

Gas to the West

Technical Advice on High Pressure Submissions

Context

The Utility Regulator (UR) is currently conducting a competitive licence application process to award the necessary gas conveyance licence(s) to extend the natural gas network in Northern Ireland. Two exclusive gas conveyance licences will be awarded, one for high pressure assets and another for low pressure assets. Rune Associates has supported UR with advice on the content of the operational business plans to be submitted by applicants.

The applicant submissions have now been received and are being evaluated against DETI Published Criteria by a three member Committee acting on behalf of the Authority. Rune Associates has been asked to provide advice regarding certain identified aspects of the three high pressure applications from BGE(UK) (connected)¹, Mutual Energy and Phoenix Natural Gas. UR has indicated that it would like Rune Associates to set out for these aspects:

1. The information and evidence Rune Associates would expect to see submitted in a strong and well-evidenced application against each of the identified headings.
2. Rune Associates' view as to the nature and quality of the information and evidence submitted by each applicant against those headings.

This following table provides responses on this basis for the identified aspects:

¹ Rune Associates has not reviewed the BGE(UK) unconnected submission but from information provided by UR following a comparison between that and the BGE(UK) connected submission, it appears that there are no material differences between the two documents



Criteria 3.17 (a) (iv): Its identification and proposals as to the management of risk

Requirements of a strong and well-evidenced submission

1. Policy and processes to identify and manage risk issues are described, including procedures to mitigate risk and monitor actions to completion.
2. Significant GTTW project and asset risk issues and mitigating control actions are identified and subject to high level management

Nature and quality of submitted evidence

BGE(UK)

1. ²Section 4.1 sets out BGE(UK)'s risk management policy, *'which is supported by a risk organisation framework and an IT enabled, risk mitigation based, risk management system for managing project, organisational and compliance risks³'*. The governance and escalation arrangements identify a route ultimately to the Board Risk Committee. Section 4.1 also identifies BGE(UK)'s HAZCON system and a guidance booklet for reporting hazards for health, safety and environmental hazards, which supplements generic procedures and risk assessments for routine activities.
2. Section 3.7.4 describes how BGE(UK)'s risk management approach will be applied to the GTTW project and indicates that they *'will manage risk through a project risk register which will be prepared during the design phase of the project'*, they further indicate that *'The risk register will include risks associated with programme, planning and permitting, material procurement, land acquisition, environment and risks associated with the construction phase. This register will be reviewed in advance of the construction start up and a specific risk register will be prepared for the Construction Phase. The register would then be updated regularly and included in the monthly reports and reviewed at the bi-weekly meetings.'* Sections 3.1.2.2 and 3.1.2.3 identify a number of high level programme and programme interdependencies risks, for which some generic responses are suggested.

The submission suggests a robust policy and supporting processes for the identification and management of risk, some high level risks which are specific to the GTTW project have been identified together with some high level potential responses. The submission does not indicate whether these specific high level risks have been identified through a full risk assessment process.

PNGL

1. Section 4.1 of the submission sets out Phoenix's risk management processes that facilitate identification and quantification of risk issues, including significant asset risk issues and also describes the policy and processes to identify and manage risk issues and the procedures to mitigate risk and monitor actions to completion. The submission provides detailed information on Corporate and Operational Risk Registers, risk assessment processes, the work of the Risk Review Committee and Network Safety Group and the role of audit in providing the Directors with assurance that

² Numbering relates to requirements set out above

³ Text shown in italics is quoted from the relevant company submission



Criteria 3.17 (a) (iv): Its identification and proposals as to the management of risk

risks identified are being appropriately managed. The submission indicates that *'It is envisaged that the risk management processes currently in operation in Phoenix would be replicated for the GTW transmission business.'*

- Phoenix indicates in the Executive Summary that *'Significant work has already been undertaken to fully understand the risks associated with the construction of the transmission pipeline and a detailed preliminary plan to deliver gas as soon as possible while minimising costs has also been produced'* There is evidence in various parts of the submission of the identification of specific risks and mitigating control actions associated with the GTW project, for example Phoenix proposes the appointment of Project Management Contractor at an early stage to *'minimise the mobilisation phase and therefore mitigate the risk of delays to the commissioning of the GTW HP Pipeline System'*.

The submission suggests a robust policy and supporting processes for the identification and management of risk, there is evidence that this approach has been applied to identify specific risks for the GTTW project and to propose mitigating control actions.

MEL

- Section 1.2.2 indicates that *"Risk identification and management is covered extensively in the business plan under three main areas: corporate level, construction specific level and operational level"*. Section 4.1.2 sets out MEL's policy and processes to identify and manage risk at board, business and project level. *'Identification of risks and assessing how they are managed is carried out by a risk register process, with the register reviewed regularly by the board and the relevant board committees'*. MEL indicates that it utilises an operational risk register that is structured *'on a preliminary hazard analysis technique to identify risks and assess their consequence and likelihood to their occurrence'*. The operational risk register documents *'the controls in place or measures undertaken to manage the risk and an assessment is made on the adequacy of the controls in place to manage the particular risk'*. MEL states that mitigating actions or controls are listed in the Remedial Action Register, which are not closed until the risk is mitigated as far as practicable.
- Section 3.7.4 indicates MEL's intention that *'Risk registers will be produced as an overall risk to the project and also for each individual pipeline. The main risk register will be produced at the outset of the project and will encompass the main risks likely to impact on either the delivery or cost of the project. Every risk will identify the likelihood of occurrence and impact. Mitigation measures will be described for each risk and will be pursued until the risk is appropriately mitigated'*. Figure 3.1.1 presents the output of an initial high level construction risk assessment, which identifies risks, impacts and potential mitigation and there is evidence elsewhere in the text of the application of risk management to the GTTW project, for example in response to the risk of delays in implementation and roll out, MEL indicates that will be further mitigated by conducting a cutover rehearsal within the pre-production environment to validate the approach and timings.

The submission suggests a robust policy and supporting processes for the identification and management of risk, there is evidence that this approach has been applied to identify specific risks for the GTTW project and to propose mitigating control actions.



Criteria 3.17 (a) (v): Its proposals as to the use of tendering arrangements

Requirements of a strong and well-evidenced submission

1. Accountability for development and management of procurement processes clearly identified in the organisation structure
2. Proposed policies and procedures to ensure compliance with EU procurement regulations set out
3. Processes, authority levels and financial controls are specified
4. Competitive tendering arrangements specified
5. Supply contracts specified for essential requirements
6. Services contracts specified for essential requirements

Nature and quality of submitted evidence

BGE(UK)

1. Section 3.1, Fig 4 – The project team includes the (named) position of Contract Manager, with responsibility for contract strategy, negotiation and management. BGE(UK)'s existing Support Services will provide procurement support for the contract arrangements.
2. Section 6.1 - Policies and procedures to ensure compliance with EU procurement regulations are described. Financial thresholds for advertisement in the EU Journal are specified.
3. Section 6.1.1 – BGE will utilise its' *'Responsible Approving Supporting Consulted Informed'* 9 step process for contract lifecycle and contract risk management. Summary details of the process are provided.
4. Section 6.1 - Competitive tendering and evaluation scoring processes are described in general terms.

Section 6.3.1 – Details of the award for the various types of contract required are provided and include construction, maintenance and specialist services contracts. The submission includes reference to BGE's experience in the award of all contract types,; *'BGE has a vast amount of experience in forming and implementing multiple construction contracts for large distribution and Transmission pipelines, above ground installations, underground installations, fibre optic and complex Infrastructure crossings. BGE have extensive working knowledge of all contract types available within Ireland and the UK market.'*
5. Section 6.2 – Provides details of the materials procurement strategy including utilisation of relevant existing framework agreements with suppliers. These agreements cover a range of materials, including pipe, and provide benefits in terms of delivery lead time and BGE bulk purchasing power. Provisional arrangements for on-site storage of pipe have been investigated and are described.
6. Section 6.1.1 – Information is provided regarding the arrangements to establish framework contracts and details of existing contracts of this type



Criteria 3.17 (a) (v): Its proposals as to the use of tendering arrangements

that can be utilised for various specialist services. Summary details of 17 Strategic Framework Contracts that are relevant to the GTTW project are included.

The submission provides detailed information regarding tendering arrangements, generally based on the application of BGE's existing policies and procedures. BGE's experience of the range of procurement requirements associated with HP pipeline construction provides confidence regarding this aspect of project delivery capability. Utilisation of relevant existing Framework contracts is a contributing factor in terms of assurance regarding project delivery capability and potential cost benefit.

PNGL

1. Section 2.2 – Existing procurement services resources within Phoenix will be utilised to provide the range of support required for the GTTW project.
2. Section 6.1 – High level details of policies and procedures to ensure compliance with EU procurement regulations are provided. Financial thresholds for advertisement in the EU Journal are specified.
3. Section 6.1 – Phoenix indicates that *'The process to be applied, and principles to be adopted, with regards to the procurement of works, supplies and services are set out in Phoenix's Procurement Procedure (FINP04, "the Procurement Procedure")*. Phoenix would propose to apply the Procurement Procedure to the GTW transmission business. The Procurement Procedure has been drafted by, and has the ownership of, the Contracts and Procurement Manager with authorisation for implementation coming from the Finance Director.' This procedure includes specification of limits of financial authority and control processes.
4. Section 6.1 - Competitive tendering and contract award processes are described at high level only with no clear evidence of consideration of a strategy to address the specific requirements for the GTTW project.
5. Section 6.2 –It is proposed that responsibility for procurement of pipeline construction materials will rest with either Phoenix or the construction contractor, dependent on the material type as indicated in the following extract from the submission.
'During the construction phase of the project, Phoenix will be responsible for, and will initiate, the procurement of materials which will be subsequently delivered "free issue" to the Construction Contractor. This will include specialist engineering materials such as linepipe, hot bends, piping, barred tees, isolation joints, ball valves, actuators, pig traps and control kiosks.' All other materials required will be procured by the contractor under the terms of the construction contract.
6. Section 6.3 – The information provided regarding the range and procurement arrangements for specialist services is high level only. Phoenix does not operate HP pipeline assets currently and, therefore, there are no references to existing framework arrangements that can be utilised in this respect.

The submission addresses the GTTW specific contracts and materials procurement requirements in high level terms only. Evidence of understanding the procurement requirements associated with HP pipeline construction and maintenance is limited. Organisational arrangements to indicate reporting lines



Criteria 3.17 (a) (v): Its proposals as to the use of tendering arrangements

and responsibility for project procurement processes are not clear.

MEL

1. Section 6.1.1 – Existing resources within SGN will be utilised to provide key procurement support for the GTTW project. High level details of accountability within SGN for procurement are provided.
2. Section 6.1.2 – Detailed information is provided regarding policies and procedures to ensure compliance with EU procurement regulations. The process that will apply to the GTTW project is outlined.
3. Section 6.1.3 – Detailed information regarding procurement processes, levels of authority and financial controls is provided for both MEL and SGN. Levels of authority are appropriately structured to support the range of expenditure approval required for the GTTW project.
4. Section 6.1.4 – High level details of the process for competitive tendering are provided and indicate an overall timescale of approximately 3 months from initiation to award.

Section 2.1.3 – This Section includes reference to the NEC suite of contracts and SGN experience of utilisation that potentially will support the GTTW construction contract award process. The submission text states *'SGN has utilised many aspects of the NEC suite of contracts for a number of years. The documents are regarded as best practice in the construction industry and through our own experiences we have adapted our contracting strategies to suit the advantages the NEC offers.'*
5. Section 6.1.4 – Information regarding procurement of construction materials is limited and is confined to the statement *'The pipe and materials will be competitively tendered to drive price and delivery times down'*. SGN has existing materials supply framework contracts that include the supply of steel pipe and fittings but there is no indication that these arrangements will be utilised.
6. Section 6.1.4 – Information is provided regarding existing SGN framework contracts that can be utilised for provision of various specialist services. Summary details of 13 framework contracts, relevant to the GTTW project, are included.

The submission provides detailed information regarding tendering arrangements, generally based on the application of MEL and SGN existing policies and procedures. Procurement support by SGN provides confidence regarding this aspect of project delivery capability.



Criteria 3.19(c): Experience of system operation

Requirements of a strong and well-evidenced submission

1. Evidence of operating experience of, and work and asset management processes for, high pressure transmission network(s),
2. Evidence of existing system operation arrangements to monitor and control high pressure transmission network(s), including control room, associated staff and procedures, SCADA and related computer applications
3. Evidence of operating high pressure transmission network(s) under Network Code arrangements and successful integration of commercial and physical operations

Nature and quality of submitted evidence

BGE(UK)

1. Sections 1.1 and 2.1 indicate BGE(UK)'s experience of high pressure transmission network operations in Northern Ireland, which includes '*the North-West Pipeline (NWP), which became operational in 2004. This is a 450mm pipeline extending 112km from Carrickfergus to supply the power station at Coolkeeragh*' and '*The South-North Pipeline (SNP) (operational 2006) is 156 kms long and extends from the landfall of the second gas interconnector (IC2) at Gormanston, Co. Meath in Ireland to Ballyalbanagh on the Northwest Pipeline*'. BGE(UK) indicates that it '*has an exemplary safety record in high pressure pipeline construction and operation as the result of its competence, capability, and experience in the industry*'.
2. Section 8.2.2.1 indicates that BE(UK) has an existing central control room operation which '*has successfully managed the gas supply and demand to the current Northern Ireland pipeline network during the record winter cold weather periods experienced in 2009/2010. During this period, no interruptions in gas supplies were experienced by Northern Ireland customers and record gas flows were transported through Beattock Compressor Station. Thus we expect it will be more than capable of monitoring and supervising the GTTW pipeline also. Grid Control will also co-ordinate emergency response activities on the pipeline*'. Section 5.5.5 indicates that '*All Installations on the proposed pipeline will be monitored via remote telemetry at BGE (UK)'s Grid Control Centre, where any deviation from the standard operating parameters may be detected and result in a call out of the local BGE (UK) Operations personnel*'. Section 5.5.8.1 provides details of BGE(UK)'s existing SCADA system.
3. Section 5.4.1 indicates that BGE(UK) operates its existing high pressure transmission networks under the single NI network code. Section 5.4.3 indicates that BGE(UK) is already a party to the Northern Ireland Network Operators Agreement, which it assumes would be a requirement for the holder of the new GTTW high pressure network licence.

The submission provides detailed evidence of BGE(UK)'s experience of system operation in the context of a high pressure network.



Criteria 3.19(c): Experience of system operation

PNGL

1. Section 1.2 indicates that *'Phoenix was responsible for constructing, operating and maintaining the Belfast Gas Transmission network for a period of c.12 years from 1996 until it was sold in 2008. Phoenix undertook the largest single transmission 'pull' across Belfast Lough which demonstrated Phoenix's attitude to using innovative solutions. Therefore although Phoenix has not been directly involved in transmission activities over the last few years, key personnel who were previously responsible for transmission are still employed by Phoenix'*.
2. Section 5.5 indicates that *'Phoenix own and operate a dedicated Network Control Room ("the control room"). A team of five Grid Controllers operate on a 24 hour seven days a week shift pattern and fall under the remit of the Asset Manager'. Staff at this control room monitor the Phoenix low pressure distribution system but Section 5.5 further indicates that from 2005, when they transferred control from National Grid until 2008 when the assets were sold, 'the control room safely and efficiently provided the control and operational monitoring' of the Belfast Transmission Pipeline, the Larne Lough Crossing and the Belfast Lough Crossing along with the three associated AGIs.*
3. Section 5.4 indicates that *'Phoenix is aware of, having once been party to, an existing TSO's agreement, the Northern Ireland Network Operators Agreement ("NINOA"), and indeed was responsible in part for its drafting. Phoenix would suggest that any new agreement builds on existing arrangements'*. Phoenix also indicates in this Section that it is aware of Network Code and commercial operations related developments including *'the single Transmission Network Code, a single Network Code to be used by all TSOs in Northern Ireland with a current proposed implementation date of October 2015'*.

Phoenix's submission provides limited evidence of recent experience of system operation in the context of a high pressure network.

MEL

1. Section 1.2.2 indicates that *'Mutual Energy has been the primary system operator for gas since the acquisition of Premier Transmission from British Gas in 2005. All gas used in NI has flowed through the Premier Transmission assets and Mutual Energy has used three different providers for the routine gas control room functions, namely National Grid, BGE, and latterly SGN'*. The Section further indicates that *"The two existing TSOs owned by Mutual Energy staff are the only certified fully ownership unbundled transmission system operators in NI and the Mutual Energy staff are the only NI based system operator staff.*
2. Section 5.5 provides details of the existing SCADA and telemetry systems plus supporting applications for grid control and sets out how it is intended these will be expanded to incorporate the GTTW pipelines. Section 1.2.2 indicates that they have secured agreement for control room services and maintenance and emergency response services, from their JV partner SGN. Section 2.1.2 also states that *'Control room services will be contracted out in line with MEL's other gas businesses. This contract is known as the Control Room Services contract and PTL currently contracts this to SGN. As part of the joint venture agreement the Control Room Services will be provided by SGN to the new company in a co-ordinated manner at commercial terms consistent with the existing contract'*.

The submission provides detailed evidence of MEL's experience of system operation in the context of a high pressure network.



Criteria 3.19 (e): Its proposals as to the securing, mobilisation and management of the internal resources necessary to construct a high pressure network

Requirements of a strong and well-evidenced submission

1. Detailed proposals are presented in a credible plan supported by evidence drawn from previous experience and are comprehensively detailed, defined and justified
2. Robust and clear organisational arrangements based on a detailed and justified rationale are set out
3. Manpower numbers and competence to manage the process are specified and credible
4. Arrangements to establish required information systems are set out

Nature and quality of submitted evidence

BGE(UK)

1. Section 3.1 – An Executive Steering Group led by the BGE(UK) Chairman has been established for the project and, to inform preparation of the submission, an initial team has undertaken consultation with key stakeholders including the Distribution System Operator, FE. BGE intends to establish the project team drawing on past experience; *‘For the GTTW project we will put in a similar project team that delivered the Northwest, South North and Kernan to Derryhale pipelines. The Project team was also located in our Antrim operational base with our field operations team.’* It is proposed that a single project team is established with firmus, an approach that has proved successful in the past. Detailed information is provided regarding the potential areas of significant benefit from this arrangement, for both the HP and the LP license projects, in terms of delivery and costs.
2. Section 3.1, Fig 4 – The Project Team organisational arrangements are described with roles clearly indicated. BGE Group functional support is also identified. Key personnel are named, CVs are provided and the interface with the FE Project Manager is indicated.
3. Section 3.7, Fig 7 – Key dedicated personnel resources indicated by the Project Team organisation structure total 8 including the Project Team Manager. Essential other expertise is provided from within the BGE(UK) Support team.
4. Section 3.5 – BGE(UK) has an existing range of information systems developed to support construction, operation and maintenance of HP networks. It is intended that these systems will be utilised for the project; *‘BGE (UK) and Bord Gais Networks already having existing systems in place such as the asset management system “Maximo” and GTMS. These are used in the Republic of Ireland and Northern Ireland and therefore we do not envisage any new systems.’*

The submission provides detailed information regarding mobilisation of internal resources that indicates capability to deliver the project. The proposals are significantly based on previous experience in undertaking similar projects, including joint Project Team arrangements with firmus that provide



Criteria 3.19 (e): Its proposals as to the securing, mobilisation and management of the internal resources necessary to construct a high pressure network

potential benefits to both the HP and LP license projects.

PNGL

1. Section 3.1 – Phoenix has limited experience in construction of HP pipeline systems and, therefore, '*has engaged with external advisors to assist in the development of a high level programme*'. It is proposed that critical activities in the mobilisation phase will be carried out by a competent external Project Management Contractor resource which will be procured post license award.

Section 3.7 – 'The initial mobilisation (or start up) stage is anticipated to be highly challenging and will require significant and robust risk management process.' The submission follows on with details of the general approach to address this risk.
2. Sections 2.1 and 3 – The information provided regarding the organisational arrangements for mobilisation/deployment of internal resources to the project is limited and not specified to any significant degree.
3. Section 3.1 - Dedicated internal manpower resources comprise 1.5 personnel only that will also be appointed post license award. Support will be provided by a Senior Manager required to manage the consolidated activities within Phoenix. Details of these roles and the competence required are limited.
4. Section 3.5 – High level details of the information systems that will be required and procured for construction, operation and maintenance of the HP system are provided. Existing systems associated with the current low pressure system license may be utilised to some degree.

Phoenix has limited recent experience in construction and operation of HP pipeline systems and evidence of capability is substantially based on organisational arrangements, policies and procedures associated with the current LP license. Mobilisation is primarily dependent on external resources and the appointment of a competent Project Management Contractor post award of license.

MEL

1. Section 3 – The submission is based on a joint venture between MEL and SGN. Under this arrangement SGN will be responsible for construction services and will provide the internal resources and competent expertise required for mobilisation. The overall proposals for mobilisation are detailed and draw on SGN's experience gained from completion of similar projects.
2. Section 2.1.2, Fig 2.1.2 - The Construction Project Team organisational arrangements are provided with roles and the relationship with the SGN structure indicated.
3. Section 2.1.2 – Responsibility to appoint the resources required for project delivery is assigned to the Construction Project Manager; '*It is the responsibility of the Construction Project Manager to appoint sufficient resources to ensure the project is delivered in accordance with project requirements. The resource required will depend upon complexity and timescales specific to the project.*'



Criteria 3.19 (e): Its proposals as to the securing, mobilisation and management of the internal resources necessary to construct a high pressure network

Information regarding estimated total manpower numbers for mobilisation is not provided.

Section 2.3.2 - Key SGN management and construction personnel are named, including the Construction Project Manager, and summary details of experience are provided.

4. Section 3.5 – *'There is no need to procure any additional IT systems as all required systems exist and are operational.'* Existing systems will be extended to include the new assets.

Section 3.7.3 – Proposed arrangements for project cost control utilise existing SGN systems as indicated by the following text - *'At the outset of the project the record system employed by SGN for record capture will be started and the records will be built up over the life of the project. This consists of a section for project management including contracts, consents, finance, approvals, EIA etc and a section for the build records. These records form part of the pipeline and PRS asset on completion.'*

MEL's partner SGN will be responsible for construction services including provision of all internal resources/expertise for project mobilisation. The detailed information provided, based on SGN's experience of completion of similar HP projects, indicates capability to provide the resources required.



Criteria 3.19 (f): Its proposals as to the securing, mobilisation and management of the external resources necessary to construct a high pressure network
Requirements of a strong and well-evidenced submission
<ol style="list-style-type: none"> 1. Detailed proposals are presented in a credible plan supported by evidence drawn from previous experience and activities are comprehensively detailed, defined and justified 2. Evidence of a detailed review of the gas load and network proposals set out in the Fingleton McAdam study 3. Credible alternatives to the high and low pressure approach proposed in the Fingleton McAdam study based on network analysis and high level cost benefit analysis 4. Robust proposals: <ol style="list-style-type: none"> a. to finalise the pipeline and AGI designs, and the pipeline route planning, including consents, easements and AGI land acquisition and to initiate materials procurement b. for preparation of construction contract tender documents, initiation of the competitive tender process and award of the construction contract c. to establish the project management team and information system
Nature and quality of submitted evidence
<p>BGE(UK)</p> <ol style="list-style-type: none"> 1. Sections 3.1 through 3.7, of the submission provide detailed information on the proposed activities necessary to deliver the high pressure pipelines and references the construction of circa 300km of high pressure pipeline in Northern Ireland in the past 10 years. BGE(UK) indicates that <i>'These pipelines have been constructed within programme and budget. BGE (UK) has achieved success in delivery of projects of this magnitude through development of strategic relationships and the suite of tendering framework agreements we have in place'</i>. The proposed approaches to project management, design, site investigation, engineering matters, environmental considerations, stakeholder engagement and construction tendering some of which will be integrated with firmus' low pressure proposals, are described in detail. Figure 5 in Section 3.1.1 shows a high level overview of the proposed programme, which draws together the activities required to secure and mobilise the necessary external resources and includes relevant key milestones. A more detailed commentary on BGE(UK)'s proposals for timely delivery of the pipelines is provided in the response to 3.19 (f) below. 2. Sections 3.6.2 and 8.4.2.1 indicate that in relation to AGI locations, <i>'the design can be optimised and have set out an alternative in Appendix E which will reduce the Transmission network and allow more customers to be connected as the Distribution feeder main increases'</i>. Appendix E is a technical note which investigates 3 options for extending the natural gas transmission pipeline in Northern Ireland, these options are listed as firstly the Fingleton McAdam design, secondly an optimised BGE(UK) design <i>'which involves changing the original route of the proposed transmission</i>



Criteria 3.19 (f): Its proposals as to the securing, mobilisation and management of the external resources necessary to construct a high pressure network

pipeline and installing a distribution network to replace some of the transmission pipeline where possible" and thirdly a review of the Fingleton McAdam design "based on minimum pressure of 12 bar'.

3. The results of the investigation of the 3 options, which was based on network analysis, concludes as follows:

- Verification modelling of the Fingleton McAdam design results in a difference in outlet pressure at the Derrylin extremity of 3%, which *'may be down to the use of different modelling tools'*.
- The BGE(UK) optimised design proposes a reduction in high pressure transmission pipeline of 11km from the proposed 169km, it also suggests that additional distribution pipework would be required in the vicinity of Omagh to balance load and pressure.
- In respect of the '12 bar' option, the Appendix indicates that *'it is not feasible based on current pipe sizes to meet minimum pressure requirements. Significant upsizing of the pipe sizes (up to 550mm), in addition to compression would be required to meet minimum pressure requirement of 12 bar, this would increase the capital cost of the project significantly.* A similar statement is provided at Section 3.1.2.2. of the submission.

4. Responses below:

- a. Section 3.1 provides information on BGE(UK)'s approach to conceptual design and indicates *'our experience from designing pipelines and understanding how the network can be optimised and the interface with the existing network. Our knowledge is unparalleled, and our network modelling capability will be key in determining the optimised final pipeline design sizes'*. Section 3.6.3 indicates that *'BGE (UK) will leverage off existing agreements from its parent organisation with material suppliers and engineering service providers'*, which will enable rapid mobilization of route planning, land and wayleave acquisition, environmental survey and material and equipment procurement.
- b. Section 3.1.1 indicates in relation to construction tendering and evaluation that BGE(UK)'s *'experience through our robust conditions of contract, detailed design process, thorough site investigations provide a concise set of tender documents that we have developed over the past 30 years, which we continually evolve to ensure we mitigate cost overruns. We include schedules of notional quantities to ensure competitive prices are in place to cater for any contract variations, should they materialize'*. A more detailed commentary on the BGE(UK)'s proposals in relation to tendering is provided in the response to 3.17 (a) (v) above.
- c. Section 3.1 indicates that *'For the GTTW project we will put in a similar project team that delivered the Northwest, South North and Kernan to Derryhale pipelines. The Project team was also located in our Antrim operational base with our field operations team'*. The submission also indicates the intention to establish a single project management team with firmus for both high and low pressure applications, *'which would reduce Design and Project Management costs'* and provide *'a single point of contact for stakeholders such as statutory bodies, third parties, and the public'*, a proposed project team structure is set out in Figure 4. Section 3.1.1 also proposes the use of existing project management information and financial systems, which are *'well defined and established within the business'*.

The submission provides detailed information related to securing, mobilisation and management of external resources necessary to construct a high



Criteria 3.19 (f): Its proposals as to the securing, mobilisation and management of the external resources necessary to construct a high pressure network

pressure network, generally based on the application of BGE's existing policies and procedures. BGE's track record of high pressure pipeline construction provides confidence regarding these aspects of project delivery capability. BGE(UK) has reviewed the Fingleton McAdam study with the use of network analysis, verifying the results and proposing a credible alternative design based on pressure regimes without evidence of high level cost benefit analysis. The rationale for the 12 bar minimum pressure option is not explained and is clearly not a credible alternative.

PNGL

1. Sections 3.1 through 3.7 provide information on the proposed activities necessary to deliver the high pressure pipelines, these include the appointment of a Project Management Contractor (PMC), route selection, land issues, environmental impacts, engineering design, planning approval, linepipe and AGI procurement and the appointment of a Construction Contractor. Phoenix has some previous experience of high pressure pipeline construction related to construction of the Belfast Gas Transmission network and indicates that it *'has engaged with external advisors to assist in the development of a high level programme. These advisors, Penspen and RPS, have considerable experience in the field of HP pipeline design, construction and commissioning. This experience ranges from environmental impact assessments to planning applications and project management, with both companies having operated as a Joint Venture 2003 to 2007 for BGE UK South / North Pipeline'*. A programme for delivery of the proposed activities is provided at Table 1 of the submission. A more detailed commentary on the Phoenix's proposals for timely delivery of the pipelines is provided in the response to 3.19 (f) below.
2. Section 3.6 indicates that Phoenix created a high pressure network model that replicated the basic configuration of the GTTW HP Pipeline System as proposed by Fingleton McAdam and a replica model to operate at Distribution Pressures and using the maximum diameters that have been employed in the Phoenix network. These models were then used to discount, or otherwise, the possibility of using Distribution Pressures pipelines as an alternative to high pressure pipelines.
3. Section 3.6 also sets out the results of the analysis, which concludes *'From this analysis, carried out by Phoenix and subject to the assumptions outlined above, there is considerable scope for substituting LP pipelines for HP pipelines. The total length of HP pipeline required would drop to approximately 66km from 169km while, based on these preliminary designs, 109km of LP pipeline would be substituted. The construction costs of LP pipelines are considerably less than the construction of HP pipelines. Indicatively Phoenix has estimated a possible net saving of c.£15m to c.£20m (this is the net effect of substituting the HP pipelines identified with the LP pipelines identified) when compared to the FMA costs'*.
4. Responses below:
 - a. Section 3.6 includes proposals to finalise the pipeline and AGI designs, which will be carried out by the appointed PMC. Phoenix indicates that it intends to undertake and complete the front end engineering design in advance of receiving final planning approval as *'This is necessary as to delay commencement of the FEED until after receipt of Planning Approval would introduce at least nine months delay into the project and possibly longer as a full construction season may be missed'*. This Section also indicates that materials procurement will be the responsibility of the PMC as will finalizing the pipeline route and obtaining consents and easements.



Criteria 3.19 (f): Its proposals as to the securing, mobilisation and management of the external resources necessary to construct a high pressure network

- b. Section 3.6 sets out Phoenix's proposals for construction contract tender documents and indicates that *'The procurement process associated with the proposed contracts for the GTW HP Pipeline System will be managed by Phoenix's Contracts and Procurement Department'*. Phoenix indicates it *'will, in conjunction with the PMC, produce an Invitation to Tender document consisting of, amongst other sections, a Contract, based upon the New Engineering Contract Three framework as specified in the Applicant Information Pack. This Invitation to Tender will be the document against which the short-listed tenderers shall be required to compile their bid'*. A more detailed commentary on the Phoenix's proposals in relation to tendering is provided in the response to 3.17 (a) (v) above.
- c. Section 3.6 indicates that *'Phoenix will appoint an Operations Manager and an Operations Engineer (the GTW Operations Manager and the GTW Operations Engineer) to work with, and supervise, the PMC. The PMC will assume the role of Project Manager; managing the overall delivery of the project and be responsible for administration, invoicing, maintaining the project programme, handling commercial and technical issues and chairing monthly Project Management meetings throughout the duration of the project'*. There appears to be no explicit mention of information systems to support project management but the submission indicates that there is a *'centralised IT department to the whole Phoenix Group, with responsibility for developing and maintaining computing services using third party providers under commercial contracts as required'*.

The submission provides information related to securing, mobilisation and management of external resources necessary to construct a high pressure network. Phoenix's track record of high pressure pipeline construction is limited and it will be heavily dependent on the Project Management Consultant that it appoints. Phoenix has reviewed the Fingleton McAdam study with the use of network analysis and proposed a credible alternative design with an indication of possible capital expenditure reductions.

MEL

1. Sections 3.1 through 3.7, of the submission provide detailed information on the proposed activities necessary to deliver the high pressure pipelines and Section 1.2.2 references the construction by MEL of the existing SNIP and Belfast Gas transmission pipelines and the experience of their partner SGN who *'has built some 120km of high pressure, 415km of medium pressure and 6,700km of Low Pressure pipelines since 2005'*. The proposed approaches to project management, route planning, design, site investigation, engineering matters, environmental considerations, stakeholder engagement and construction tendering, are described in detail. Figures 3.1.1a and 3.3.1 both show a high level project plan, these appear to contain the same activities and similar timescales. A more detailed commentary of MEL's proposals for timely delivery of the pipelines is provided in the response to 3.19 (f) below.
2. Section 3.1.1 indicates that *'It is envisaged that the section to Strabane will be suitable to lay as a below 7bar pipeline, possibly in PE100 for the majority of the route; and it is intended that this section be laid in 2016'*, no evidence of analysis is provided to support this statement nor to suggest a detailed review of the Fingleton McAdam design.
3. The sole alternative identified, the proposed low pressure pipeline to Strabane, is not supported with evidence.
4. Responses below:



Criteria 3.19 (f): Its proposals as to the securing, mobilisation and management of the external resources necessary to construct a high pressure network

- a. Section 3.6.2 includes proposals for finalization of the pipeline and AGI designs, *'which will be developed in up to three phases, Feasibility, Preliminary and Detail Design'*, the proposals include detailed processes for change controls and design freeze and approval. Material procurement will be carried out by SGN and *'The pipe and materials will be competitively tendered to drive price and delivery times down'*
- b. Section 3.6.6 indicates that *'The procurement process will be carried out by the existing SGN procurement team, who are already in place and procuring large quantities of materials for the two existing SGN group networks. The main works will be tendered as a bespoke tender under the NEC terms and conditions. The scope of the works will be developed by the designers and site supervisors with input from the environmental consultants as appropriate'*. A more detailed commentary on the Phoenix's proposals in relation to tendering is provided in the response to 3.17 (a) (v) above.
- c. Section 3.7.1 indicates that *'It is proposed that each section of pipeline be managed as an individual section with a Project Supervisor, Document Controller and Routing Engineers dedicated to each section. All sections will be overseen by the Project Manager, CDMC and Project Engineers to ensure consistency across the project and provide additional support where required'*. The Section also indicates that *'A web-based system for document sharing will be set up and co-ordinated by the Document Controller. All personnel employed on the project will have access to the system. The Document Controller will be responsible for ensuring that only the most current document is available for viewing'*.

The submission provides detailed information related to securing, mobilisation and management of external resources necessary to construct a high pressure network, generally based on existing MEL and SGN policies and procedures. MEL's partner SGN's track record of high pressure pipeline construction provides confidence regarding these aspects of project delivery capability. MEL has not presented evidence to suggest that a detailed review of the Fingleton McAdam has been undertaken to identify credible alternatives.



Criteria 3.19 (h): Its proposals as to the timely delivery of the high pressure network

Requirements of a strong and well-evidenced submission

1. Detailed proposals are presented in a credible plan, supported by evidence drawn from previous experience
2. Planned activities are comprehensively detailed, defined and justified
3. Significant project progress risk issues and mitigating control actions identified and subject to high level management

Nature and quality of submitted evidence

BGE(UK)

Section 3.1 – Proposals are detailed and based on previous experience in undertaking similar HP projects.

1. Section 3.1.1, Fig 5 – A high level overview of the programme is provided to illustrate completion of pipeline construction and commissioning over a 3 year period (as instructed by NIAUR) from award of license. Final reinstatement follows on over a subsequent 18/24 month period.

Section 3.1.1 - Based on experience of project completion timescales BGE indicate a 4 year period is required for a project of this magnitude.

Appendix B – Detailed information is provided in the form of project plan diagrams for both a 3 and a 4 year programme period. The duration of each of the discrete 110+ activities is included.

2. Section 3.1 – Detailed information is provided to define the planned activities.
3. Section 3.7.4 – The submission states – *‘BGE (UK) similar to all other pipelines will manage risk through a project risk register which will be prepared during the design phase of the project.’* Risks will be managed in accordance with BGE’s existing risk management policy - *‘This policy is supported by a risk organisation framework and an IT enabled, risk mitigation based, risk management system for managing project, organisational and compliance risks. While a project risk register will be maintained for GTTW, the project will also be overseen and supported by the Major Projects Risk Review Committee’.*

A sample of a project risk register for a recent HP project is provided in Section 3.7.4, Fig.12.

BGE(UK) has considerable experience in construction and operation of HP pipeline assets to inform understanding of the activities involved and development of the project construction programme. BGE’s proposed programme for construction and commissioning of the HP pipeline over a 3 year period is credible, but their view is that the realistic timescale required is 4 years.



Criteria 3.19 (h): Its proposals as to the timely delivery of the high pressure network

PNGL

1. Section 3.1 – Supporting information presented is high level. Phoenix has some previous experience of high pressure pipeline construction related to construction of the Belfast Gas Transmission network and indicates that it *"has engaged with external advisors to assist in the development of a high level programme. These advisors, Penspen and RPS, have considerable experience in the field of HP pipeline design, construction and commissioning. This experience ranges from environmental impact assessments to planning applications and project management, with both companies having operated as a Joint Venture 2003 to 2007 for BGE UK South / North Pipeline"*.
2. Section 3.1 – High level information is provided to indicate and describe the key activities covered by the programme to achieve commissioning of the HP pipeline within 3 years from the award of the license.

Section 3.1, Table 1 – The diagram *specifies the various key activities and the time planned for completion of each activity within the 3 year programme*.
3. Section 3 – Various Risks to the completion of the project are identified and described, including actions to mitigate, throughout the text in Section 3 of the submission but there is no summary in the form of a sample risk register.

Phoenix has limited recent experience in construction and operation of HP pipeline assets. Activity information provided in relation to the proposed construction programme is high level. The programme and has been developed with support from external expert advisors which provides a degree of credibility.

MEL

1. Section 3.1 – Proposals are detailed and based on previous MEL's partner SGN's experience in undertaking similar HP projects.
2. Section 3.1.1, Fig 3.1.1a – The programme diagram represents the high level project plan which indicates a period of approximately 3.75 years from award of license to completion of construction of the final section of the pipeline. Construction activities span a period of the final 3 years within the overall programme. Text in the submission implies that completion of construction includes commissioning the pipeline to deliver gas.
3. Section 3.1.1, Fig 1.1.b – The Table provides a detailed assessment of initial high level construction risks. The information for each risk identified comprises a risk description, programme impact, cost impact and mitigation.

MEL's partner SGN has considerable experience in construction and operation of HP pipeline assets to inform understanding of the activities involved and development of the project construction programme. The high level information provided in the submission suggests that the proposed project delivery plan is credible.



Criteria 3.21: Proposals for innovation

Requirements of a strong and well-evidenced submission

1. Demonstrable track record of identifying and successfully implementing new technology, techniques, materials, processes etc. in relation to all aspects of high pressure network development, construction and operations including environmental sustainability, operational efficiency and new sources of gas
2. Evidence of securing funding from other governmental or regulatory authorities from innovative developments
3. Credible and robust proposals to apply innovative approaches to the project

Nature and quality of submitted evidence

BGE(UK)

1. BGE(UK) has provided an Innovation and Technology Transfer document to support its application, this provides evidence of developing and implementing innovative engineering approaches including temporary filtration for pipeline pigging and pre-insulated transmission pipe as well as the introduction of mobile work management capabilities. The document also references techniques developed to support environmental sustainability including Enviroplan and Enviroops and indicates that *'These documents provide guidance to planning and assessment, operations, construction and office staff. They are easy to navigate, providing concise information and answers, with next step advice'*. With regard to the efficient use of gas, the document indicates that *'We seek to optimise the use of gas, either through technology in our pressure reducing installations in terms of fuel gas for heating, maximising the use of materials and design or mitigating pressure losses through optimally designed equipment'* and refers to the replacement of modulating boilers with modulating condensing boilers and small CHP units.
2. No evidence is provided of securing funding for innovative developments.
3. There is little evidence of specific proposals to apply innovative approaches to the GTTW project beyond those already identified in the Innovation and Technology Transfer document, this indicates that *'BGE (UK) and BGE are committed to designing, constructing and operating the natural gas network as efficiently as possible. In order to drive efficiency and create value for the gas industry we will transfer our knowledge and technology in to the Gas to the West project for the benefit of the Northern Ireland Consumer'*. There is also reference in the Executive Summary and Section 4.4.1.1 of the submission to benefits arising from *'Innovation through optimised planning and design that delivers cost and efficiency savings'* although these are not quantified, examination of alternative design proposals is part of an effective design process and in the context of gas network development, cannot be considered to be innovative.

BGE(UK) has provided evidence of a track record of innovation but little by way of specific proposals to apply further innovative approaches to the GTTW project.



Criteria 3.21: Proposals for innovation

PNGL

1. Phoenix has provided an Innovation and Technology Transfer document to support its application, this provides evidence of developing and implementing innovative engineering approaches, which as well as designing and operating the first 4 bar medium pressure network in the UK, includes the integrated flow limiter to enhance safety related to consumer supplies and the pre-assembled meter installation. The document also includes references to the development of alternative network designs to substitute high pressure pipelines with those of lower pressure, it should be noted that examination of alternative design proposals is part of an effective design process and in the context of gas network development, cannot be considered to be innovative. There are no explicit references in the document to environmental sustainability, although reductions in gas usage and emissions flowing from some initiatives are mentioned, as is Phoenix's involvement in a consortium to introduce compressed natural gas vehicles to NI. The Executive Summary of the submission references *'Phoenix undertook the largest single transmission 'pull' across Belfast Lough which demonstrated Phoenix's attitude to using innovative solutions'* and indicates that *'Within its distribution business Phoenix has undertaken innovative pipe laying techniques'*. Section 3.5 refers to *"the implementation of innovative GIS solutions"*. Section 3.6 refers to Phoenix's *'innovative proposals to replace high pressure transmission pipeline with low pressure distribution pipeline'*. Section 7.2 mentions the innovative use of social media in communicating with stakeholders referring to *'new channels of communication include a Phoenix Twitter account and a bespoke Phoenix You Tube channel'*.
2. There is no direct evidence of securing funding for innovative developments but in its Innovation and Technology Transfer document Phoenix has provided evidence of working closely with Government agencies to convert housing stock to natural gas. Phoenix indicates that it pioneered the 'Boiler Scrappage Scheme' and works closely with the Northern Ireland Sustainable Energy Programme and Warm Homes to develop the gas market.
3. There is little evidence of specific proposals to apply innovative approaches to the GTTW project beyond those already identified in the Innovation and Technology Transfer document. The Executive Summary of the submission indicates that *'Phoenix currently operates an efficient business and as such the GTW Licensed Area would immediately benefit from the innovation, improvements and efficiency gains already embedded within Phoenix's operation'*.

Phoenix has provided evidence of a track record of innovation but little by way of specific proposals to apply further innovative approaches to the GTTW project.

MEL

1. MEL has included reference to innovation by itself and its partner SGN in its submission. Section 8.4.1 indicates that *'The relationship with SGN gives access to its innovation processes developed to support the move to 'RIIO' regulation in 2013'* and Section 8.4.2 indicates that *'SGN is also very active in the field of Innovation, as evidenced by its recent success in Ofgem's National Innovation Competition. SGN has acquired major funding to support its innovation programme and is currently undertaking a plethora of field trials of new products and processes that have potential to be rolled out in order to reduce operating costs in the gas industry'*. Section 8.4.2 also provides evidence of other innovative approaches developed and implemented by SGN including those associated with Control Room operation and network simulation, Personal Atmosphere Monitors and the use of



Criteria 3.21: Proposals for innovation

ground source heat pumps for gas pre-heating. There are no explicit references in the submission to innovative approaches to develop environmental sustainability, although SGN do evidence their involvement in the construction of the UK's first Biomethane to Grid plant at Didcot Sewage Works, the submission indicates '*The pioneering works included the clean up, quality monitoring and injection to trial biomethane injection into our network. Its success has shown that contributions can be made to the transition to a low carbon economy as the productions of biogas and biomethane are carbon neutral.*'

2. Sections 8.4.1 and 8.4.2 indicate that MEL's partner SGN has achieved funding from Ofgem under the Network Innovation Competition for 2 innovation projects.
3. Section 8.4.2 indicates a number of innovative approaches that MEL and its partner SGN proposes to utilise on the GTTW project including a new Intervals methodology for on line inspection, micro CHP and thermo syphon approaches for gas pre-heating as well as application of output from the Ofgem Network Innovation projects.

MEL and its partner SGN have provided evidence of a track record of innovation and success in obtaining funding for the development of innovative approaches. They have also provided specific proposals to apply further innovative approaches to the GTTW project.

