Introduction

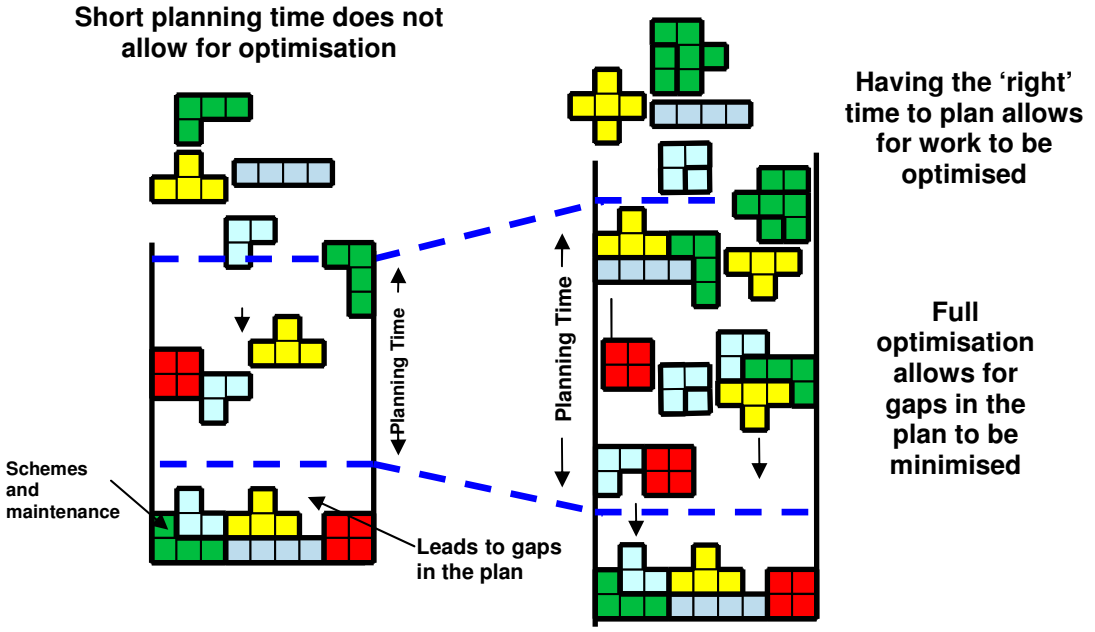
My ES Cornwall Scholarship period is currently agreed to be from March 2009 to September 2010. My proposed work program is aimed at gaining experience in alternate project management and delivery methodologies.

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

This report is the second of six, focussing on my second period of employment from 16 May to 16 August 2009.

Programme Management

The success of the Alliance modelling is heavily dependent on the success of the planning and programme management. The Programme Management Team is a section of the Alliance responsible for the programming/planning of projects, project performance monitoring and overall project management of the Alliance projects. Programme Management is an independent section within the Alliance; independent from Design, Commercial and Operations. Independence in this role was identified as being vital in ensuring the impartiality of the project management decisions and maintaining the quality of information provided to the Alliance Management Team.



A Visual Representation of the Theory of Planning & Programme Management

Consents/Wayleaves

Consents are approvals or agreements in place that allow an entity (NG) to conduct certain elements of their business, e.g. to operate a transmission line along a certain corridor at 275kV, access routes, environmental agency approvals etc.

The Consents & Wayleaves team are responsible for reviewing and maintaining all consents & wayleaves required for the works being conducted by NG (by the Alliance). Due to the time required to negotiate and obtain consents and wayleaves, identification of the required consents & wayleaves (or more specifically; the missing consents & wayleaves) is critical in the early stages of the project lifecycle. Negotiations are conduced by NG.

The teams' interactivity with companies and landowners has resulted in the consents & wayleaves team being responsible for the identification of any 3rd party site safety requirements (i.e. inductions) required for workers throughout the project.

Nuclear Projects

As part of the National aim of reducing Carbon emissions, there have been a number of nuclear power connections identified as being critical in achieving these emission targets. In order to connect these new power stations, new transmission lines are required to accommodate the large generation stations. Due to the complexity of the identified new transmission corridors (and to a lesser extent, the transmission refurbishments), a specialist team has been formed to address the pre-requisite design, consents and wayleaves issues.

The major obstacle facing this team is time-frames of the connections, combined with the new wayleaves that need to be agreed. The length of the new corridors has raised significant public relations issues. In order to meet these restrictive time-frames, it is expected that the newly established National Planning Policies will alleviate the public relations issues.

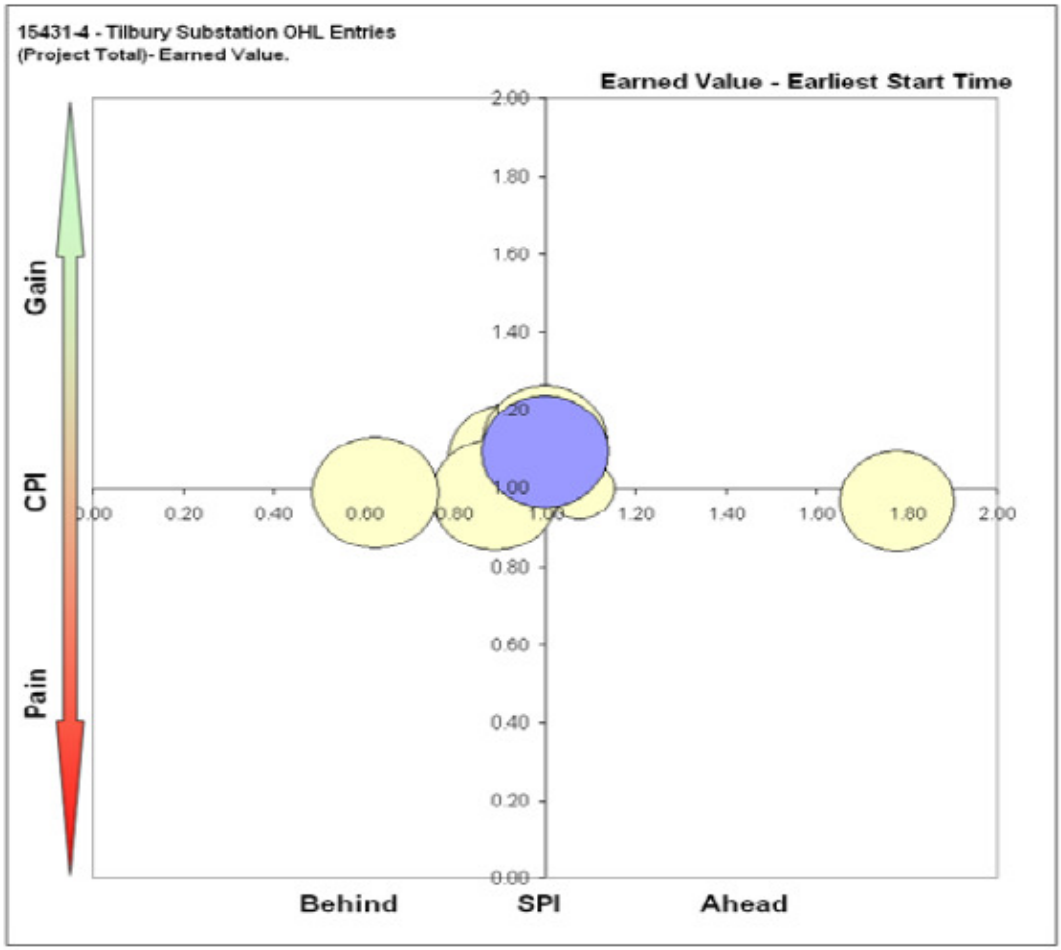
Another significant issue that is currently causing problems is the current state of the Security and Quality of Supply Standard (SQSS). The SQSS was last reviewed when the largest single generating unit was 1320MW. The resultant standard states the 1320MW value as the largest acceptable amount loss of power infeed. However, the nuclear generators that are currently being considered are in excess of this amount. This essentially means that 2 things may occur; either the power station design changes (subsequently the transmission line requirements change), or the SQSS standards are amended to allow for larger single generating units. It is currently assumed that the latter is more likely.

Workbook Management

A critical element to Alliances is their respective workbook. This workbook documents the projects that are allocated to the respective alliances, and critical deadlines within those projects. As part of the management of the business, workloads are predicted at least a year in advance. Line of sight is developed and any resource deficiencies are flagged for attention and actions are identified.

Project Programming

Programming proves to be a critical element of the management of the workbook within the Alliance. The primary use of the project programme is to ensure that each project has a distinct time and cost baseline. Continual monitoring of the project is done in order to maintain control. Reports that are generated as part of the monitoring relate to 2 factors; is the project on time, and is the project on cost. These reports are visualised in a simple earned value graph (see below), and presented to the Alliance Management Team on a monthly basis.



Displaying the previous 6 months EV Data

Period	01-Oct-08	01-Nov-08	01-Dec-08	01-Jan-09	01-Feb-09	01-Mar-09
CPI	1.06	1.08	0.98	0.99	1.12	1.09
SPI	0.93	0.92	0.89	0.63	1.00	1.00
Actual Cost	£741,757	£825,382	£907,415	£933,860	£894,146	£919,620

If a project is deemed to be over-running in cost or time, preliminary investigations are carried out in order to determine the cause. The results of the investigations dictate what actions should be applied. The results of all investigations are also analysed, and any systematic deficiencies are addressed within the business.

The secondary function of project programming is resource planning. Due to project planning initially occurring in the IP2 phase of the project, foresight is developed regarding upcoming workload and hence, resource requirements for not only projects, but for the Alliance as a whole. Subsequent to the

resourcing being identified in the IP2 phase, recruitment and training can be organised well before the resource is required. In addition to the resource planning, the programming of projects also benefits resource smoothing, so as to ensure job security for the employees. Initially resource planning was only applied to field operatives. It has since been identified that in the current employment environment, resource planning within the office can also be attached and trended to match work profiles. As a result, the EAE is in the initial stages of office based staff resource planning.

Project Management

The project management team is often referred to as a "Cradle to grave" team. Project engineers are responsible for overseeing the IP2, IP3, DDD & IP4 stages of the respective projects. This continuity of project engineer is meant to enable seamless transitions between stages and ensure smooth delivery of the projects; effectively the project engineer is tasked with being the champion of the project throughout the entirety of its lifecycle. The Project Engineer's involvement in the project increases in the throughout the project lifecycle.

Change Management

Due to the number of changes that occur throughout a project's life, and the subsequent impact these changes have on all aspects of the business, a change management procedure has been developed. The volume of the changes has meant single points of contact within the Alliance and NG have been established.

Changes in scope and timing are communicated and documented via the change management procedure. The procedure has two processes; changes initiated by the Alliance, and changes initiated by NG.

Alliance Change Request

Alliance change requests require a change request to be documented and forwarded to NG. NG assesses this change and subsequently responds by either approving or denying the change (including any associated reasoning).

NG Change Request

NG change requests require the request to be documented and forwarded to the respective Alliance. The Alliance responds with a documented impact assessment. NG is then required to respond to the impact assessments, stating whether or not the change should occur.

Outage Management

The number of outage requested by all Alliances has necessitated a single point of contact within Alliances and NG. The theory for outage management during the project lifecycle is:

- IP1: Outage lengths and availability are roughly flagged,
- IP2: Availability is confirmed and resource requirements are identified. Potential outage synergies with other projects are identified.

- IP3: Resource Availability is confirmed, Outage details are further refined (Emergency Return To Service (ERTS) is accurately defined)
- DDD: Outages details are locked in the outage plan, and resources are committed to the project during DDD

Outage management is co-ordinated within NG in order to maintain system availability and to better synergise outages between Alliances respective projects. The relative success of this approach is good; however unforeseen system events (weather, system faults etc) disrupt the outage plan. The subsequent success of the outage management system is primarily in the knowledge of (a) how long ERTS is for a circuit/bay of plant, and (b) how much outage time is required to complete each work period. These two pieces of information are critical in maintaining system availability and re-organisation of the project plans.

Business Performance Management/Improvement

AMT Reporting

The business performance management team are a critical link between the projects and the Alliance Management Team (AMT). The performance management team are responsible for gathering information regarding projects and presenting to the Alliance Management Team in a condensed format. The AMT monthly information packs contain information such as project earned value vs. time, whereby project performance is monitored and, in the event of any projects problems occurring, initiating investigations. The business performance against Key Performance Indicators is also monitored and presented.

Business Improvement

In addition to the reporting, the results of investigations are monitored internally and improvement initiatives are developed. The team is also responsible for the management of the implementing the performance improvement initiatives throughout the business.

Incentivisation

Incentivisation of the Alliance is done with “Gain and Pain” sharing. The Gains are differentiated into Returned gains and Retained gains.

Returned Gain

Returned gains are identified as gains that are due to improved designs or intelligent delivery programming. All returned gains are delivered back to NG.

Retained Gain

Retained gains are identified as gains that are achieved due to improved delivery processes, or gains due to the implementation of innovation/new technology, intelligent timing of purchasing during fluctuating metal prices, etc. Retained gains are divided in a 50/50 split between NG and its Alliance Partners. The Alliance gains (Tier 1 gains) are then proportioned according to their KPI performance. The remaining Alliance gains are then consolidated

across Alliances. This fund is then distributed by NG in Pan Alliance business improvement projects.

NG gains (Tier 2 gains) are calculated based upon the respective Alliance's gains. NG retains half of what the Alliance gains, while the other half is again consolidated across the Alliances. This fund is accessible by NG, allowing NG to select Alliance initiatives it wishes to invest in further, and allocate funds accordingly.

Pain

Pain is equally divided between the Alliance and NG.

Conclusions

Working in Programme Management has highlighted that, while the physical delivery of projects is the major element of the Alliance; stakeholder management is equally important.

This is best highlighted by two parts; nuclear development, and recognizing the need that has meant that critical interfaces between the two organisations are managed by dedicated resources.

The network investments required in order to accommodate the large nuclear generation stations has raised significant public relations issues. These issues must be management in an appropriate and measured manner. Failure to do this will mean that the timeliness of these connections (not to mention damage to the respective company's public image) will be jeopardised and affected considerably. Subsequent to managing the expectation of the general public, political management will be also required to be done in conjunction.

The management of the Outages and Scheme Changes is essential in maintaining a consistent flow of information within the Alliance. The establishment of the processes associated with Scheme Changes is well managed, however, I feel that the awareness of the processes is limited to those that are directly involved in the management of them. As a result, critical elements within a schemes delivery teams (employees from both the Alliance and NG) are unaware of the official process, and changes in projects are not adequately documented. I feel the development of processes has resulted in robust processes, however, fully educating and informing all the respective affected individuals is proving to be equally important.

The reporting mechanisms that have been developed have meant that snapshots of projects have been condensed and information has been distilled to provide only the critical information. The amount of time required acquiring information is large, and as such, a large proportion of my work within Programme Management involved information gathering.

Business improvement is a natural by-product of the reporting on projects. Business improvement ideas are identified within the Alliance, and subsequent projects or initiatives are implemented. The implementation and

measurement of the effects are done by a single resource, and reports to the AMT on the projects are done in a similar manner to NG schemes. I feel that the intense reporting of projects has reduced the problems associated with defining whether an internal improvement project is justified or beneficial.

The EAE reports to 2 shareholding groups; National Grid & Balfour Beatty. Both are equally interested in the performance of the Alliance. The performance of the Alliance is measured using KPI. As the shareholder interest is focussed on return, the interest on KPI performance is equally important. The need to manage the KPIs and obviously needed to ensure a maximum return to the shareholders. As this focus is deemed important, KPI management is a major influencing factor in all aspects of the project delivery. Overall, I feel that structure of the KPIs accurately reflects the business's core values. A critical element of the structure is the use of Safety KPIs as 'Gateway' KPIs; in effect, failure to meet the minimum Safety KPIs means that the Alliance is not allowed access to any Gain Sharing Payment.

However, I feel the influences a number of KPIs have played on the delivery of schemes were not fully understood at the initial stages of the KPI development. Rather than indicating the success of an element of the scheme (or Alliance for that matter), a number of KPIs have meant that work processes have been adjusted to maximise the respective KPI measurement. For example; safety contacts measurements are meant to indicate how much of the safety information is filtered down to field operatives. The measurement is how many 'toolbox talks' are conducted for any given period. As a result, numerous 'toolbox talks' are held in order to maximise the measurement. This focus on numbers has meant that the quality of the information being distributed has been diluted and takes a considerable amount of time away from genuine learning and the respective performance of field operatives. In addition to the dilution of information, the amount of information has meant that a number of operatives are apathetic to the talks, thereby further reducing the effect of them.

Ongoing Work

Project Development

The Salthome project has been split into two schemes, due to the complexity of the crossing element of the scheme. The timing is such that completion of the IP2 crossing element is substantially delayed due to the wayleave issues. It is foreseen that the crossing element will not complete IP2 by the time I finish my time at the Alliance, and as such, the value in me continuing is diminished. Therefore, I have reduced my role to managing the reconductoring element of Salthome. The reconductoring element of the Salthome project is close to having IP2 closed out. It is planned that this element of the project will have finished the IP2 phase by the time my next report is due.

A critical issue that has been raised during the progress of this scheme is the lack of consistent scheme requirements and communication from NG. The lack of an initial, approved, document outlining the scheme (NG) requirements has proved a major obstacle in orderly progression of the scheme. This is probably due to the timescale of the previous attempts are IP2 delivery, and the changeover from 'in-house' development to Alliance development. The subsequent lack of motivation or resources to address the lack of documentation has meant that the end goal of the scheme has not been adequately defined. Subsequent attempts to rectify the situation have proved that, while the change processes have been developed, the lack of adherence to them has meant direction of the scheme has been haphazard. A firm stance has been required in maintaining development progress, especially as the scheme is approaching the completion of IP2.

Carbon Workshops

The pan-alliance activities associated with this are continuing. Considering the amount of work that the EAE have done (i.e. me and a graduate) is far in excess of what other alliances have done, the work associated with this activity has been minimal.

I believe the limiting factors behind the speedy development of a Carbon Budget are two-fold; resourcing, and additional KPI development (although the two may be interlinked). Other Alliances have all indicated that resourcing is a critical issue for new initiatives. In addition to this, the development of Carbon KPIs is seen as additional work for the Alliances; work they are under resourced for. Confidence in accuracy and validity of the KPIs is also low, as no formal, researched methodology has been developed for the calculation of Carbon Budgets.

Staff Survey & Workplace Improvement Initiatives (Focus Group)

As part of the ongoing maintenance of the Alliance, staff surveys from all employees of both parent companies (NG and Balfour Beatty) have been consolidated. As part of the feedback, the focus group are responsible for the

analysis of the results and developing an action plan to address the respective issues. I have been brought in as an 'outsider' and have been responsible for managing the Communication Focus Group.

Other Work

Zero Harm

As mentioned in my previous report, Balfour Beatty has a safety initiative that is dubbed 'Zero Harm'. The aim of this initiative is reduce the Accident Frequency Rate (AFR) to zero. It is interesting to note that although the stated AFR aim is zero, the target AFR is 0.1.
The Zero Harm day was primarily aimed at field operatives. The purpose was to raise the awareness of the Zero Harm initiative, and increase its importance in the field.

Safety Audits

As part of the Zero Harm initiative, more safety audits are being carried out on-site. As part of the change management associated with increasing the depth of the site safety audits, site staff was conducting their own preliminary audits, prior to the official audits. I was asked to conduct a safety audit of the site office for one of the projects currently in the DDD phase.

Training

An integral part of all work the Alliance carries out is ensuring the relevant people have sufficient training in order to carry out their work. For all work carried out on and around NG assets, competency levels have been identified for each category of work. It is worthwhile noting that these competency matrices are not fully developed. This is primarily due to resourcing constraints.

NG insists on two items of training for all individuals who access the areas in and around transmission lines; the Contractors Passport, and the Basic Electrical Safety Competency.

Contractors Passport Basic Safety Training

The contractor's passport is a UK wide, industry recognised safety course. The basis of the training is to outlines the legal requirements of the Health & Safety at Work (etc) 1974. As part of the training, basic safety fundamentals in the workplace were reinforced.

Basic Electrical Safety Competency (BESC) & NG Persons - OHL

The BESC safety course used to educate workers on the basic safety requirements and behaviour around OHL, cables and towers (there is a separate substations training course). The course was developed as a response to the deaths in the industry and subsequent reports highlighting the insufficient training assessments that existed within the industry. Reports highlighted a need for practical assessment of people in order to best assess peoples competency. The course was developed by the power industry and it is now a nationally recognised course aimed at power workers and

contractors on the practical safety requirements on sites. The course highlights and educates the person in the safety procedures, tower climbing procedures, tower markings, conductor clearances and expectations (specifically with respect to their interaction with the public) placed on the individuals contracted to NG or its Alliance partners.

During the NG Persons course, I was exposed to the NG methodology of tower climbing associated with earthing of circuits. NG has structured it's methodologies to allow access to individual circuits. The methodology is based upon the simple understanding that work conducted within the structure of the tower is safe (even when the lines are energised). Subsequently, circuits can be taken out of service, earthed, made safe, and worked on while adjacent feeders are live. I feel this methodology could prove valuable in the near future, as work on towers could be conducted in a safe manner, with minimal risk to network security.

Future

In the upcoming 3 months, I plan on continuing my involvement with the Salthome scheme, as well as spending more time within the Operations team. In the final 3 months with Balfour Beatty, I intend to spend time within the Innovation Department (focussing on the issues associated with accelerated wear rates on quad conductor bundles), and possibly within the North West Gas Alliance.

Commercial

My time in commercial has been delayed until mid August. At the time of writing, I had just started my commercial secondment.

Operations

The operations team are responsible for the construction of all the workbook projects. The team is responsible for ensuring the field operatives are sufficiently trained, sufficient in quantity, and sufficiently retained for future project works. Operations are also responsible for producing construction and resource plans for the delivery of the works.