NIA ENWL019
Interface

Progress Report

31 July 2021

VERSION HISTORY

Version	Date	Author	Status	Comments
V1.0	16.07.21	Steve Davenport	Final	

REVIEW

Name	Role	Date
Lucy Eyquem	Innovation PMO Manager	20.07.21
Dan Randles	Head of Innovation	21.07.21

APPROVAL

Name	Role	Date
Steve Cox	Engineering & Technical Director	21.07.21

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GLOSSARY

Term	Description
API	Application Programming Interface - computing interface which defines interactions between multiple software intermediaries
CoTS	Commercial off The Shelf
DNP3	Distribution Network Protocol 3 - communications protocols used between components in process automation systems
DMZ	Demilitarised Zone
IoT	Internet of Things
MQTT	A messaging protocol for small sensors and mobile devices
REST	Representational State Transfer - architecture style for designing networked applications
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition

1   PROJECT FUNDAMENTALS

Title	Interface
Project reference	NIA_ENWL019
Funding licensee(s)	Electricity North West Limited
Project start date	October 2018
Project duration	3 years
Nominated project contact(s)	Steve Davenport (innovation@enwl.co.uk)

2   PROJECT SCOPE

The project will investigate the various interfaces, communications mediums and protocols needed to support the transition to a future network. Trials will be conducted to ensure all the different devices work together whilst maintaining security.

3   OBJECTIVES

- Identify all existing and planned communications mediums and protocols for the monitoring and control of the DNO and customer's equipment.

- Trial interfaces between the DNO and customer equipment.

- Develop control methodologies for managing customers' and DNOs' equipment to resolve local constraints.

4   SUCCESS CRITERIA

- Production of functional specification for a communications hub to transfer monitoring data and controls between the NMS and DNO / customer owned equipment.

- Production of control methodologies for managing customers' equipment.

- Successful trial of a communications hub, its various interfaces and associated control methodologies.

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

. Progress to date includes:

- Engaged with a project partner to modify an existing SIM card-based LV Substation Monitor to ethernet to prove flexibility and connectivity to provide the networks teams with data to test the data flow to the ENW OT networks and data lake and beyond ENW to the external world.

- Modify the LV substation monitoring device to allow evaluation of LoRaWan connectivity and its operational limitations.

- Working with partners to install advanced LV network health monitoring devices which currently transmit the network data via a SIM card direct to their servers for assessment, and explore options to move from SIM card connectivity to Ethernet and transmit the data via DNO systems and forwarding to third-party servers.

- Explore options to merge Smart Street -related network data into a single communication path via ENW data network, therefore exploring bi-directional communication between ENW and third-parties.

- A new HV switchgear actuator is currently being developed and trailed which is primarily design to work with its own SIM card. This device is being modified to allow the it to be integrated, choosing between onboard SIM comms and external comms via an existing RTU or existing substation communication hub.

- ENW's network team have designed a plan to mirror the IBM model. Once the data starts transmitting data to prove the redirection of data to different locations, internal and external to ENW.

- An outdoor location has been established, GRP prepared and sited to house the test substation network in a real-world environment.

This project has been a valuable project to explore multiple connectivity and communication options with each Innovation project containing a SIM device.

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

- Owing to resource constraints experienced in recent months, a 12 months extension to the project will be requested.

- ENW are approaching the end of a full Network Management & SCADA application change, and the delivery of this project has a dependency on this.

7 LESSONS LEARNED FOR FUTURE PROJECTS

Cyber Security

- Cyber security may prove to be a risk to the Operational Technology Infrastructure with respect to any 3rd Party data system, therefore limiting what "On the wall" items of kits we can prove / test the single data communication route.

- 3rd party organisations may manage aspects of our distribution systems and require bi-directional communications to their wall mounted devices.

- This area will be explored but may prove to be too high of a risk to a cyber intrusion.

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.