

Network Innovation Allowance Closedown Report

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form.

Network Licensees must publish the required Project Progress information on the Smarter Networks Portal by 31st July 2014 and each year thereafter. The Network Licensee(s) must publish Project Progress information for each NIA Project that has developed new learning in the preceding relevant year.

Project Closedown

Project Title

Architectural Design of Compressor Site

Project Reference

NIA_NGGT0025

Project Licensee(s)

National Grid Gas Transmission

Project Start Date

Feb 2013

Project Duration

11 Months

Nominated Project Contact(s)

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Scope

National Grid has to operate in an ever more stringent planning environment. The implementation of the Planning Act 2008 has resulted in all Nationally Significant Infrastructure Projects being captured by the Planning Act. The result of this has been a greater responsibility on a developer to provide evidence that a full and open engagement has been undertaken with both statutory and non statutory organisations and particularly the public at large and further that opinions expressed by third parties have been properly noted and where possible used to influence the final design submitted for consent to the Planning Inspectorate.

National Grid is committed to being the industry leader in the implementation of the requirements of the Planning Act. To this end, where National Grid is required to construct an above ground installation, it is imperative that they investigate fully all alternatives available to minimise the impact of the development on its environment and those who live in that environment. As part of the early stages of the public consultations on the Don Valley Power CCS project, preliminary compressor site design drawings and animations were created for three different design options:

1. Contemporary
2. Farmstead
3. Landscaped

The overwhelming preference from the public was for the landscape design (i.e. the environmental option).

Objective(s)

This project will explore three environmentally sensitive architectural design alternatives that will be suitable for a typical compressor site, based on size (one small, two medium).

Success Criteria

National Grid will be able to use the resulting 3D animations and models for presentations during public consultations, as appropriate, where projects are being planned, and for submissions to the Planning Inspectorate to gain a Development Consent Order, with a view to improve the efficiency of the National Grid Compressor facilities in the future.

Performance Compared to the Original Project Aims, Objectives and Success Criteria

The outcome of the project, namely that of designing a Concept for Design Toolkit, has been successfully delivered and trialled on developing design options for a new compressor AGI.

In order to submit a successful development consent application National Grid is committed in engaging with the public in order to gain their support and reduce the risk of failing to gain consent. Based on previous experiences one of the concerns that is often raised by members of the public is the visual impact caused by building new infrastructure. Therefore the design of new AGIs must satisfy the requirements of the public, which in most cases means that it needs to be aesthetically pleasing and in keeping with its surroundings, whilst also being fit for purpose.

As part of public consultations National Grid communicates the design of future installations through the use of 3D design of what the end product could look like. By getting both statutory and non-statutory organisations involved early on in the design they can relay any concerns or feedback which can easily be incorporated into the design without much cost to the project.

National Grid identified that when developing future designs more effort will be required in reducing the visual impact, reducing maintenance costs and making best use of the renewable energy sources available. Given these challenges National Grid employed the services of Aecom to develop an approach which assesses the landscape and location in order to produce a sustainable design that is in keeping with the surroundings, makes best use of the space available, provides an early accurate cost estimate, utilises available renewable resources and can be integrated with Building Information Modelling (BIM). This led to the development of a Concept for Design Toolkit which draws on the experience from Aecom's architectural expertise.

The adopted approach begins with developing an engineering layout to determine the space that is required in order to select a suitable location for the installation. Analysis of the chosen site landscape and terrain is conducted in order to determine the most appropriate design for the local surrounding (see image 1 in the supporting document) and based on the information obtained the design options can then be developed (see image 2 the supporting document). Once the site layout and building design has been agreed the conceptual design is then progressed further in an effort to reduce visual impact as much as possible (see Image 3 in the supporting document).

Once the conceptual design has been produced it can then be reviewed by both statutory and non-statutory organisations. Considering the early stage of the design any changes which are required can be easily implemented with little cost and effort required. Once the design has been reviewed and approved the next stage of the toolkit process is material selection. The toolkit contains a library of materials for the design of the buildings which allows the designer to consider the most suitable option based on the local surroundings and suitability for use. The option can be extended further to modify the terrain by considering the option of landform, water sources and vegetation to further reduce visual impact (see image 4 in the supporting document).

The final concept decision is the selection of energy supply to improve the environmental friendliness of the design and reduce operating costs. Once all conceptual decisions have been made the toolkit will produce a preliminary cost estimate to help the designer ensure that the project remains within budget and to assess what modifications are required to reduce costs further.

The toolkit was successfully trialled during the AGI design activity in that it greatly assisted with better engendering public support throughout the public consultation programme. In particular, significant benefit was derived from the facilitation of visual displays of each design option as well as 3D Animations and Models which were facilitated by the Concept for Design Toolkit. Based on the trial findings it is believed the toolkit will appreciably de-risk the planning process. This addresses a key project objective, namely the concern about mitigating increased project disruption under the new and emerging planning regime.

Based on trials within a working environment, the project demonstrated that de-risking is possible if information is developed, shared and acted upon at an early stage of consultation. This is feasible through more standardisation of design approach, which is the ultimate goal from this piece of work.

Subsequent development that carries forward the findings of the innovation project are required in order to fully realise a standardised design approach. Based on the final report there is recommendation that a fully developed Concept for Design Toolkit can potentially be applied across National Grid and can greatly assist with reducing delay and disruption to critical programmes for new national infrastructure and replacements.

Required Modifications to the Planned Approach During the Course of the Project

Following the successful completion of the Toolkit trial, adaptation of the Concept for Design Toolkit to the Compressor Replacement programme was discussed at a project meeting in October 2013. Further discussion in December 2013 included a demonstration on how the Toolkit could be embedded within the business.

One aspect that wasn't considered at the inception of this work was a cost modelling function. Therefore an additional demonstration

was given on how a comprehensive Cost Modelling function is handled in the Toolkit to meet good standard UK practice. This shows the potential for future development of the toolkit and highlights an important aspect whereby costs can be generated at an early stage for budgeting purposes using an industry standard model.

Lessons Learnt for Future Projects

During the course of this work the project team confirmed that the concept of improving architectural and other aspects of design for Above Ground Installations is equally applicable across the business, and indeed, for other licensees who undertake similar infrastructure and replacement activities.

Engagement with other parts of National Grid is a key element to success and should be considered by future projects as a core deliverable.

Note: The following sections are only required for those projects which have been completed since 1st April 2013, or since the previous Project Progress information was reported.

The Outcomes of the Project

Following a review of three sites during the initial phase of work, design and development of the Concept for a Design Toolkit was undertaken.

The new Concept for a Design Toolkit approach to preliminary visual design was trialled for a Compressor Station AGI site on an existing Cross Country Pipeline Project. This comprised of three alternative conceptual architectural designs based on:

1. Landscape
2. Farmstead
3. Contemporary/Urban

All three Design Options were presented during public consultation in 2013 and stakeholder feedback was sought. Based on feedback, the landscape option was a clear favourite for its lowered visual impact in the rural environment. The Landscape Option was therefore embraced by National Grid in the developing design. Allowing early engagement with members of the public through the use of 3D design and understanding their aspirations proved valuable in gaining their support and reducing the risk to the project. The cost of making design changes was also very low as the alterations were made very early in the process whereby the impact on the project is less significant.

With the design accepted the Toolkit allowed for further development to reduce operational costs associated with the installation by identifying the options available for utilising renewable energy and considerations for water management such as rainwater harvesting. The integrated cost plan allowed for greater control over the budget which meant that more informed decisions could be made, allowing for a greater and more precise refinement of the design.

The concept of early consultation on key initial design decisions/options is considered likely to impact a level of de-risking during the planning process through lessened public opposition and therefore reduced delay and disruption to project programme.

There is an added benefit in that the developed 3D design as an output of the Toolkit can be integrated into a BIM model. Although this was not progressed under this project, the option remains available. The 3D design has the functionality to incorporate further information as it becomes available. This including but, is not exclusive to, incorporating information on a construction programme, cost information, equipment details, and maintenance schedules.

Planned Implementation

As mentioned, the Toolkit was trialled on an existing pipeline project and received a positive reception during public consultations. The Toolkit was presented to a wider National Grid audience and appealed to the company's drive towards reducing emissions and promoting innovation through the option to integrate into a BIM system.

Regarding implementation of the Toolkit, following initial discussions from interested parties the Toolkit is ready and has been made available for use on all future projects where Above Ground Installations (AGIs) are intended to be built. Importantly, the Toolkit is not limited to use on AGI pipeline projects, it can be adapted for use on electricity installation of substations projects.

Whilst this new solution has not yet been implemented on a wider scale beyond the extremely successful field trial, the requirements of the Planning Act 2008 and National Grid's desire to improve stakeholder engagement promote use of the Concept for a Design Toolkit approach. On completion of this work this approach was made available for future projects to reduce consenting risks by taking advantage of the Toolkit and adding to the experience obtained from the trial conducted as part of the existing pipeline project mentioned above.

Other Comments

Benefits of the Concept for a Design Toolkit include support of the BIM process, and provision of an audit trail for the design decisions taken on a project; it can also be developed to include an integrated estimating function based on industry-standard guidelines.