

# **NIA ENWL027 Enhanced LFDD**

## **Progress Report**

**31 July 2022**



## VERSION HISTORY

Version	Date	Author	Status	Comments
V1.0	29/07/2022	Stephen Stott	Final	

## REVIEW

Name	Role	Date
Lucy Eyquem	Innovation PMO Manager	29.07.22
Ben Ingham	Innovation Technical Manager	25.07.22
Victoria Turnham	Head of Network Innovation	25.07.22

## APPROVAL

Name	Role	Date
Steve Cox	DSO Director	29.07.22

# CONTENTS

1	PROJECT FUNDAMENTALS	5
2	PROJECT SCOPE	5
3	OBJECTIVES	5
4	SUCCESS CRITERIA	5
5	PERFORMANCE COMPARED TO THE ORIGINAL PROJECT AIMS, OBJECTIVES AND SUCCESS CRITERIA	6
6	REQUIRED MODIFICATIONS TO THE PLANNED APPROACH DURING THE COURSE OF THE PROJECT	6
7	LESSONS LEARNED FOR FUTURE PROJECTS	6
8	THE OUTCOME OF THE PROJECT	7
9	DATA ACCESS	7
10	FOREGROUND IPR	7
11	PLANNED IMPLEMENTATION	7
12	OTHER COMMENTS	7

## GLOSSARY

Term	Description
BSP	Bulk Supply Point – Generally a 132/33kV transformer substation
FAT	Factory Acceptance Test
LFDD	Low Frequency Demand Disconnection
PSP	Primary Supply Point – Primary Substation (33/11kV)

# 1 PROJECT FUNDAMENTALS

Title	Interface
Project reference	NIA_ENWL027
Funding licensee(s)	Electricity North West Limited
Project start date	June 2021
Project duration	1 year 7 months
Nominated project contact(s)	<a href="mailto:innovation@enwl.co.uk">innovation@enwl.co.uk</a>

## 2 PROJECT SCOPE

The project will carry out the following:

- Design and test firmware updates for the SuperTAPP SG relays to allow provision of the LFDD function
- Design a number of variations of LFDD schemes around the relay that takes levels of generation into account
- Carry out a set of test installations at a number of Electricity North West primaries
- Test the functionality of the relays in situ, using methods which do not put customers at risk, i.e. using accepted protection testing methods such as secondary injection with the trip links removed
- Carry out a desktop study to show the costs and benefits of rolling out this approach network wide
- Investigate the possibility of using a centralized LFDD response scheduler application to adjust the number of sites required for each LFDD block, including consideration of how these adjustments might be made

## 3 OBJECTIVES

- Demonstrate the ability of the relay to provide a LFDD response that complies with required standards for operation
- Identify a scheme design that provides the appropriate response whilst accounting for power flows
- Test this scheme on real world installations at around six primary substations fed from a common BSP and which have high levels of connected generation
- Identify future possible improvements to the scheme and a next phase of this project

## 4 SUCCESS CRITERIA

- Design of potential options for delivering intelligent LFDD at a primary level
- Successful FAT of the updated relays to demonstrate the technical compliance with the LFDD requirements
- Update of a group of primaries to the new firmware, along with monitoring on high generation circuits
- Site testing of the new firmware to prove operability in real world scenario's

- Report detailing the outcomes of the testing, identifying potential future improvements, setting out any possible changes to the GridCode pinpointed by the trials

## **5 PERFORMANCE COMPARED TO THE ORIGINAL PROJECT AIMS, OBJECTIVES AND SUCCESS CRITERIA**

The project has produced an Outline Design Document which fulfils the following project aims, objectives and project success criteria:

- Design a number of variations of LFDD schemes around the relay that takes levels of generation into account
- Identify a scheme design that provides the appropriate response whilst accounting for power flows
- Design of potential options for delivering intelligent LFDD at a PSP (Primary Supply Point aka primary substation) level

This document defines four use cases to be trialled during the project, which are as follows:

- A primary substation with no connected generation
- A primary substation with connected generation, where both transformers are to trip dependant on export level
- A primary substation with connected generation, where the intent is to trip on bus section only
- A primary bus section with connected generation, where the intent is to trip one bus section dependant on the export level

The document also details the initial design proposals including the proposed architecture and performance requirements.

The project is currently working on the following project aims and objectives in order to satisfy its success criteria over the next three months:

- A paper on the options and recommended on-site wiring method of tripping PSP bus-section 11kV circuit breakers during an LFDD event is under a final redraft following comments from the ENWL project group.
- Design and test firmware updates for the SuperTAPP SG relays to allow provision of the LFDD function
- Demonstrate the ability of the relay to provide a LFDD response that complies with required standards for operation
- Successful FAT of the updated relays to demonstrate the technical compliance with the LFDD requirements

## **6 REQUIRED MODIFICATIONS TO THE PLANNED APPROACH DURING THE COURSE OF THE PROJECT**

The project has just completed the scoping and design stage, to date there have been no modifications to the planned approach required.

## **7 LESSONS LEARNED FOR FUTURE PROJECTS**

There have been no lessons learned to date that would be applicable to other projects

## **8 THE OUTCOME OF THE PROJECT**

Not applicable.

## **9 DATA ACCESS**

Electricity North West's [innovation data sharing policy](#) can be found on our website.

There has been no data gathered so far during the project.

## **10 FOREGROUND IPR**

None

## **11 PLANNED IMPLEMENTATION**

Not applicable.

## **12 OTHER COMMENTS**

Not applicable.