and appraisal.

As a minimum, a formal NGN/PM/G/17 re-approval and appraisal of a design may be required if the design change includes any of the following;

- Gas Engineering
- Equipment functionality / capacity
- Process parameters (e.g. pressure. temperature, flow, speed etc)
- Change of hazardous Area Zones if affecting electrical equipment or safety considerations
- Material Specification
- Stress Analysis
- Other changes at the discretion of the Project Manager
- Electrical Load increase

The Project Manager shall carry out regular reviews of the Design Change register to ensure that NGN/PM/G/17 Design re-approval and appraisals has been invoked and, where necessary, seek Part-C approval for the changes.

Installation, Inspection and Testing

The Installer must ensure that the works are undertaken in accordance with the approved design and the relevant NGN policies, procedures and specifications.

Upon completion of the installation, inspection and testing stage, any Safe Operating Limits must be verified and Written Schemes of Inspection made available as required under the Pressure System Safety Regulations together with requirements of the Electricity at Work Act and the Installer must complete the part D *Installation Completion Form*, the installation **must** then be verified on site by the Project Manager or technically competent person who should sign the Part D. (There will be a Part D for each discipline)

Part D must be signed by the User prior to commissioning. Where deemed appropriate by the User, at the time of Part C approval he may Pre Approve commissioning on the Part D, this would normally be on small Low Risk projects

Commissioning Completion

Upon completion of commissioning of the installation, the Commissioning Engineer must complete section E1 of the Part E *Commissioning Completion Form*, confirming that the work has been commissioned in accordance with the approved design

The installation must then be verified on site by the Project Manager or technically competent person who should complete and sign section E2 of Part E *Commissioning Completion Form.*

Records

On completion of the project the Project Manager must then confirm that all relevant Project documents have been received and relevant systems updated. This should be done by completing the Part F *Records Completion Form.* For High Risk projects this would include confirmation of certification as per NGN/PM/RE18. All rows must be completed, where a particular record is not relevant to the project N/A should be entered.

Once complete the Project Manager must sign the Part F and forward the completed Parts A to F of the G17, together with any other relevant paperwork etc., to the User. If everything is acceptable the User will then sign Part F of the G17 to close the G17 process

Auditing

The CDA should conduct a sample audit of the organisations carrying out Design and Design Appraisal work for the company. Audits are required in order to demonstrate:

- compliance with legislation, NGN Corporate Policy and Directives, and the Gas Requirements Manual
- that adequate management control systems are in place and are implemented
- that Health, Safety & Environment issues are properly addressed
- that a continuing improvement in application of the process is achieved
- That consistency of design appraisals is achieved.

The auditor may examine any or all of the following aspects of the appraisal process:

- how an organisation manages and controls appraisal work
- how an individual appraiser undertakes an appraisal
- how any specific or particular appraisal is undertaken and managed
- the effectiveness of a particular appraisal by undertaking a parallel appraisal
- The ongoing competence and suitability of a particular appraiser.

The audit must include examination of the organisation's understanding and application of this Management Procedure and of relevant documentation. The execution of one or more completed Design or Design Appraisal contracts should be examined in detail by means of discussion with the User/Project Manager, Design Approver and Appraiser, and by inspection of relevant documentation.

The frequency of audits should be determined by the company and must be based on content, quality and regularity of the work undertaken in accordance with the company safety management framework. The CDA should manage the requirements of the audit.

APPENDIX 1

Note: *- An assessment should be carried out for each individual discipline to determine the risk category and entered on the initiation form.*

MODIFICATION RISK ASSESSMENT – RA1		
Description of Modification Provide PIPELINE SECTION DETAILS or SITE NAME with a clear description of the work and reason. Note: Include / attach the design or modification information.		
Technical Discipline Type		
PSSR System Number	**Project Manager**	**Date**

All questions must be completed with a Low, Medium, High or N/A response

	Question	Categorisation Yes, No or N/A	Risk Response Yes, No or N/A	Outcome Low, Medium, High or N/A
1	Is the work covered by G19?	Yes – Low No - Low, Medium or High		
2	Does Replacement device / equipment have the same specification & manufacturer? *Note For E&I refer to point 15 on page 2 of NGN/PM/G17	Yes – Low No – Medium or High		
3	Is there a new design/ specification required for the modification or repair?	Yes – Medium or High No – Low		
4	Will a new or change to a hazardous area occur as a result of the repair / modification?	Yes – Low, Medium or High No - Low		
5	Is this a new Asset being introduced?	Yes – Medium or High No – Low or Medium.		
6	Will there be a change to any drawing or diagram e.g. ELD, Instrument / Electrical Loop, Hazardous Area, Drainage etc.	Yes – Low, Medium or High No - Low		
7	Does the modification or repair affect a Safety Integrity Loop?	Yes – Medium or High No - Low		
8	Will the modification alter the control panel display (Human Factors) or alarm handling processes?	Yes – Medium or High No - Low		
9	Does the modification result in a change to software settings or logic?	Yes - Medium or High No - Low		
10	Will the modification involve welding to pressure containing equipment?	Yes – High No – Low		
Assessment Outcome				

Project Manager Signature		Date	
User Agreed Risk Rank			
User Comments (Inc Allocated G17 Reference Number)			
User Signature		Date	

APPENDIX 2

G17 Request Pro-Forma

Please completed this form when requesting G17 to be raised and return with applicable Modification Risk Assessment Forms to ARM Network Integrity department

Complete all Yellow highlighted sections

NGN/PM/G/17 Request Pro-Forma	**Identify Work Type:- eg.**	**EX = PSSR Remedial Work Only**	
		OT = All Other Work	

New Works/Modification / Repair Location	

REASONS FOR NEW WORKS, MODIFICATION OR REPAIR		
Pressure System No (if applicable)		**Reason:**
Safe Operating Limits (if applicable)		

DESIGN BRIEF FOR NEW WORKS, MODIFICATION OR REPAIR

PROJECT DRAWINGS, DOCUMENTATION ETC

Required Completion Date	

	DESIGN APPROVAL &APPRAISAL REQUIRED TO SUPPORT DESIGN ACCEPTANCE			
Appraisal Type	**Design Approval**	**Design Appraisal**	**Risk Category**	**Please Indicate which Approval & Appraisal are required together with Risk Category for the Project** **Complete all Boxes – Enter N/A where Not Applicable**
Mechanical				
Gas Engineering				
Civil/Structural				
Electrical				
Instrumentation				
Cathodic Protection				
Software				

PROJECT MANAGER / INITIATOR			
Name		**Signature**	
Title		**Date**	
Postal Address			
E-mail Address			
Line Manager Name			

APPENDIX 3

NGN/PM/G/17: PART A Initiation	REFERENCE NUMBER	

New Works/Modification / Repair Location	

User		Address	
Competent Design Authority	DNV-GL	Address	Ashby Road Loughborough LEICESTERSHIRE. LE11 3GR
Design Organisation		Address	

REASONS FOR NEW WORKS, MODIFICATION OR REPAIR		
Pressure System No (if applicable)		Reason:
Safe Operating Limits (if applicable)		

DESIGN BRIEF FOR NEW WORKS, MODIFICATION OR REPAIR

PROJECT DRAWINGS, DOCUMENTATION ETC

Required Completion Date	

TECHNICAL APPRAISAL TYPE REQUIRED TO SUPPORT DESIGN ACCEPTANCE					
Appraisal Discipline	Design Approver	Approver Ref	Design Appraiser	Appraiser Ref	Risk
Mechanical					
Civil/Structural					
Gas Engineering					
Cathodic Protection					
Electrical					
Instrumentation					
Software					

PROJECT MANAGER			
Name		Signature	
Title		Date	
Address			

NGN/PM/G/17: PART B DESIGN APPRAISAL STAGE	Reference Number	

New Works/Modification / Repair Location	

BASIC INFORMATION	
Technical Appraisal Type	

DESIGN APPROVAL			
Name Of Approver		G/17 APPROVER DATABASE REF NO.	
Position Of Approver			
Address Of Approver			

APPROVAL RESULTS		
Design Approved (See Attached Report)	YES	
Comments:		

Signature Of Approver	
Date	

DESIGN APPRAISAL			
Name Of Appraiser		G/17 APPRAISER DATABASE REF NO.	
Position Of Appraiser			
Address Of Appraiser			

APPRAISAL RESULTS		
Appraisal Supported (See Attached Report)	YES	
Comments:		

Signature Of Appraiser	
Date	

NGN/PM/G/17: PART C USER ACCEPTANCE	Reference Number	

New Works/Modification / Repair Location	

TECHNICAL APPRAISAL TYPE	

User Name / Duty Holder		Address:
User Title / Duty Holder		
User / Duty Holder Signature		
Date		

Comments:

Only Applicable To Electrical TT Systems

From electrical design what is the maximum permitted Zs value: _____Ω

NGN/PM/G/17: PART D INSTALLATION COMPLETION	Reference Number	

New Works /Modification / Repair Location	
Technical Appraisal Type	

NEW WORKS/MODIFICATION / REPAIR INSTALLED IN ACCORDANCE WITH THE APPROVED DESIGN. ALL RELEVANT INSPECTION AND TESTING HAVE BEEN CARRIED OUT AND CERTIFICATION PROVIDED AS SPECIFIED BY THE PROJECT.		
Installer		**Installer Address**
Installer Title		
Installer Signature		
Date		
Safe Operating Limits Have Been Confirmed		Yes / Not Applicable
Written Schemes Of Inspection Are Available		Yes / Not Applicable
Electricity at Work Act		Yes / Not Applicable
Comments:		

PROJECT MANAGER			
High Risk Project – Certification As Per NGN/PM/RE/18	**YES / NO**		
Medium & Low Risk Projects Minimum Records Requirements	**Pipes, Mains & Services (Y/N or NA)**	**Governors Y/N or NA**	**E & I (Y/N or NA)**
As-built Records, Sketch, Valve details			
Confirmation of CP Installation			
Weld Inspection Report			
Hydraulic Test Results & Certification			
Pneumatic Test Results & Certification (Incl. Impulse)			
Certification of Conformity			
ATEX/DSEAR Compliant			
Hazardous Area Drawing On Site			
Electrical Cable Test			
Calibration			
Pre-commissioning TT only – From the design confirm maximum Zs permitted value before commissioning			Ω
Comments			

FOLLOWING ON SITE INSPECTION I CONFIRM THAT WORKS ARE INSTALLED IN ACCORDANCE WITH THE APPROVED DESIGN. ALL RELEVANT INSPECTION AND TESTING HAVS BEEN CARRIED OUT AND CERTIFICATION PROVIDED AS SPECIFIED BY THE PROJECT.		
NAME	**SIGNATURE**	**DATE**

APPROVAL TO COMMISSION			
USER / DUTY HOLDER SIGNATURE		**DATE**	

NGN/PM/G/17: PART E COMMISSIONING COMPLETION	Reference Number	

New Works /Modification / Repair Location	

E1	NEW WORKS/MODIFICATION / REPAIR COMMISSIONED IN ACCORDANCE WITH THE APPROVED DESIGN.
Commissioning Engineer Name	
Address	
Comments:	

Only Applicable To Electrical TT Systems

When Zs values are calculated, the maximum Zs value shall comply with BS7671 : 2008. (Zs = Ze + (R1 + R2))
Note: *If compliance is not achieved refer to Project Manager for guidance.*

Max permited Zs value from design _____ Ω	Max Zs value on commissioning: _____Ω

Signature		DATE	

E2	FOLLOWING ON SITE INSPECTION I CONFIRM THE NEW WORKS/MODIFICATION / REPAIR IS COMPLETED IN ACCORDANCE WITH THE APPROVED DESIGN AND COMPLIANT WITH ALL RELEVANT NGN TECHNICAL DOCUMENTS AND SPECIFICATIONS.
Project Manager	
Drawings / Documentation Provided For Records:	

Comments / Outstanding Minor Work:

(For High Risk Projects An “Technical Limitations & Restricted Operation” Form Must Be Used - See NGN/PM/RE/18)

Signature		Date	

NGN/PR/G/17: PART F. Records Completion	Reference No	
New Works /Modification / Repair Location		

All Project Documents Received By Project Manager & Relevant Systems Updated

HIGH RISK PROJECT			
	Confirmed By	YES / N/A	Signature
Certification As Per NGN/PM/RE18	PROJECT MANAGER		

MEDIUM & LOW RISK PROJECTS			
Records Updated	Update Confirmed By	YES / N/A	Signature
PSSR Drawings Updated & On Copy Site	PROJECT MANAGER		
Hazardous Area Drawings Updated & Copy On Site	PROJECT MANAGER		
All Components Labeled As Per PSSR Drawing	PROJECT MANAGER		
Site Drawings & Records (as per NGN/PL/RE/1) & On Site	PROJECT MANAGER		
CP Schedules (UPTIME)	PROJECT MANAGER		
SAP Maintenance Schedules	PROJECT MANAGER		
GIS Maps	PROJECT MANAGER		
As Laid / Strip Maps	PROJECT MANAGER		
SRP (Aerial Surveillance)	PROJECT MANAGER		
FR/1 Form / UKOPA Database	PROJECT MANAGER		
FR/2 Form / UKOPA Database	PROJECT MANAGER		
Project Databook	PROJECT MANAGER		
Electrical Drawings & On Site	PROJECT MANAGER		
Instrument Drawings & On Site	PROJECT MANAGER		
Electrical / Instrumentation “Like For Like” Record Sheets	PROJECT MANAGER		
Asbestos Register Updated	PROJECT MANAGER		
Other Relevant Records	PROJECT MANAGER		
SOL Reaffirmed	NGN ARM		
WSoE Updated	NGN ARM		
G17 Database	NGN ARM		
PSR Database	NGN ARM		
Asset Heath Database Updated	NGN ARM		
Comments:			

Project Manager	Signature		Date	
User Acceptance	Signature		Date	

APPENDIX 4

DESIGN APPROVAL REPORT FORM

CATEGORY OF COMMENTS	
A INTEGRITY	Comments under this category have system integrity or code compliance implications and must be resolved under the approval procedures.
B – DESIGN	Comments under this category relate to aspects of the design. These comments are raised to highlight an issue the Approver considers should be addressed.
C – GENERAL	Comments under this category will include minor points of interest raised for information purposes

Client:	
Address:	
Contact Telephone No:	

NGN/PM/G/17 TECHNICAL APPROVER REPORT			
Discipline			
This exercise is a check of a submitted design or modification – DETAIL DESIGN			
It DOES include the responsibility to check & approve the design.			
Location:			
G17 Ref No:			
Approver Name:		Dbase ID	
Signature:			
Address:			
Contact Telephone No			

Issue No.	Date:	Number of pages: 1 of x

G17 REF:		LOCATION:		DISCIPLINE:	
Topic	**Comment No.**	**Approver Comments**	**Cat.**	**Designer Response**	**Approver Assessment and Status**

APPENDIX 5

DESIGN APPRAISAL REPORT FORM

Northern Gas Networks

NGN/PM/G/17 TECHNICAL APPRAISAL REPORT			
Discipline			
This appraisal is an assessment of a submitted design or modification			
It does not include the responsibility to check or approve the design, although the appraisal process may involve checking specific aspects of the design.			
Location:			
G17 Ref No:		Dbase ID	
Appraiser:			
Signature:			
Address:			
Contact Telephone No			

CATEGORY OF COMMENTS
A INTEGRITY Comments under this category have system integrity or code compliance implications and must be resolved under the appraisal procedures.
B – DESIGN Comments under this category relate to aspects of the design. These comments are raised to highlight an issue the appraiser considers should be addressed.
C – GENERAL Comments under this category will include minor points of interest raised for information purposes

Client:	
Address:	
Contact Telephone No:	

Issue No.	Date:	Number of pages: 1 of x

G17 REF:		LOCATION:		DISCIPLINE:	
Topic	**Comment No.**	**Appraiser Comments**	**Cat.**	**Designer Response**	**Appraiser Assessment and Status**

APPENDIX 6

ELECTRICAL LIKE FOR LIKE RECORD SHEET

Electrical Equipment/Cable Replacement Register

Northern Gas Networks

Site /Location: | **JV:**

Sheet No. Of

CIRCUIT DESCRIPTION			LOCATION	NOTES	
EQUIPMENT TITLE / USE			PLANT No.		
MODEL No.			SERIAL No.		
MANUFACTURER			QUANTITY		
EQUIPMENT Ex CLASS:-	Zone	EEx TYPE:	GROUP :	TEMPERATURE CLASS	
CERTIFICATE No.				CERTIFICATE AVAILABLE	Drawing Number
CERTIFICATION BODY				DATE OF ISSUE	
CIRCUIT DESCRIPTION			LOCATION	NOTES	
EQUIPMENT TITLE / USE			PLANT No.		
MODEL No.			SERIAL No.		
MANUFACTURER			QUANTITY		
EQUIPMENT Ex CLASS:-	Zone	Eex TYPE	GROUP	TEMPERATURE CLASS	
CERTIFICATE No.				CERTIFICATE AVAILABLE	Drawing Number
CERTIFICATION BODY				DATE OF ISSUE	
EQUIPMENT REMOVED					
CIRCUIT DESCRIPTION			LOCATION	NOTES	
EQUIPMENT TITLE / USE			PLANT No.		
MODEL No.			SERIAL No.		
MANUFACTURER			QUANTITY		
EQUIPMENT Ex CLASS:-	Zone	EEx TYPE:	TEMPERATURE CLASS		
CERTIFICATION BODY			CERTIFICATE AVAILABLE	Drawing number	
CERTIFICATE No.			DATE OF ISSUE		

Checklist

	Initial	Remarks
1. Inspection and test results		
2. Site maintenance records updated		
3. Office maintenance records updated		
4. Drawings Updated		

Technician / Engineer

Name :-

Signature :-

Date:-

Notes :- On completion of work please send copy of this and relevant documentation to Eric Mchugh- Network Integrity.

Instrument Equipment/Cable Replacement Register.

Site /Location			JV:		

New Instrument/Cable details

Loop/Cable/Tag Number	Manufacturer	Model no	Serial No.	Certification Body	Certification No.	Zone	I.S. cable calc check Doc ref if required	Drawing Number	Description/Remarks

New Barrier details

Loop/Cable/Tag Number	Manufacturer	Model no	Serial No.	Certification Body	Certification No.	Cable Type / Length	Drawing Number	Description/Remarks

New Instrument/Cable details

Loop/Cable/Tag Number	Manufacturer	Model no	Serial no	Cetification Body	Certification No.	Zone	I.S. cable calc check Doc ref if required	Drawing Number	Description/Remarks

Existing Barrier details

Loop/Cable/Tag Number	Manufacturer	Model no	Serial No.	Cetification Body	Certification No.	Cable Type / Length	Drawing Number	Description/Remarks

Technician / Engineer

Name : -

Signature :-

Date:-

Checklist

	Initial	Remarks
1. Pre inspection and calibration results		
2. Pressure testing		
3. Revise loop drawing		
4. Site maintenance records updated		
5. Office maintenance records updated		

Notes :- On completion of work please send copy of this form and relevant documentation to Eric Mchugh- Network Integrity.

APPENDIX 7 - SITE AUDIT CHECKLIST

Quality Assurance Control check	**G17 Reference No** (If Applicable)	
Works Location		

Quality Assurance & Quality controls	✓, X or N/A	Remarks
Materials and equipment selected should be assessed to ensure safety and suitability for the conditions of use, in accordance with relevant legislation, standards, technical specifications and company policy & procedures.		
Effective arrangements should have been made to ensure that materials and workmanship are in accordance with the construction specification. All material certificates, test certificates, weld records and coat-and-wrap records should be available.		
Has modification be undertaken in accordance with design scope detailed in G17 procedure		
Does housing have a Safe means of Emergency Exit		
Updated Drawings On Site (PSSR, Hazardous Area etc)		
Are Operating procedure available		
Has a Noise assessment been undertaken		
Examination & Inspection been undertaken in accordance with company procedures.		
Pipework Condition		
Painting certificates available		
Supports installed & adequate		
Flange Protection installed		
Reinstatement		
Housings		
Security (building & site)		
Site Signage in accordance with current standards		
General Site Condition		
Additional Comments:		

Audit Carried Out By	Print Name		
Signature		Date	