WESTERN POWER DISTRIBUTION

FALCON

DEVELOPING FUTURE POWER NETWORKS

PROJECT PROGRESS REPORT

REPORTING PERIOD: JUNE 2014 – NOVEMBER 2014

LCN Fund Low Carbon Networks

ALSTOM

Aston University Birmingham

CGI

cisco

Cranfield UNIVERSITY

Report Title	:	Six monthly progress report Reporting period: June 2014 to November 2014
Report Status	:	FINAL
Project Ref	:	WPDT2002 - FALCON
Date	:	10.12.2014

Document Control

	Name	Date
Prepared by:	Jenny Woodruff	28.10.2014
Reviewed by:	Roger Hey	10.12.2014
Recommended by:	Paul Jewell	10.12.2014
Approved (WPD):	Philip Swift	10.12.2014

Revision History

Date	Issue	Status
10.12.2014	1	FINAL

Contents

Glossary

Term	Definition
ALT	Automated Load Transfer
ANM	Authorised Network Model , the database covering the Milton Keynes area containing information about the assets and their connectivity to support network analysis and the trials.
DAR	Dynamic Asset Rating
DNO	Distribution Network Operator
DR5	The price control period covering 2010 - 2015
DSR	Demand Side Response. Customers altering their consumption/generation as an interactive service.
ENA	Energy Networks Association
EST	Energy Savings Trust
I&C	Industrial and Commercial , referring to non-domestic customers
IET	Institute of Engineering and Technology
IPSA	Network Analysis software provided by TNEI as the Network Modelling Tool within the SIM
Netspan	This is Airspan's proprietary network monitoring tool for the WiMAX communications network
NMT	Network Modelling Tool – the powerflow analysis software within the SIM
POF	Power On Fusion Distribution Management System provided to WPD by GE and modified to form part of the TDMS for the FALCON Trials.
PPR	Project Progress Report
PRG	Project Review Group
RAD	Rapid Application Development cycles
SIM	Scenario Investment Model. This is a new network modelling and optimisation tool being built specifically for the project.
SDRC	Successful Delivery Reward Criteria
TDMS	Trials Distribution Management System, software to act as an adapted control room system for the Falcon Trials.
TSB	Technology Strategy Board
TSO	Transmission System Operator

1 Executive Summary

FALCON is funded through Ofgem's Low Carbon Networks Second Tier funding mechanism. The project commenced in December 2011 and will be complete by 30th September 2015.

This report details progress of FALCON, focusing on the last six months, June 2014 to November 2014.

1.1 Business Case

We forecast that there will be no significant benefits (either carbon or financial) during the course of the project trials, as there is no change to the existing DR5 plan. Our approach for capturing benefits for each technique has been documented and a process is in place to ensure any future benefits are captured.

1.2 Project Progress

FALCON completed its initial Design Phase in September 2012. The subsequent Build Phase has taken longer than we envisaged but the Trials Phase commenced in parallel with build. Delivery of project tasks has taken longer than we thought they would, but trials are now well under way in all the techniques or indeed nearly complete. For Mesh Networks the trials are behind schedule due to significant technical issues with the innovative telecommunications platform. More information is provided within this report.

Key Achievements during this reporting period are:

- Thermal models for DAR are progressing well within the T1 Dynamic Asset Rating (DAR) Technique
- First trial of overhead T2 Automated Load Transfer (ALT) technique completed and analysis progressing well
- T3- Mesh Network installation of the equipment for the Simple Mesh has been altered and installed, based on some key learning around the design.
- Trials for T4 Battery Storage are progressing well
- Sufficient LV monitoring sites (97%) are now active with data being received from sites, collated and analysed. 5 sites are not connected yet due to communications issues or faulty equipment. These are being looked at with a view to installation of higher antennas and/or replacement units.
- The Energy Model is performing well, with the SDRC due for October completed.
- The Authorised Network Model (ANM) is now in use for SIM integration testing. A new release of the network model was made in August 2014 to include BAU changes to the network which have taken place since ANM issue 1.
- Second winter commercial trials re-designed and underway taking on board the learnings from last year trials.

1.3 Project Delivery Structure

1.3.1 Project Review Group

The FALCON Project Review Group met during this reporting period. These meetings have been to agree the revisions to the final phases of the project and provide updates on the telecommunications network and more detailed updates on the progress of the trials.

1.3.2 Resourcing

During the period the WPD Project Manager has changed. Jenny Woodruff has taken over responsibility for leading the project. There has been no impact on the Workstream leaders who carry out the day to day running of the project.

1.3.3 Collaboration Partners

There has been no change to the collaboration partners during this reporting period.

1.4 Procurement

There has been no major procurement activity during this reporting period.

1.5 Installation

Continued installation of the trials equipment has been the primary activity during this period. The installation activities for the commercial trials were completed in time for the trials starting late last year. We have revised the monitoring solution and installed new smart metering devices following a period of review and testing for this year's trials.

We are nearing completion of the engineering trials installation and more information on this is provided later within this report.

1.6 Project Risks

The Project Office, Manager and Workstream leaders take a proactive role in ensuring effective risk management for FALCON. Processes have been put in place to review whether risks still exist, whether new risks have arisen, whether the likelihood and impact of risks has changed, report significant changes which adjust risk priorities and deliver assurance of the effectiveness of control.

In keeping with the last report, Section 8 contains the current top risks associated with successfully delivering FALCON as captured in our Risk Register along with an update on the risks captured in our last six monthly project report. Table 8-3 provides an update on the most prominent risks identified at the project bid phase.

1.7 Project learning and dissemination

Project lessons learned and what worked well are captured throughout the project lifecycle. They are captured through a series of on-going reviews with stakeholders and project team members, and will be shared in lessons learned workshops at the end of the project. These are reported in Section 0 of this report.

During this reporting period we have shared our learning from FALCON through increasing schools engagement, produced some video's and made them available on line to explain the engineering and commercial trials as well as our new project newsletter. We will also shortly be publishing the results of the commercial trials for dissemination and undertaking an event in Milton Keynes. As well as this we will be shortly undertaking an online web dissemination event on data, more information on this will be available in due course.

In addition to this we have shared our learning (where applicable), through discussions and networking at a number of knowledge sharing events hosted by other organisations. An example of these are shown in Table 1-1 below:

Event Title	Date	Host	Contribution
iMechE	03/04/2014	iMechE	Presenter
IET Power in Unity	02/10/2014	IET	Presenter
LCNI Conference	20-22nd October	ENA	Presenters & Sponsors

Table 1-1 - Contribution to knowledge sharing events hosted by other organisations

We continue to share our learning with other DNOs and have followed up on a UKPN led workshop by inviting them to visit Project FALCON in Milton Keynes and discuss our DSR findings. In addition to this, we are hosting a visit from the Smarter Network Storage team in November to discuss our findings around the energy storage trials.

Further information in respect of key project learning is provided in Sections 2 and 6. We continue to make progress in this area.

2 Project Managers Report

2.1 Project Background

FALCON aims to facilitate the installation of low carbon technologies by delivering faster and cheaper connections of the HV network by complementing conventional reinforcement with smarter solutions. The trial will provide learning on the use of real time data to inform network planning rather than traditional indicators such as total demand and engineering guidelines. The learning obtained throughout the project will be shared with other DNOs and the wider industry.

FALCON is based in in Milton Keynes areas and is designing and deploying four technical and two commercial intervention techniques, and combinations thereof, designed to address network constraints.

FALCON is also developing a piece of software – a Scenario Investment Model (SIM). The SIM will be a tactical and strategic planning tool that will provide network engineers with a ranked set of solutions for developing the 11kV network by the application of the new techniques or using conventional reinforcement. The SIM will provide a visualisation of the actual constraints and the solutions to those constraints on the network using predicted demands over an assessment period. (The assessment period would typically be 10 years for tactical planning and 40 years for strategic planning). It includes a network modelling tool that models the HV network to identify potential constraints and tests suggested technique solutions; identifies techniques to apply to resolve constraints; and assess and rank the set of techniques that resolve the network issues over the assessment period. The assessment will include measures such as implementation and operational costs of the techniques, impact on Customer Minutes Lost and impact on Customer Interruptions.

To support the use of the SIM, FALCON is developing a predicted set of customer load data based on a number of different Demand Scenarios. Two methods will be assessed in developing the customer load data namely (i) the use of currently industry data used for electricity market settlement and (ii) the development of customer energy models based. The accuracy of each of the two methods will be compared to data collected from new substation monitoring installed as part of the Trials. This will allow an assessment of the effectiveness of using these estimates as an alternative to physical substation monitoring.

2.2 Project Progress

The FALCON project is three years into its lifecycle. The Design Phase was successfully completed and this report focuses on progress during month's June 2014 to December 2014 of the final parts of the Build Phase and Trials Implementation. The Build Phase was scheduled to last 12 months from October 2012 to October 2013 and it is now largely completed although there are a few matters outstanding. Trials have been undertaken on DAR, ALT and Battery Storage.

Due to challenges encountered with High Speed Tele-protection work on Mesh Networks has been re-phased and work is currently underway to implement a simple mesh trial using conventional protection approaches. More complex mesh trials have been removed from the project scope based on negative learning from the telecoms part of the project. They may be revisited outside of Project FALCON should the telecoms suppliers be able to improve the performance of their products to match the engineering requirements.

The construction of the infrastructure, including commissioning, of the trial sites has been considerably more extensive than originally planned, but of course has provided learning which we will discuss in more detail within this report. In summary though the Engineering trials started during July 2014 and throughout Q3-Q4 with data capture (for analysis purposes) being available for some of the techniques since December 2013. Whilst some of the trials are running behind schedule we have ensured that data capture has been the focus of our mitigating actions throughout. Data is the key requirement for the SIM and therefore been a constant factor throughout our planning and actions.

The SIM workstream is running well and to timescale. We have experienced some issues with the integration of the SIM Harness and the IPSA Network Modelling Tool, but these are being actively managed. The software providers (TNEI and Cranfield IVHM) have received management escalations and have responded positively. More information is provided on the approach and status in the detailed report below.

The Trials Distribution Management System (TDMS) being built by GE for FALCON was delivered as part of their product release cycle. This will allow the functionality to be available within WPD and other users of the system with immediate effect. However this approach has meant that extensive testing both within "business as usual" and the FALCON teams has been required. To mitigate unnecessary project risks, we have worked on supplementary data collection solutions where appropriate to ensure that data for the trials and the SIM is captured. This approach has proven to be invaluable given the extensive testing that has been required to get the overall FALCON telecoms Network up and running. In effect for the project the TDMS is a collection of systems rather than the single integrated system originally envisaged.

The Commercial Trials ran successfully over the winter period of 2013-2014 and the first billing run was completed. We are in the process of executing the second winter of trials, and the changes we proposed from 2013/14 learning have been developed and consolidated into project plans. We have developed the billing solution changes to reflect the enhanced trials as well as the new commercial arrangements for potential customers.

Because of the delayed start of the engineering trials rather than following the original waterfall delivery approach we are following a more "agile" approach whereby we will be running the Trials Phase and the re-runs of the trials in parallel. This does not change the delivery schedule it only compresses what is left to do into an overall shorter timescale, but still enables the optimum amount of data to be collected and analysed.

During the last reporting period we experienced a number of challenges in the engineering trials that were exacerbated by some issues with the new Telecoms WiMAX based network. Some ad-hoc periods of instability prevented some of the automated parts of the engineering trials starting and we are now intending to run those parts of the ALT and Mesh trials over backup communications network solutions (using proven BAU solutions). These have now largely been addressed and we're currently working through the installation of the final bits of equipment, and installing larger poles where signal strength has required it.

To further mitigate risks associated with lack of data from SIM we are also undertaking ALT trials using manual switching and existing automation. If confidence in the WiMAX network is re-established we may then look again at transferring where appropriate the trials over to the WiMAX network.

These telecoms issues are not wholly surprising, this is new technology and whilst it is frustrating to have some problems, there are encouraging signs such as the consistency of data from the LV Monitoring sites. A key learning for future projects is the management of high risk dependencies of engineering trials and new ICT solutions. WPD would be unlikely to combine such innovative telecoms solutions into future based engineering projects.

Our High level plan for the remainder of the project is shown in Figure 1 and remains unchanged from the last report:

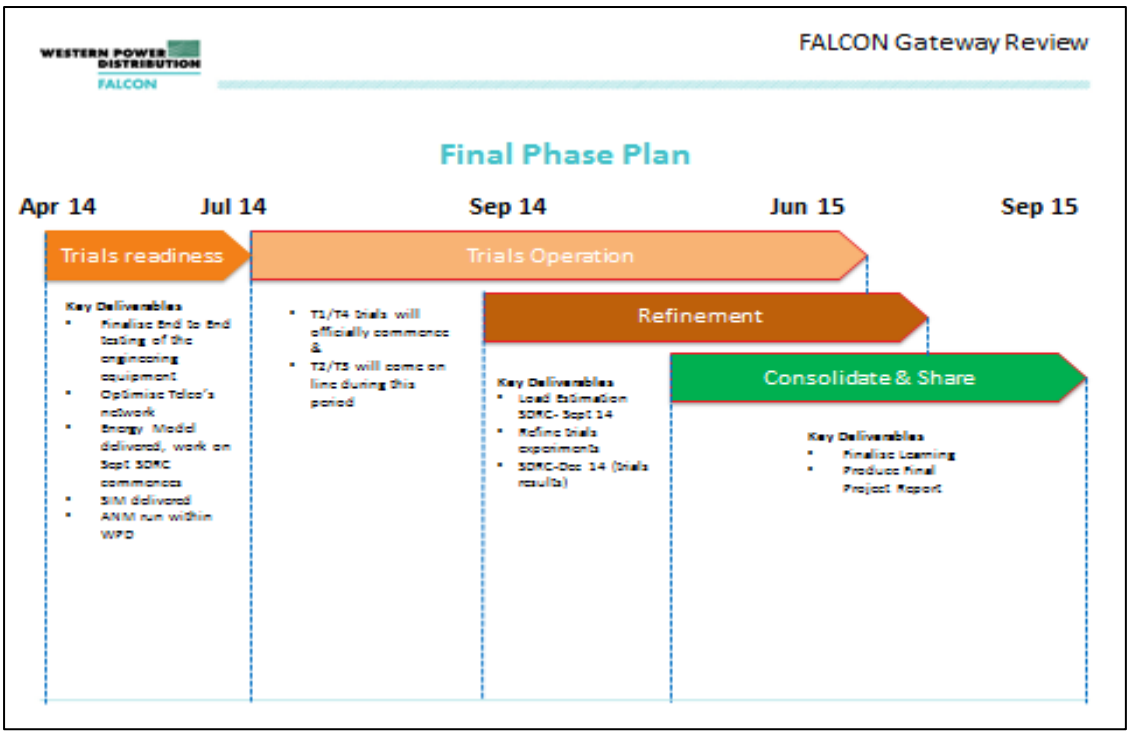

Figure 1 - Final Phase Plan

In the previous report we reported that we had agreed this plan with the team as well as the Project Review Group and were confident that this will give us what is required in order to deliver the project as was originally envisaged, there is no budgetary or delivery impact.

The remaining sections of the report reflect the progress within each project area. Below is a table which highlights the key milestones for this reporting period and their status. It is pleasing that we have been able to meet all of them despite the challenges over the engineering and telecommunications installations.

Due Date	Type	Description	Status
31/10/2014	SDRC	At least four future low carbon uptake scenarios will be developed and published. Details of the scenarios and the underlying assumptions will be documented and consulted upon (including other energy network operators, DECC and Ofgem).	Green
19/09/2014	Milestone	Real network data will be gathered from the trials and loaded onto the SIM *(via models)* by 19th September 2014.	Green

Due Date	Type	Description	Status
31/12/2014	Milestone	A specific workshop will be held to present the analysis of the network data by the SIM(Milestone DE4) Note: More information on this workshop is provided later in the report, but will be happening 29th January 2015.	Green
31/12/2014	Document	The results of the field testing, loading results of the trials in the SIM and subsequent analysis will be available and disseminated as detailed in the communications plan.	Green

Table 2-1 - Progress to date - Key Outputs and Milestones

2.3 Progress against Knowledge Capture and Dissemination

The Knowledge Capture and Dissemination part of the project continues to make consistent and positive progress as we move into the final period of the project.

More detailed information is provided within Section 6, but in summary our key achievements during this period are:

- Signoff of all high level learning areas that will support the basis for closing reports and outputs
- DSR Dissemination report produced
- Two quarterly newsletters shared with the industry

http://www.westernpowerinnovation.co.uk/Documents-(1).aspx?category=2

- Secured contribution to a major industry article on Low Carbon Projects in DNOs

Key Knowledge Capture and Dissemination Risks

Risk	Mitigation
Commercial matters with University of Bath cannot be resolved satisfactorily	**Risk Closed:** This has now been resolved.
Knowledge gained so far and not captured via existing tools and techniques has been lost	Documenting prior phase knowledge is complete. We have the tools in place to support the project team and expect no further problems in knowledge capture. **Update:** Risk now closed.

Table 2-2 - Key Knowledge Capture and Dissemination Risks

2.4 Progress against Installation activities

Engineering Techniques

The engineering trials are now progressing with techniques at different stages. We have had some challenges to date. Issues were encountered during commissioning the trials equipment and the FALCON telecoms solution. These issues meant that the trials switchgear equipment could not be commissioned over the project WiMAX solution. Instead they are currently being commissioned over legacy UHF telecoms.

We expect all trials to be running during Q3-Q4 2014 for Techniques for 1, 2 and 4 and Q1 2015 for T3. The status of each of the trials is shown in Table 2-3 below:

Technique	Status
DAR - Technique 1 Overhead Line & Primary Transformers	Data collection is underway and the mathematical model is being validated against actual temperatures. Plans are being developed in detail for early active operation (i.e. step changes in load to validate further the mathematical models).
DAR - T1 Cables	Early data collection is underway mathematical model being validated against actual temperatures.
DAR - T1 Secondary transformer	Data collection is well underway and the trials have been modified on the basis of learning from initial results and measurement points have been refined. The mathematical models are being further refined against measured temperatures and plans for capturing data from active operation are under way.
ALT and Mesh - T2 and T3- remote control	The instability of FALCON telecoms network led to plans being made for interim commissioning of remote control of the switchgear in these techniques via legacy UHF communications. We will look at the feasibility of commissioning over to the FALCON communications network once stability and confidence is achieved. We are actively working with the partners and suppliers to remedy the network issues as a matter of urgency as part of the Telecoms workstream.
ALT - Technique 2- Automated Load Transfer	An initial manual switching reconfiguration of open points on one of the trial networks took place in May as planned, with a further trial taking place in June. An initial trial of the Overhead trial network took place in October. Key learnings from these initial trials are outlined in the December SDRC report with dissemination planned for January.
Mesh - Technique 3- Meshed Network	High speed signalling over the FALCON Telecoms network has not yet been satisfactorily achieved and the implementation programme has therefore been adjusted. Efforts to improve high speed switching times will continue within the Telecoms Workstream whilst protection arrangements are implemented that allows early operation of the simple mesh network. Results of this are expected early Q1 2015.

T4- Energy Storage	Substantial operating experience has been built up since January 2014. All sites have been commissioned and trials have been actively undertaken throughout the year. Some unavailability of equipment has been experienced and work continues with GE, the supplier of the equipment.
LVM	Data is now being consistently captured from 97% of the sites. This data is available via access databases and is positively feeding into learning on substation profiles through comparison with the work of EST and was used in the completion of the SDRC for October.

Table 2-3 - Engineering Trials status

Telecoms

We have continued to support the network components installed and conduct monitoring of the health of the network overall.

We previously noted that there were performance issues with the network in some areas and in particular around the sites associated with Techniques 2 and 3 (ALT and Mesh) . We have moved the trials for these techniques to the existing business communications network to allow engineering trials to proceed but continued to investigate options for improving the WiMAX based radio solution at these locations.

This included the preparation of an Options paper in July and obtaining commercial quotes for an alternative solution from BT. However, internal escalation through the PRG has meant that we have sufficiently progressed the remaining issues and alternative options are no longer considered necessary.

Whilst we have noted some issues with signal quality at some sites, the solution has been working well for the SCADA application at the LV monitoring sites, most of the DAR technique sites and the battery locations for some months. We have had data consistently during this period from some 180 substations.

In addition we have been able to continue to develop our analytics on this data as well- this gives us confidence that with a final push of effort that we can resolve the outstanding problems. The main thrust of effort in recent months has been the installation of much taller antenna masts at the problematic sites in a rolling programme tacking the locations in priority order.
With taller mountings we have seen improvements in signals at ALL locations and significant improvements in many where we previously struggled to connect. We also noted that the UHF scanning radio BAU system surveys turned up a very similar list of problem sites to the WiMAX problem site list, showing that our previous efforts might not be unexpected.

We have isolated a number of other issues and will report on these more fully in the telecoms debrief document, but in summary these include:

- Identification and rectification programme for a limited number of systematic faults in the supplied equipment;

- Identification of certain flawed installation practices and approaches such that we are now in a better position to advise how such work should be tackled in the future;
- Identification of the signature of instances of radio interference in observed radio stats plots and IP layer ping stats plots. These are caused by fortuitous alignments of multiple primary base station transmitters in the line-of-sight of some secondary substations. We have determined that we can de-point antennas, chose a completely new base station or deploy attenuation in some such cases to rectify the issue.
- We investigated a report of possible interference between our equipment and remote barrier gate operation at a customer's warehouse in Milton Keynes. This turned out to be a fault with the customer gates and their remote commanders originating at around the same time our antenna was installed. The results of the investigation give us more confidence however that the equipment does not cause interference of the type suspected.
- We have now installed attenuation at a number of sites where the signal strength was too high. We determined that the presence of sites effectively "shouting at" the base stations might be causing them to back off and ramp down power with a consequent detrimental effect on the poorer signal locations. We are now collecting and evaluating the results.

In addition, we continue to collect all the WiMAX radio stats from the network and now have over a year of these at 1 minute data points intervals for all deployed locations. We also now have continuous IP level monitoring in place for all sites including schematic site graphics permitting quick look assessment of the whole network or parts of it.

As this is the first pilot implementation of a WiMAX network for a Utility company, it is inevitable that there will be teething problems. We have had to write off some sites, however this all adds to the learning that we will disseminate in due course.

Key engineering and telecoms risks

Risk	Mitigation
Installations will not be complete by the end of the Build Phase	A detailed installation plan has been developed and has been shared with all parties involved in the installation. The team have closely liaised with the team managers and Surf Telecoms team managers to ensure resources are available when needed. **Update**: This risk came to fruition for the engineering techniques and telecoms– the installation activity wasn't complete by the end of September 2013. Some Commissioning work is still ongoing, and there are technical issues which are adding to the delay. The installation work, however, for techniques 5 and 6 was completed on time.

Risk	Mitigation
	The Engineering Trials are now running in parallel to the remaining build activities and we are following an agile, rather than waterfall, approach to trials implementation. This work continues as per our plan.
The technology used in the Project doesn't work - it may fail during testing	Detailed designs, descriptions and testing plans are being created or have already been created. The equipment has been tested in the test lab before it has been deployed on the network. We have ensured that there has been and will continue to be close liaison between suppliers, partners and WPD to develop a deliverable solution. We continue to use the lab to test equipment and we remain confident that at the conclusion of installation activity it will work but have catered for some end to end testing to ensure it does. **Update:** The test lab continues to prove itself as a very useful asset over the last twelve months. What is can't do is completely mimic external conditions, but it has proven invaluable throughout the project to test equipment before installation at site or retest it should it fail when on site. It has also been useful when equipment fails and we have been able to trial different ways of fixing problems. We have investigated a number of issues with suppliers and have some deployed "test fixes" now in place on the network and we are closely following these locations. The performance issues of Wimax used for complex protection applications has caused us to abandon trials of the complex mesh project aspects. Provision of "workaround" communication solutions is not appropriate in the case of complex mesh as no additional learning over and above simple mesh would be generated for the SIM. The testing of complex mesh was included in the engineering trials primarily as a stress test of the telecoms solution to ensure it could facilitate a single converged IP network for all DNO traffic types. CISCO and Airspan have received management escalation and are committed to fully investigating the root cause of the issues. CISCO intend to return to their Lab environment at their HQ in San Jose during the coming weeks. This work will be done outside of FALCON at no cost to WPD/LCNF.

Table 2-4 - Key engineering and telecoms risks

2.5 Progress against Commercial Techniques

Following the highly positive results from the season 1 trials we published an interim results document and were able to host a well-attended dissemination event in June at the Milton Keynes stadium. At this we were privileged to have an excellent group of speakers who were well received and gained positive feedback from the attendees.

- Roger Hey – WPD – Future Networks Team Manager
- Paul Jewell – WPD – Policy Team Manager
- Sanna Atherton – WPD – Innovation Engineer
- Jill Cox – Flexitricity representing the Demand Response Association
- Sean Rendall – Thameswey – trial participant
- Matthew Pluke – Energy Manager at Thames Water – trial participant

At the event we shared the interim results of the trial which confirmed that as reported in the previous PPR we met the majority of our primary objectives within the trial with the exception of aggregators not managing to secure any load reduction sites but meeting all the required capacity for distributed generation. This however was not unexpected and confirms the learning from other DSR trials and the available statistics on existing DSR programmes such as those operated by National Grid.

Due to the extent of the positive learning and broader developments within the marketplace it was noted that there would be significant merit in proposing a change in the winter 2 trials that would allow FALCON to further the industry learning rather than just attempting to validate results in season 2.

An important aspect of this has been the work being carried out by ENA Shared Services Group who sought to address the challenge of avoiding a competitive market being established between TSO & DNO. The first stage of the group's concept development was published as a consultation in May with responses returned by June. It has been generally well received and established the principal that assets could be shared on a timeline basis with a DNO being provided first access up until a week ahead of real-time. We therefore based the change around testing this principal and modifying all the contracts, systems and monitoring to support it. While this may appear to be a relatively small change it required a full redesign of the trials systems as there are fundamental differences between providing 30 minutes notice against a week ahead schedule in order to prevent abuse by participants.

Therefore we have also extended the trials to include an in-house smart metering solution and capping of consumption calculated from a baseline based on the previous year's consumption data. These changes also necessitated a further piece of work to modify the back office systems that support the trial by providing performance assessment, financial settlement and billing functions.

The trials have commenced as planned at the beginning of November and have the benefit of two load reduction sites completing an almost full scope of learning as they have been contracted from two of the three possible size categories as well as directly and via third party aggregator. The trials will continue to the end of February after which the learning will be consolidated and a final commercial trials report incorporating results from both seasons expected to be published in June.

Key risks

Risk	Mitigation
Demand Turndown availability will not materialise	There is a risk that we will not have secured sufficient volume to fully demonstrate this aspect of the trial, but we are actively working with a number of prospects to ensure that we can operate this part of the trial. **Update:** This risk came to fruition last winter and we worked closely with partners in the Milton Keynes area to secure customers willing to take part in the winter 2014/15 trials. We have made changes to the scheme for this year, but we will keep this risk live and monitor it closely through to completion of the project.

2.6 Progress against Scenario Investment Model

The SIM Workstream continues to run effectively, building on the successful delivery of the SDRC (identification of Network Hotspots) at the end of September 2013. We finished integration testing with the Network Modelling Tool (NMT), IPSA and whilst it took longer than planned due to the need for NMT supplier to keep their product development and release schedules on plan, overall it produced few surprises and followed the path of a typical complex software integration. We did an initial run of the SIM with the NMT in April and the results have been really encouraging. Since then we have been developing and integrating further components and expect to complete this by the end of December 2014. This is later than the original schedule but we prefer to make the SIM tool as stable, usable and useful as possible.

The systems integration activity ran into difficulties during the reporting period caused by resource shortages at TNEI. Management escalation and additional support by Cransfield have resolved the immediate issue but the risk of reoccurrence is being monitored closely. TNEI have nominated a new Project Manager. CGI continue to manage the SIM aspects of the project due to their expertise in systems integration activities.

In August we sought additional funding for the next stage of SIM development as a partnership of organisations (WPD, CGI and Cranfield University) on the TSB/Energy Catalyst call for submissions. Unfortunately we failed the first gate review as we had not convinced them of the business case. We are currently working on a possible new approach to this as we believe that the SIM has a very useful future.

We are extremely pleased with the progress of the SIM workstream and the quality of the work being undertaken. This has validated the approach undertaken throughout.

Our approach throughout was to follow the usual waterfall development lifecycle but to deploy a number of Rapid Application Development (RAD) cycles to provide a dynamic response based on user interaction with the SIM as well as consider a number of optional requirements(which had been identified during the design phase). To this end we engaged a user group early in the planning process, as mentioned in previous reports.

After establishing a SIM User Group, consisting of experienced WPD 11kV and strategic planners, we have subsequently held five SIM user group meetings and continue to issue regular update newsletters.

Our focus in recent months has been on continuing integration and preparation for the December 2014 SDRC – preparing both the submission and the research which drives it. The work centres on informing the SIM techniques implementation (as theoretical models transformed into algorithms then coded into SIM modules to action these techniques in the software) by the output findings of the active trials. We will report on this much more fully in the SDRC Report which is due at the same time as this 6 month progress report.

Key risks

Risk	Mitigation
TNEI and IVHM Centre can't make the SIM work as a whole	Cranfield University's IVHM Centre, TNEI, CGI and WPD are working closely together to ensure requirements, roles and responsibilities are clear (and reflected contractually, where appropriate) as well as ensuring a common understanding. Interface documents between the NMT and the SIM Harness are being developed as part of the detailed design to ensure the two elements can work. This of course remains a risk to an extent, but we are increasingly confident that the SIM project will deliver to requirements and therefore intend to only monitor this risk moving forward. **Update:** Risk is closed.
Validation/Verification of Results	There is a risk that we might be able to make the SIM work but the results will not be meaningful. This requires a vigilant eye on the work-stream to ensure that the overall design is in line with expectations and that its core functions are doing what we envisaged. We will report on this risk more in the next report as it will become clearer over the next period whether the SIM is doing what we intended.

Risk	Mitigation
	Update: This risk is ongoing and we continue to monitor it. We are nearing a time soon when we can make more definitive statements about how well the SIM works in practice. This risk will be closed once real data is run through and results validated.

2.7 Progress against Load Estimation

As stated in previous reports we are developing a set of predicted customer load data based on a number of different Demand Scenarios to support the SIM. These Demand Scenarios allow us to see the impact of different rates of uptake of low carbon technologies.

Two methods of estimating load have been assessed:

- industry data used for electricity market settlement and
- the development of an Energy Model.

Since the previous progress report the four demand scenarios have been configured within the Energy Model. These scenarios are closely aligned to those used by the Transform model for ED1 planning, which reflect the assumptions within the DECC Scenarios. There has been a consultation with DNOs and other interested parties and some aspects have been adjusted following the consultation responses. This is described in more detail in the SDRC document.


Falcon Scenarios Report v2.0.pdf

The process of fully testing the demand scenarios has uncovered some performance issues with the Energy Model which have now been improved.

In addition to creating the demand scenarios, the area of network that is covered by the Energy Model has been extended. While previously the model only covered the core six primaries that were within the FALCON Area, the area now includes additional circuits which are associated with trials or could be involved in providing an alternative network arrangement under fault conditions. The power flow analysis that takes place in the SIM includes testing networks under fault conditions and therefore the loads in these adjoining circuits must also be known and taken into account, even though they are not the subject of the study.

The quality of the Energy Model output has been assessed by comparing the estimates to the monitoring data. This confirms that the Energy Model output is realistic and that there do not appear to be systematic errors in the way that the load is calculated. The analysis reconfirms previous work showing that the best results are obtained for substations with more customers and for substations dominated by domestic load. This work is described in more detailed in the SDRC document.


Energy Model-
Comparision of Estima

Risk	Mitigation
Risk that the Energy Model does not deliver the quality of results that we expected	**Update**: This is now closed as the Energy Model output has been validated against the monitoring data. The change to peak demand for the demand scenarios as seen in 2050 has been compared to similar estimates and is within a credible range.
Risk that the NMT is not capable of handling the volumes of data	Have run early DAR technique through NMT and SIM and used NMT for SDRC in September 2013 to test capability. We have no concerns moving forward on this risk. **Update:** Risk is now closed

3 Business Case Update

We forecast that there will be no significant benefits (either carbon or financial) during the course of the project trials, as there is no change to the existing DR5 plan. Our approach for capturing benefits for each technique has been documented and a process is in place to ensure any future benefits are captured.

4 Progress against Budget

A revised budget will be submitted to Ofgem to reflect the updated project plan during the next period. For the purposes of this report; progress against the previous budget is shown below:

	Total Budget	Forecast Spend Nov 2014	Actual Spend Nov 2014	Variance £	Variance %	Comments
Labour	**2281**	**1480**	**1170**	**310**	**-26%**	
Project Management Costs (WPD)	**813**	499	418	-81	-19%	See Note 1.
WPD Design Team	**1468**	981	752	-229	-30%	See Note 2.
Equipment	**1679**	**1664**	**2022**	**359**	**18%**	
Solution Design - Use Cases Review and finalise use cases	**8**	7	4	-3	-64%	See Note 3.
Solution Design - Use Cases Detailed desktop network design	**56**	44	29	-15	-52%	
Solution Design -Method infrastructure scenario investment model Design	**8**	7	4	-3	-64%	
Deploy intervention techniques Intervention technique 1 - Dynamic Asset Management	**61**	61	75	14	19%	See Note 4.
Deploy intervention techniques Intervention technique 2 - Automatic Load Transfer	**12**	12	15	3	19%	
Deploy intervention techniques Intervention technique 3 - Meshed Networks	**138**	138	171	33	19%	
Deploy intervention techniques Intervention technique 4 - Storage	**1388**	1388	1715	327	19%	
Operate Scenario Investment Model Deploy learning from intervention techniques to SIM	**8**	8	9	2	19%	
Contractors	**6012**	**5292**	**4452**	**-841**	**-19%**	
Project Management Costs (Logica)	**736**	513	988	475	48%	See Note 2.
Solution Design - Use Cases Review and finalise use cases	**240**	215	160	-55	-34%	See Note 5.
Solution Design - Use Cases Detailed desktop network design	**287**	287	214	-73	-34%	
Solution Design -Method infrastructure scenario investment model Design	**325**	277	206	-71	-34%	
Scenario Investment Model Build Scenario Investment Model Software Development	**244**	233	173	-59	-34%	
Deploy monitoring equipment infrastructure Deploy IP infrastructure	**6**	262	195	-67	-34%	
Deploy intervention techniques Intervention technique 1 - Dynamic Asset Management	**3**	3	2	-1	-34%	
Deploy intervention techniques Intervention technique 2 - Automatic Load Transfer	**1671**	1683	1252	-430	-34%	
Deploy intervention techniques Intervention technique 3 - Meshed Networks	**73**	66	49	-17	-34%	

Deploy intervention techniques Intervention technique 4 - Storage	**336**	153	114	-39	-34%	
Deploy intervention techniques Intervention technique 5 - Distributed Generation	**44**	34	26	-9	-34%	
Deploy intervention techniques Intervention technique 6 - Demand Side Management	**86**	71	53	-18	-34%	
Operate trials Intervention technique 2 - Automatic Load Transfer	**24**	23	17	-6	-34%	See Note 5.
Operate trials Intervention technique 3 - Meshed Networks	**7**	5	4	-1	-34%	
Operate trials Intervention technique 5 - Distributed Generation	**90**	72	54	-18	-34%	
Operate trials Intervention technique 6 - Demand Side Management	**90**	72	54	-18	-34%	
Operate Scenario Investment Model Gather intervention technique results	**218**	223	166	-57	-34%	
Operate Scenario Investment Model Assess Results	**397**	326	243	-83	-34%	
Operate Scenario Investment Model Deploy learning from intervention techniques to SIM	**245**	227	169	-58	-34%	
Operate modified trials Assess Results	**56**	37	28	-10	-34%	
Learning dissemination Market research with stakeholders	**28**	419	263	-156	-60%	
Learning dissemination Electronic media	**49**	2	0	-2	-100%	
Learning dissemination Workshops / seminars	**302**	25	4	-21	-527%	
Learning dissemination FALCON Dissemination conferences	**73**	2	0	-2	-100%	See Note 6.
Learning dissemination Academic dissemination	**120**	26	7	-19	-270%	
Learning dissemination Other media	**41**	2	0	-2	-100%	
Learning dissemination Reports	**132**	30	12	-18	-151%	
Learning dissemination Training	**91**	5	1	-4	-384%	
IT	**2914**	**2476**	**2603**	**127**	**5%**	
WPD IT Costs - Hardware and connection	**72**	61	64	3	5%	
Solution Design - Use Cases Detailed desktop network design	**247**	210	221	11	5%	
Scenario Investment Model Build Hardware/Software purchase	**97**	82	87	4	5%	
Deploy monitoring equipment infrastructure Deploy IP infrastructure	**1620**	1377	1448	71	5%	
Deploy intervention techniques Intervention technique 1 - Dynamic Asset Management	**133**	113	119	6	5%	
Deploy intervention techniques Intervention technique 2 - Automatic Load Transfer	**133**	113	119	6	5%	
Deploy intervention techniques Intervention technique 3 - Meshed Networks	**133**	113	119	6	5%	
Deploy intervention techniques Intervention technique 4 - Storage	**133**	113	119	6	5%	
Deploy intervention techniques Intervention technique 5 - Distributed Generation	**135**	115	121	6	5%	

Deploy intervention techniques Intervention technique 6 - Demand Side Management	**173**	147	155	8	5%	
Operate Scenario Investment Model Assess Results	**35**	30	31	2	5%	
Learning dissemination Market research with stakeholders	**2**	2	2	0	5%	
IPR Costs	**0**	**0**	**0**	**0**	**0%**	
Travel & Expenses	**329**	**269**	**267**	**-3**	**-1%**	
Phase 1 - Solution Design	**157**	127	126	-1	-1%	
Phase 2 - Solution Build	**124**	108	107	-1	-1%	
Phase 3 - Trial Implementation	**21**	17	16	0	-1%	
Learning Dissemination	**28**	18	18	0	-1%	
Payments to users	**240**	**228**	**73**	**-155**	**-213%**	
Operate modified trials Gather intervention technique results	**240**	228	73	-155	-213%	See Note 7.
Contingency	**0**	**0**	**0**	**0**	**0%**	
Decommissioning	**0**	**0**	**0**	**0**	**0%**	
Other	**668**	**635**	**679**	**45**	**7%**	
Phase 1 - Solution Design	**421**	400	428	28	7%	
Phase 2 - Solution Build	**95**	90	97	6	7%	
Phase 3 - Trial Implementation	**106**	101	108	7	7%	
Learning dissemination	**46**	44	47	3	7%	
TOTAL	**14123**	**12044**	**11266**	**-778**	**-7%**	

Table 4-1 - Progress against budget

Note 1. Temporary reduction to WPD internal resource
Note 2. Anticipated WPD resource has been filled by contractors
Note 3. Works completed under budget
Note 4. Additional equipment to cater for work arounds
Note 5. Large payments to Alstom & Aston Uni all due within the next quarter
Note 6. Contract with Bath Uni cancelled, more cost effective alternative for K,C&D now being deployed
Note 7. Remainder of budget to be spent over the 2014/15 Winter trials

5 Successful Delivery Reward Criteria (SDRC)

We have one SDRC due during this period with two further SDRCs due at the end of the calendar year. Below offers an update on the current state of each area.

SDRC	Status	Due Date	Comments
At least four future low carbon uptake scenarios will be developed and published. Details of the scenarios and the underlying assumptions will be documented and consulted upon (including other energy network operators, DECC and Ofgem).	Green	31/10/2014	This SDRC was due at the end of October, was completed and delivered successfully on time to Ofgem.
The Engineering intervention technique trials 1-4 will be deployed onto the network and the results loaded on the SIM. The results will be analysed and available for dissemination by December 2014	Green	31/12/2014	Each element of this SDRC has been addressed to ensure delivery is met on time and to the appropriate quality. The functional specification for the batteries has been updated to reflect the current specification and the technical arrangements with the supplier have been captured. Dissemination continues throughout multiple channels, but reflects the current position of each technique i.e. heavier dissemination across energy storage. The workshop event is scheduled for 29th January 2015. We do not expect any issues preventing achievement of this SDRC.

SDRC	Status	Due Date	Comments
The Commercial intervention technique trials will be deployed onto the network. The results will be analysed and dissemination by December 2014.	Green	31/12/2014	This SDRC is also due for delivery by 31/12/2014 and is on target to be completed in time. As the commercial trials take place over two seasons, much of this can be derived from the first season trials and reports. A specification document with use cases has been compiled and revised reflecting the updates to the trials for Season 2. Commercial agreements are in place – again these have been updated and revised for Season 2. We also continue to pro-actively disseminate learning around T5/6 through various industry channels, such as the Shared Services Group and inter-DNO events. The workshop is included in the above SDRC.

5.1 Future SDRCs

Table 5-1 captures the remaining SDRCs for completion during the project life cycle.

SDRC	Status	Due Date	Comments
Assess the suitability of the Method for mainstream adoption and produce an optimum investment plan by 30th September 2015.	Green	30/09/2015	We are well on track to complete this SDRC with on-going sharing contributing to achieving this SDRC.

Table 5-1 - SDRCs to be completed

6 Learning Outcomes

KC&D continues to collect at the same pace as each workstream, with regular reviews continuing with key internal stakeholders and the Project Leads. We are at a stage where all high level learning areas (Parent) have been signed off by the main stakeholders in the business and we continue to grow the learning captured in these areas to begin reporting on them in 2015.

As we progress towards our final SDRC in 2015 these Parent Learning areas will begin to form the focus for reporting and closing out of the project. Alongside ongoing knowledge dissemination and industry exposure we are making good progress to sharing what we are learning as we progress. As well as our formal dissemination events, and those planned for 2015, we are also engaging DNOs on a local basis to discuss trials and techniques at a more detailed level.

We continue to capitalise on our internal awareness drive and following the completion of the LCNI event we will be displaying the interactive models along with some literature about Project FALCON in two main areas at Pegasus and Bristol. This will allow several parts of the business additional exposure to the techniques.

Our first targeted dissemination event was held in June at stadium:MK and discussed the first winter commercial trials for Project FALCON. The event was a wide success with a positive list of attendees. Feedback taken during and after the event showed the audience were very receptive.

Later in the summer our formal output from the first set of trials was disseminated formally to the industry. This interim learning document also received praise from many of the recipients and also generated further engagement from industry colleagues.

Many of those points we ‘set out to learn’ are some way towards being complete now, but only in those areas up to speed in the project. Much of the T5/6 learning objectives have been addressed in some format and we now continue to get further learning from the next set of trials.

With Technique 4 at the forefront of the engineering trials and generating valid tangible data, we continue to build on our learning from this portion of the trial. Energy storage is a popular topic in the industry at present and we aim to capitalise on WPD’s projects in this area. Alongside the remainder of the Future Networks Team we have also fed into the Good Practice Guide and industry bodies such as ESOF, using FALCON as one of the case studies.

DETAILED LEARNING OUTPUTS

Project FALCON hasn't had as significant a requirement for interaction as other similar projects. Our main source of interaction with consumers has been in the design and build of the engineering projects and telecoms, essentially to avoid interference. That said, since our energy storage sites have gone live, we have received some feedback about the units and have begun to address these immediately. We continue to monitor the situation to avoid any further issue.

We continue to engage I&C consumers through our second set of winter DR trials and have recruited some additional capacity, both directly and via an aggregator. These additional sites will represent a turndown opportunity.

We have also updated our commercial contract with these customers to reflect the nature of Season 2 trials as detailed in the next section.

Project Management, Procurement & Legal

It is clear that given the complexity of FALCON that projects which contain multiple workstreams need a more considered design phase and as part of our key learning, which we will link to our "learning to learn" proposals, that FALCON and future projects should have a longer design phase and that will allow build, implementation and trials to run that much more smoothly.

During the Energy Storage roll out, we found that some of our originally chosen sites were not viable due to concerns about the potential for noise transmitted from the devices. We therefore identified some more appropriate sites. In order deploy the batteries to those sites, we engaged landowners' procurement division, as well as our legal department, and managed to purchase of the plots of the land necessary to complete the installations for the trials.

A new contract template for the revised commercial trials is currently under discussion after receiving approval for the new trials. The contract will take on board the lessons that have been learnt from last year trials, this we hope will make for an even more valuable trial next year.

The contractual template (appended) has now been amended to take into account the revised commercial trials for Season 2. This takes into account lessons learnt during last year's trials, increasing the strength of the relationship.

Construction Process

Our energy storage sites have been a real success, generating some interesting data for our stakeholders and we are capitalising on this by hosting a visit from an energy storage project run by UKPN, looking at our construction process and findings.

Much of our build phase is behind us now as we are engaged in trials, so most construction, both physical and software, is complete and only requires revisits for alterations or improvements.

We have worked with project partner CGI, as well as the in house IR team, to build and develop a back office platform for supporting the commercial trials. This new system is now in trials use for Winter 2014/5.

Technology & Equipment

We continue to learn with our technology and equipment and we have been engaging suppliers much more as we start to draw conclusions and discuss technological advances. Some of our suppliers have taken the opportunity to spend on time on site to look at improvements and developing their product to be fit for purpose.

Learning points will emerge for all of the Engineering Techniques; an initial flavour of this is exemplified by:

- DAR- Suitability of selected instrumentation for underground installation
- ALT- stability of comms network for operational switching; accuracy of current measurement at ring main units;
- Mesh Networks –phasing of implementation plans such that low technology risk learning is not made dependent on high engineering risk activities(e.g. HST);
- Energy Storage- sites are all commissioned and functional and we have drawn a huge amount of learning from the end to end systems so far.

We have also installed our own smart metering solutions across each of the trial sites in the commercial trials. These are in series with the settlement meters and will allow us to assess sites when looking at turndown/generation behind the meter.

People & Culture

We continue to liaise with stakeholders at all levels and have seen a marked increase in the levels of internal engagement as the project nears the final phases.

We have also engaged those participants in the commercial trials before the trials commence, in order to maintain a time stamped reflective view throughout the second set of winter trials.

2014 has seen a significant increase in dissemination activities as we share learning with the industry, through appearances at events and conferences, engagement with other industry groups such as LCRI and our display at LCNI. We are keen to further raise the profile of FALCON within the industry and have increased the level of engagement with other DNOs and partners as we reach the final phases and share our knowledge.

Industry Processes & Regulations

Over the past a year UK DNOs and National Grid have formed a DSR Shared Services Group have been developing a Shared services model. The model conveys a joint view of how DSR could work across the electricity system. Representatives from the FALCON project have attended the meetings and taken an active part in developing the report, currently out for consultation. Learning from the FALCON 2013/14 winter trials has been fundamental in shaping the framework. The learning gained through the commercial trials has also been fed into Ofgem's Workstream 6 meetings and specifically the Shared Services report.

The 2014/15 commercial trials will be testing whether certain aspects of the model could work in reality, rather than remain a theoretical possibility. This is a clear indication of how FALCON is taking industry development and dynamically incorporating them into the project's learning objectives.

Our work on energy storage has helped us support the development of national best practise, with our recent feed into the industry document Electrical Energy Storage – Good Practice Guide presented to DECC.

IT & Telecommunications

We have continued to refine the FALCON telecommunications network beyond the initial deployment both to optimise and improve the overall system as well as to drive out learning from the operational stage. We have gone through a process of identifying and following the progress of problematic sites in a number of issues categories and investigated and deployed a range of resolution strategies. We have also brought into operation a number of monitoring tools, gathered long term monitoring statistics, identified and resolved (or have in train to do so) configuration and hardware issues and deployed a complimentary radio solution for control purposes. We have written an options paper for WiMAX backup solutions, fully commercially costed one alternative and explored with the radio authorities (and subsequently discounted) another radio "mesh" backup solution. At the present time we have some 184 WiMAX active sites (of 200 originally intended), are gathering LVM data continually from 155 locations to supplement the Energy Model work, and already support the passive technique components of DAR and Energy Storage for which data analysis is ongoing.

The SIM modelling tool is still going through integration a process which has taken longer than anticipated due to constraints with linking to the release schedule of the commercial power flow modelling tool at its core. However all the major components (including the network data sources) are in place and undergoing refinement as necessary. We are also now working on updating (ie refining based on feedback) the way that the intervention techniques are modelled within the SIM by drawing upon the results of the FALCON field trials as documented in the December 2014 SDRC report.

Our new back office platform for the commercial trials has been rolled out in the trials and we hope to make any improvements over Winter 2014/5 as we identify them.

Internal Dissemination

Internally we have continued to engage key stakeholders formally, through Project Review meetings as well as informally through team meetings. We also have a series of interactive models developed for the project, which will shortly be going on a roadshow display of our main sites in order to allow BAU staff across all parts of the business, learn more about the techniques.

During 2015 we anticipate a further dissemination article in the company wide magazine Powerlines.

External Dissemination

External dissemination continues as scheduled, with various briefing sessions and industry representations attended, with an example of a few below.

Our summer dissemination event, held in Milton Keynes, focussed on our first seasons commercial trials. This event was a success with a high industry attendance from other DNOs and similar scheme providers. Shortly after we followed this up with the sharing of our interim report detailing the commercial trials in more depth.

We continue to liaise with local stakeholders in schools and major businesses in the area and aim to increase the exposure in the local business community during 2015.

WPD continue to be a key stakeholder in the Low Carbon Living Programme chaired by Milton Keynes Council. As part of our low carbon projects in the area, we also share updates from FALCON on a regular bi-monthly basis.

During this period we have undertaken the following key external dissemination activities:

Event/Activity	Purpose
LCNI 2014	Industry event
LCRI 2014	Industry event
iMechE	Presentation and knowledge sharing
A Balancing Act	Industry Dissemination
IET Power in Unity	Presentation and knowledge sharing

Table 6-1 - Key External Dissemination Activity

7 Intellectual Property Rights

There is no IPR generated or registered during this reporting period and it is not expected that we will register any IPR in the next period.

8 Risk Management

As stated in the previous Report, our risk management objectives are to:

- ensure that risk management is clearly and consistently integrated into the project management activities and evidenced through the project documentation;
- comply with WPDs risk management processes and any governance requirements as specified by Ofgem; and
- anticipate and respond to changing project requirements.

These objectives will be achieved by:

- ✓ defining the roles, responsibilities and reporting lines within the team for risk management
- ✓ including risk management issues when writing reports and considering decisions
- ✓ maintaining a risk register
- ✓ communicating risks and ensuring suitable training and supervision is provided
- ✓ preparing mitigation action plans
- ✓ preparing contingency action plans
- ✓ regular monitoring and updating of risks and the risk controls

8.1 Current Issues

For this period we are also highlighting the current issues that we are dealing with. Issues are those risks that we have previously raised that then come to fruition and that we are now actively managing.

Issues are raised with the Project Review Group should they need escalating for resolution.

Issue	Status	Description	Mitigation Action Plan
Telecoms Network-stability/ responsibility	Amber	The stability of the network has previously been reported as an issue	This was escalated to the PRG who are worked with the relevant stakeholders to achieve a solution. This issue is now under control with work under well under way to improve stability and get the network to a position where we confidence is restored. To be downgraded to Risk.

Issue	Status	Description	Mitigation Action Plan
Telecoms Network-Recovery effort/budget	Amber	A number of activities need to be undertaken in order to re-establish confidence in the network. These include some reconfiguring of the devices and other related engineering matters.	Budget is being worked through now and any changes will be managed in accordance with WPD and LCNF governance requirements
Engineering Trials	Green	Because the telecoms network suffered some problems, and the extensive testing that has been required in order to bring TDMS on line, coupled with the End to End testing required on the network- delays have been somewhat inevitable. Data is being collected at a local level for T1&4, however the delays are now such that trials will start in July 2014.	Informed PRG of the matter and we have a plan to get to the end of the project. We will keep the PRG informed of progress throughout to ensure that where any escalation actions are needed that they can assist as appropriate. We continue to regularly report on progress and trials are well under way in three of the techniques. The remaining work is progressing.
TDMS	Green	TDMS is being delivered in the context of a Poweron Fusion upgrade and supplementary systems.	The PRG are aware and we have contingency in the place so as not to delay commencement of the trials any further than is necessary. We originally envisaged the TDMS being a single system however we feel that this is no longer appropriate given the complexity of what we were trying to achieve. The interim solution works in the way that we intended TDMS so we will continue with this solution.

Table 8-1 - Current Project Issues

8.2 Current Risks

The FALCON risk register is a live document and is updated regularly. There are currently 44 live project related risks. Mitigation action plans are identified when raising a risk and the appropriate steps then taken to ensure risks do not become issues wherever possible.

In Table 8-2, we give details of our top five current risks by category and also those risks that we have been actively tracking since the last report. For each of these risks, a mitigation action plan has been identified and the progress of these are tracked and reported.

Risk	Risk Rating	Mitigation Action Plan	Progress
There is a risk that when TDMS is delivered that it will not work in the way that the team envisaged.	Minor	We have a mitigation to get data back for the trials. Whilst TDMS was initially set out to be a single system solution, we have recognised that it is harder to integrate it seamlessly in the timescales required. We ensured that we could obtain data by alternative mechanisms so as not to delay the trials and impact the SIM.	Now that we are not progressing with a multi-platform TDMS this risk no longer presents a potential threat to the delivery.
We are currently experiencing server maintenance matters for the Netspan system. The Netspan system provides an overview of the signal strength of the radio network .There is a risk that some data may be lost in the event of a failure at the data centre.	Minor	The FALCON Comms Network is relatively new and establishing the appropriate support arrangements is crucial. We are actively engaging with the internal stakeholders to ensure the level of support is provided for the trials. Data loss will be small in the event of an outage as the Project Team take backups periodically.	Steady progress has been made to make sure that the relevant support arrangements are in place and this is now under control.
Requirements misunderstood or misinterpreted. There is a risk that the SIM requirements may have been misunderstood and that when the system goes live that this will only come	Moderate	Continual dialogue throughout the project with Users and other parties as well as ensuring that the team remains consistent throughout should mitigate this risk	This is always a risk in projects such as this, but we are confident that given the approach to date that this is being managed. We are using specialist consultants from CGI to treat this risk. User Acceptance Testing will also act as an early warning.

Risk	Risk Rating	Mitigation Action Plan	Progress
to light then.			
If trials equipment needs to be commissioned over WiMAX at a later date, the project will incur time additional resource costs and potentially additional support costs from Cisco (unless Surf have built up technical knowledge)	Minor	Ensure that Surf Telecoms are engaged so that handover from Cisco to Surf is achieved.	Cut over to the WiMax solution for mesh operation will happen beyond FALCON timescales if justified.
The Energy Storage Systems may emit a noise, which is of a pitch that is unacceptable to customers in the vicinity of the installation.	Moderate	We initially selected one site where we can test the devices and make any impact on the local community minimal.	We are installing and commissioning one site at a time to fully assess the impact of the noise. Three of the five sites chosen are away from customer premises, and therefore will have minimal impact. The remaining two are close to residential houses; these are now installed and we continue to monitor the situation.. In parallel, we are looking at sound cancelling methods.
The technology used in the Project doesn't work	Minor	As the equipment is installed it may not deliver what we expect or it fails during testing	Detailed designs, descriptions and testing plans are or have been created. The Technical Design Architect owns the whole design and it's 'deliverability'. The test lab functionality ensures that we are able to test

Risk	Risk Rating	Mitigation Action Plan	Progress
			the equipment to be deployed on the network before field testing commences. We have ensured that there has been and will continue to be close liaison between suppliers, partners and WPD to develop a deliverable solution. We will not know this for certain until we have carried out our End to End testing. **Update:** this is still a risk and one that may well become an issue in due course as the trials get under way and as such is currently under monitoring.
The whole solution does not integrate effectively (For clarity, the whole solution may not integrate at a suitable level of quality in the time and cost constraints of the project)	Moderate	There are a number of solutions within the overall design and there is a risk that the whole solution might not work.	Detailed requirements and designs have been developed in conjunction with impacted parties e.g. Cranfield University, TNEI and WPD IR. Interface specifications are being developed and reviewed as a technical community – members from project partners, the core project team and WPD. As stated previously the Technical Design Architect owns the whole design and it's 'deliverability'. Our testing and integration planning should ensure

Risk	Risk Rating	Mitigation Action Plan	Progress
			that this is tested robustly. **Update:** Risk is under monitoring as this may well come to fruition during the trials.
Little or no uptake in commercial trials (techniques 5 & 6)	Minor	There is a risk that, even with the expertise now recruited into the project team, customers are not interested in taking part in the trials, either due to not enough financial incentive or just not interested in the concept.	Risk for T5 – demand turn down came to fruition in 2013 despite our best efforts. Generation customers (T6) had been very responsive, but demand response customers have failed to materialise for the last trial period. **Update**: Winter trials 2014/15 have sufficient customers.
Costs exceed the budget	Moderate	There is a risk that as the technical design becomes more detailed and clearer, costs could increase	Continuous dialogue is taking place between all the technical partner/suppliers to ensure a common understanding of requirements, scope, budgetary constraints and the potential impact of scope creep. Keeping costs under a tight rein is crucial and so scope is considered as part of the Change Management process and, if costs could be impacted, it's escalated to the PRG for consideration and decision. We continue to keep this under monitoring.

Table 8-2 - Top five current risks (by rating)

Descriptions of the most prominent risks, identified at the project bid phase, are provided in Table 8-3 with updates on their current risk status. As the project is into the final phase, most of these risks have been closed or mitigated.

Risk	Previous Risk Rating	Current Risk Rating	Comments
The project team cannot be effectively resourced	Major	Minor	**Risk closed**. Obtaining the right skills for the project was a key learning point for WPD during the Mobilisation and early part of the Design Phase. Where non-standard DNO, or niche, specialised skills have been required we have sourced these from external organisations. Whilst the risk is closed, another has opened. Sourcing skills externally has placed pressure on the budget, the impact of which is being carefully monitored.
The project Delivery Team does not have the knowledge required to deliver the project	Moderate	Minor	**Risk closed**. Key members of the Bid team transferred across to the Project Delivery Team, plus external partners remained the same, therefore a vast amount of knowledge was retained. The Design phase proved critical in developing the detailed scope of the project. This risk is closed.
The overall Project scope and cost could creep	Severe	Moderate	Time, cost and quality parameters are carefully monitored to ensure project scope does not creep and negatively impact the budget and timescales. Any changes to the original scope are subject to approval via the change control processes. Close scrutiny on costs is maintained throughout and this ensures that whilst potential impact of scope creep can be severe it is managed proactively. No change to report in this period.

Risk	Previous Risk Rating	Current Risk Rating	Comments
Partner perceptions on their project scope may change as we move from MoU to signing a ontract	Moderate	Minor	**Risk closed**. All partners moved successfully from MoU to a collaboration agreement during the Mobilisation Phase. The purpose of the Design Phase was to refine the scope of each partner and, where appropriate, contracts updated.
A partner may withdraw from the project or may have oversold their solution	Moderate	Minor	**Risk Closed:** We experienced this with Aston University, as outlined in previous reports. We mitigated this by sharing the work between CGI and WPD and revised each partner's contract accordingly. Whilst requirements have been captured, this risk will remain open for the remainder of the project. In case of changes in partner scope, we have an established change management process in place. In terms of a partner withdrawing, we have ensured that designs are documented effectively and, through our knowledge capture processes, are ensuring knowledge is shared amongst the team.
CGI unable to resource the Project Office, Independent Technical Design Consultant and Quality Assurance and Benefits Management roles	Moderate	Minor	**Risk closed.** Logica (now CGI) resource populate these roles.

Risk	Previous Risk Rating	Current Risk Rating	Comments
The SIM software cannot be designed within the required timescales	Severe	Moderate	**Risk closed.** This was a key learning for WPD – the SIM is a software development, which required specialised, non-standard DNO skills. The allocated time for the design phase was not long enough for this activity; therefore the Design Phase for the SIM has been extended. This does not, however, have a negative impact on the SDRC deliverables associated with the SIM.

Table 8-3 - Top five risks identified at the project bid phase

9 Consistency with Full Submission

The project remains consistent with the original submission for this period.

10 Accuracy Assurance Statement

This report has been prepared by the FALCON Project Manager (Jennifer Woodruff), reviewed by the Future Networks Team Manager (Roger Hey), recommended by the Policy Manager (Paul Jewell) and approved by the Operations Director (Philip Swift).

All efforts have been made to ensure that the information contained within this report is accurate. WPD confirms that this report has been produced, reviewed and approved following our quality assurance process for external documents and reports.