

Introduction

My ES Cornwall Scholarship period is currently agreed to be from March 2009 to September 2010. My proposed work program is aimed at gaining experience and exposure in alternate project management and delivery structures.

My initial period of employment is a 12 month period with Balfour Beatty Utility Solutions (BBUSL) that commenced on the 16th February 2009.

This report is the fourth of six, focussing on my period of employment from 16 November to 15 February 2010.

Operations

For the remainder of my time in operations, the weather played a significant role as the rain and snow meant there were many large delays. The number of EWN's that have been developed due to weather is large, and due to the unpredictable nature of the weather they are constantly being extended and updated. The low availability and hence low productivity associated with winter work has meant that the operatives' time is predominantly used for training purposes.

Overall I found the majority of processes developed for the delivery of projects are aimed purely at Alliance employees, and as such work quite well. However, the processes do not cater for sub contractors very well as they are inflexible. This led to inconsistent application of safety and training requirements of site operatives and hampered project execution. I also found additional problems associated with the centralisation of project procurement services which led to long supply chains resulting in equipment and supplies often being undelivered or misdirected. These two problems were the main cause of many project inefficiencies.

Change & Innovation

For my final 2 months with BBUSL, I was based in their head office in Derby with the Change & Innovation group. The group are responsible for investigating new techniques and technology associated with all facets of BBUSL's work. The department develop numerous small changes to existing methodologies & equipment in order to improve capability, reliability, usability, efficiency and safety. In addition to this, there are a number of larger solutions that are developed such as a Tunnel Cable Pulling/Hanging/Sagging Machine (an Australian machine incidentally), tunnel monorail cable pulling system & CSS capability extensions.

The projects are varied and a number of solutions are bespoke in nature. The uniqueness of each project is primarily due to bringing older installations up to current specifications. These improvements generally result in reduced costs.

My time was somewhat limited so I was involved in smaller projects, namely; Derrick cathead modifications, derrick erection attachment points & field operatives sound sensor.

The use of derricks to assemble towers is limited to towers with extremely limited access, where only 4x4 vehicle accesses are possible. Due to the limited access, the supply of equipment to site is slow and consequently, erection times are very slow (compared to traditional methods). The goal of the derrick projects was to increase tower assembly speed, safety and efficiency by modifying the equipment and processes. A number of changes incorporating new equipment were agreed upon and trials of the new processes are expected to be conducted in May.

The goal of the sound sensor was to increase operatives' safety by alerting them in the event of excessive sound pressure levels. The initial brief required the unit to be small, simply mounted, capable of operating for up to a week before recharging and inexpensive. The alarm mechanism was required to be either visual or vibration. After some investigation, a number of

potential candidates were identified; however, none managed to meet all the expectations of the initial brief. The most effective device cost close to £1000 each, and as such was deemed far too expensive, therefore the sensor project has been put on hold. Alternate methods of managing sound exposure are being developed such as workplace analysis designed to provide details used to update work instruction as to when hearing protection is to be worn.

As the risks and technical problems raised by older installations are unique to each project, I found the Innovation group to be focussed and essential for dealing with these issues, and developing solutions that integrated with current work practices.

Other Work

Maintaining Single Vendor Solutions into the Future

I organised a meeting with the Manager of National Grid's Architecture for Substation Secondary Systems (AS³) project. AS³ has been established to develop the strategy and architecture associated with managing the lifecycle of National Grid's substation secondary systems. The project has been running for 2 years. It was identified that the existing architecture stipulated by National Grid for secondary systems was limited when applied to a single vendor solution. A large amount of analysis into the architecture was conducted and concluded that, due to high network utilisation and hence, limited outage availability, the current architecture did not readily allow for fast replacement of the systems. Further investigations have concluded that copper wired secondary systems further complicated replacement of secondary systems, and as such, IEC61850 is a crucial element of their strategy. IEC61850 allows for the replacement of copper connections with optical fibre, thereby reducing wiring works, and providing additional worker safety by providing electrical isolation.

Manufacturer IED interoperability and interchangeability are essential requirements for the success of the project, and as such thirteen working

groups (consisting of members from National Grid, Manufacturers, academic institutions & Alliances) have been established to address the architecture and implementation issues, including dedicated manufacturer working groups. National Grid's experience with the manufacturers has been positive, with many participating through new product trials. National Grid has also engaged universities in England to carry out studies on their behalf, and for their benefit in achieving the interoperability/interchangeability goals.

The AS³ project has been successful to date, with many problems identified and solved, however, initial estimates of 2 years to complete the project are now seen as being overly ambitious.

Alliances

My opinion on Alliances can be best broken down into three main parts: market share, efficiency and transparency. Subsequently, value should be easily demonstrated - in a regulated business that maintains & operates nationally critical infrastructure, this is a key element that must be addressed.

Market Share

One of the main goals of the Alliances was to capture the required market share of the labour pool necessary to deliver the large quantity of work National Grid were expecting to achieve. In this respect, the Alliances have delivered. The amount of work being delivered each year has been continually increasing. The workload foresight afforded to the Alliances is especially beneficial in forecasting training and recruitment needs.

The major weakness of the structure of the Alliances is the balancing of the amount of work each Alliance is receiving and producing. As there are two overhead and cable Alliances, transfer of work in order to maintain a relatively even share of workload has been relatively simple. However, as there are 4 substation Alliances, the sharing of the workload is neither as simple, nor straightforward since the workload was initially divided between alliances geographically. As such, many of the respective alliances have invested in their employees in their respective region. However, augmentation works

have proven to be focussed in certain geographical areas therefore, shifting work between alliances has meant shifting workers between regions, which has not been particularly successful.

Efficiency

I believe the efficiency of any organisation is best achieved through implementing intelligent organisation structure & processes and the respective management of these.

Implementing an organisation structure within a single Alliance seems to be a difficult task to achieve, primarily due to the differing terms of employment, and subsequent competing interests of the relevant Alliance partners. As such, maintaining an appropriate 'balance of power' is difficult. An inherent problem in trying to maintain a 'balance of power' is evident when management positions are required to be filled. In order to maintain the 'balance of power' there is an implied need to employ a management person from a specific company (or conversely, to not employ someone from a specific company). This creates tension, disenchantment and malcontent among employees.

The development of processes takes time. The processes are constantly evolving and being refined. As such, the communication of these changes & the respective intent of the changes are critical in maintaining high levels of efficiency. I believe this to be the root cause of a large number of issues that I witnessed during my time in the Alliance. The processes that govern this cascading of information are in place, however, the actual transfer of information between companies, and subsequent cascading of information to individuals, is often overlooked or not valued enough to be fully appreciated. As such, there is constant misinterpretation of new processes, and the execution of the processes is stifled. I also believe there is an added problem of being too 'process' oriented, whereby the efficiency is diminished by strict adherence to processes when the intent of process is ignored or unknown.

Transparency

Transparency within an organisation that is scrutinised on a regular basis is a key element in stakeholder management. The ability to demonstrate intent through thorough record keeping is definitely advantageous when 3rd party audits are carried out. Rigorous record keeping has a strong influence on dictating processes and methodologies employed by the Alliances. Individually, I believe each Alliance manages to maintain a good level of transparency to National Grid due to the embedded National Grid roles within each Alliance.

Value

As part of being a critical element of a regulated public utility, an ever present question that must be addressed is whether or not that element is delivering value for the public. It is an interesting question that National Grid is having difficulty answering with Electricity Alliances. I believe that if each Alliance was looked at in isolation, most would be delivering projects at a reasonably fair market cost. I think the main difficulty is justifying the need for overheads for six separate Alliances. In addition to this, there are multiple processes that must be duplicated for each Alliance. For example, as mentioned in a previous report, Type Registration of key elements that are constructed must be carried out by each respective Alliance. This is done despite the fact that each Alliance is type registering the same product (effectively either doubling or quadrupling the work done).

With respect to the overhead and cable alliances, there was a belief within National Grid that having separate alliances would result in competition between the two companies. However, the sheer volume of work required by National Grid has meant that each alliance is assured large quantities of work, therefore the need to compete with the respective alliance is somewhat diminished as the focus is more on delivering the quantity of work.

Although not originally intended by National Grid, the establishment of the Alliances has increased its employee's technical understanding of its assets and project delivery. National Grid, as a company, was somewhat limited in

its technical ability due to the limited exposure and experience gained from its previous method of delivering network augmentations. As such, the lack of technical understanding of the client leads to inefficiencies associated with the management of the projects and assets. Alliancing has allowed National Grid to gradually rectify this limitation by increasing the depth of exposure it has in the delivery of schemes. Conversely, the partner companies have also been given increased exposure to the role National Grid plays in the industry; their restrictions and requirements, and as such, a greater appreciation of the issues and effects that are expected of National Grid.

Going Forward with Alliances

The Electricity Alliances are currently entering their fourth year of their initial five year contract. National Grid has commissioned a review of the Alliances and the results are expected to be published in the very near future.

Going forward in the UK, I don't believe the Alliances (in their exact current form) will be sustainable. The amount of duplicated work is unnecessary and difficult to justify. For example, type registration requirements for each Alliance are difficult to justify when the different Alliances are type registering the same product. As mentioned in previous reports, there are a number of initiatives that are currently being implemented in the Alliances in order to increase efficiency. Pan-Alliance working has been identified as a major element in this, e.g. sharing of work methods or technology. However, there is significant strain placed on the Alliance partners due to the investments that have already been committed to technology & processes and the respective intellectual rights associated with them.

However, given the position National Grid is in (requiring to deliver large quantities of works) Alliances in general are necessary if National Grid is to deliver the quantity of projects needed in the coming future.

My experience within Balfour Beatty and the Alliance has provided me with a greater appreciation of the organisational structure used to achieve different

goals. The exposure to different working conditions and varied work has allowed me to expand my views on issues that are similar to all businesses, as well as issues that are unique to certain countries or environments.

I believe there are a number of initiatives that the Electricity Alliance East uses that could benefit any business. For example, a dedicated performance improvement team focuses any changes to the 'business as usual' processes. The dedicated team would also benefit the business by ensuring the changes are implemented as effectively as possible, as well as monitoring and documenting the respective impact of the changes.

Future

On March 8 I will continue my scholarship in Toronto, Canada. I will be working for HydroOne. HydroOne are responsible for the transmission networks in Ontario, as well as certain geographical areas of the distribution network. A number of changes have been made recently to the network access rules to encourage more renewable generators onto the grid. My role will be to manage projects associated with generator connections.