electricity north west
Bringing energy to your door

# Respond
# Project Progress Report

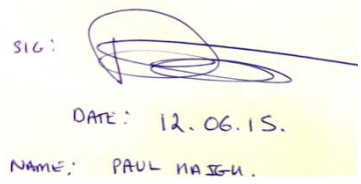
Version 2.0
19 June 2015 – Revised 30 July 2015

RESPOND

## VERSION HISTORY

| Version | Date | Author | Status | Comments |
|---|---|---|---|---|
| V1.0 | 19/06/2015 | A J Howard | Final | |
| V2.0 | 30/07/2015 | A J Howard | Final | Textual error in submission corrected.<br>Risk relating to $I_s$-limiter delivery clarified |

## APPROVAL

| Name | Role | Signature & date |
|---|---|---|
| Paul Bircham | Networks Strategy and Technical Support Director | Paul Bircham<br>Digitally signed by Paul Bircham<br>DN: cn=Paul Bircham, o, ou, email=paul.bircham@enwl.co.uk, c=GB<br>Date: 2015.08.03 12:34:20 +01'00' |
| Steve Cox | Head of Network Engineering | Mr Stephen Cox<br>Digitally signed by Mr Stephen Cox<br>DN: c=GB - UNITED KINGDOM, email=steve.cox@enwl.co.uk, o=Electricity North West Ltd, ou=Network Strategy, cn=Mr Stephen Cox<br>Date: 2015.07.31 16:42:11 +01'00' |
| Paul Haigh | Finance Business Partner |  |

# CONTENTS


1 Executive summary ..... 6
1.1 The Respond Project ..... 6
1.2 Progress to date ..... 6
1.3 Risks ..... 7
1.4 Learning and dissemination ..... 8
2 Project manager's report ..... 8
2.1 General ..... 8
2.2 Technology, Trials and Research Workstreams ..... 9
2.3 Customer Engagement Workstream ..... 9
2.4 Learning and Dissemination Workstream ..... 9
3 Consistency with Full submission ..... 10
4 Risk management ..... 10
5 Successful delivery reward criteria (SDRC) ..... 11
6 Learning Outcomes ..... 12
7 Business case update ..... 12
8 Progress against Budget ..... 12
9 Bank Account ..... 13
10 Intellectual property rights ..... 13
11 Accuracy Assurance Statement ..... 13

# GLOSSARY OF TERMS

| | |
|---|---|
| **Adaptive Protection** | The use of adjustable protection settings that can be changed in real time |
| **Association of Decentralised Energy (ade)** | Leading industry advocate of an integrated approach to delivering energy services using combined heat and power and district heating. Previously known as the Combined Heat and Power Association (CHPA) |
| **Breaking Capacity** | Maximum fault current that the circuit breaker can interrupt |
| **Capital Expenditure** | Expense to acquire or upgrade network assets |
| **CEP** | Customer Engagement Plan |
| **Circuit Breaker** | Protection device that interrupts the flow of current in an electric circuit in the event of a fault |
| **Combined Heat and Power (CHP)** | Simultaneous generation of usable heat and power (usually electricity) in a single process |
| **Demand Side Response (DSR)** | Actions undertaken by distribution network operators to influence customers to change their electricity use, in terms of quantity and/or time of use |
| **Distributed Generation (DG)** | Generation connected directly into the distribution network, as opposed to the transmission network. This generation typically supplies local demand |
| **Distribution Network Operator (DNO)** | The owner and/or operator of an electricity distribution system and associated assets |
| **Distribution Use of System (DUoS) Charges** | Use of system charges for demand and generation customers which are connected to and utilising the distribution network |
| **Fault Level Assessment Tool (FLAT)** | Intelligent software which assesses near real time fault current peaks on the network and decides to enable or disable the mitigation technologies |
| **Fault Current** | Actual current which flows during a fault |
| **Fault Current Limiting Protection** | Adaptive protection equipment installed on a customer's electrical machine to facilitate the Fault Current Limiting service |
| **Fault Current Limiting service (FCL service)** | A distributed generation and/ or industrial and commercial customer provided response to reduce overall fault current on the distribution network |
| **Fault Current Mitigation Technology** | Device that responds to the flow of fault current in an electricity network and ensures that the fault current remains within network switchgear and network ratings |
| **Fault Level** | Prospective maximum current which will flow during a fault |
| **Fault Level Headroom** | Capacity to increase the fault level without exceeding the fault level limit |
| **FlexDGrid** | Second Tier LCN Fund fault level mitigation project run by Western Power Distribution |
| **Innovation Funding Incentive (IFI)** | Ofgem incentive mechanism to encourage DNO innovation |
| **$I_S$-limiter** | A fault current mitigation technology |

| | |
|---|---|
| **Long Term Development Statement (LTDS)** | Statement published annually by DNOs to make network information available to the public domain. This enables anyone interested in connecting generation or load to the network to identify opportunities or constraints on the network |
| **Making Capacity** | Maximum fault current that the circuit breaker can close onto |
| **Near Real Time** | A measure of the frequency of the calculation by the Fault Level Assessment Tool. For FLARE this will be every five minutes |
| **Primary substation** | A point on the network where the voltage changes from 33kV to 11kV or 6.6kV |
| **Protection relays** | Device that analyses power system voltages and currents to detect faults and sends signals to circuit breakers to open |
| **Sequence tripping** | A form of Adaptive Protection |
| **Substation** | A point on the network where voltage transformation occurs |
| **Switchgear** | Device for opening and closing electrical circuits (including circuit breakers) |
| **Transformer** | Device that changes the voltage of an alternating current, without changing the frequency |
| **Withstand Capability** | The number of seconds switchgear can tolerate fault current |

# 1 EXECUTIVE SUMMARY

## 1.1 The Respond Project

This is the first six-monthly Project progress report (PPR) for the Respond Project. This project was approved under the name Fault Level Active Response (FLARE). This report covers the period from project award to the end of May 2015.

Funded via Ofgem's Second Tier Low Carbon Network funding mechanism, Respond is being undertaken by Electricity North West in partnership with key technology and industry Partners. Formal notification of selection for funding was received from Ofgem on 19 December 2014. The Project is due for completion by 31 October 2018.

Respond is seeking to demonstrate that a network's Fault Level can be estimated in near real time, and in responding to that estimation a series of innovative technical and commercial techniques can be initiated to reduce the Fault Level without the need for expensive and time consuming asset replacement. As this approach could maximise the use of existing assets and minimise the need for capital investment, Respond has the potential to realise significant cost savings to customers and improve the connection of generation to the network. There are four key elements to Respond:

- **Fault Level Assessment Tool:** This intelligent software will be deployed alongside the Network Management System (NMS) and use data from it to predict the networks Fault Level in near real time. When it estimates the Fault Level increasing beyond a set threshold it will issue an enable command to one of the Respond innovative techniques

  *Respond will be the first demonstration of an assessment tool, and will investigate the accuracy of the tool demonstrated.*

- **Adaptive Protection:** This technique re-sequences the operation of circuit breakers (CBs) and is retro fitted into existing substation equipment. The technique will be initiated when required following analysis using the Fault Level Assessment tool.

  *Respond will investigate the application of adaptive protection across a type and age range of existing equipment and develop a standard method for installation.*

- **Fault Current Limiting (FCL) service:** This will identify customers who operate equipment that contribute to fault current (eg large motors and generators) and are willing to help develop and ultimately enter into a managed commercial service backed by new technical interfaces with their equipment.

  *Respond will engage with a wide range of industrial and commercial (I&C) customers to identify those willing to help develop and value this new service, which will enable customers to earn rewards for this service*

- **$I_S$ Limiters:** These devices are widely used across the world to limit fault current, but are not used on GB DNO networks due to compliance issues with GB regulations. Two devices will be installed, along with a further five installations of monitoring only equipment.

  *Respond will demonstrate how these devices can be deployed safely and legally and unlock the benefits of this technology could provide for customers.*

## 1.2 Progress to date

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

**Mobilisation of project team**

This work has commenced with the appointment of all Electricity North West team members to the project. A full partner initiation meeting has been held with detailed work stream planning ongoing.

**Partner Contracts**

A number of contracts with Respond partners have been agreed and formally signed, whilst the remaining contracts are nearing completion.

**Customer Engagement Plan and Data Privacy statement**

Work was able to be commenced on this first major SDRC prior to contract signature with our partner Impact Research due to the strong relationship built up over a number of LCN Fund projects. This will lead to the early delivery of this work to Ofgem for approval. Initial consultation has taken place with our Project Partners Impact Research Ener-G and the Association of Decentralised Energy (ADE), formerly Combined Heat & Power Sustainable Energy Services (chpa). These preliminary discussions have taken place to shape the overall customer engagement strategy and the development / early delivery of the customer engagement plan (CEP)

**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 two 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.

The Respond project website will be live by the end of July 2015. Requisite evidence for SDRCs will be available for viewing on this website.

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

| SDRC (evidence) | Planned date | Completion date |
|---|---|---|
| Publicise Respond within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by January 2015 | January 2015 | January 2015 |
| Publish newsletter by May 2015 | May 2015 | May 2015 |

The Project actual costs to date are £54 000, and the estimated at completion costs is now £5 543 783, which is to Project Budget (including contingency).

## 1.3 Risks

Risks identified at Respond project bid have been initially reviewed by the delivery team and remain unchanged. It is anticipated additional risks will be identified and mitigated over the next 6 months

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.

The completion of partners contracts is being prioritised alongside confirming installation planning.

### 1.4 Learning and dissemination

A detailed description of the Project's learning outcomes can be found in section 6. At this stage in the project there are no learning outcomes to report but dissemination work has commenced as summarised below:

- Respond was publicised in the in house companywide communications bulletin "CONNECT" in January 2015

- The first Respond industry newsletter was published in May to approximately 700 industry stakeholders who are on the email circulation list database developed through our previous LCN Fund project

The Respond project team will be utilising a range of tools to disseminate and share knowledge about the project with stakeholders. The first such event was held in May which brought all project partners involved in delivery of the project together for the first time.

The interim Respond website will be upgraded in July 2015, to a structure and style in line with our previous LCN Fund projects. The project's learning will be uploaded throughout its delivery to this website.

**Table 1-2: Participation in knowledge sharing events during the reporting period**

| Event | Contribution | Date |
|---|---|---|
| Electricity North West internal communications | Authored | January 2015 |
| First Respond Industry Newsletter | Authored | May 2015 |
| Project Partner "Start-Up" meeting | Meeting | May 2015 |

# 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:** The internal resources required for the delivery of Respond have been identified and placed. A number of these resources bring experience of our other second tier projects ($C_2C$, CLASS and Smart Street) and still maintain an input to those active projects.

- **Project monitoring and control:** Processes for the monitoring and control of the delivery of the Respond project are now in place. These processes build on those developed during our earlier LCN Fund projects such that this project progresses in a controlled manner and that the outputs are of the highest quality.

- **Regular engagement with Project Partners:** The Electricity North West Respond Project team will engage and hold regular meetings with the Project Partners. A project delivery "start-up meeting" was held in May, the first Project Steering Group (with all project partners) will be held in September 2015.

- **Engagement with Ofgem Project Team:** The Electricity North West Innovation delivery manager and Respond project manager met with the Ofgem project and programme representatives and have agreed additional regular communications between the teams.

## 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:

- Meetings held with technical partners to discuss the design and installation plan in detail.
- A comprehensive list of suitable primary substations was selected for all aspects of the trial using a set criteria and a on-site survey of the sites was completed. The selection was adjusted due to issues found eg operational restriction, site access

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

- Produce draft design and Installation plan for 3 project trial techniques including equipment specifications.
- Design monitoring and analysis procedures for the trial period

## 2.3 Customer Engagement Workstream

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

- Commenced work on Customer Engagement Plan.
- Commenced work on Customer Data Privacy Statement.
- Early consultation has taken place with our Project Partners Impact Research, Ener-G and the Association of Decentralised Energy (ADE). These preliminary discussions have taken place to shape the overall customer engagement strategy and the development / early delivery of the customer engagement plan (CEP)

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

- Complete Customer Engagement Plan and send to Ofgem for approval.
- Complete Data Privacy Statement and send to Ofgem for approval.
- Go live of the Respond website and social media forums.
- Design, create and test the customer survey and associated materials using an Engaged Customer Panel workshop.
- Publish survey materials and Engaged Customer Panel lessons learned on the Respond website

## 2.4 Learning and Dissemination Workstream

Delivery of the Respond Project remains within its formative stage and has not yet delivered substantive learning outcomes that warrant specific dissemination to industry stakeholders.

We have however:

- Hosted our first knowledge sharing event which was a platform to present the Project objectives to partners and identify risks and opportunities across all workstreams.

- Delivered our first internal communication via the Electricity North West intranet (Connect) in January 2015 and have also commenced planning for the first Respond advertorial and the Project website, both of which are due for completion in the next reporting period.

**Internal Electricity North West social media:** To improve information sharing within the business, regular use is made of the internal social media application "Yammer". Respond has been introduced to the wider business via this medium.

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

- Deliver the Respond website and social media forums
- Internally publicise general awareness materials with Respond progress update
- Publish the first Respond advertorial
- Publish the second Respond newsletter
- Host the first Respond knowledge sharing webinar
- Actively participate at the annual LCN Innovation conferences in November 2015
- Submit the second six monthly Project progress report to Ofgem

# 3 CONSISTENCY WITH FULL SUBMISSION

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

# 4 RISK MANAGEMENT

The project risks identified in the Flare bid document have been migrated into the Respond delivery risk register, reviewed and are still valid.

There has been a delay against the plan in the signature of the partner contract with ABB. An early contractual signature was given as mitigation for the risk of delayed delivery and installation of the IS limiter due to its 6 month lead time.

The risk has been updated to reflect the new mitigation, that a number of activities normally commenced post contract signature have started pre contract signature. These include site design works including identifying modifications to reduce construction time and the reservation of production slots.

Risks will be monitored on a continuous basis, including the potential risks that were documented in the Full Submission.

Project risks are described in detail in Appendix A

# 5 SUCCESSFUL DELIVERY REWARD CRITERIA (SDRC)

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

**Table 5.1: Respond Project SDRCs delivered in the reporting period**

| SDRC (Evidence) | Planned date | Completion date |
|---|---|---|
| Publicise RESPOND within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by January 2015 | Jan 2015 | Jan 2015 |
| Publish newsletter by May 2015 | May 2015 | May 2015 |

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

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

| SDRC (Evidence) | Planned date | Status |
|---|---|---|
| Send Customer Engagement Plan and Data Privacy Statement to Ofgem by June 2015 | June 2015 | On Schedule |
| Issue Project progress reports in accordance with Ofgem's June and December production cycle and publish on Respond website | June 2015 | On Schedule |
| Deliver live Respond website and social media forums by July 2015 | July 2015 | On Schedule |
| Publish advertorial by July 2015 | July 2015 | On Schedule |
| Deliver Engaged Customer Panel workshop by September 2015 | September 2015 | On Schedule |
| Publicise Respond within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by September 2015 | September 2015 | On Schedule |
| Webinars held by September 2015 | September 2015 | On Schedule |
| Lessons learned from testing customer survey materials incorporated into survey and all survey materials published on the Respond website by October 2015 | October 2015 | On Schedule |
| Publish newsletter by November 2015 | November 2015 | On Schedule |
| Actively participate at 2015 annual LCN Innovation conference. | November 2015 | On Schedule |

The current status of the evidence for all Respond 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:

- Lesson 1: Importance of project start up meeting involving all partners.

  **Background:** In May a Respond Project Partner event involving Electricity North West, Partners and suppliers was held. A project overview was given by Electricity North West which was followed by open discussions across all stakeholders.

  **Lessons learned:** Early interaction between all stakeholders is essential in order to give clear understanding to all parties of each stakeholder roles and accountabilities. This is particularly critical in ensuring that early SDRC's are understood and subsequently delivered.

# 7 BUSINESS CASE UPDATE

The Project team are not aware of any developments that have taken place since the issue of the Respond (Flare) 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 May 2015.

It will be noted that the Project is currently performing favourably relative to budget, this is predominately due to the contract for the $I_s$-limiter, that includes a payment on order, is awaiting agreement of final terms and conditions. Project expenditure as at the end of May 2015 was £54 000 compared to a cost baseline of £784 000.

**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 | 54 | 142 | 88 | 1,307 | 1,307 | (0) |
| Equipment | 0 | 499 | 499 | 1,342 | 1,342 | 0 |
| Contractors | 0 | 108 | 108 | 1,173 | 1,173 | 0 |
| IT | 0 | 0 | 0 | 730 | 730 | 0 |
| IPR Costs | 0 | 0 | 0 | 0 | 0 | 0 |
| Travel & Expenses | 0 | 0 | 0 | 0 | 0 | 0 |
| Payments to Users | 0 | 0 | 0 | 91 | 91 | 0 |
| Contingency | 0 | 0 | 0 | 484 | 484 | 0 |
| Decommissioning | 0 | 0 | 0 | 54 | 54 | 0 |
| Other | 0 | 35 | 35 | 363 | 363 | 0 |
| **Total Costs** | **54** | **784** | **730** | **5,544** | **5,544** | **(0)** |

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

# 9 BANK ACCOUNT

The Respond 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 Respond 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 Respond 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

| Project Phase /Workstream | Description *(Delivery Risk Category)* | Probability Score | Impact Score | Mitigating Action/ *Contingency* Action | Revised Probability | Revised Impact Score |
|---|---|---|---|---|---|---|
| **Mobilisation** | There is a risk that Project Partners are not able to mobilise their resources in time because of other commitments leading to a delay in achieving potential milestones which could have a Project, reputational, and financial repercussion. *(**Other**)* | 2 | 4 | • Suitable partnership agreements that ensure collaborative working, value for customers' money and achievement of learning objectives in a timely manner have been identified for all Partners.<br>• A project initiation document will be issued to the Project Partners to ensure that all parties are ready.<br>*Contingency: Electricity North West will seek new Partners should existing Partners fail to mobilise.* | 1 | 4 |
| **Technology** | There is a risk that installation of the new Fault Level Assessment Tool or configuration of the network management system will overrun leading to delayed start of live Trials. ***(Installation)*** | 3 | 5 | • Robust T&Cs for the Fault Level Assessment Tool provision will be agreed to ensure Partner focus on achieving the FLARE project timescales.<br>• Resources and mobilisation plan will be defined to achieve the Project milestones and will be developed in conjunction with our selected software Partner.<br>*Contingency: Regular progress meetings/reports to track progress against the plan. Electricity North West will commit additional operational resource should any delays occur to the installation, testing and commissioning programme.* | 2 | 5 |
| **Technology** | There is a risk that the new Fault Level Assessment Tool will not perform as expected during testing and commissioning, leading to delayed start of live Trials. *(**Installation**)* | 3 | 4 | • Guidance on the use of a fault level monitor to validate the Tool's calculations has been sought from WPD using their learning from FlexDGrid.<br>• Validation of the Fault Level Assessment Tool will occur prior to live Trials and periodically, and at different points on the Trial networks during the live Trial period.<br>*Contingency: n/a* | 2 | 4 |
| **Technology** | There is a risk that the six month lead time for delivery of $I_S$-limiters may lead to a delay in the installation of this technology. *(**Procurement**)* | 3 | 3 | • Pre-contract reservation of production slot and site design works including identifying modifications to reduce construction time.<br>*Contingency: Flexibility is built into the installation programme so that installation of this technology can occur in autumn 2015 or spring 2016.* | 2 | 1 |
| **Technology** | There is a risk that retrofit of Adaptive Protection (for distribution system and electrical machines) may be more complex than anticipated leading to a delay in the installation programme. *(**Installation**)* | 3 | 3 | • The installation programme will be considered alongside known operational and maintenance activity peaks to allow for extra resource to be secured and deployed.<br>• Electricity North West has scoped FLARE with the input from a generator manufacturer and a customer with motors.<br>• Protection requirements for generators are explored in ENER-G's test cell. The | 2 | 2 |

| Project Phase /Workstream | Description *(Delivery Risk Category)* | Probability Score | Impact Score | Mitigating Action/ *Contingency* Action | Revised Probability | Revised Impact Score |
|---|---|---|---|---|---|---|
| | | | | project cost includes for external contractor retrofit of the Adaptive Protection for electrical machines.<br>*Contingency: Alternative substations may be selected to ensure FLARE Trials are not delayed. Learning from every installation/ attempted installation will be published through knowledge dissemination activities.* | | |
| **Technology** | There is a risk that appropriately skilled resource may not be available to perform the retrofit installation of technologies leading to a delay in the installation programme. ***(Installation)*** | 3 | 4 | • Guidance on the specific skills requirements has been sought and FLARE's installation programme will be designed in consideration of known operational and maintenance activity peaks.<br>*Contingency: Contractors may be brought in to cover business as usual activities to allow internal resource to cover installation requirements of this Project.* | 2 | 4 |
| **Technology** | There is a risk that FLARE technologies do not perform as anticipated leading to Trial circuits exceeding their fault level limits. ***(Other)*** | 3 | 5 | • Forerunner projects explored techniques with academic and technical colleagues.<br>• Fault level mitigation techniques will be installed at substations with no fault level constraints. Standard protection capability will not be exceeded.<br>*Contingency: n/a* | 2 | 5 |
| **Customer** | There is a risk that our data protection strategy will be complicated by accessing customer survey participants from outside our area leading to legal and reputational issues. ***(Recruitment)*** | 3 | 5 | • The CHPA/ ENER-G has members/ customers across the UK and will promote involvement in the survey.<br>• Impact Research will work with the CHPA/ ENER-G to design and undertake the customer survey work and ensure complete compliance with data privacy requirements.<br>• Impact Research and Electricity North West will undertake a pilot communication Trial, with a range of stakeholders to ensure that we are able to effectively communicate and engage with our stakeholders.<br>*Contingency: n/a* | 2 | 5 |
| **Customer** | There is a risk that customers with relevant demand or generation equipment do not engage in the customer survey leading to a lack of robust data for Hypothesis 5. ***(Recruitment)*** | 3 | 4 | • Impact Research has experience of this issue in a Second Tier project delivery environment. The survey contact list will be designed to identify key decision makers within organisations.<br>• Incentive payments are being offered for participation.<br>*Contingency: More customers will be approached and incentivised to participate.* | 2 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Trials & Analysis** | There is a risk that the selected networks do not experience a fault during the period of the Trials leading to the techniques and devices being untested.<br>*(**Other**)* | 3 | 5 | • We will use up-to-date fault statistics in the Site Selection phase to ensure that networks with higher than average faults are selected for FLARE demonstration.<br>*Contingency: In the absence of any faults, PB Power will test, via simulation, operation of the Fault Current Assessment Tool and three mitigation techniques.* | 1 | 2 |
| **Trials & Analysis** | There is a risk that a FCL service participant decides they no longer wish to participate in the Trial.<br>*(**Recruitment**)* | 2 | 3 | • The FLARE team will work with the customer to understand why customer perception has changed and to capture learning from the Trial.<br>*Contingency: n/a* | 2 | 2 |

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 |
|---|---|---|
| Publicise RESPOND within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by January 2015 | Jan-15 | Delivered |
| Publish first newsletter by May 2015 | May-15 | Delivered |
| Send Customer Engagement Plan and Data Privacy Statement to Ofgem by June 2015 | Jun-15 | On track |
| Issue first Project progress report in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Jun-15 | On track |
| Deliver live RESPOND website and social media forums by July 2015 | Jul-15 | On track |
| Publish first advertorials by July 2015, | Jul-15 | On track |
| Deliver Engaged Customer Panel workshop by September 2015 | Sep-15 | On track |
| Second publicise RESPOND within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by September 2015 | Sep-15 | On track |
| First Webinar held by September 2015 | Sep-15 | On track |
| Deliver lessons learned from testing customer survey materials incorporated into survey and all survey materials published on the RESPOND website by October 2015 | Oct-15 | On track |
| Publish second newsletter by November 2015 | Nov-15 | On track |
| Actively participate at 2015 annual LCN Innovation conference. | Nov-15 | On track |
| Issue second Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Dec-15 | On track |
| Brief and train Electricity North West operational teams, including planning engineers, on fault level mitigation management protocols by April 2016 | Apr-16 | On track |
| Publish second advertorials by April 2016. | Apr-16 | On track |
| Publish monitoring and analysis procedures for Trials on RESPOND website by May 2016 | May-16 | On track |
| Publicise commencement of live Trials on RESPOND website by May 2016 | May-16 | On track |
| Publish on RESPOND website a summary of each fault event three months after each event, with the expectation that a minimum of 18 faults will be reported on. | May-16 | On track |

| SDRC (evidence) | Due date | Status |
|---|---|---|
| Purchase a Fault Current Limiting service from at least one Electricity North West demand customer and one Electricity North West generation customer | May-16 | On track |
| Publish third newsletter by May 2016 | May-16 | On track |
| Hold first Knowledge Sharing Events by May 2016 | May-16 | On track |
| Third publicise RESPOND within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by June 2016 | Jun-16 | On track |
| Issue third Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Jun-16 | On track |
| Publish third advertorial by July 2016 | Jul-16 | On track |
| Publish equipment specifications and installation reports for the Adaptive Protection and the IS-limiter by September 2016 | Sep-16 | On track |
| Publish NMS interface and configuration specifications and commissioning reports by September 2016 | Sep-16 | On track |
| Second webinars held by September 2016 | Sep-16 | On track |
| Publish report on validation of the Fault Level Assessment Tool by November 2016 | Nov-16 | On track |
| Publish fourth newsletter by November 2016 | Nov-16 | On track |
| Actively participate at 2016 annual LCN Innovation conference | Nov-16 | On track |
| Issue fourth Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Dec-16 | On track |
| Publish customer survey report and information for customer evaluation of FCL service provision on RESPOND website by May 2017 | May-17 | On track |
| Publish fifth newsletter by May 2017 | May-17 | On track |
| Hold second Knowledge Sharing Events by May 2017 | May-17 | On track |
| Issue fifth Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Jun-17 | On track |
| Fourth publicise RESPOND within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine) by July 2017 | Jul-17 | On track |
| Publish fourth advertorial by July 2017 | Jul-17 | On track |
| Hold third Webinar by September 2017 | Sep-17 | On track |

| SDRC (evidence) | Due date | Status |
|---|---|---|
| Publish sixth newsletter by November 2017 | Nov-17 | On track |
| Actively participate at 2017 annual LCN Innovation conference | Nov-17 | On track |
| Issue sixth Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Dec-17 | On track |
| Publish equipment specifications and installation reports for the FCL service by April 2018 | Apr-18 | On track |
| Publish contract templates for FCL service with new and existing customers and commercial arrangements learning by May 2018 | May-18 | On track |
| Publish seventh and final newsletter by May 2018 | May-18 | On track |
| Publish updated fault level management, planning, design, protection settings and operation and maintenance policies by June 2018 | Jun-18 | On track |
| Issue seventh Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Jun-18 | On track |
| Publish on RESPOND website the Cost Benefit Analysis study report and the buy order of RESPOND/ FlexDGrid/ traditional reinforcement fault level mitigation solutions by July 2018 | Jul-18 | On track |
| Publish on RESPOND website the Carbon Impact Assessment report by July 2018 | Jul-18 | On track |
| Publish Asset Health Study on RESPOND website by July 2018 | Jul-18 | On track |
| Submit a DCUSA change proposal for amending application approach to Fault Level Cost Apportionment Factor in Common Connection Charging Methodology by August 2018 | Aug-18 | On track |
| Publish peer reviewed Safety Cases on the RESPOND Project website by September 2018 | Sep-18 | On track |
| Hold third Knowledge Sharing Events September 2018 | Sep-18 | On track |
| Hold fourth Webinar | Oct -18 | On track |
| Fifth publicise RESPOND within Electricity North West in monthly team brief pack and/ or Volt (intranet) and/ or Newswire (quarterly employee magazine | Oct-18 | On track |
| Publish fifth advertorial by October 2018 | Oct-18 | On track |
| Issue RESPOND Project Close Down Report to Ofgem and publish on RESPOND website by October 2018 | Oct-18 | On track |
| Publish Electricity North West's approach to managing fault level reinforcement on RESPOND website by October 2018 | Oct-18 | On track |

| SDRC (evidence) | Due date | Status |
|---|---|---|
| Actively participate at 2018 annual LCN Innovation conference | Nov-18 | On track |
| Issue eighth Project progress reports in accordance with Ofgem's June and December production cycle and publish on RESPOND website | Dec-18 | On track |

# APPENDIX C: PROJECT DIRECTION BUDGET

| £000's<br>Excluding Partner Funding<br>Ofgem Cost Category | |
|---|---|
| **Labour** | **1,307** |
| Project Management - Labour | 866 |
| Install/Commissioning - Labour | 398 |
| General Labour - Labour | 43 |
| | |
| **Equipment** | **1,342** |
| Materials - Equipment | 4 |
| General Equipment - Equipment | 22 |
| Monitoring Equipment - Equipment | 168 |
| IS Limiter - Equipment | 954 |
| Adaptive Protection - Equipment | 194 |
| | |
| **Contractors** | **1,173** |
| Project Management - Contractor | 21 |
| Install/Commissioning - Contractor | 570 |
| Research - Contractor | 302 |
| Customer Survey - Contractor | 59 |
| Customer Engagement - Contractor | 177 |
| Dissemination - Contractor | 43 |
| | |
| **IT** | **730** |
| IT Hardware - IT | 0 |
| IT Software - IT | 721 |
| IT Licences - IT | 9 |
| | |
| **IPR Costs** | **0** |
| IPR Costs | 0 |
| | |
| **Travel & Expenses** | **0** |
| Travel & Expenses | 0 |
| | |
| **Payments to Users** | **91** |
| Payments to Users | 66 |
| Fault Current Limiting Service | 0 |
| Customer Payments | 26 |
| | |
| **Contingency** | **484** |
| Contingency | 484 |
| | |
| **Decommissioning** | **54** |
| Decommissioning | 54 |
| | |
| **Other** | **363** |
| Rent - Other | 60 |
| Telecoms - Other | 0 |
| Dissemination - Other | 303 |
| Customer Survey - Other | 0 |
| Conference Reg. Fees - Other | 0 |
| Other | 0 |
| | |
| **Total** | **5,544** |

# APPENDIX D: DETAILED PROJECT EXPENDITURE

| £'000s<br>Excluding Partner Funding<br>Ofgem Cost Category | Spend to date | | | Total Project | | | Comments |
|---|---|---|---|---|---|---|---|
| | Actual | Plan | Variance | Forecast | Plan | Variance | |
| **Labour** | **54** | **142** | **88** | **1,307** | **1,307** | **(0)** | |
| Project Management - Labour | 53 | 73 | 20 | 866 | 866 | (0) | |
| Install/Commissioning - Labour | 1 | 50 | 49 | 398 | 398 | (0) | |
| General Labour - Labour | 0 | 19 | 19 | 43 | 43 | 0 | |
| **Equipment** | **0** | **499** | **499** | **1,342** | **1,342** | **0** | |
| Materials - Equipment | 0 | 0 | 0 | 4 | 4 | 0 | |
| General Equipment - Equipment | 0 | 0 | 0 | 22 | 22 | 0 | |
| Monitoring Equipment - Equipment | 0 | 0 | 0 | 168 | 168 | 0 | |
| IS Limiter - Equipment | 0 | 463 | 463 | 954 | 954 | 0 | Contract not yet signed |
| Adaptive Protection - Equipment | 0 | 36 | 36 | 194 | 194 | 0 | |
| **Contractors** | **0** | **108** | **108** | **1,173** | **1,173** | **0** | |
| Project Management - Contractor | 0 | 12 | 12 | 21 | 21 | 0 | Contract not yet signed |
| Install/Commissioning - Contractor | 0 | 78 | 78 | 570 | 570 | 0 | Contract not yet signed |
| Research - Contractor | 0 | 1 | 1 | 302 | 302 | 0 | |
| Customer Survey - Contractor | 0 | 2 | 2 | 59 | 59 | 0 | |
| Customer Engagement - Contractor | 0 | 15 | 15 | 177 | 177 | 0 | |
| Dissemination - Contractor | 0 | 0 | 0 | 43 | 43 | 0 | |
| **IT** | **0** | **0** | **0** | **730** | **730** | **0** | |
| IT Hardware - IT | 0 | 0 | 0 | 0 | 0 | 0 | |
| IT Software - IT | 0 | 0 | 0 | 721 | 721 | 0 | |
| IT Licences - IT | 0 | 0 | 0 | 9 | 9 | 0 | |
| **IPR Costs** | **0** | **0** | **0** | **0** | **0** | **0** | |
| IPR Costs | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Travel & Expenses** | **0** | **0** | **0** | **0** | **0** | **0** | |
| Travel & Expenses | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Payments to Users** | **0** | **0** | **0** | **91** | **91** | **0** | |
| Payments to Users | 0 | 0 | 0 | 66 | 66 | 0 | |
| Fault Current Limiting Service | 0 | 0 | 0 | 0 | 0 | 0 | |
| Customer Payments | 0 | 0 | 0 | 26 | 26 | 0 | |
| **Contingency** | **0** | **0** | **0** | **484** | **484** | **0** | |
| Contingency | 0 | 0 | 0 | 484 | 484 | 0 | |
| **Decommissioning** | **0** | **0** | **0** | **54** | **54** | **0** | |
| Decommissioning | 0 | 0 | 0 | 54 | 54 | 0 | |
| **Other** | **0** | **35** | **35** | **363** | **363** | **0** | |
| Rent - Other | 0 | 5 | 5 | 60 | 60 | 0 | |
| Telecoms - Other | 0 | 0 | 0 | 0 | 0 | 0 | |
| Dissemination - Other | 0 | 30 | 30 | 303 | 303 | 0 | |
| Customer Survey - Other | 0 | 0 | 0 | 0 | 0 | 0 | |
| Conference Reg. Fees - Other | 0 | 0 | 0 | 0 | 0 | 0 | |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Total** | **54** | **784** | **730** | **5,544** | **5,544** | **0** | |

# 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 May 2015 month end reporting period.

**Lloyds Bank** — Statements and Balances

Yesterday's Statement — C082421

308012-11782760
ELECTRICITY NWL NO.14 LCNF (FLARE) (GBP)

| Date | Type | Narrative | Value Date | Payments | Receipts | Balance |
|---|---|---|---|---|---|---|
| 23FEB15 | | Opening Ledger Balance | | | | 0.00 Cr |
| 21APR15 | BGC | UK PN OPERATIONS BGC LCNF | | | 5,916.21 | 5,916.21 Cr |
| 21APR15 | BGC | UK PN OPERATIONS BGC LCNF | | | 28,759.41 | 34,675.62 Cr |
| 21APR15 | BGC | UK PN OPERATIONS BGC LCNF | | | 44,845.15 | 79,520.77 Cr |
| 24APR15 | F/FLOW | F/FLOW WESTERN POW TFR RE: ENWL NO.14 FLA RE | | | 79,924.29 | 159,445.06 Cr |
| 28APR15 | BGC | NORTHERN ELECTRIC BGC LCNF | | | 19,955.56 | 179,400.62 Cr |
| 28APR15 | BGC | NORTHERN ELECTRIC BGC LCNF | | | 28,646.82 | 208,047.44 Cr |
| 28APR15 | CR | FROM A/C TFR 02749020 300002 | | | 583,349.78 | 791,397.22 Cr |
| 28APR15 | F/FLOW | F/FLOW SP DISTRIBU TFR SCOTTISHPOWER | | | 107,556.11 | 898,953.33 Cr |
| 28APR15 | F/FLOW | F/FLOW SP MANWEB P TFR SCOTTISHPOWER | | | 18,796.26 | 917,749.59 Cr |
| 30APR15 | F/FLOW | F/FLOW SSE SERVICE TFR LCNOFGEM APR2015 1 215021297 L | | | 29,024.96 | 946,774.55 Cr |
| 22MAY15 | BGC | UK PN OPERATIONS BGC LCNF | | | 5,916.23 | 952,690.78 Cr |
| 22MAY15 | BGC | UK PN OPERATIONS BGC LCNF | | | 28,759.39 | 981,450.17 Cr |
| 22MAY15 | BGC | UK PN OPERATIONS BGC LCNF | | | 44,845.19 | 1,026,295.36 Cr |
| 26MAY15 | F/FLOW | F/FLOW WESTERN POW TFR RE: ENWL NO.14 FLA RE | | | 79,924.28 | 1,106,219.64 Cr |
| 28MAY15 | BGC | R B S-SP MANWEB BGC | | | 18,796.27 | 1,125,015.91 Cr |
| 28MAY15 | BGC | NORTHERN ELECTRIC BGC LCNF | | | 19,955.62 | 1,144,971.53 Cr |
| 28MAY15 | BGC | R B S-SP DISTRIBUT BGC | | | 25,117.00 | 1,170,088.53 Cr |
| 28MAY15 | BGC | NORTHERN ELECTRIC BGC LCNF | | | 28,646.82 | 1,198,735.35 Cr |
| 29MAY15 | BGC | SCOTTISH&SOUTHERN BGC 1357887 | | | 29,025.04 | 1,227,760.39 Cr |
| 01JUN15 | | Value of Credits (19) | | | 1,227,760.39 | |
| 01JUN15 | | Value of Debits (0) | | 0.00 | | |
| 01JUN15 | | Closing Ledger Balance | | | | 1,227,760.39 Cr |
| 01JUN15 | | Closing Cleared Balance | | | | 1,227,760.39 Cr |

*** End of Report ***