RIIO-T1/GD1

Enhanced Physical Security Review

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Executive Summary

This report has been commissioned by Ofgem to provide analytical and costing support to the Security Enhancement Programme currently being undertaken at gas and electricity sites designated to be part of the Critical National Infrastructure (CNI) of the United Kingdom.

The findings of the author can be found under five main headings, and are as follows;

1.1 Project Management Costs

- The Security Enhancement Programme (SEP) has been in-being since 2007 but despite experience gained by National Grid (NG), their Project Management (PM) costs have risen to an average of 26% instead of showing an expected decline.

- NG have adopted the model of engaging a Project Management company to manage their Security Enhancement Programme (SEP), to manage and oversee all aspects of the contractor engagement REDACTED contracts and construction projects at any one time with the involvement of four contractors, two Civil Main Works Contractors and two Technical Contractors. This workload would be difficult to manage with an 'in house' approach as adopted by the smaller network operators

- Multi-layers of Project Management are necessary for NG when dealing with various simultaneous projects thus raising costs

- A major factor in increases to costs has been the Extensions to Time allowed through the lifetime of the project due to changes in scope of works and design and excessive delays between site commissioning and project hand-over.

- Smaller network operators have adopted an 'in house' approach to Project Management which has proved to be extremely cost effective albeit when working on smaller projects

- The average National Grid Project Management costs per week are REDACTED with Scottish Power it is REDACTED and Scotia Gas Networks REDACTED. These costs indicate the effect that a project duration has on overall costs and suggests that an average weekly cost of ± 15% of £ REDACTED for Project Management regardless of personnel would represent value for money.

1.2 General Items and Preliminaries

General items and preliminaries contain those items that are not specific to the Integrated Security System (ISS) under construction (REDACTED), but have an identifiable cost which must be included in submitted tenders.

There are numerous components which are brought together to form this section of a project but these can be divided into four main subsections the costs of which are charged on a daily or weekly basis thereby inflating overall costs the longer the duration of the project.

- Site Office/ Accommodation; Welfare Facilities; Electricity/Water/Communications Provision which are a statutory requirement for the contractor
- Provisions for Environmental Plan and Health and Safety Risks; Preparation of Risk Assessments and Method Statements also a statutory requirement
- Security Cabins and REDACTED; Temporary Barriers and Fencing which are usually dictated by the Network Operator.
- Access / Haul Road and Traffic Management often subject to Traffic Management Survey and/or local council orders.

1.2.1 Site Establishment

All NG sites are initially costed to include Site Establishment within the sites perimeter fence line. However, the demands by the Contractors for space to put the cabins required for offices, work force welfare facilities, secure storage, first aid and drying areas when coupled with parking areas, lay down areas, LGV access and turning areas and secure storage compounds for large items and site plant, can lead to large areas needed for site establishment. Extra security will be required for these compounds and project duration then becomes an important factor in determining the final cost.

To date, DNO's have been able to restrict the site establishment to on site areas, however, NG have adopted a policy where in general off site land is hired from local land owners transformed into site compound areas and returned to its former use on completion of the project.

The size and positioning of the compound and the amount of plant and cabins needed by the contractor must be prudently managed by the Project Manager employed by the Network Operator.

1.2.2 REDACTED levels

Security at the sites is the responsibility of the Operator and decided upon by a site survey and advice from CPNI, the Operator's Security Department and the Security Contractor. Following this action a Site Security Management Plan is produced which will allow flexibility should further actions be required.

The requirement for REDACTED can vary between the Network Operator and the Site Security Management Plan. SGN and Scottish Power have adopted differing systems both of which being a good value for money option. National Grid have embraced a third system with an added tier of security justified by them on the grounds that as the site has a security classification and is part of the CNI, then the extra layer of security will be employed to ensure the integrity of the site.

The National Grid solution, owing to the extra tier of security is therefore more expensive than the SGN and Scottish Power solution but lowers the risk threshold to them to an acceptable level.

Irrespective of which solution is chosen, all are adversely affected by the project duration with the highest cost ratio going to the solution adopted by National Grid.

1.2.3 Access/Haul Road and Traffic Management

Haul Roads are roadways generally constructed either side of the perimeter fence line and used to move plant around the site during the construction period without causing damage to underground pipework and services. On completion of the work the roadways are dismantled and the site returned to normal. Costs of all Haul Roads to date have been

reviewed by the Auditor who is of the opinion that they are value for money although project duration, and conditions imposed by local authorities has an adverse affect on costs.

Research has found that in general terms the costs for General Items and Preliminaries for National Grid are almost four times greater than those of SGN and UKPN

1.2.4 Fencing Costs

- The term 'fence' is a 'catch-all' which range from Perimeter Security Fencing to chain link or wooden fencing to Corner Posts, Intermediate Posts and Strainer Posts.

- Costs for fencing are encapsulated together with no differential between Perimeter Security Fence and 'other fences'

- The physical nature of a site can cause large fluctuations in fencing costs as can site location and local planning regulations

- There is no standard pricing schedule as fence costs can be for supply only, or supply and fit, including or not including the removal and disposal of redundant fencing together with any necessary civil works

- Three sources of pricing information has been collated and used to calculate a mean price per meter of perimeter fence. These are manufacturer price, tender price and actual price. Using these three sources research indicates that fencing costs can vary between as little as £ REDACTED per meter to £ REDACTED per meter depending on the complexity of the site

1.2.5 CCTV Costs

- Similar to the issues regarding fencing, cameras are many and varied with each performing a unique function, all of which impacts on costs
- A camera on its own is of little use in an integrated security system which requires other parts to produce imagery of the required quality
- Different demands dictate which cameras are required, REDACTED and what extras are required to make that camera perform to the level required
- REDACTED
- To reduce costs some contractors assemble off site and test before delivery / installation thus ensuring any faults are eliminated before site testing
- Other technical contractors will price items on a Supply, Install and Commission basis therefore individual part prices are brought together as one
- Cameras and Camera lens are constantly evolving and improving and it is anticipated that improved systems will become available for installation.
- The average price for a camera through to the point where the CCTV system is coupled with Security Management System is £ REDACTED which includes an inflationary figure of +2% although a higher inflationary figure would not be totally unexpected.

1.3 Disallowed Costs

Utilising average costs that have been quoted within this report Table 1 demonstrates overall costs that may be disallowed as a result.

This report acknowledges the fact that without detailed costing information it is difficult to make generalisations, and as demonstrated in the above Table 1 some assumptions are quite clearly incorrect. In this respect it may be appropriate to calculate the disallowance value using the average percentage produced by NGET and NGGT which is 49%, the figures produced are shown also.

Table 1

	Reopener application (£m)	Disallowance (£m)	Adjusted allowance (£m)	Disallowance 49%
NGET	391.8	59.22	332.58	192.0
NGGT	194.0	42.58	151.52	95.1
NGGD (EoE)	36.9	8.51	28.39	18.1
NGGD (Lon)	19.1	5.68	13.42	9.4
NGGD (NW)	12.9	1.42	11.48	6.3
OPEX Costs	50.6	-	50.6	
NG total	**705.30**	**117.41**	**587.89**	
SGN (Scotland)	12.70	0.19	12.51	
SGN (Southern)	33.92	0.86	33.06	
SGN total	**46.63**	**1.05**	**45.57**	
Total (NG & SGN)	**751.93**	**118.46**	**633.47**	

2. Introduction

2.1 Purpose

The Performance Audit Team at Harnser (UK) Ltd, an independent security risk analysis company, has been invited by Ofgem to provide analytical and costing support to the Security Enhancement Programme (SEP) currently being undertaken at gas and electricity sites designated to be part of the Critical National Infrastructure (CNI) of the United Kingdom.

This report presents an independent assessment of the costs relating to the below Security Enhancement Project (SEP) headings together with an overview of the possible inclusions and exclusions that can be made during the design and construction phases undertaken. The headings referred to are:

1. Project Management costs
2. General Items and Preliminaries
3. Fencing Costs
4. CCTV Camera costs

2.2 Background to the Security Enhancement Project.

The Security Enhancement Programme (SEP) was conceived in the early 2000's, by HMG, following a series of terrorist incidents, to provide an appropriate level of security at gas and

electricity sites throughout the United Kingdom, that were seen to be part of the Critical National Infrastructure.

An Agreement was reached that expenditure for this programme was recoverable from a relevant adjustment to the levels allowed in relation to Enhanced Physical Site Security Costs through existing mechanisms with the Regulator, Ofgem.

Design and construction for this Programme (SEP) which included **REDACTED** commenced in 2007 and gradually expanded from 4 sites to the number it has attained today.

The following Network Operators have indicated to the Auditors that they operate sites which will be included with the SEP:

- National Grid
- Scottish Power
- Scottish and Southern Energy
- UK Power Networks
- Scotia Gas Networks
- Northern Gas Network
- Western Power

It is from the knowledge gained from working within this scope of works over the last 8 years that Harnser Group (formerly Economic Security Consultants Ltd - ESC) have been able to formulate the basis of this report which has been prepared at the request of Ofgem.

3. Project Management Costs

Project Management is the application of processes, methods, knowledge, skills and experience to achieve the project objectives, these skills can be dispensed by an individual person or a company which has been made responsible for all aspects from inception to closure of the project.

A project is a unique, transient endeavour, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget.

The levels of Project Management vary greatly between Operators/Contractors and it is a complex issue which could and should be made easier with an examination of those posts and responsibilities that are required. Once again it must be the responsibility of the Operator to ensure that the levels of manpower adopted by the contractors are in line with site requirements.

It has been noticeable throughout the Security Enhancement Programme thus far that the smaller Transmission and Distribution Network Operators have been able to progress without the need for large project management teams and their associated costs while National Grid and their contractors have attracted much higher overall costs.

An examination of the possible reasons behind these anomalies have indicated that:

1. The length of the construction contract directly impacts on the level of project management fees charged.
2. The type of contract between contractor and client has a direct impact on the level of fees.
3. All Network Operators have similar on site management responsibilities i.e. Staff costs, Legal costs and site management costs.

4. Smaller Network Operators have been able to manage the Programme by utilising in a relatively small number of in house staff to manage the Contractor(s).
5. National Grid has considered it necessary to engage the services of a Project Management Company (REDACTED) to manage their Programme.
6. The engagement of Agency staff to fill vacancies within the Project Team will have been done at enhanced rates.

It is the requirement by National Grid to employ the services of a Project Management company throughout the Programme thus far that has seen costs rise to an average percentage level of 26%, a sum which should be reduced by the following factors.

1. The Programme has now been running since 2007 and yet the experience gained is not reflected in reduced costs.
2. The Programme does not now require formation costs.
3. Personnel levels have not noticeably diminished.
4. Projects are still over – running despite high levels of project management.
5. The delays between site commissioning and the final project hand over date are excessive causing extended project management costs.

In analysing the aforementioned paragraphs they demonstrate that in any one Project there are three layers of Project Management.

1. Contractor Project Management
2. Network Operator Project Management
3. Programme Project Management

3.1 Contractor Project Management

Contractors employed by Network Operators to undertake projects within the Security Enhancement Programme maintain two or three layers of Project Management teams:

- Detailed Design
- Off Site
- On Site

The below diagram sets out an elementary On site and Off site project management structure.

Although this is a rudimentary diagram it demonstrates the crossover within tasks that have to be undertaken by personnel from both disciplines. Included at Annex 'A' (pages) are a list of the Project Management positions together with a list of the responsibilities that these personnel have. These lists are not definitive, other factors may be included depending upon the project and the size of the management team.

REDACTED

Detailed Design Project Management positions may be but not restricted to the following:

- Project Engineer
- Project Manager
- QA Advisor
- CDM Co-Coordinator
- Planner/Programmer
- Safety Advisor
- Administration Clerk

Off Site Project Management positions may be but not restricted to the following:

- Project Manager
- HSQE Manager
- Planner
- Buyer
- Design Co-Coordinator

On Site Project Management positions may be but not restricted to the following:

- Site Manager
- Site Engineer
- F/T Site H & S Officer
- General Foreman
- Quantity Surveyor
- Environmental Officer
- Quality Advisor

3.2 Network Operator Project Management

The Network Operator will provide a number of management personnel to oversee all construction work taking place on High Pressure Gas Sites and High Voltage Electricity Sites. Their primary duty is to ensure the safety of the work force during the day to day working of the sites which remain operational throughout the entire construction period. This responsibility is shouldered by:

1. Site Engineer

2. Permits Officer

The additional management costs experienced by the Operators include, but are not restricted to:

- Senior Project Manager
- Legal Department and/or Contract management costs
- Asset Management costs
- Finance Department costs
- Security Department

3.3 Programme Project Management

Network Operators have adopted two methods of managing the Security Enhancement Project (SEP).

1. The utilisation of in house personnel to oversee the project and Contractor Project Management Teams. This approach has been adopted by those Network Operators who operate a small number of sites REDACTED and has generally been viewed as extremely cost effective.
2. The employment of a Project Management company to manage the SEP and oversee all aspects of the Contractor engagement from the initial tender to contract completion. This approach has been adopted by National Grid and has inevitably led to high project management costs.

The In house supervision approach has been adopted by four Network Operators, including Scotia Gas Network, and has proved, thus far, effective in managing the projects and keeping the Project within budget.

The Project Management company approach has been adopted by National Grid to manage between REDACTED contracts and construction projects at any one time, with the involvement of four contractors, two Civil Main Works Contractors and two Technical Contractors. This workload would, quite clearly, be difficult to manage if given to in house personnel.

The experience gained from auditing the completed sites thus far, has shown that the major factor in increases to costs has been the Extensions to Time allowed through the lifetime of the project due to changes in scope of works and design.

Another factor in the calculation of Project Management costs is the decision by National Grid to adopt a weighting process for “Project Services” and “National Grid – Associated Costs”. All costs, for sites within a given geographical area, are placed into one account and allocated to the sites by using a weighting formula.

3.4 Methodology

The data used to produce the costs quoted below is drawn from similar sources and therefore remains "Commercial in Confidence" information.

The 3 x Tables below highlight the points raised in the above section, indicating the overall Project Management Costs in comparison to the VFM 2 total costs across 3 x Network Operators.

All Project Manager total costs quoted in the below tables comprise, where appropriate, of Contractor PM costs, Operator PM costs and PM Company costs (REDACTED)

Also highlighted, in particular, is the influence that Project Duration has on the overall project management fee and the lack of correlation between the percentage of total project costs and the overall project management fee.

National Grid operated sites:

Table 2
REDACTED
Scottish Power operated sites:

Table 3
REDACTED

In the VFM 2 Reports completed for these sites, PM costs which are between REDACTED % and REDACTED % refer only to Contractor PM costs.

For the RIIO Report, all aspects of PM costs have been included which include:

1. Design
2. Contractor
3. Engineering
4. On site junior management and transport.

This produces the parameters shown in Table 3 of between REDACTED % and REDACTED %.

Scotia Gas Network operated sites, VFM 1 prices quoted:

Table 4
REDACTED

The above 3 Tables produce average figures of:

Table 5
REDACTED

These figures again indicate the effect that project duration has on the overall costs and suggest that an average weekly cost of ± 15% of £ **REDACTED** for Project Management regardless of personnel would represent value for money.

3.5. Case Study

REDACTED is a shared site operated by NG and SGN, the perimeter fence line for SGN is **REDACTED** metres while the perimeter for NG is **REDACTED** metres.

Due to the different PM methods outlined above the total Project Manager Costs for National Grid are:

REDACTED Project Management Costs – National Grid

Civil Construction	**REDACTED**
Technical Construction	**REDACTED**
Project Services and NG costs	**REDACTED**
Total	**REDACTED**
Total Project Cost	**REDACTED**
Percentage of Total Cost	**REDACTED**
Design Costs	**REDACTED**

REDACTED Project Management Costs – Scotia Gas Networks

Total Project Cost	**REDACTED**
Total Project Management Costs	**REDACTED**
Percentage of Total Cost	**REDACTED**
Design Costs	**REDACTED**

An initial response has been forwarded to National Grid concerning the quoted costs, a reply is awaited.

4. General Items and Preliminaries

General items and preliminaries contain those items that are not specific to the Integrated Security System (ISS) under construction (REDACTED), but have an identifiable cost which must be included in submitted tenders.

General items and preliminaries relate to cost-significant items required by the method and particular circumstances under which the ISS work is to be carried out, and those costs associated with the overall project rather than specific ISS sections. These costs may be 'fixed' such as the cost of delivering and erecting site accommodation (and subsequent removal), or 'variable' such as electrical supply and maintenance costs for the accommodation.

The main components which are brought together to form this cost section of a construction project include, but are not limited to:

- Site Office / Accommodation
- Welfare Facilities
- Electricity / Water / Communications Provision
- Project Management Costs
- Provisions for Environmental Plan and Health and Safety Risks
- Preparation of Risk Assessments and Method Statements
- Security Cabins and REDACTED
- Temporary Barriers and Fencing.
- Access / Haul Road and Traffic Management

Once again General Items and Preliminaries together with Project Management are time relative and the overall cost depends very much on the project duration. Each of the cost headings are charged on a daily or weekly basis and charged to the project by the Main Works or Principal Contractor.

The above list can be brought together under four headings with Project Management Costs fully explained in Section above.

These four sub sections are:

1. Site Office/ Accommodation; Welfare Facilities; Electricity/Water/Communications Provision.
2. Provisions for Environmental Plan and Health and Safety Risks; Preparation of Risk Assessments and Method Statements
3. Security Cabins and REDACTED; Temporary Barriers and Fencing.
4. Access / Haul Road and Traffic Management

4.1 Site Office/ Accommodation; Welfare Facilities; Electricity/Water/Communications Provision.

On all construction projects there are statutory requirements for contractors to supply their workforce with the following:

1. A secure site
2. Clean and hygienic amenities
3. First Aid and Emergency facilities
4. An area free from dangerous or hazardous substances and clear of dangerous obstructions
5. An area posted with the right signs and notices

6. The maintenance of the right registers and forms for work on the site
7. A site induction process
8. A Health & Safety representative together with the identification of safety needs throughout the duration of the project.

The siting of a Site Compound should be undertaken within the existing site, however space may be found on land adjacent to the site either owned by the Network Operator or by a third party. If this is the case then clearance may be necessary and conversely reinstatement required at the end of the project.

Site Establishment is, in the experience of the VFM Auditor, a cost that lends itself to abuse, by the size and amount of plant and cabins needed on site and once again by project duration.

The size and positioning of the compound and the amount of plant and cabins needed by the contractor must be prudently managed by the Project Manager employed by the Network Operator. Unfortunately the mechanism is not in place for the VFM Auditors to undertake site visits during the construction process, however, briefings suggest that contractors employed by National Grid, as opposed to other Operators, have site compounds which are extremely large and require off site land usage.

National Grid does not believe the site establishment costs are excessive. The rates are based on competitive tender events, and are therefore in line with market rates which have been judged as 'value for money'. However it is apparent from the final costs that although the rates are value for money the duration of the project, as impacted by the complexity of the construction work where it extends the project through Extension of Time applications, govern high total costs. It is the hire of Plant, Cabins, Generators, Services and REDACTED for the Site Compound together with land lease which constitute the main body of costs for a site establishment.

It is noted that in the answer to Question 1 – 6, NG state that:

"The efficiency savings that are embedded into future costs means the future site establishment costs are lower cost than the historic costs."

This statement lends itself to challenge that NG now realise that historic costs were excessive and further that it has taken the experience of approximately REDACTED sites to reach this conclusion and act upon the findings.

4.2 Provisions for Environmental Plan and Health and Safety Risks; Preparation of Risk Assessments and Method Statements

There are a number of surveys, plans and statements that are required by law before the commencement of a construction project.

4.3 Security Cabins and REDACTED Guarding; Temporary Barriers and Fencing.

REDACTED Guarding levels are dictated by the Network Operator and the Site Security Management Plan as amended by local factors and the advice received from security institutions.

SGN have adopted REDACTED to site security, while Scottish Power REDACTED; both these options being a good value for money option. National Grid have generally adopted a REDACTED, however, the Company has further stated that as the site has a REDACTED and is part of the CNI, then while the Perimeter Fence and REDACTED are decommissioned then extra REDACTED guarding will be employed to ensure the integrity of the site.

Whichever solution is selected the cost will depend upon the sizes of the breach of the perimeter fence together with the number of breaches, these factors will determine either the amount of REDACTED.

This solution is then an expensive response to an in house demand, which it is difficult to fault for fear of an intrusion taking place and furthermore it lowers the risk threshold to a level that is acceptable to National Grid.

Once again these solutions are all adversely affected by the project duration with the highest cost ratio going to the solution adopted by National Grid.

The key inputs for pricing the options costed by NG for temporary security are the cost of REDACTED guarding (typically REDACTED, which would equate REDACTED on a 24/7 basis) and the cost of installing and running REDACTED With duration a major factor impacting on this cost, installing a hybrid solution (REDACTED) should still provide a substantial saving.

4.4 Access/Haul Road and Traffic Management

Haul Roads are roadways generally constructed either side of the perimeter fence line and used to move plant around the site during the construction period without causing damage to underground pipework and services. The roadways are constructed using either wood, metal or composite material and placed in situ by the Civil Works Contractor, on completion of the work the roadways are dismantled and the site returned to normal. Costs of all Haul Roads to date have been reviewed by the Auditor who is of the opinion that they are value for money.

Once again this solution is adversely affected by project duration where any delay will cause additional hiring fees.

Many of the sites which have been classified as part of the CNI network are sited in REDACTED fed by a narrow road system which requires a Traffic Management Survey to ensure that all road traffic can approach and leave the site safely with little disruption to local residents. Indeed local council authorities will insist on certain measures to deal with local issues such as road closures, traffic calming measures and road-sweepers.

4.5 Methodology

The data used to produce the costs quoted below is drawn from similar sources and therefore remains “Commercial in Confidence” information.
The 3 x Tables below demonstrate the spend on General Items and Preliminaries by Scotia Gas Networks and National Grid. It must be noted immediately that the costs for SGN are those that have been presented for VFM 1 Audit review while those for National Grid are those calculated for VFM 2 Audit Review. The difficulty being that those for VFM 1 review are those costs for items as outlined in the section above while those used for VFM 2 review represent those costs together with many other costs that do not readily fit into any other cost heading.

It is these other ‘cost headings’ that skew average cost calculations as they are legitimate expenditure, which must be included in the overall total but that do not sit readily in any cost section.

The below tables readily demonstrate this anomaly and furthermore amply demonstrate the influence Project Duration has on the overall calculations.

Costs for General Items and Preliminaries for SGN.

Table 6

REDACTED

Costs for General Items and Preliminaries for National Grid.

Table 7

REDACTED

Average costs across both Network Operators together with UK Power Networks:

Table 8

REDACTED

The perimeter size of the site may impact on costs in various ways and may impact on duration depending upon the complexity of the structure required, for example is the old sill and fence remaining in situ or will it be demolished entirely and replaced with a new construction. Duration may impact further if unknown services are discovered laying across or alongside the perimeter fence line.

5. Fencing Costs

The term "fence" within the context of this price review should be taken as the 'Perimeter Fence' which is defined as a structure that circles the perimeter of an area to prevent access, but does not include:

1. Vehicle, Pedestrian or Emergency Gates.
2. REDACTED.
3. REDACTED.

The term Perimeter Fence will include the following:

1. Corner Posts – these posts are installed along the perimeter fence line at those points where the fence line changes direction. REDACTED

2. Intermediate posts –these posts are installed along the perimeter fence line at the start and end of each fence panel (REDACTED).

3. Strainer Posts – REDACTED.

Depending upon the interpretation of the term "Fence" adopted by a Network Operator, it must be pointed out that there are a number of examples of "Fence" which are legitimately installed on site but which do not come under the definition of the term 'Perimeter Fence'.

The costs of these other fences may, understandably, be included under the heading "Fence" but do not fall under the definition of the term 'Perimeter Fence'. Examples of other fences that have been installed on sites thus far in the Security Enhancement Programme are:

1. External demarcation fences which allow for the construction of a sterile zone in front of the Perimeter Fence. REDACTED

2. Internal Citadel Fencing – at some sites, on site buildings have historically been constructed of a REDACTED.

   REDACTED

   The costs of this fence may, understandably, be included under the heading "Fence" but do not fall under the definition of the term 'Perimeter Fence'.

3. Other Fences – these are on and off site fences constructed within the terms of the Construction Contract:

   a. To replace those fences necessarily dismantled on and off site during the construction
   b. To demarcate those areas of land purchased during the construction project.
   c. To demarcate public rights of way on land that is adjacent to the site after changes to the Perimeter Fence Line.
   d. To protect high value/long lead items on site.

A number of further factors should be taken into consideration when viewing the cost per metre of the "Fence":

1. Whether prices quoted are for supply only or to supply and install.
2. The type of fence fabric that is planned for installation, REDACTED
3. Whether there are local planning regulations that dictate fence type, colour or height.
4. Whether there are external factors that dictate changes to the standard fence design.
5. Whether the main works contractor has fence installers within the work force or whether Sub Contracted Fence Installers have to be employed.

5.1 Methodology

Three sources of pricing information has been collated and used to calculate a mean price per metre of perimeter fence. These sources are:

1. Manufacturer prices; costs per metre as supplied by manufacturers
2. Tender prices; prices per metre as supplied by companies tendering for contracts.
3. Actual prices per metre as charged for supplying the fencing material.

All the above three categories of prices have been supplied to the Harnser Group on a "Commercial in Confidence" basis, during private contracts, undertaken by the Group, in

Designing, Project Managing and Auditing security construction projects in the United Kingdom and throughout Europe.

This collation of information from the different sources, contractors and manufacturers has demonstrated the complexity of the prices and the various 'other items' that have been included in the overall costs. It is these complexities that have been outlined in paragraph 5.1 above.

Site visits by the Harnser Group Audit have shown examples of the different types of fences involved and why those different types of fencing material were required. The visits have also demonstrated that the size of the site and its shape has a direct impact on the cost per metre, requiring more posts for a polygonal shaped site as opposed to minimal posts for a rectangular site. Larger sites will by definition dictate that the **REDACTED** requires more zones and more gates and therefore more strainer posts, again impacting on the overall cost per metre.

Table 9 below demonstrates a sample of the fencing costs per metre as submitted by the Network Operator for the VFM 1 Audit review. It must be highlighted that the wording used for this price heading is 'Fencing and Barriers' and therefore any Drop Arm Barriers and installation costs will be included together with any dismantling and disposal costs of fence material.

Table 9
REDACTED

Three sites are highlighted which immediately demonstrate the site complexities increasing the overall cost of the fence per metre and further show that a different method of cost allocation also impacts on the overall price.

REDACTED

1. A high bank next to the site required an improved design, the costs of which are included under the "Fence" heading
2. **REDACTED** metres of fence line had to be increased to **REDACTED** due to advice from CPNI.
3. The local council required that the fence was to be painted/powder coated black.
4. An Intermediate strengthening bar had to be included for additional support.
5. The costs of an Access Haul road during construction of the fence were included under the "Fence" heading.
6. A total cost of **REDACTED** associated with civil works in relation to the fence were included under the "Fence" heading.

REDACTED

1. Specification changed on advice from CPNI from REDACTED fence
2. Additional labour costs to construct REDACTED priced separately
3. The costs of an Access Haul road during construction of the fence were included under the "Fence" heading.

REDACTED

1. Civil works associated with the construction of the fence totalling REDACTED are included under the "Fence" heading.

The removal of these three sites from Table 8 immediately reduces the average cost per metre to £ REDACTED a reduction of REDACTED.

Fencing Costs quoted for those sites operated by Scotia Gas Networks include the installation of a concrete sill and the demolition and disposal of the old fence.

Table 10 below shows the average price per metre of three fencing fabrics:

Table 10

REDACTED

This indicates that the average cost to supply and install perimeter fence per metre regardless of fabric is REDACTED.

Table 11 demonstrates the fencing costs per metre to supply and install on site fencing and posts regardless of the fence fabric, length and overall shape of the perimeter fence line.

Table 11
REDACTED

This indicates that the average cost to supply and install a fence per metre regardless of fabric is REDACTED. This average cost is higher and may be attributed to changes in specification to the perimeter fence make up including the posts.

6. CCTV - Camera Costs

The costs that are included within this cost heading are totally dependent on the definition of the term "CCTV - Camera Costs" and the parameters that this term is meant to encompass. The basic camera will be of little value to the overall Integrated Security System without the addition of other parts which gradually come together to produce an image of the quality required.

Different demands for CCTV coverage demand different combinations of parts attached to the camera and it is these combinations which fall under a number of different titles, these are:

1. REDACTED.

The above camera types are designed and constructed to fulfil specific on site requirements and are installed, where required, following the completion of a detailed CCTV survey. Subsequent Technical Audits by the Centre for Applied Science and Technology (CAST) ensure that the design and installation fully complies with the Site Specific Operational Requirement (SSOR).

REDACTED

6.1 Methodology

There are a number of factors that must be taken into account when viewing costs for Camera Systems submitted by Contractors.

1. Contractors will assemble the Camera Systems off site and test before delivery and installation thus ensuring that any faults are eliminated before site testing.

2. Many technical contractors will price technical items on a Supply, Install and Commission basis and therefore individual part prices are brought together as one.

Table 12 below demonstrates the cost of individual cameras together with the standard lens installed on sites and averages the cost as **REDACTED**.

Table 12

REDACTED

However the cost will increase proportionately with improved lenses fitted for specific tasks raising costs to levels in excess of **REDACTED**.

3. Cameras and Camera lens are constantly evolving and improving and therefore following advice received it is anticipated that improved systems will become available for installation.

Table 13 below demonstrates the wide range of prices for fully fitted and other types of cameras currently being installed on sites and further demonstrates the need for precise parameters to be set on pricing models.

Table 13

REDACTED

Table 14 demonstrates the cost per camera using the data provided by the Contractor on the VFM 1 Audit Review document included with the VFM 1 Audit Report. This data will include the costs of all items from the camera through to the point where the CCTV system is coupled with Security Management System.

Table 14

REDACTED

A inflationary figure of +2% per year has been included on most figures, this is a speculative amount and should be treated as such, product prices may fluctuate even more so suggesting a rise of between 15% and 20% would not be unexpected.

7. Review of Network Operator Submissions

Two Network Operators have tendered documentation relating to the Physical Security Upgrade Programme Re-opener Submission for May 2015. These Operators are:

- National Grid (NG)
- Scotia Gas Networks (SGN)

7.1 National Grid

7.1.1 Project Costs

In total, the submission amounts to £705M (in 2014/15 prices) of Totex costs over the total RIIO period, which includes total savings of £425M (or 38%). £305M (27%) of these savings have been achieved through implementing operational and hybrid solutions. £120M (11%) of the savings are forecast to be achieved through new strategies to deliver the physical security works at sites. The submission comprises of £655M of Capex and £50M of Opex and covers National Grid's Electricity Transmission, Gas Transmission and Gas Distribution businesses.

The Re opener Cost Tables submitted by National Grid have been reviewed and indicate the following as shown in Table 15.

Table 15

REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED				REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED				REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED				REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED				REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
REDACTED				REDACTED
REDACTED				REDACTED

Within Table 16, captured within the NGET and NGG TO, are 9 sub sections which have been designated to be not allocated; these are listed in Table 16 below.

Table 16
REDACTED

Table 15 demonstrates that NG are claiming a total of £578.2m to construct an enhanced security system at a total of **REDACTED** sites, this produces an average cost per site of **REDACTED**. Further analysis demonstrates that the average cost per electricity site is **REDACTED** while the average cost per gas site is **REDACTED**

The Auditors have currently completed VFM 2 Audits at **REDACTED** electricity and gas sites across the **REDACTED** with a total auditable value of **REDACTED**; this produces an average cost per site of **REDACTED**.

Therefore, overall, project costs have risen by approximately 20%.

A rise in construction costs of 20% is almost acceptable however a rise of 20% across all facets of the project is excessive suggesting that little effort has been made to rein in those facets that cause extensive price increases.

7.1.2 Project Management Costs

Table 17 below contains information drawn from the Site Survey Reports completed by NG together with the Re-opener Cost Table – Cost Breakdown. Each of the 7 sites were picked at random, however they have demonstrated the following two points.

1. Each of the sites have differing durations and this table clearly demonstrates the impact of this on the total Project Management Costs.
2. The total Project Management sum is at least twice the sum quoted by NG once the PM Costs incurred by the Contractor are taken into account. This point has been described within section 3 of this report.

Table 17
REDACTED

This sample table indicates that the average NG Project Management cost is **REDACTED**, using the figures provided by NG in the Re-opener Cost Tables the average across all sites that have to be constructed is **REDACTED**.

Table 17 indicates that the average costs for Civil and Technical Project Management is **REDACTED**. This in turn indicates that a total Project Management sum across all **REDACTED** x "to be constructed" sites as **REDACTED**.

Table 15 indicates that the average cost of enhancing the security on site is **REDACTED**. Civil and Technical PM costs as produced in Table 17 indicate that constructor PM costs alone represent 22.77% of the total. The average Constructor PM cost between SGN and Scottish Power is 12.65%.

Utilising this figure the NG average as indicated in Table 17, REDACTED should be reduced by REDACTED to REDACTED. This will produce a reduction across all REDACTED sites of REDACTED

The total NG Project Management cost in the Re-opener Cost Tables submitted by NG for completed sites REDACTED (columns AX and AY on Tab B1 Cost Breakdown).

REDACTED

In recent submissions to the VFM Auditor, Network Operators have employed a team comprising of a Project Manager and Quantity Surveyor to manage one or several sites, overseen by a Senior Project Manager working together with a Security Manager.

Allowing a 2 year window to complete each site it would not seem unreasonable for a team to complete REDACTED sites per 2 year period or REDACTED sites between 2015 and 2021. In order to complete REDACTED sites in the period allowed 5 teams would be required, 10 personnel together with the Senior Project Manager and Security Manager making a total of 12 personnel.

An average cost of £ REDACTED per day for each person whilst accepting that REDACTED days per year are worked evaluates to an annual wages bill of REDACTED which in turn equates to a total wages bill for the period 2015 to 2021 of £8.4m.

The below Table 18 demonstrates the disallowance value achieved by adopting the aforementioned method. The Disallowance Value is achieved by including the following sums per site:

£ REDACTED Contractor PM Costs
REDACTED NG PM Costs

Total Disallowance REDACTED

Table 18

Company	Number of Sites	Total PM claimed (£m)	Disallowance (£m)
NGET	REDACTED	128.11	11.71
NGGT	REDACTED	85.41	7.81
NGGD (EoE)	REDACTED	17.08	1.56
NGGD (Lon)	REDACTED	11.39	1.04
NGGD (NW)	REDACTED	2.85	0.26
NG total	REDACTED	**244.84**	**22.38**

The authors of this report are aware that there will be an element of double accounting when viewing the overall savings that can be made as described in Section 7.1.2 above and the savings that can be made as described within this section.

All financial data used in compiling these Tables 17 and 18 has been drawn from the REDACTED May 2015; Re-opener cost tables; all tabs.

7.1.3 General Preliminaries and Site Establishment Costs

Taking the costs as stated within the REDACTED May 2015 Re-opener Cost Tables: Table B1 Cost Breakdown, the total cost claimed by NG relating to all sites for General Items, Preliminaries and Site establishment costs, including Security, is REDACTED.

Using the data from the same table, the total cost for those REDACTED sites to be constructed is REDACTED

As outlined in section 4.5 the average cost for NG General Items and Preliminaries is REDACTED as set against the average across all Network Operators of REDACTED a sum that is REDACTED of the NG total.

The below Table 19 demonstrates the disallowance value achieved by adopting the aforementioned strategy.

Table 19

	Disallowance (£m)
NGET	47.51
NGGT	34.77
NGGD (EoE)	6.95
NGGD (Lon)	4.64
NGGD (NW)	1.16
NG total	**95.03**

7.1.4 Fencing

The 'cost breakdown structure' in Paragraph 160 of the submission document illustrates the blank pro-forma that the Main Works Contractors were asked to complete as part of the site surveying and cost estimating exercise

The completed Civils and Technology proforma for each site are included in the site survey reports that are in the folder named 'Appendix I' on the submission of the ISS – Work Package – Overview.

The efficiency savings described in Section 4.4.2 were applied to these MWC costs, and then the costs were prepared in the table format requested by Ofgem, which provides the cost comparison between sites.

The difficulty remains that the costs prepared by the Contractors remain at odds with those prepared for this report, in so much as the line items, that make up the overall costs are, in many cases, unknown.

However it is possible to see that in general the costs are in line and as such appear to represent current market rates.

7.1.5 CCTV

Due to the complexities of the CCTV networks installed on site, the comments outlined in Section 7.1.5 above are re emphasised and should be taken into consideration within this section.

However again it is possible to see that in general the costs are in line and as such appear to represent current market rates.

7.1.6 OPEX Costs

OPEX costs relate to ongoing costs associated with running a security system which includes communications, additional Network Operator staff costs required to manage and operate the ISS, together with other minor security elements.

Included in this review are the costs which have been necessarily incurred by the REDACTED These include identical OPEX cost components which are not only site specific but also incorporate elements of each site which has been subject to the programme.

Costs submitted as part of the OPEX review can be split into four main areas:

- Post Service Delivery Agreement (PDSA)
- Communications / REDACTED
- Internal Labour
- Miscellaneous

Post Delivery Service Agreement (PDSA)

Under the terms of the original Framework Contract the Contractors responsible for the ISS installation were asked to provide maintenance and repair support for the National Grid

sites on completion of the Security Enhancement work. This includes an annual planned preventative maintenance visit which ensures the continued functionality of the various components of an ISS such as:

- REDACTED
- REDACTED
- REDACTED
- REDACTED
- REDACTED
- REDACTED
- REDACTED

The PDSA service is run by the National Grid PDSA Contract Manager. The current National Grid PDSA contract framework expires in 2017; currently the contracts are with the Technology providers; REDACTED. Civil works are not covered by the PDSA – any initial civil defect would be covered in the Defect Liability Period; subsequent defects or damage would require a separate order.

REDACTED
REDACTED is the telecommunications provider for National Grid and costs incurred by this company for supplying services for the Security Enhancement Programme are included within this cost element. The services supplied include the use of the REDACTED network, Bandwidth, the REDACTED and a fault repair service.

Charges for the REDACTED sites are reduced by 20% due to the fact that they do not require a REDACTED unlike REDACTED sites. A REDACTED is a REDACTED circuit only required by the REDACTED sites as the REDACTED network is not available. Using the REDACTED network for the REDACTED sites provides a 20% discount on the cost. Payments are made by National Grid, in arrears, on a monthly basis and are based on pro-rata calculations.

Internal Labour

Internal Labour costs are those costs incurred by National Grid personnel having to attend REDACTED sites to ensure the safety of all persons present, the issue of work permits and to carry out minor fault repairs. The on site personnel includes:

- Delivery Engineers
- Site Managers
- Craftsmen and Engineers
- Senior Authorised Persons.

Also included within this element are the costs incurred by the Contract Manager whose responsibilities include overseeing and managing the PDSA, the call outs and the day to day administration of faults. The costs are calculated on a time spent basis and accrued monthly.

Internal Labour – Resourcing Strategy REDACTED
The most efficient strategy to provide the REDACTED National Grid resource is through overall National Grid resourcing, with the appropriate use of either:

- Dedicated 100% enduring or time limited chargeable resource
- Non-100% enduring or time limited chargeable resource

The non-100% resource is not 'free' to National Grid. If a resource is used on the REDACTED it is not available for other work, and as the workforce is managed on a full utilisation basis, the overall resource level increases by the amount of work done on the REDACTED.

Conversely, if there was no REDACTED programme then this work would not be done and the associated resource level would not be needed. This resourcing strategy ensures the REDACTED is only charged for the resource it specifically requires and avoids the need to fund full time roles when a partial role or a time-limited role is all that is required. This is particularly true for the REDACTED where the workload has fluctuated.

The alternative of a separate dedicated ISS National Grid workforce would not have been as efficient as the REDACTED resource pool, which in turn, wouldn't be large enough to ensure full utilisation of resources at all times and would have struggled to efficiently resource the large fluctuations in workload.

REDACTED

Miscellaneous Items

This section refers to certain miscellaneous costs that have been incurred throughout this claim period including outsourced security costs and police authority costs.

Methodology for RIIO Review

Costs associated with the aforementioned headings were reviewed and compared to previous OPEX submissions to ensure they were representative of market rates. The submission allowed for inflation rates over the submission period.

Due to the increased number of sites that will be in operation it is the opinion of the Auditor that the costs submitted for the RIIO period can be deemed to be Value For Money.

7.2 Scotia Gas Networks

Scotia Gas Networks operates REDACTED sites throughout the United Kingdom that have been designated to be part of the Critical National Infrastructure, REDACTED of these sites are owned by Scotia Gas Networks Southern, REDACTED sites are owned by Scotia Gas Networks Scotland and the final site is REDACTED which although owned and operated by

SGN Southern a percentage of the costs are allocated to SGN Scotland to the ratio of 64% Southern to 36% Scotland.

Table 20 demonstrates the Total Amount submitted for each company together with the components of those sums. The figures used are taken from the Final RIIO REDACTED re-opener Template submitted by SGN: Summary Tab.

Table 20

Site Owner	Base Cost – Audited or Forecast	REDACTED	REDACTED	Total Amount for submission
SGN Southern	£27.2m	REDACTED	REDACTED	£33.9m
SGN Scotland	£10.2m	REDACTED	REDACTED	£12.7m
Total	**£37.4m**	REDACTED	REDACTED	**£46.6m**

The totals quoted in Table 20 are inclusive of the shared costs REDACTED.

REDACTED

7.2.2 Technical Variations

Prices have been submitted by the MWC based on a standard design and installation; Technical Variations are subject to required survey work and completed G17 design. SGN have committed all REDACTED sites confirmed as CNI across their network to this May 2015 reopener, all expenditure including any potential Variations highlighted after G17 design and ground survey have been completed and submitted. It is probable that G17 completion will identify additional construction requirements which are not part of the standard designs; historically construction projects of this scale are rarely completed to base cost due to unknown or unexpected site conditions.

It is also understood that any potential Technical Variation costs will not reach the sum required to trigger the 2018 window and it is therefore necessary to include them in this submission.

Table 20, above, highlights the costs of the Technical Variations referred to, Table 21 below relates the cost to Probability and Cost Variance and to a Disallowed Value which should be considered should further funding not be reclaimable with the 2018 RIIO Opener.

This report would suggest that Technical Variances should reduce as the programme progresses and further experience is gained as to the requirements of surveys and G17 authentication. Table 21 would offer possible reductions that should be considered should

this be the case however the ability to reclaim additional expenditure over and above the claim for the 2015 must be considered.

Table 21
REDACTED

7.2.3 OPEX Costs – SGN

REDACTED

REDACTED is the first site that will enter a PDSA in REDACTED which includes:

Costing REDACTED and would allow for a full time dedicated SGN Maintenance Engineer, 3rd Party Generator Maintenance, REDACTED.

In addition to the cost above, a further REDACTED will be required for REDACTED staff.

The costs above are for both distribution networks and the **Scotland share** is a total cost of REDACTED across the REDACTED **Scotland sites** of which resources will be via the existing REDACTED guarding framework rates with REDACTED. The total central overhead costs of REDACTED represent a REDACTED % uplift of the base costs and reflect the internal finance, procurement, IT and accounts payable resources required to monitor and report on the programme and aid in the contractual agreements.

The Southern share is a total cost of REDACTED million across the REDACTED **Southern** sites of which resources will be via our existing REDACTED guarding framework rates with

REDACTED. The total central overhead costs of REDACTED are a REDACTED % uplift of the base costs and reflect the internal finance, procurement, IT and accounts payable resources required to monitor and report on the programme and aid in the contractual agreements.

8. Observations

In producing this report there have been a number of areas that warrant particular notice, especially when they appear to be catalysts in raising costs in particular areas. It is these points which warrant particular attention if overall programme costs are to be reduced.

It has been the inclusion of Distribution Network Operators into this programme that has demonstrated that costs can be reduced by imaginative use of personnel and technology while ensuring that wastage and profligate use of resources is kept to a minimum.

The difficulty has arisen where attempts have been made to use data attributable to the other Operators:

- Scottish Power
- SSE
- UKPN

The data has been presented in a number of formats and therefore to list the data has bee n difficult and complex leading to inaccuracies and misinterpretation. The information used in this report from these sources has had to be cherry picked but discarded if inaccurate.

8.1 Cost Areas – National Grid

There are four cost areas which must be highlighted, which appear to influence the overall costs, these are

1. Contract
2. Duration
3. Site Security
4. Project Management

8.1.1 Contract

The type of contract adopted by the Network Operators with the contractors plays an important role in the apportionment of costs for time and money overruns and in some cases actively restricts the same two factors.

National Grid have adopted a contract which when compared with contracts adopted by other Network Operators does not appear to restrict these activities with the same vigour allowing the contractors to overrun and overspend without apparent damages or costs. Consequently, although the reasons for the overruns may be genuine there appear to be no enforced parameters placed on the contractor to restrict this behaviour.

NG have stated that approaches to contracting that have been considered to date include NEC (Options A, C and E), EPC (Engineer, Procure, Construct) and FIDIC contracts, all of which would include penalty clauses for damages caused by contractor de lays. In delivering the

PSUP programme to date, NG has adopted an NEC3 Option A approach, on the basis of the cost certainty and reduced client risk that this approach provides.

UK Power Networks however appear to have adopted a different contract strategy where overruns and cost savings are apportioned between client and contractor.

8.1.2 Duration

It has been referred on a number of occasions throughout this report that the duration of the project either planned or unforeseen greatly impacts on the overall cost of a project. Any Extension of Time (EoT) will extend the cost of employing Project Managers and management staff, hiring and utilising the equipment required for a site establishment and ensuring site security.

The costs as outlined within this report demonstrate that even short period of extension of time have the ability to increase overall totals and therefore the need to have in place legally enforceable parameters within contracts to ensure time is rigorously managed is essential.

It is noted that in the answer to Question 10, NG state that:

"Strongly incentivising contractors to deliver to time and budget will be key part of the future contracts we will be putting in place to deliver the future **REDACTED** *programme."*

This statement lends itself to challenge that NG now realise that the historic method of incentivising Contractors was insufficient and further that it has taken the experience of approximately **REDACTED** sites to reach this conclusion and act upon the findings.

8.1.3 Site Security

Site Security costs are influenced by two factors, duration and requirement, the duration element has been outlined and described within section 8.1.2 above, the requirement factor needs further explanation.

Site security remains an integral part of the construction project and is required for general security as well as specific security features such as when part of a perimeter fence has been dismantled, before installation of either a temporary fence or a newly installed perimeter fence.

Distribution Network Operators are adopting a hybrid solution by utilising **REDACTED** for general security duties as required, while using modern technology solutions for site specific security requirements.

National Grid have adopted a singular strategy to secure the site and that is by increasing the amount of **REDACTED** required and insisting that additional security is required once the

perimeter fence line has been breached until such time that the new perimeter is commissioned.

In order to reduce costs new technology must be introduced to secure the site during construction and auditable advice must be obtained from CPNI as to the length of time that additional security is required.

8.1.4 Project Management

The subject of Project Management has been explored within section 3 above, while the area of concern, Programme Project Management has been described with section 3.3 above.

Within the National Grid programme there remains two levels of project management, although NG have addressed the outsourced level as the "Specialist Project Services Resource". This Programme Project Management team reportedly gives the flexibility by being able to scale up or down resources to efficiently meet the demands of the overall the Security Enhancement Programme and manage the Contractors' Project Management team that manage the project.

Distribution Network Operators have not adopted this strategy and have adopted low cost alternative solutions.

The need for Managers to manage Managers is not a cost effective solution and this strategy needs to be revisited to find alternatives that will offer greater value for money.

NG state within the response to Question 12 that; *"Going forward, with increased certainty over the scale and timeframes of the PSUP programme, and therefore a more predictable resource requirement, National Grid is planning to use a greater share of internal resource to provide the project management capability, complimented by external resource (reporting directly through National Grid structures) to manage fluctuations in demand."*

As stated above this statement lends itself to challenge that NG now realise that the historic method of Project Management became inefficient and further that it has taken the experience of approximately **REDACTED** sites to reach this conclusion and act upon the findings.

8.2 Scotia Gas Networks – Cost Areas

There are two cost areas which must be highlighted, which must be viewed individually to establish they should have part of the cost disallowed; these are

1. **REDACTED**
2. Technical Variations

REDACTED

8.2.1 Technical Variations

Prices have been submitted by the MWC based on a standard design and installation, Technical Variations are subject to required survey work and completed G17 authentication. SGN have committed all REDACTED sites confirmed as CNI across their network to this May 2015 reopener, all expenditure including any potential Variations highlighted after G17 design authentication and ground surveys have been completed and submitted.

The G17 management procedure details and provides a structured framework for the management and control of new works, modifications and repairs undertaken on gas systems and is carried out following the submission of the Detailed Design.

The design cycle is broken down into several distinct Key Stages: Initiation, Design development, Design Approval, Design Appraisal, User acceptance, Installation, Inspection/testing, commissioning and records completion.

For each design, independent competent persons are used to Approve and Appraise the works. The Approver/Appraiser has to have extensive, recent and relevant experience of statutory requirements and NGG codes of practice /operations; furthermore they are registered on a nationwide UK NGG database.

It is also understood that any potential Technical Variation costs will not reach the sum required to trigger the 2018 window and it is therefore necessary to include them in this submission.

Table 20, above, highlights the costs of the Technical Variations referred to, Table 21 above relates the cost to Probability and Cost Variance and to a Disallowed Value which should be considered should further funding not be reclaimable with the 2018 RIIO Opener.

This report would suggest that Technical Variances should reduce as the programme progresses and further experience is gained as to the requirements of surveys and G17 authentication. Table 21 would offer possible reductions that should be considered should this be the case however the ability to reclaim additional expenditure over and above the claim for the 2015 must be considered.

Neil Briggs
Harnser Group

Appendix A –Project Management Positions and Responsibilities

Title: Project Engineer
Role: Completes engineering projects by organising and controlling project elements
Responsibilities: • Develops project objectives by reviewing project proposals and plans; conferring with management. • Determines project responsibilities by identifying project phases and elements; assigning pers onnel to phases and elements; reviewing bids from contractors. • Determines project specifications by studying product design, customer requirements, and performance standards; completing technical studies; preparing cost estimates. • Confirms product performance by designing and conducting tests. • Determines project schedule by studying project plan and specifications; calculating time requirements; sequencing project elements. • Maintains project schedule by monitoring project progress; coordinating activities; resolving problems. • Controls project plan by reviewing design, specifications, and plan and schedule changes; recommending actions. • Controls project costs by approving expenditures; administering contractor contracts. • Prepares project status reports by collecting, analyzing, and summarizing information and trends; recommending actions. • Maintains safe and clean working environment by enforcing procedures, rules, and regulations. • Maintains project data base by writing computer programs; entering and backing up data. • Maintains product and company reputation by complying with federal and state regulations. • Contributes to team effort by accomplishing related results as needed.

Title: Project Manager
Role: Accomplishes project objectives by planning and evaluating project activities
Responsibilities: • Accomplishes human resource objectives by recruiting, selecting, orienting, training, assigning, scheduling, coaching, counseling, and disciplining employees; communicating job expectations; planning, monitoring, appraising, and reviewing job contributions; planning and reviewing compensation actions; enforcing policies and procedures. • Achieves operational objectives by contributing information and recommendations to strategic plans and reviews; preparing and completing action plans; implementing production, productivity, quality, and customer-service standards; resolving problems; completing audits; identifying trends; determining

system improvements; implementing change.

- Meets financial objectives by forecasting requirements; preparing an annual budget; scheduling expenditures; analyzing variances; initiating corrective actions.
- Updates job knowledge by participating in educational opportunities; reading professional publications; maintaining personal networks; participating in professional organizations.
- Enhances department and organisation reputation by accepting ownership for accomplishing new and different requests; exploring opportunities to add value to job accomplishments.

Title: Quality Assurance Advisor

Role: Assures consistent quality of production by developing and enforcing good automated manufacturing practice (GAMP) systems; validating processes; providing documentation; managing staff.

Responsibilities:

- Accomplishes quality assurance human resource objectives by recruiting, selecting, orienting, training, assigning, scheduling, coaching, counseling, and disciplining employees; communicating job expectations; planning, monitoring, appraising, and reviewing job contributions; planning and reviewing compensation actions; enforcing policies and procedures.
- Achieves quality assurance operational objectives by contributing information and analysis to strategic plans and reviews; preparing and completing action plans; implementing production, productivity, quality, and customer-service standards; identifying and resolving problems; completing audits; determining system improvements; implementing change.
- Meets quality assurance financial objectives by estimating requirements; preparing an annual budget; scheduling expenditures; analysing variances; initiating corrective actions.
- Develops quality assurance plans by conducting hazard analyses; identifying critical control points and preventive measures; establishing critical limits, monitoring procedures, corrective actions, and verification procedures; monitoring inventories.
- Validates quality processes by establishing product specifications and quality attributes; measuring production; documenting evidence; determining operational and performance qualification; writing and updating quality assurance procedures.
- Maintains and improves product quality by completing product, company, system, compliance, and surveillance audits; investigating customer complaints; collaborating with other members of management to develop new product and engineering designs, and manufacturing and training methods.
- Prepares quality documentation and reports by collecting, analysing and summarising information and trends including failed processes, stability studies, recalls, corrective actions, and re-validations.
- Enhances department and organisation reputation by accepting ownership for accomplishing new and different requests; exploring opportunities to add value to job accomplishments.

Title: CDM Coordinator

Role: a qualified Health and Safety whose role is to advise the Client on health and safety issues during the design and planning phases of construction work and is someone who has and knowledge and experience of planning, management,

construction, and communications.

Responsibilities:

- Notify the project to the Health & Safety Executive.
- Advise and assist the client with the client's duties for engaging or appointing competent and adequately resourced organisations.
- Assist the client with ensuring that suitable management arrangements are made for the project (This may include the performance of design audits and construction site audits and inspections)
- Identify and collect the pre-construction information and provide it in a convenient form to designers, the principal contractor and other contractors.
- Advise the client on the sufficiency of the time allocated for all phases of the project.
- Ensure that the design complies with the requirements of the regulations, including any designs undertaken by designers who are not based within Great Britain.
- Ensure that the designers and the principal contractor co-operate.
- Assist the client with verifying the sufficiency of the construction phase plan to commence construction and the adequacy of the welfare provisions.
- Prepare the health and safety file, or review and update an existing health and safety file, and pass it the client at the end of construction.

Title: Planner

Role: Develops planning studies and reports in support of new and updated plans, programs and regulations.

Responsibilities:

- Reviews or assists in the review of moderately difficult development proposals and site plans for conformance with codes, plans, and regulations
- Prepares and presents detailed reports on development proposals to government bodies
- Collects a variety of statistical data and prepare reports and maps on topics such as census information, land use, tax base data, and occupancy rates
- Evaluates or assists in the evaluation of rezonings, ordinance amendments, site plans, special use permits, variances and other proposals
- Acts as liaison between community groups, government agencies, developers and elected officials in developing neighborhood plans
- Coordinates community review of public and private development projects
- Provides information to the public regarding development regulations
- Assists in resolving citizen and customer issues
- Oversees the work of consultants and interns
- Conducts field evaluations and assessments

Title: Health & Safety Advisor

Role: responsible for ensuring that employers and workers comply with safety legislation and that safety policies and practices are adopted and adhered to.

Responsibilities:

- Carrying out risk assessments and considering how risks could be reduced;
- Outlining safe operational procedures which identify and take account of all relevant hazards;
- Carrying out regular site inspections to check policies and procedures are being properly implemented;
- Making changes to working practices that are safe and comply with legislation;

- Preparing health and safety strategies and developing internal policy;
- Leading in-house training with managers and employees about health and safety issues and risks;
- Keeping records of inspection findings and producing reports that suggest improvements;
- Recording of incidents and accidents and producing statistics for managers;
- Being up to date with new legislation and maintaining a working knowledge of all Health and Safety Executive (HSE) legislation and any developments that affect the employer's industry;
- Attending Institution of Occupational Safety and Health (IOSH) seminars and reading professional journals;
- Producing management reports, newsletters and bulletins;
- Ensuring the safe installation of equipment;
- Managing and organising the safe disposal of hazardous substances, e.g. asbestos;
- Advising on a range of specialist areas, e.g. fire regulations, hazardous substances, noise, safeguarding machinery and occupational diseases.

Title:Administrative Clerk

Role: responsible for providing administrative and clerical services in order to ensure effective and efficient administrative operations.

Responsibilities:

- Types agendas for meetings
- Prepares meeting packages and distributes to members at least two days prior to the meeting
- Attends, records and transcribes minutes of all meetings
- Transcribes formats, inputs, edits, retrieves, copies and transmits correspondence, documents, data and graphics
- Word processes all manuscripts, letters, documents and proposals
- Records, date stamps and distributes all incoming mail
- Processes outgoing mail
- Compiles and maintain an up to date telephone directory of numbers and addresses
- Files all correspondence
- Updates the bulletin board by posting and removal of outdated materials

Title: Site Manager

Role: to prepare sites prior to the commencement of construction work (to set out the site and organise facilities), to plan projects and ensure that they meet agreed specifications, budgets and timescales and to oversee building work.

Responsibilities:

- Liaising with clients and reporting progress, professional staff (such as architects and surveyors) and the public
- Supervising contracted staff
- Meeting subcontractors
- Making safety inspections and ensuring construction and site safety
- Checking and preparing site reports, designs and drawings
- Maintaining quality control procedures
- Motivating the workforce
- Problem solving
- Using specialist construction management computer applications

Title: Buyer
Role: Obtains requirements by verifying, preparing, and forwarding purchase orders; verifies receipt of items; authorises payment.
Responsibilities: • Verifies purchase requisitions by comparing items requested to master list; clarifying unclear items; recommending alternatives. • Forwards available inventory items by verifying stock; scheduling delivery. • Prepares purchase orders by verifying specifications and price; obtaining recommendations from suppliers for substitute items; obtaining approval from requisitioning department. • Obtains purchased items by forwarding orders to suppliers; monitoring and expediting orders. • Verifies receipt of items by comparing items received to items ordered; resolves shipments in error with suppliers. • Authorises payment for purchases by forwarding receiving documentation. • Keeps information accessible by sorting and filing documents. • Provides purchasing planning and control information by collecting, analysing, and summarising data and trends. • Accomplishes purchasing and organisation mission by completing related results as needed

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