

EDGE-FCLi

6 Monthly Project Progress Report
October 2020 – March 2021



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1. Executive Summary

The Embedded Distributed Generation Electronic Fault Current Limiting interrupter (EDGE-FCLi) project is funded through Ofgem's Network Innovation Allowance (NIA). EDGE-FCLi was registered in September 2018 and is due for completion by March 2022.

EDGE-FCLi aims to develop a prototype solid-state fault current limiter into a commercial scale device. The device is manufactured by GridON, Israel and has been designed to connect in series with Distributed Generators (DG) on the 11kV network with a maximum 5MW rated output. The device can quickly disconnect the generation from the network upon detection of a fault condition. The FCLi has the capability to limit the fault current contribution from DG and therefore overcome fault level issues that can limit network capacity and prevent future DG connections.

The project is being delivered collaboratively between WPD and UKPN to ensure that a device is developed that is safe to connect to the 11kV network and is also replicable so that it can be deployed throughout GB. Both WPD and UKPN plan to install and trial an FCLi device on their respective 11kV networks with significant coordination of the FCLi design, factory and laboratory testing to ensure that the devices are suitable for longer-term testing and trials in the field.

This report details project progress from October 2020 to March 2021.

1.1. Business Case

The growth of connected DG has caused an increase fault level across the 11kV network. This is particularly an issue in urban areas, where the fault level is more likely to exceed the capability of the switchgear to safely disconnect a network fault. The following section describes the business case for the FCLi device.

A typical 33/11kV urban primary substation can be assumed to contain 25 no. circuit breakers in total, with on average 20 no. 11kV feeders per substation. It has been assumed that there is eight Ring Main Units (RMUs) per 11kV feeder.

Within the GB distribution network, the majority of the existing 11kV switchgear is rated at 13.1kA (250MVA). The typical reinforcement approach includes upgrading the switchgear to 25kA (476MVA) units. In addition, RMUs close to the primary would also need to be upgraded.

The typical cost of replacing an 11kV circuit breaker and all peripheral equipment is £50k. Similarly, the typical cost of replacing an 11kV RMU is £20k. It is assumed that 25% of RMUs will need to be replaced if the fault level at the site increases above the existing limits. Therefore:

Base Case Cost= 11kV switchgear cost + 11kV RMU cost = $(25 \times £50k) + 0.25 \times (20 \times 8 \times £20k) = £2,050k$

The fault level headroom enabled by the 25kA switchgear is 226 MVA per site and this can accommodate approximately six no. 5MW synchronous generators. Due to other technical constraints, it is reasonable to assume that there will be a 33% reduction in allowed DG connections, hence allowing only four additional 5MW DGs.

The business-as-usual cost of an 11kV, 5MW FCLi is expected to be £275k, hence:

Method Cost = $4 \times £275k = £1,100k$

There is therefore a saving of £950k per installation (Base Case Cost – Method Cost).

1.2. Project Progress

During the period from October 2020 to March 2021, the FCLi that is intended for trials on WPD's network has been delivered and offloaded to the University of Warwick (UoW) site from the WPD storage facility on 21 January 2021. The device was fully cold commissioned by mid-February 2021 and the Long Duration Performance Test (LDPT) was successfully completed on 15 March 2021 after a test duration of four full calendar weeks.



There have been no delays in the project programme due to the COVID-19 pandemic in this reporting period. Throughout the reporting period we have continued to communicate regularly with UKPN to share progress information and to understand the respective impact of COVID-19 on each of our project programmes. This will continue going forwards to ensure that the projects are delivered safely and effectively.

1.3. Project Delivery Structure

The EDGE-FCLi Project Review Group (PRG) meets on a bi-annual basis. The role of the PRG is to:

- Ensure the project is aligned with organisational strategy;
- Ensure the project makes good use of assets;
- Assist with resolving strategic level issues and risks;
- Approve or reject changes to the project with a high impact on timelines and budget;
- Assess project progress and report on project to senior management and higher authorities;
- Provide advice and guidance on business issues facing the project;
- Use influence and authority to assist the project in achieving its outcomes;
- Review and approve final project deliverables; and
- Perform reviews at agreed stage boundaries.

1.3.1. Project Resource

Table 1-1 provides an overview of the project resources for the project.

Table 1-1 Project resources

Project Partner	Name	Role
WPD	Yiango Mavrocostanti	Innovation Manager
GHD	Daniel Hardman	Project Manager
UKPN	Jack McKellar	Project Manager
GridON	Yoram Valent	CEO
	Roy Iscovitsch	President & Co-Founder
	Uri Garbi	Project Manager
	Alex Oren	Senior Engineer
	Dvir Landwer	Senior Engineer



1.4. Procurement

Table 1-2 provides a summary of the status of the procurement activities for the project.

Table 1-2 Procurement status

Provider	Services/Goods	Project Area	Status/Due Date
GridON	Detailed Design	Design	Complete
GridON	FCLi	Build	Complete
GridON	FAT	Testing	Complete
GridON	Short circuit testing	Testing	Complete
EMS	Sub.net monitoring system	Trial	Delivered
Envico	GRP housing	Installation	Delivered
Control Engineering Ltd	HMI wall box panel	Installation	Delivered
Nexans	Surge Arrestors	Installation	Delivered
Nexans	T-connectors	Installation	Delivered

1.5. Project risks

A proactive role has been taken to effectively manage risk in the delivery of the EDGE-FCLi project. Processes have been put in place to review the applicability of existing risks; identify and record new risks that have arisen; and update the impact, likelihood and proximity of risks that have developed.

A summary of the most significant risks is provided in Section 7.2.

1.6. Project learning and dissemination

The project learning is captured throughout the project lifecycle by ongoing engagement with the project partners and stakeholders. The learning is regularly recorded and updated through our reporting processes and disseminated through various media. Table 1-3 gives a summary of the dissemination activities that have already taken place. The project learning for the current reporting period is given in Section 5.

Table 1-3 Project dissemination

Event	Date	Attendance	Location
Energy Networks Innovation Conference	8 December 2020	D. Hardman	Virtual
Low Carbon Network Fund Conference	16 October 2018	N. Pogaku*	Telford, UK
Electricity Innovation Forum on New Technology and Commercial Evolution, ENA	28 September 2018	N. Pogaku*	London, UK

*Note – These staff members are RINA employees that were responsible for project management prior to the re-baselining activities in late 2019. RINA no longer have an active involvement in the development and deployment of the WPD FCLi; however, they are providing support to UKPN's programme delivery.



2. Project Manager's Report

2.1. Project background

The project aims to design, build, test, install and trial a solid state FCLi on the 11kV distribution network. The FCLi is designed to connect in series with DG and quickly disconnect the generation upon the detection of a network fault. The FCLi is therefore able to reduce the fault current contribution from generation fitted with the device, thus allowing the cost-effective connection of DG to networks that are fault level constrained.

2.1.1. Project re-baseline

The FCLi project was re-baselined in December 2019 to allow for greater collaboration with UKPN to ensure that the device is replicable and deployable throughout GB. The collaboration will consist of working jointly on the design of the FCLi device, factory, and laboratory testing to ensure that it is suitable for longer-term testing and site trials. A further addition has been the inclusion of a LDPT into the programme to understand how the device behaves over an extended period in a controlled environment. This will give further assurances that the FCLi is safe to connect to the 11kV network.

The project work packages have been adjusted accordingly to meet the new project requirements. Table 2-1 gives the work package structure along with the current status of each of these work packages.

An updated NIA Project Registration and Project Eligibility Assessment (PEA) document was subsequently submitted to the ENA on 3 January 2020 after agreement was made with UKPN on their more integrated role in the project.

Table 2-1 Adjusted work packages following project re-baseline

Work Package No.	Work Package Description	Status
1	Device specifications	Completed
2	Preliminary FCLi design and review	Completed
3	Detailed FCLi design and review	Completed
4	FCLi device manufacture	Completed
5	Performance testing (FAT & Short Circuit Testing)	Completed
6a*	LDPT (conditional on successful completion of WP 1-5)	Completed
6b*	Installation and operation of the UKPN FCLi on their 11kV network	In progress
7*	Trial of the WPD FCLi on 11kV network (conditional on successful completion of WP 6a and 6b for six months)	Not started

Asterisk (*) indicates the updated/new work packages

2.1.2. UKPN status

The UKPN FCLi has been fully manufactured and tested; it is currently in storage awaiting deployment to their trial site. However, UKPN are in discussions with the generating customer due to changes in their operational environment because of COVID-19. This delay has meant that the conditional element of Item 7 in Table 2-1 above could not be adhered to without delay to the overall project schedule. Therefore, to maintain progress and project learning, we have continued with our FCLi connection independently of UKPN and continue to monitor the situation. No overall impact to the existing project plan is foreseen, and the change will have no bearing on the project learning and outcomes.



2.2. Project progress in the last six months

Significant progress has been made on the EDGE-FCLi project in the last six-month period. The following sections summarise the main activities.

2.2.1. Delivery and offloading

The FCLi was transported from the WPD storage facility and delivered and offloaded onto its concrete foundation at UoW 33/11kV primary substation on 21 January 2021. Figure 2-1 shows the crane lifting the FCLi onto the concrete foundation.



Figure 2-1 Crane offloading FCLi being onto the concrete foundation at UoW

2.2.2. Cold commissioning

GridON carried out the cold commissioning of the FCLi after the delivery and offloading of the unit at the UoW site. This involved:

- Reconnection of the Uninterruptable Power Supply (UPS) batteries (disconnected prior to going into temporary storage);
- A 500V DC insulation resistance test on the FCLi Low Voltage AC (LVAC) circuits to check the integrity of the insulation;
- A 500V DC insulation resistance test on the FCLi High Voltage (HV) circuits to check the integrity of the insulation;
- Initial power up check and dehumidification to allow the cooling fans to remove any moisture in the cooling system that may have accumulated during temporary storage; and
- A range of functional tests, including:
 - A full power up test
 - Verification that each alarm and trip signal is correctly initiated
 - Verification of all interface wiring including all SCADA commands



2.2.3. Long duration performance test preparation

The LDPT was the last stage of testing prior to connection of the FCLi in series with the 11kV generator at UoW. The design of the LDPT involved connecting the FCLi to the UoW substation local LVAC supply and driving a current (approx. 35A) through the device using a programmable three phase load bank for a duration of four calendar weeks. A simplified schematic diagram of the LDPT test circuit is shown in Figure 2-2. The aim of the test was to complement the testing carried out during the FAT and to ensure that the device is able to carry load current for extended periods of time without failure or nuisance tripping.

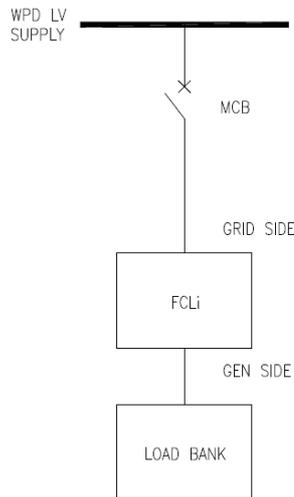


Figure 2-2 Simplified schematic of LDPT test circuit

Most of the preparatory works, such as the installation of the LVAC cabling and modifications to the local substation LVAC distribution board were able to be completed prior to the delivery of the FCLi to the site to reduce the overall commissioning timescales.

The design for the LDPT paid particular attention to the electrical protection of the FCLi during the test. All the FCLi alarm and trip signals were commoned and rewired to trip the main test supply Miniature Circuit Breaker (MCB) shown in Figure 2-2. This ensured that the FCLi was safely isolated from the incoming LVAC supply should any fault occur in the device. These protection and wiring modifications were implemented and tested shortly after the manufacturer had carried out their cold commissioning activities.

The project team developed a robust test method and plan for the LDPT. This document provided:

- A detailed overview of the test circuit;
- The protection scheme and its operation;
- A step-by-step guide to energising/de-energising the FCLi to ensure that the site operatives could safely operate, inspect and isolate the FCLi; and
- The test pass criteria including the actions to be taken should a fault develop in the test.

GridON also provided a training session to the WPD site personnel responsible for monitoring the FCLi during the LDPT. This training session along with the test method and plan document was key to ensuring the site personnel were able to operate the FCLi safely and confidently throughout the LDPT.

2.2.4. Long duration performance test

The LDPT was initiated on the 15 February 2021 and ran for four calendar weeks, concluding on the 15 March 2021. The FCLi successfully passed the test, operating as expected for the duration of the test with no causes for concern. A thorough examination of the device and the associated GRP enclosure was carried out immediately after



disconnection from the LVAC supply. No observations were raised as part of this inspection, which meant that preparations could immediately begin for the final connection to the 11kV network.

2.2.5. Preparation for final 11kV connection

The preparatory works for the final connection of the FCLi to the 11kV switchboard at UoW substation began after the conclusion of the LDPT. The first step was to remove the wiring modifications and temporary cabling installed to facilitate the LDPT, and to restore the site to its original configuration. This is now complete.

The 11kV cables are currently being installed from the existing 11kV switchboard to the FCLi HV cable box. We plan to have the 11kV cables installed and terminated onto the FCLi by the end of April 2021, after which GridON will carry out their final remaining commissioning activities.

The final step will be to carry out a brief outage of the UoW CHP generator so that the FCLi can be connected to the 11kV switchboard and energised. We have been working with the UoW energy centre to formulate a schedule and plan to coordinate the disconnection and resynchronisation of the CHP machine to the grid after energisation of the FCLi. The final connection is scheduled for mid-April after which the FCLi trial will commence.

2.2.6. COVID-19 impact

Whilst having a significant impact on the project during the device testing phase over the summer in 2020, the COVID-19 pandemic has had minimal impact during this reporting period. However, we have continued to monitor and assess the COVID-19 risks on an ongoing basis. Table 2-2 presents a summary of the overall COVID-19 impact to the project and a summary of the actions being taken in response to the event.

Table 2-2 Summary of COVID-19 impact

Work Package No.	Work Package Description	Affected?	Comment
5	FAT & Short Circuit Testing	Yes	This work package is now complete. In the re-baselined programme, the FAT & Short Circuit Testing was due for 17-18 March 2020 and 23-24 April 2020, respectively. They were then postponed to 1 June 2020 and 29-30 June 2020 respectively
6a	Long Duration Performance Test (LDPT)	Yes	This work package is now complete. Whilst there were some minor restrictions, the impact on this phase of work was minimal
6b	Installation and operation of the UKPN FCLi on their 11kV network	No	This situation is being monitored carefully through regular teleconferences with UKPN, however, there are no indications at this time that there will be delays due to COVID-19
7	Trial of the WPD FCLi on 11kV network	No	This situation is being monitored carefully, however, there are no indications at this time that there will be delays due to COVID-19



3. Progress against budget

Table 3-1 summarises the details of the progress that has been made with respect to the project budget.

Table 3-1 Project finances

Budget Item No.	Budget Item	Budget (£k)	Expected Spend to Date (£k)	Actual Spend to date (£k)	Variance to Expected (£k)	Variance to Expected (%)
1	GridON EDGE-FCLi Unit	1,250.0	1,137.5	1,137.2	-0.3	-0.03
2	Contractor Costs	367.6	360.5	360.5	0.0	0.00
3	WPD Project Management	122.1	67.8	67.1	-0.7	-1.03
4	Equipment and Labour	258.9	221.6	221.6	0.0	0.00
5	Schneider Switchgear	105.2	105.2	105.2	0.0	0.00
6	Long Term Performance Test	108.0	108.0	0.0	-108.0	-100
-	Totals	2,211.8	1,999.9	1,891.6	-109.0	-5.45

Comments around variance

The LDPT budget item (no. 6) was originally set up to account for the costs of testing the FCLi at a third-party external laboratory. As explained in the previous six-monthly report, an alternative method of performing the test at the UoW substation was explored and found to be the optimal solution. The cost for the alternative LDPT solution was significantly lower than the original solution and was able to be absorbed into the budget for the site commissioning activities, hence the reason for zero spend on the associated line item in Table 3-1.



4. Progress towards success criteria

Table 4-1 presents the progress towards the success criteria documented in the EDGE-FCLi Project Registration and PEA document.

Table 4-1 Progress towards success criteria

Criterion No.	Success Criterion	Progress
1	The FCLi limits and reduces the fault current contribution of the generator to zero before the first current peak	The FCLi underwent Short Circuit Testing on 29-30 June 2020. The device successfully detected and interrupted all short circuit conditions before the first current peak of the prospective short circuit current. Refer to further detail on the findings from the testing in April 2020 – September 2020 six monthly progress report
2	The FCLi introduces minimal disturbance to the network and the generator during normal operation	The LDPT is complete and no disturbances were observed. This criterion can only be assessed fully following final connection to the UoW site and after the field trial. Refer to Section 2.2.4 for further detail on outcome of the LDPT
3	The FCLi remains in normal conduction mode for transient non-fault related events and for faults outside the 11kV network on to which it is connected.	The FCLi underwent Short Circuit Testing on 29-30 June 2020. The device successfully detected and interrupted all prospective fault currents greater than the fault detection settings. The device did not trigger for currents below the settings value and remained in its conduction mode. Refer to further detail on the findings from the testing in April 2020 – September 2020 six monthly progress report



5. Learning outcomes

The following sections list some of the key learning outcomes that resulted from activities during this reporting period:

5.1. GRP housing and cooling ducts

The FCLi was shipped to the UK and kept in temporary storage with its cooling ducts disassembled to save space and make the device easier to transport. Figure 5-1 shows the general arrangement of the FCLi with the cooling ducts in place. Figure 5-2 shows the same cooling ducts removed for transportation and lifting.

The FCLi is an indoor device but can be installed outdoors in a GRP housing for protection from the external environment, as is the case at the UoW site. The contractual arrangement agreed between WPD and GridON meant that WPD was responsible for procuring the GRP housing, with the specification coordinated and agreed between both parties. This separate contractual arrangement meant that the FCLi and its housing was delivered to site separately and had to be placed sequentially on the concrete foundation at UoW substation. **Error! Reference source not found.** in Section 2.2.1 shows the GRP housing and this process in more detail.

There was a risk that the FCLi internal compartments would be left exposed to bad weather during the offloading process at UoW, especially given that this task was being performed in January. This led to the decision to unpack the FCLi at the temporary storage location, fit the ducts and re-package the unit prior to shipment so that the internal components were protected during transport and offloading to the site.

It is a learning point that the design of future devices is improved to ensure that they can be offloaded more efficiently even in inclement weather. An improved solution would be for the manufacturer to supply the FCLi and its associated protective enclosure as a single unit under one contract, or to install the device indoors therefore avoiding issues with the external environment. This would allow the device to be offloaded at site quickly and efficiently, whilst also reducing the onsite commissioning timescales further.

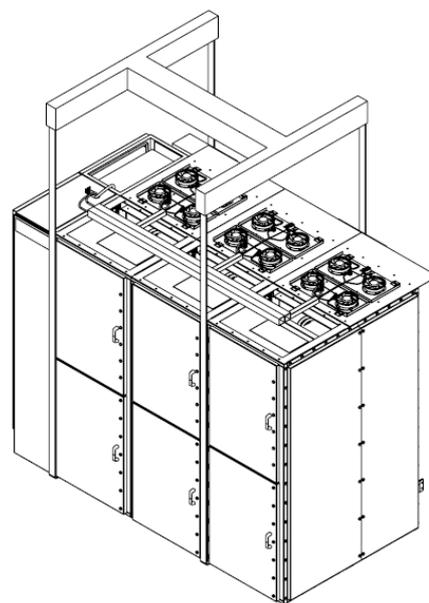
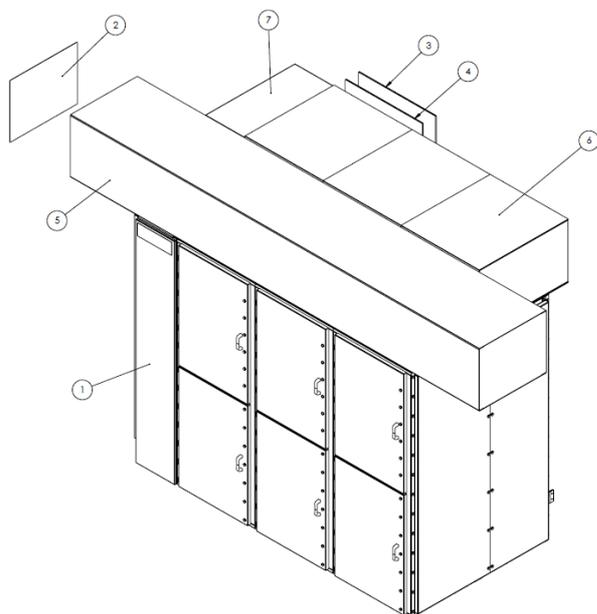


Figure 5-1 General arrangement of the FCLi with cooling ductwork installed (item 5/6)

Figure 5-2 FCLi shown during lifting with cooling ductwork removed

5.2. Crane offloading

The FCLi is positioned on a dedicated concrete foundation constructed within the UoW primary substation compound. Figure 5-3 shows the FCLi final installation location relative to the overall UoW site. The foundation was next to a



gravel area with several ducted 11kV cables (running right to left in Figure 5-3). It was therefore decided to use a 'spider' crane for the FCLi offloading instead of a traditional crane. This piece of equipment allows the lifting forces to be spread out over a wider area than a traditional crane outrigger, alleviating our concerns that the ducted 11kV cables would be damaged during lifting. The spider crane that was used for the offloading is shown in Figure 5-4 and proved to be successful.

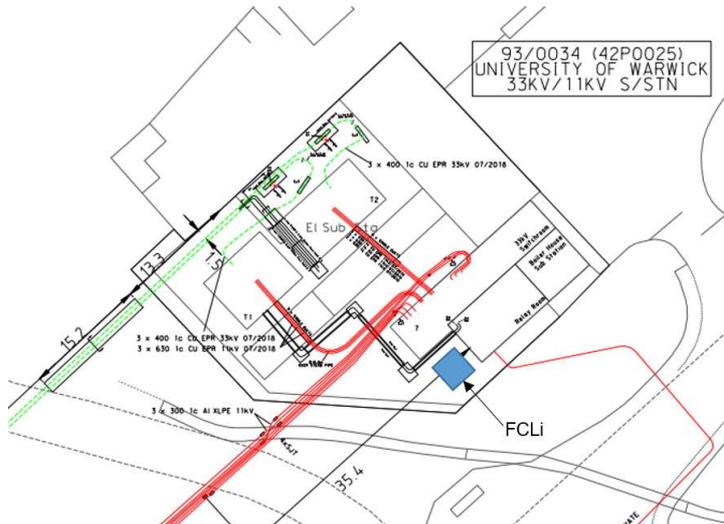


Figure 5-3 Layout of UoW substation showing FCLi installation location



Figure 5-4 Spider crane used for FCLi lift

5.3. Shorting lead during commissioning

There was an issue on site during the commissioning of the wiring modifications for the LDPT. One of the power supply supervision relays in our interface panel with the FCLi was continually causing the test circuit power supply to trip. The wiring design at the interface terminal blocks was inspected in the as-built drawings to determine if there had been any errors. No errors could be found in the schematic drawings. After further inspections of the FCLi interface terminal blocks at site, our commissioning engineer identified a shorting link that was left inside the panel, most likely this was utilised in the short circuit testing at KEMA but left in the panel in error as the device was prepared for shipment to the UK. This caused only minor delays to the commissioning; however, the point reinforces the need for robust testing and commissioning processes at site to identify issues and rectify them before final energisation. We recommend that the post-FAT or pre-commissioning procedures are updated to check and confirm that any wiring modifications have been removed since the factory and/or type tests.

5.4. Long duration performance test

The FCLi successfully passed the LDPT with no issued or observations noted. The LDPT was initiated on the 15 February 2021 and ran for four calendar weeks, concluding on the 15 March 2021. Further details can be found in Section 2.2.4.

The LDPT was a necessary part of the testing sequence prior to the connection of the FCLi to the distribution network. The FCLi is a 'first -of-its-kind' device and therefore it was important to ensure it was safe and reliable for trial on the live network. In addition, the timing of the FCLi installation works allowed the project team to complete the LDPT in February/March 2021, resulting in the most onerous environmental conditions that could be expected. It would be recommended to carry out soak testing on future devices in the same manner should the project programme facilitate this. The successful completion of the LDPT, along with the prior FAT and short circuit testing, has given the project team significant confidence that the device is robust and reliable enough to proceed with the final connection and trial.



6. Intellectual property rights

A complete list of all background IPR from all project partners has been compiled. The IP register is reviewed on a quarterly basis.

GridON entered this project with two relevant background IPR patent applications:

1. Patent application “DC Power Supply Arrangement” - filed on 24 January 2017
2. Patent application “AC Switching Arrangement” - filed on 21 March 2017



7. Risk management

7.1. General

Our risk management objectives are to:

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

These objectives will be achieved by:

- Defining the roles, responsibilities and reporting lines within the project delivery;
- Team for risk management;
- Including risk management issues when writing reports and considering decisions;
- Maintaining a risk register;
- Communicating risks and ensuring suitable training and supervision is provided;
- Preparing mitigation action plans;
- Preparing contingency action plans; and
- Monitoring and updating of risks and the risk controls.

7.2. Current risks

The EDGE-FCLi risk register is a live document and is updated regularly. There are currently seven live project related risks, which has reduced from 12 in the last six-monthly report. This is due to the successful completion of the FAT and Short Circuit Testing combined with a reduced impact from COVID-19 as restrictions have been eased. The risk register includes mitigation action plans for each identified risk and appropriate steps then taken to ensure risks do not become issues wherever possible.

Table 7-1 details the top five current risks by category. For each of these risks, a mitigation action plan has been identified and the progress of these are tracked and reported.

Table 7-1 Top five current project risks (by rating)

Risk	Risk Rating	Mitigation Action Plan	Progress
FCLi fails LDPT	Major	A robust test specification and test criteria are required to ensure that there is no ambiguity in the results of the test	LDPT was successfully completed on 15 March 2021 (Risk can now be closed)
UoW have concerns over the operational aspects of the FCLi in the run-up to HV connection	Moderate	Organise regular communication with UoW before HV connection and be transparent on schedule, technical requirements to sync with CHP	A plan for the final HV connection has been coordinated and agreed with UoW
UoW request changes to their current network feeding	Moderate	Regular updates with the Primary Systems Design (PSD) team	The feeding arrangement will most likely not affect the 12-



Risk	Risk Rating	Mitigation Action Plan	Progress
arrangement			month trial of the WPD FCLi
Delays in UKPN schedule requires modification of the project direction to account for updated trial duration	Moderate	The situation is to be monitored with regular calls between UKPN and WPD	No anticipated requirement to modify the project direction, however, monitoring ongoing
The COVID-19 pandemic continues for a long period of time creating extended delays to the NIA project programme	Moderate	Monitor the situation closely to give time for altering the installation and commissioning plans	No indication of delays but review continuing

Figure 7-1 provides a graphical summary of the project risk register to give an ongoing understanding of the project risks.

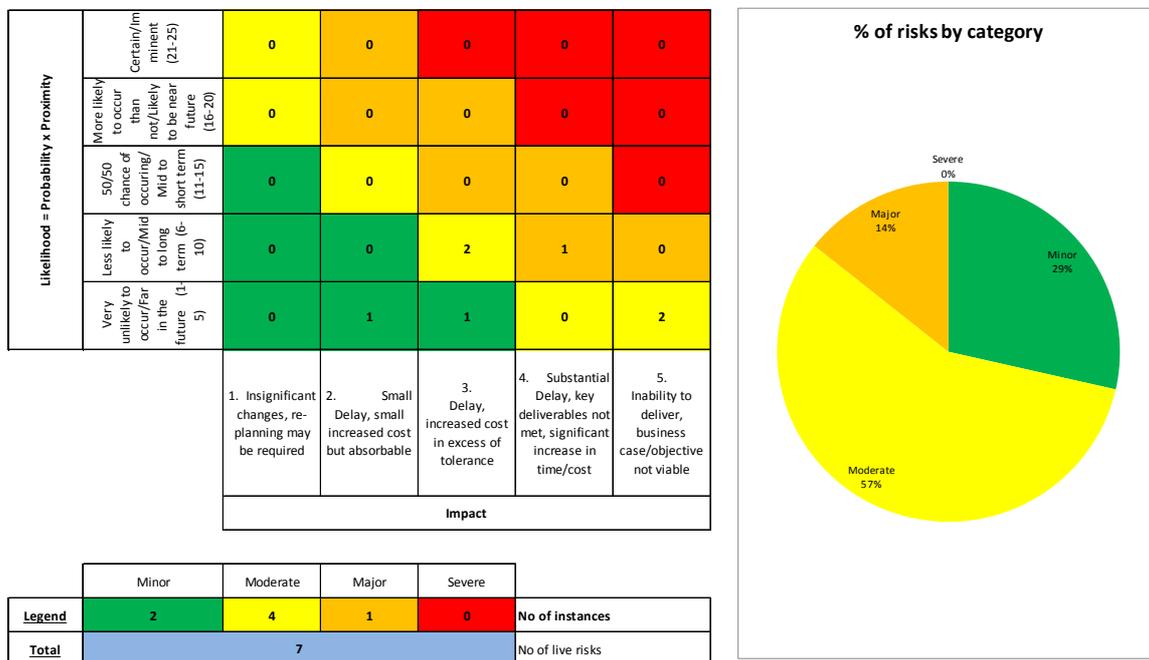


Figure 7-1 Graphical view of project risks

7.3. Update for risks previously identified

Descriptions of the most significant risks identified in the previous six-monthly progress report are provided in Table 7-2 with updates on their current risk status.

Table 7-2 Top five risks from previous reporting period

Risk	Previous Risk Rating	Risk Rating	Mitigation Action Plan	Progress
The COVID-19 pandemic continues for a long period of time creating extended delays to the NIA project programme	Major	Moderate	The action to be taken is to monitor the situation closely and identify risks early so that they can be mitigated	No indication of any delays but review continuing
FCLi fails the LDPT	Major	Closed	A robust test specification and test criteria are	LDPT has been successfully passed



Risk	Previous Risk Rating	Risk Rating	Mitigation Action Plan	Progress
			required to ensure that there is no ambiguity in the results of the test Ensure both parties know the procedure to be taken if the device trips	
UoW request changes to their current network feeding arrangement	Major	Moderate	Regular updates with the Primary Systems Design (PSD) team in charge of the budget quotation. Research the proposed UoW scheme to see the impact of the changes	The feeding arrangement will most likely not affect the 12-month trial of the WPD FCLi
GRP needs a crane for offload onto plinth at UoW	Moderate	Closed	A clear site layout is communicated to the GRP manufacturer to allow them to perform a second site/route survey and confirm if a crane is indeed required	Device has been offloaded successfully
Delays in UKPN's programme translate to delays in WPD's FCLi installation and energisation dates	Moderate	Moderate	Regular progress calls with UKPN to discuss their test and install schedule and identify delays early	Situation is being monitored closely but is not expected to be an issue as UKPN programme is largely independent of WPD's



8. Consistency with project registration document

A copy of the latest Project Registration and PEA document can be found [here](#).

At this point in time the project is consistent with the project budget and programme. The COVID-19 pandemic is also not causing delays to the overall WPD and UKPN programmes. However, the situation is being reviewed carefully and it may be necessary to revisit the registration document in the future to adapt the project scope or timescales to consider COVID-19 related delays. Further details of the impact the COVID-19 pandemic on the project is given at the end of Section 2.2.6.



9. Accuracy assurance statement

This report has been prepared by the EDGE-FCLi Project Manager (Daniel Hardman), reviewed, and approved by the Innovation Manager (Yiango Mavrocostanti).

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



Glossary

Acronym	Definition
AC	Alternating Current
CEO	Chief Executive Officer
CHP	Combined Heat and Power
COVID	Coronavirus disease 2019
DC	Direct Current
DG	Distributed Generation
EDGE-FCLi	Embedded Distributed Generation Electronic Fault Current Limiting interrupter
ENA	Energy Networks Association
FAT	Factory Acceptance Testing
GB	Great Britain
GHD	Gutteridge, Haskins & Davey Limited
GRP	Glass Reinforced Plastic
HMI	Human Machine Interface
HV	High Voltage
IP	Intellectual Property
IPR	Intellectual Property Rights
KEMA	Keuring van Elektrotechnische Materialen te Arnhem
LDPT	Long Duration Performance Test
LVAC	Low Voltage Alternating Current
MCB	Miniature Circuit Breaker
MVA	Mega Volt-Amperes
NIA	Network Innovation Allowance
PEA	Project Eligibility Assessment
PRG	Project Review Group
PSD	Primary Systems Design
RMU	Ring Main Unit
SCADA	Supervisory Control and Data Acquisition
UKPN	UK Power Networks
UPS	Uninterruptible Power Supply
WP	Work Package
WPD	Western Power Distribution



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