



CLASS Project Progress Report

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GLOSSARY OF TERMS

Abbreviation	Term
ASC	Autonomous Substation Controller
CLASS	Customer Load Active System Services
DNO	Distribution Network Operator
ICCP	Inter-Control Centre Communications Protocol
NETSO	National Electricity Transmission System Operator
SDRC	Successful Delivery Reward Criteria
SDRC output	Discrete evidence of attainment or part attainment of an SDRC as defined in the Project Direction
RTU	Remote Terminal Unit

1 EXECUTIVE SUMMARY

1.1 The CLASS Project

This is the fourth six-monthly Project progress report (PPR) for the Customer Load Active System Services (CLASS) Project. It covers the period June 2014 to end November 2014.

Funded via Ofgem's Second Tier Low Carbon Network funding mechanism, CLASS is being undertaken by Electricity North West in partnership with key technology and academic Partners. Formal notification of selection for funding was received from Ofgem on 21 December 2012. The Project is due for completion by 30 September 2015.

CLASS is seeking to demonstrate that the natural relationship between demand and voltage can be exploited to cost-effectively accommodate increasing energy demand, including low carbon technologies (LCTs), on electricity networks. As this approach could maximise the use of existing assets and minimise the need for capital investment, CLASS has the potential to realise significant cost savings to customers.

There are three key elements to CLASS:

- **Demand reduction at time of system peak:** The potential increase in electricity demand by 40% to 60% by 2050 will put strains on existing network capacity. The relationship between voltage and demand can be exploited to alleviate this strain.

CLASS will investigate the application of voltage reduction to reduce demand at a primary substation at times of system peak. The potential that this provides for deferral of network reinforcement, and any impacts on customers, will be assessed.

- **Frequency reserve and response:** The increasing proportion of intermittent renewable energy sources in the UK generation mix will increase the need for system balancing. The costs of conventional balancing services, eg spinning reserves, are significant. A fast-acting demand management facility to aid system balancing would therefore be beneficial.

CLASS will investigate the benefits of switching out a transformer at a primary substation to rapidly reduce demand when system frequency falls below a threshold. The aim is to demonstrate that a very fast demand response (ie <0.5 seconds) can be provided to meet National Electricity Transmission System Operator (NETSO) criteria.

CLASS will also investigate the provision of a fast frequency response to the NETSO by reducing voltage at a group of primary substations.

- **Voltage control:** A key challenge for network operators is managing the unacceptably high voltages that can occur on distribution and transmission networks during periods when high renewable generation output coincides with low demand.

CLASS will investigate the benefits that operating primary transformers in a staggered tap configuration provides by absorbing reactive power on the network.

1.2 Progress to date

The key Project highlights during the reporting period are outlined below.

The CLASS Trials are progressing to plan

To ensure that the various CLASS hypotheses are adequately tested, a complex suite of tests and Trials are being undertaken to assess both the efficacy and impacts of the CLASS

functions. The suite of tests are summarised in the CLASS Trials Methodology document¹. They are intended to capture any temporal, geographical and customer-type variations in the effectiveness of CLASS.

To date, all CLASS Trials are progressing to plan. This puts the Project on a sound pathway to achieving its objectives and to completing on time.

The CLASS technologies are functioning as expected

Notably, the CLASS technologies, both on site and in the control rooms, are performing as expected. In particular, the on-site technologies are responding to the commands from the control room, and where required are also undertaking certain specified actions autonomously. These actions are in turn generating a range of data that will ultimately illuminate the effectiveness of CLASS. The data is being passed to the Project's academic partners, University of Manchester, who have now started to undertake analyses to assess the extent to which the various CLASS hypotheses are being achieved.

Analyses of the survey responses are showing that CLASS has had no adverse impacts to date on the customers surveyed

To understand what, if any, effects CLASS has on customers, a series of customer surveys are being undertaken alongside the CLASS Trials. These surveys are seeking to assess whether customers in the Trial areas observe or experience any negative impacts on their electricity supply when the CLASS functions are activated.

Analysis of the customer survey responses to date, shows that up to now, there have been no changes in customer perception of their electricity supply, ie customers are not observing any discernible effects of CLASS.

All Successful Delivery Reward Criteria (SDRCs) due in the reporting period have been achieved, and those due in the next period are on track.

The seven SDRCs due in the reporting period were successfully delivered. The most significant of these are shown in Table 1.1 below, and all are discussed in section 5.

Notably, the requisite evidence for all SDRCs is available for viewing on the CLASS Project website.

¹ <http://www.enwl.co.uk/docs/default-source/class-documents/design-approach-to-class-trials-and-associated-test-schedules.pdf?sfvrsn=4>

Table 1-1: Most significant SDRCs delivered in this reporting period

SDRC (evidence)	Planned date	Completion date
Publish on CLASS website video podcast 2 by 15 August 2014	August 2014	August 2014
Distribute third customer communication by August 2014	August 2014	August 2014
Publish on CLASS website an initial capability report for all the Trial scenarios by September 2014	September 2014	September 2014
Raw monitoring data downloadable from CLASS website by September 2014	September 2014	September 2014
Distribute fourth customer communication by November 2014	November 2014	November 2014

The Project actual costs to date are £5 386 000, and the estimated at completion costs is now £7 332 000, which is £765 000 favourable to Project Budget (including contingency).

1.3 Risks

CLASS commissioning activities have now been completed. Therefore the installation/commissioning risk highlighted in the last report has been closed.

There are currently no uncontrolled risks that could impede the achievement of any of the SDRCs outlined in the Project Direction, or which could cause the Project to deviate from the Full Submission.

Risks are monitored on a continuous basis, including the potential risks that were documented in the Full Submission. The status of these is described at Appendix A.

1.4 Learning and dissemination

A detailed description of the Project's learning outcomes can be found in section 6, the key areas where learning has emerged are summarised below:

- Some I&C customers have equipment sensitive to any variation in voltage, even where voltage levels remain well within statutory voltage limits and voltage deltas are at normal business-as-usual levels. This is in the main due to incorrect settings on their equipment and is a business as usual issue and not specific to the Trials.
- Initial observations from the Trials to date suggest that significant reactive power absorption may require large tap staggers between primary transformers.
- Legacy primary transformer tap changer status signals may not be sufficiently reliable for MicroTAPP relays and require an element of wiring work.
- Where tap change fail alarm facilities are installed, the alarm management philosophy may need to be reviewed.
- Customers surveyed have noticed no changes to their electricity supply, or any adverse effects on their electrical appliances, since the Trials commenced.
- There have been no adverse effects on levels of customer satisfaction with Electricity North West's service since the Trials commenced.

The CLASS Project team has been utilising a range of tools to disseminate and share knowledge about the Project with stakeholders. These include webinars, one of which was held in June 2014, as well as providing regular updates on the Project website and via social media.

The team also attends relevant industry events to present Project developments; the most recent of these was the Smart Grid Forum dissemination event. In particular, members of the CLASS team attended and participated in the industry events shown in Table 1.2 below.

Table 1.2: Participation in knowledge sharing events during the reporting period

Event	Contribution	Date
CLASS webinar	Hosts	June 2014
WPD - Low Carbon Hub Event	Presented	July 2014
2014 LCNI Conference	Presented	October 2014
Smart Grid Forum – Workstream 7	Participated	October 2014
WPD - Distribution networks: A Balancing Act	Participated	November 2014
CLASS stakeholder newsletter	Authored	November 2014
CLASS customer newsletter	Authored	November 2014

2 PROJECT MANAGER'S REPORT

2.1 General

The key Project management activities undertaken during the reporting period are summarised below:

- **Management of Project resources:** CLASS has diverse teams working on the range of Project activities. During the reporting period, these resources continued to be managed and coordinated in order to deliver the agreed SDRC schedule.
- **Project monitoring and control:** Monitoring of Project finances and outcomes has been ongoing to ensure that the Project progresses in a controlled manner and that the outputs are of the highest quality.
- **Regular engagement with Project Partners:** The Electricity North West CLASS Project team engages and holds regular meetings with the Project Partners. These include weekly and monthly meetings with individual partners, *ad hoc* meetings as necessary and quarterly Project steering group meetings that are attended by all Partners.
- **Change of Project manager:** At the end of November 2014 the CLASS Project manager changed. This is not anticipated to affect the Project and was part of a planned redeployment of employees as the innovation programme workload changed.

2.2 Technology, Trials and Research Workstreams

The key activities undertaken by the Technology, Trials and Research Workstreams during the reporting period are summarised below:

- **Progressed the CLASS Trials:** In this reporting period, the CLASS Trials were progressed. In particular, the summer and autumn Trials were conducted in line with the CLASS Trial schedule, which is available for review at: <http://www.enwl.co.uk/docs/default-source/class-documents/design-approach-to-class-trials-and-associated-test-schedules.pdf?sfvrsn=4>.
- **Maintenance of CLASS technologies:** Occasionally, some of the CLASS technologies have raised alarms, which is effectively an indication in the control room that an on-site check is necessary. The resultant on-site checks are helping to inform future maintenance regimes, and highlight an enhanced reporting capability on the historic equipment on site.
- **Data is being collected and made available to the University of Manchester:** Since the CLASS Trials have commenced, a range of network data is being collected that will enable the University of Manchester to undertake analyses to assess whether CLASS is achieving the expected demand response and reactive power absorption associated with the different CLASS functions. The University of Manchester has been provided with access to the CLASS data storage platform (iHost), which means that it can access the data directly, rather than relying on Electricity North West to access and pass on the data to it.
- **Analysis of data:** Having been provided with access to CLASS network data, the University of Manchester has started to analyse the data. Indeed, the University has completed early drafts of its interim reports. These are currently being reviewed and refined, and will be published on the CLASS website in the next reporting period.

In the next reporting period, the Technology, Trials and Research Workstreams will undertake the following activities:

- Progress the CLASS Trials in accordance with the Trial plan
- Provide support and ongoing maintenance as required to ensure that the CLASS technologies perform as required
- Support the CLASS learning and dissemination activities
- Publish on CLASS website the interim network modelling and analysis report
- Publish on CLASS website the interim profile modelling study
- Publish on CLASS website the interim asset health study report

2.3 Customer Engagement Workstream

The key activities undertaken by the Customer Engagement Workstream during the reporting period are summarised below:

- **Completed *summer* customer surveys and commenced *autumn* surveys:** In the previous Project progress report, it was reported that the summer Trials and the associated customer surveys had commenced. These summer surveys were completed in this reporting period.
- The autumn seasonal surveys commenced in October 2014 and are ongoing. To date, all surveys are progressing as planned and Project Partner, Impact Research, who is supporting with these surveys, is achieving significant success in contacting the participating customers to carry out the necessary surveys.

- **Updated customers in the Trial areas of Project progress:** The Project team recognise the importance of keeping customers informed of what they are doing and updating them on the overall progress of the Project. Accordingly, electronic Project updates are issued regularly to customers in the Trial areas. In this reporting period, two such updates were issued. These took the form of electronic newsletters and were sent in August 2014 and November 2014 respectively.
- **Undertook preliminary analyses of the survey data:** With the summer customer survey having been completed, and the autumn surveys started, some preliminary analysis based on the survey responses thus far has been carried out. This analysis shows that when compared to the baseline survey undertaken prior to the Trials, customers have not observed any adverse impact on their electricity supply since the CLASS Trials started. More detail on this initial learning outcome is provided in section 8 of this report.

In the next reporting period, the Customer Engagement Workstream will undertake the following activities:

- Complete autumn surveys and commence winter surveys
- Undertake further analysis of the customer survey responses to assess trends and outcomes to date
- Support and work closely with the Trials workstream to ensure that the customer impact of the Trials are captured
- Support CLASS learning and dissemination activities to share outcomes from the customer surveys to date

2.4 Learning and Dissemination Workstream

The key activities undertaken by the Learning and Dissemination Workstream during the period are summarised below:

- **Hosted a knowledge sharing webinar:** On 28 June 2014, the CLASS Project team hosted a knowledge sharing webinar, to which a wide range of stakeholders were invited. In the webinar, Project Partners Siemens and Impact Research provided an overview of the 'autonomous substation controller' and the 'customer survey baseline survey' respectively.
- The webinar was well attended with 50 stakeholders dialling in and the feedback was overwhelmingly positive.
- **2014 annual LCNI conference:** In October 2014, members of the CLASS team attended and actively participated in the LCNI conference in Aberdeen. There was significant interest in CLASS amongst industry colleagues at the event, which demonstrates the attractiveness of the CLASS hypotheses and approach.
- **Circulated a newsletter to stakeholders:** During this reporting period a range of approaches was used to communicate with customers and other stakeholders. In particular:
 - A Project update/electronic newsletter circulated to customers in the Trial areas in August 2014
 - A Project update/electronic newsletter circulated to customers in the Trial areas in November 2014
 - A Project update/electronic newsletter circulated to wider stakeholders, eg DNOs and other industry stakeholders, in November 2014

- **Regular updates to the CLASS website:** Throughout the reporting period, the Project website has been updated regularly with Project outputs at: www.enwl.co.uk/class.
- **Social media forums exploited:** To ensure that the key messages from CLASS are disseminated as widely as possible, the Project team is using a range of social media outlets to communicate CLASS-related information.

To maximise the effectiveness of dissemination and engagement activities, CLASS is utilising several social media channels; specifically:



<http://www.facebook.com/ElectricityNorthWest>



<https://twitter.com/ElectricityNW>



<http://www.linkedin.com/company/Electricity-North-West>



<http://www.youtube.com/ElectricityNorthWest>

Internal Electricity North West social media: To improve information sharing within the business, regular use is made of the recently released internal social media application “Yammer”.

In the next reporting period, the Learning & Dissemination Workstream will undertake the following activities:

- Record and publish the third video podcast on the CLASS website
- Update the monitoring data available on the CLASS website
- Submit the fourth six monthly Project progress report to Ofgem
- Host the third CLASS knowledge sharing webinar
- Further update the monitoring data available on the CLASS website

3 CONSISTENCY WITH FULL SUBMISSION

At the end of this reporting period, it can be confirmed that the CLASS Project is being undertaken in accordance with the Full Submission.

4 RISK MANAGEMENT

The risk highlighted in the last report: ‘Roll-out of CLASS integrated technology to site is proving to be more challenging than envisaged, thus presenting some risks to the Trials progressing’, has been closed as the CLASS commissioning has completed.

There are currently no uncontrolled risks that could impede the achievement of any of the SDRCs outlined in the Project Direction, or which could cause the Project to deviate from the Full Submission.

Risks are monitored on a continuous basis, including the potential risks that were documented in the Full Submission. Apart from the above, none of these risks have materialised or are deemed likely to. In any case, the status of these risks is described at Appendix A.

5 SUCCESSFUL DELIVERY REWARD CRITERIA (SDRC)

Twelve SDRCs were delivered in this reporting period. These are shown in Table 5.1 below.

Table 5.1: CLASS Project SDRCs delivered in the reporting period

SDRC (Evidence)	Planned date	Completion date
Second CLASS webinar by June 2014	Jun-14	Jun-14
Circulate third customer communication by August 2014	Aug-14	Aug-14
Publish on CLASS website second video podcast by August 2014	Aug-14	Aug-14
Publish on CLASS website an initial capability report for all the Trial scenarios by September 2014	Sep-14	Sep-14
Raw monitoring data downloadable from CLASS website by September 2014	Sep-14	Sep-14
Actively participate in 2014 annual LCNI conference (November 2014)	Nov-14	Nov-14
Circulate fourth customer communication by November 2014	Nov-14	Nov-14

The SDRCs due in the next reporting period are shown below.

Table 5-2: CLASS SDRCs due in the next reporting period

SDRC (Evidence)	Planned date	Status
Publish on CLASS website video podcast 3 by December 2014	Dec-14	On track
Monitoring data is updated on CLASS website by December 2014	Dec-14	On track
Fourth six monthly Project progress report submitted by 22 December 2014	Dec-14	On track
Publish on CLASS website interim network modelling and analysis reports by January 2015	Jan-15	On track
Publish on CLASS website interim profile modelling study by January 2015	Jan-15	On track
Publish on CLASS website interim asset health study report by January 2015	Jan-15	On track
Webinar 3 - 23 March 2015	Mar-15	On track
Monitoring data is updated on CLASS website by April 2015	Apr-15	On track

The current status of the evidence for all CLASS SDRCs is shown in Appendix B. Progress against the SDRCs and the Project plan will continue to be monitored, and if the current forecast for SDRC delivery changes, future Project progress reports will be updated accordingly.

6 LEARNING OUTCOMES

A number of lessons were learnt and learning outcomes achieved during the reporting period. The key learning outcomes are summarised below:

- Certain I&C customers may have equipment that is extremely sensitive to voltage variations, by design or by configuration, even when voltage levels are well within statutory voltage limits and voltage deltas are at normal business-as-usual levels. No adverse feedback has been obtained during the formal CLASS customer surveys undertaken after relevant CLASS Trials. To ensure that all potential impacts of CLASS are captured however, the CLASS team interrogates faults reported and customer contacts received via Electricity North West's traditional reporting mechanisms. Any calls or reports that could potentially be linked to the CLASS Trials are then subject to further interrogation.

After conducting a 3% demand reduction Trial, a voltage disturbance report from a local I&C customer was found as a result of this wider process. Accordingly, the CLASS team visited the site to investigate the matter further. Discussions with the maintenance manager established that two pieces of equipment had tripped while in use and co-incident with a Trial being undertaken. As already indicated, this Trial reflected only a 3% drop in voltage, which did not take the voltage outside of statutory limits. In fact, the voltage measured by the customer showed a reduction from 233V to 226V.

The incident did not result in any damage to the equipment. Furthermore, the site's engineer/maintenance manager also confirmed that the equipment in question was particularly sensitive to voltage and had a history of multiple operational failures annually.

Given the above, the customer was advised to investigate the performance of these two machines and to consult with the manufacturer. Some of the Trials at the primary substation feeding this site have been temporarily postponed until the customer's investigations are complete and a resolution is in place.

- Observations from the Trials to date suggest that the autonomous substation controller (ASC) may not provide the required amount of reactive power absorption. To achieve reactive power absorption under CLASS, the on-site ASC uses an existing MicroTAPP function to produce a tap stagger between primary transformers. This works by the MicroTAPP adjusting the primary transformer tap positions to achieve a circulating current target. This is limited to a level of 10% of the site current, resulting in a maximum tap stagger of three or four taps. This particular design of installation may still allow significant MVAR absorption but may affect the effectiveness of this function at the extremes

To determine whether this is the case, further tests will be undertaken, including manual tests, to assess reactive power absorption levels at a higher tap stagger. The University of Manchester is also conducting analysis which will illuminate the levels of reactive power absorption that are achievable using the CLASS approach. Further understanding of this issue will be reported in future progress reports.

- **Legacy primary transformer tap changer status signals may not be sufficiently reliable for MicroTAPP relays:** Following commissioning of the CLASS sites, some of the legacy (50/60 year old) primary sites equipped with MicroTAPP were observed to

be sending tap change fail alarms to the Electricity North West control room. Subsequent investigations revealed that at some sites the tap change in progress (TCIP) signal was intermittently disappearing during a tap change. It was also apparent that on some occasions, tap position indication (TPI) was changing when no tapping had been requested, and none had actually occurred (illegal tap change). Another failure mode was caused by the TPI indicating a different tap position to the one expected after being required to perform a tap (tap runaway) when in reality the tap changer had performed correctly.

These issues were remedied by cleaning and adjustment of the TCIP and TPI contacts. On one occasion the tap position resistors were found outside of original design tolerance. A working day per circuit outage was required to make the necessary cleaning, adjustments and replacements at each of the affected sites.

- **Tap change fail alarm resetting philosophy within the Electricity North West control room had to be reviewed and streamlined:** Following the initial CLASS Trials and subsequent business-as-usual (BAU) operation, it was observed that a significantly higher than normal number of tap change fail alarms were being received due to the tap relay change. This led to a review of the tap change fail alarm design and implementation philosophy.

The key output from this review was a recommendation that all such alarms to the Electricity North West control room should reset when the field contact resets and that no on-site physical resetting should be required to clear this alarm to the Electricity North West control room. In order to upgrade the Electricity North West network efficiently, BAU practice requires that when a legacy automatic voltage control (AVC) scheme is changed, existing legacy alarm annunciators are retained. This leads to hand reset tap change fail alarms still being used to inform the Electricity North West control room of a tap change fail event. The review recommended that BAU for AVC replacement should be to retain the legacy alarm annunciator but to send directly the MicroTAPP alarms to the Electricity North West control room, the hand reset flag being retained for local indication only.

- The customers who were surveyed noticed no changes to their electricity supply, or any adverse effects on their electrical appliances since the Trials commenced. In line with the CLASS customer survey methodology, a series of formal customer surveys are being undertaken after relevant Trials are undertaken. In total, 700 customers, comprising of domestic and commercial customers are being surveyed as part of CLASS.

To date, customer surveys for the all summer Trials and some of the autumn Trials have been undertaken. Analysis of the summer customer survey has been undertaken, and the results show that to date, there has been no statistically significant change in customers' perception of their electricity supply. Notably, the proportion of customers who indicated that their appliances was working differently in the past seven days was 7.8% in the baseline survey, ie before the CLASS Trials, and 6.7% after the summer Trials. Therefore, there has been no statistically significant change.

- There have been no adverse effects on levels of customer satisfaction with Electricity North West's service since the Trials commenced. It was felt useful to assess the satisfaction of customers in the Trial areas with Electricity North West's services. The driver for this was to pick up any inadvertent impacts that the CLASS Trials may have on customer perceptions of the DNO. This might be the case, for example, if the Trials were causing disruption or were having a detrimental impact on customers.

Analysis of the summer customer survey data shows that CLASS is not having any detrimental impact on customers' satisfaction with Electricity North West. Indeed, the

analysis shows that overall customer satisfaction increased from 89% in the baseline survey to 97% when the summer Trials were being undertaken.

7 BUSINESS CASE UPDATE

The Project team are not aware of any developments that have taken place since the issue of the CLASS Project Direction that affects the business case for the Project.

8 PROGRESS AGAINST BUDGET

The Project Budget as defined in the Project Direction is shown in Appendix C.

Actual spend to date compared to Project Budget is summarised in Table 8.1 below. The report includes expenditure up to and including 31 November 2014.

It will be noted that the Project is currently performing favourably relative to budget. Project expenditure as at the end of November 2014 was £ 5 386 000 compared to a cost baseline of £6 605 000.

Table 8.1: Summary of Project expenditure

£'000s Excluding Partner Funding Ofgem Cost Category	Spend to Date			Total Project		
	Actual	Budget	Variance	Forecast	Budget	Variance
Summary						
Labour	1,655	1,614	(41)	1,944	1,948	4
Equipment	824	1,141	318	929	1,141	212
Contractors	2,265	2,824	559	3,582	3,644	63
IT	216	243	27	273	287	14
Payments to users	54	70	16	85	141	56
Contingency	187	496	310	220	595	375
Other	186	216	30	300	341	41
Total Costs	5,386	6,605	1,219	7,332	8,098	765

The challenging rollout of CLASS technologies completed during this period (referred to in section 4: Risk Management) has resulted in a change in the profile of costs incurred against budget, most visible in the £41 000 variance in labour spend to date. It is anticipated this issue will correct itself within the next six months.

Detailed expenditure is shown at Appendix D at Project activity level.

9 BANK ACCOUNT

The CLASS Project bank statement is shown in Appendix E. The statement contains all receipts and payments associated with the Project up to the end of November 2014.

10 INTELLECTUAL PROPERTY RIGHTS

Electricity North West is following the default IPR arrangements. No IPR have been generated or registered during the reporting period.

The IPR implications of forthcoming Project deliverables is currently being considered, and will be reported in the next Project progress report.

11 ACCURACY ASSURANCE STATEMENT

This document has been reviewed by a number of key business stakeholders. The Project team and select members of the CLASS Project steering group, including the lead member of the bid development team have reviewed the report to ensure its accuracy. The narrative has also been peer reviewed by the Electricity North West future networks manager and the Electricity North West networks strategy and technical support director.

The financial information has been produced by the CLASS Project manager and the Project's finance representative who review all financial postings to the Project each month in order to ensure postings are correctly allocated to the appropriate Project activity. The financial information has also been peer reviewed by the Electricity North West Head of Business Performance.

Issue of the document has been approved by the networks strategy & technical support director.

APPENDIX A: STATUS OF RISKS FROM THE FULL SUBMISSION

Risk description	Category	Owner	Likelihood	Impact	Status	Comments
Resources are not mobilised in time, resulting in Project delay	Other	Electricity North West	Very low	Moderate	Closed	All Electricity North West resources are in place. Furthermore, all Project partners are fully mobilised
Delay to installation of voltage controllers due to resourcing constraints	Installation	Electricity North West	Low	Moderate	Closed	Installation of the autonomous substation controllers (ASCs) has been completed
Older primary substation sites may have incomplete layout drawings	Installation	Electricity North West	Fairly likely	Very low	Closed	Risk closed with completion of installation
Delay to connecting the ICCP link to Electricity North West's and National Grid's control system	Installation	Electricity North West/ National Grid	Low	Moderate	Closed	ICCP link installed and operational
Establishment of the ICCP link could impair Electricity North West's and National Grid's systems and processes	Installation	Electricity North West/ National Grid	Very low	Moderate	Closed	Link installed
National Grid may be unable to undertake their responsibilities in executing some of the Trials, due to other commitments	Installation	Electricity North West/ National Grid	Very low	Moderate	Open	The CLASS Trials and test methodology, currently in development, is being produced in consultation with National Grid. Therefore all (known) constraints on National Grid will be identified, and eliminated in the design stage
Trials could compromise Electricity North West's and National Grid's security of supply commitments	Other	Electricity North West/ National Grid	Very low	Significant	Open	The CLASS Trials and test methodology is being produced in consultation with National Grid. Notably, system security for both organisations has been at the heart of the Trial design. Furthermore, a number of tests will be undertaken before go-live to assess and minimise system risk

Risk description	Category	Owner	Likelihood	Impact	Status	Comments
Conflicts may occur between Trials and unknown planning/maintenance works at specific primary substation sites	Installation	Electricity North West/ National Grid	Very Low	Moderate	Open	The CLASS Trials and test methodology is being produced through a consultative process. Engineering teams at Electricity North West and National Grid are being engaged to ensure that Trials do not conflict with maintenance works
Customers in the Trial areas have voltage optimisers fitted, thus concealing the impact of the Trials	Other	Electricity North West	Low	Moderate	Open	The robust customer recruitment process will ensure that such customers are identified, and an approach identified for addressing them
Customers in the Trial areas notice a change in their voltage levels because of the Trials being undertaken	Other	Electricity North West	Very Low	Low	Open	The objective of the CLASS Trials is to assess whether customers observe any impacts on their electricity supply. Therefore, if they do, that would form part of the Project learning. To ensure that customers know that the Trial is ongoing, the Project team will proactively inform all customers and stakeholders in the Trial areas, and provide them with contact details for the team, etc
Potential for poor customer participation due to complexity of CLASS	Recruitment	Electricity North West	Low	Significant	Open	Workshops are ongoing with a cross-section of customers, ie the engaged customer panel (ECP). The ECP will advise on the form of the survey instruments. This will ensure that all materials are easily understandable
Placebo effect amongst survey participants	Other	Electricity North West	Low	Moderate	Open	Survey responses will be normalised against a control group to identify any placebo effects. Furthermore, the subsequent analysis will highlight any 'outliers' in the data, which will then be further investigated as necessary

Risk description	Category	Owner	Likelihood	Impact	Status	Comments
Potential for attrition amongst survey participants between surveys	Recruitment	Electricity North West	Low	Moderate	Open	Surplus participants will be recruited to negate the impacts of any drop-outs
University of Manchester undergoes personnel changes during the Project	Other	Electricity North West/ University of Manchester	Low	Low	Open	The contract with the University of Manchester ensures that all deliverables involve multiple individuals to minimise this risk. Furthermore, clearly defined timeframes have been included in the contract
Learning is not disseminated effectively to all stakeholders	Other	Electricity North West	Very low	Moderate	Open	CLASS dissemination activities have already commenced and a diverse range of tools are being used to engage stakeholders. These include webinars, podcasts, social media, a dedicated CLASS website, newsletters, etc
Electricity North West may not be able to respond to OC6 within the Project area because of an ongoing initiated Trial	Other	Electricity North West	Very low	Significant	Open	As National Grid is a CLASS Project Partner, any issue around compliance with OC6 will be addressed with National Grid as a matter of urgency
Customers may be confused by the various 'green energy' government initiatives currently ongoing	Recruitment	Electricity North West	Moderate	Moderate	Open	The input from the cross-section of customers, ie the ECP, who are advising on the design of customer materials, will ensure that CLASS is easily understood and not confused with other initiatives

As the Project progresses, the Project team will gain a better view of the likelihood of these risks and will also identify more evidence-based ones.

APPENDIX B: SUMMARY OF PROJECT SDRC

SDRC (evidence)	Due date	Status
Webinar 1	Jun-13	Delivered
Send for approval the customer engagement plan and data privacy statement to Ofgem by July 2013	Jul-13	Delivered
Publish the site selection report including the methodology by August 2013	Aug-13	Delivered
CLASS website and CLASS website and social media forums is live by September 2013	Sep-13	Delivered
Publish on CLASS website map of Trial areas by September 2013	Sep-13	Delivered
Publish on CLASS website customer marketing/campaign materials by September 2013	Sep-13	Delivered
Publish on CLASS website first video podcast by September 2013	Sep-13	Delivered
First customer workshops held by October 2013	Oct-13	Delivered
Active participation at annual LCNI conference 2013	Nov-13	Delivered
Final customer workshops held by December 2013	Dec-13	Delivered
Publish on CLASS website Trials and test regime report in January 2014	Jan-14	Delivered
Publish on CLASS website control group and Trial areas customer communication by January 2014	Jan-14	Delivered
Publish the design of the regulation scheme for substation voltage controllers by February 2014	Feb-14	Delivered
Network monitoring equipment installed and commissioned by March 2014	Mar-14	Delivered
ICCP installed and commissioned by March 2014	Mar-14	Delivered
Publish the commissioning reports by April 2014	Apr-14	Delivered
Technology go-live by April 2014	Apr-14	Delivered
Publish the ICCP commissioning reports by April 2014	Apr-14	Delivered
Baseline customer survey initiated in April 2014	Apr-14	Delivered
Learning event 1	Apr-14	Delivered
Webinar 2	Jun-14	Delivered

SDRC (evidence)	Due date	Status
Evidence of test Trial data transferred by July 2014	Jul-14	Delivered
Learning event 2	Jul-14	Delivered
Publish on CLASS website video podcast 2 by 15 August 2014	Aug-14	Delivered
Publish on CLASS website an initial capability report for all the Trial scenarios by September 2014	Sep-14	Delivered
Raw monitoring data downloadable from CLASS website by September 2014	Sep-14	Delivered
Active participation at annual LCNI conference 2014	Nov-14	Delivered
Publish on CLASS website video podcast 3 by 8 December 2014	Dec-14	On track
Monitoring data is updated on CLASS website by December 2014	Dec-14	On track
Publish on CLASS website interim network modelling and analysis reports by January 2015	Jan-15	On track
Publish on CLASS website interim profile modeling study by January 2015	Jan-15	On track
Publish on CLASS website interim asset health study report by January 2015	Jan-15	On track
Webinar 3	Mar-15	On track
Monitoring data is updated on CLASS website by April 2015	Apr-15	On track
Customer surveys completed, with an initial summary report published by June 2015	Jun-15	On track
Publish on CLASS website NETS SQSS change proposal report by June 2015.	Jun-15	On track
Publish on CLASS website final network modelling and analysis reports by September 2015	Sep-15	On track
Publish on CLASS website final profile modeling study by September 2015	Sep-15	On track
Publish on CLASS website final asset health study report by September 2015	Sep-15	On track
Publish on CLASS website customer survey report by September 2015	Sep-15	On track
Active participation at annual LCNI conference 2015	Nov-15	On track
Provide confirmation from National Grid that the long-term monitoring study has been initiated	Dec-15	On track

APPENDIX C: PROJECT DIRECTION BUDGET

£'000s Excluding Partner Funding Ofgem Cost Category	Plan
Labour	1,948
Data Management	32
Data routing configuration	99
Installation & configuration of Dashboard hardware & software	83
Monitoring Equipment	236
Project Management	1,035
Purchase & Installation of substation controllers	99
Publicity and Dissemination	20
SOAP Interface to PoF	156
Voltage Controllers interface	188
Equipment	1,141
Purchase & Installation of substation controllers	657
RTU installation	172
Monitoring Equipment	313
Contractors	3,644
Purchase & Installation of substation controllers	1,125
Installation & configuration of ICCP	27
Customer Survey	219
Development of Change Proposals	60
Carbon Impact assessment	41
Research - Technical	886
Project Management	912
Design of voltage regulation scheme	375
IT	287
Installation & configuration of Dashboard hardware & software	122
Installation & configuration of ICCP	165
Payments to users	141
Incentive to attract customers to complete surveys	141
Contingency	595
Installation & configuration of ICCP	147
Purchase & installation of monitoring equipment	124
Incentive to attract customers to complete surveys	33
Purchase & Installation of substation controllers	156
Installation & configuration of Dashboard hardware & software	78
Research - Technical	56
Other	341
Publicity and Dissemination	194
Accommodation	146
	8,098

APPENDIX D: DETAILED PROJECT EXPENDITURE

£'000s Excluding Partner Funding Ofgem Cost Category	Spend to date			Total Project			Comments
	Actual	Plan	Variance	Forecast	Plan	Variance	
Labour	1,655	1,614	(41)	1,944	1,948	4	
Data Management	41	32	(9)	33	32	(1)	
Data routing configuration	13	99	86	58	99	41	Anticipated efficiencies. However, trials may identify new data requirements.
Installation & configuration of Dashboard hardware & software	30	83	54	82	83	2	
Monitoring Equipment	173	236	63	226	236	10	
Project Management	905	712	(192)	1,032	1,035	3	
Purchase & Installation of substation controllers	105	99	(6)	105	99	(6)	Additional labour required resulting from issues with installation of ASC's.
Publicity and Dissemination	0	8	8	20	20	(0)	
SOAP Interface to PoF	117	156	39	117	156	39	Efficiencies anticipated to value of £65k
Voltage Controllers interface	271	188	(84)	271	188	(84)	Additional labour required resulting from issues with installation of Volt. Controllers
Equipment	824	1,141	318	929	1,141	212	Installation partly delivered by Labour resource
Purchase & Installation of substation controllers	510	657	146	603	657	54	Installation partly delivered by Labour resource
RTU installation	10	172	162	15	172	157	Installation partly delivered by Labour resource
Monitoring Equipment	303	313	9	311	313	2	
Contractors	2,265	2,824	559	3,582	3,644	63	
Purchase & Installation of substation controllers	914	1,125	211	1,088	1,125	38	
Installation & configuration of ICCP	33	20	(12)	33	27	(5)	Profile variance and effort variance to original plan
Customer Survey	142	87	(55)	224	219	(5)	
Development of Change Proposals	0	0	(0)	59	60	1	
Carbon Impact assessment	0	20	20	41	41	(0)	
Research - Technical	0	416	416	885	886	0	
Project Management	875	780	(96)	899	912	12	
Design of voltage regulation scheme	300	375	76	353	375	23	Efficiencies anticipated to value of £23k.
IT	216	243	27	273	287	14	
Installation & configuration of Dashboard hardware & software	44	78	34	101	122	21	
Installation & configuration of ICCP	172	165	(7)	172	165	(7)	
Payments to users	54	70	16	85	141	56	Anticipated efficiencies. However, trials may identify new incentive requirements
Incentive to attract customers to complete surveys	54	70	16	85	141	56	Anticipated efficiencies. However, trials may identify new incentive requirements
Contingency	187	496	310	220	595	375	Forecasted at completion at £375k favourable to plan
Installation & configuration of ICCP	22	138	116	22	147	125	Minimal use of contingency anticipated.
Purchase & installation of monitoring equipment	46	124	78	46	124	78	Partial use of contingency required.
Incentive to attract customers to complete surveys	0	0	0	0	33	33	No use of contingency anticipated at this stage.
Purchase & Installation of substation controllers	118	156	38	152	156	5	Full use of contingency required - Additional equipment required at 12 sites.
Installation & configuration of Dashboard hardware & software	0	78	78	0	78	78	No use of contingency anticipated at this stage.
Research - Technical	0	0	0	0	56	56	No use of contingency anticipated at this stage.
Other	186	216	30	300	341	41	
Publicity and Dissemination	129	129	(0)	199	194	(5)	
Accommodation	57	87	30	101	146	46	Efficiencies anticipated.
	5,386	6,605	1,219	7,332	8,098	765	

APPENDIX E: PROJECT BANK ACCOUNT

The bank statement below details all transactions relevant to the Project. This includes all receipts and payments associated with the Project up to the November 2014 month end reporting period.

Lloyds Bank		Yesterday's Statement			C082421	
Statements and Balances						
300002-01813272						
ELECTRICITY NWL NO.12 LCNF (CLASS) (GBP)						
Date	Type	Narrative	Value Date	Payments	Receipts	Balance
30MAY14		Opening Ledger Balance				4,368,987.93 Cr
10JUN14	INT	GROSS CREDIT INTEREST			6,042.89	4,375,030.82 Cr
10JUN14	DR	ELECTRICITY NWL NO.4 PYMT TRANSFER 00647		294,609.97		4,080,420.85 Cr
27JUN14	CHGS	ACCOUNT CHARGE		1.81		4,080,419.04 Cr
25JUL14	DR	TO A/C TFR 02749020 300002		194,171.87		3,886,247.17 Cr
08AUG14	DR	TO A/C TFR 02749020 300002		300,680.66		3,585,566.51 Cr
11AUG14	CR	INTEREST (GROSS)			3,457.11	3,589,023.62 Cr
09SEP14	CR	INTEREST (GROSS)			1,424.08	3,590,447.70 Cr
09SEP14	DR	TO A/C TFR 02749020 300002		124,009.55		3,466,438.15 Cr
30SEP14	DR	SERVICE CHARGES REF : 154748115		1.11		3,466,437.04 Cr
09OCT14	CR	INTEREST (GROSS)			1,424.56	3,467,861.60 Cr
05NOV14	DR	TO A/C TFR 02749020 300002		625,429.16		2,842,432.44 Cr
10NOV14	CR	INTEREST (GROSS)			1,468.75	2,843,901.19 Cr
28NOV14		Value of Credits (5)			13,817.39	
28NOV14		Value of Debits (7)		1,538,904.13		
28NOV14		Closing Ledger Balance				2,843,901.19 Cr
28NOV14		Closing Cleared Balance				2,843,901.19 Cr
*** End of Report ***						
Version : 3,16,1,514		This report is confidential and for the intended recipient only. If you are not the intended recipient please destroy this page immediately.			01/12/14 13:10.51 Page 1	