

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

Network Licensees must publish the required Project Progress information on the Smarter Networks Portal by 31st July 2014 and each year thereafter. The Network Licensee(s) must publish Project Progress information for each NIA Project that has developed new learning in the preceding relevant year.

NIA Project Annual Progress Report Document

Date of Submission

Jun 2022

Project Reference

WPD_NIA_063

Project Progress

Project Title

Flexible Operation of Water Networks Enabling Response Services (FLOWERS)

Project Reference

WPD_NIA_063

Funding Licensee(s)

WPD - Western Power Distribution (South Wales) Plc

Project Start Date

January 2022

Project Duration

1 year and 2 months

Nominated Project Contact(s)

Nick Devine

Scope

FLOWERS aims to increase the capacity embedded within water networks to deliver flexibility for distribution networks. Water utilities are one of the largest consumers of electrical power, about 1TWh of demand across WPD's four licence areas. South West Water contributes 300GWh of this demand. Developing new operational processes and removing commercial and regulatory barriers for water networks to deliver flexibility therefore presents a significant opportunity for unlocking of flexibility capacity which is value for money to customers.

The project builds on an NIA project delivered by National Grid ESO to investigate the potential flexibility capacity in storm drains and wastewater catchments, which quantified capacity but did not create a commercial model for accessing it. It will expand the search for capacity on water networks, quantifying the available capacity across both wastewater and drinking water systems within the inherent latency of their pumping operations. As such, it is expected to uncover a greater level of capacity and also develop a cost-saving commercial model for its delivery.

It is conservatively estimated that this project can deliver 0.25% of water network demand as flexibility. This amounts to 750MWh of capacity extracted from South West Water's Network yearly. Replicated across the breadth of the four licence areas, this could unlock upwards of 2.5GWh of flexibility capacity on water networks. These capacities could, respectively, deliver £2.5m and £8.5m of value to customers.

Objectives

Assess the technical and legal feasibility of embedding flexibility on water networks within the latency of their internal pumping operational processes.

Quantify and map water latency flexibility capacity to understand the alignment between availability and network constraint zones.

Determine the commercial arrangements necessary to procure flexibility capacity within water network processes.

Understand the technical and operational requirements of the system that would trigger latency flexibility.

Success Criteria

Details of how the Funding Licensee will evaluate whether the Project has been successful. This cannot be changed once registered.

A business case and cost-benefit analysis for using water network latency as a flexibility source will be created.

The high-level specification of a latency flexibility system will be documented for implementation in an appropriate follow-on project.

The capacity for latency flexibility on SWW's network will be quantified, with a methodology that can be replicated by WPD or other DNOs for other water networks.

A commercial proposal will be submitted to Ofgem and Ofwat for the implementation of the latency flexibility product

Performance Compared to the Original Project Aims, Objectives and Success Criteria

The Project commenced in February, and has proceeded with delivery of work packages LFA 1 and LFA 2. Performance relative to the NIA Project Registration Pro-forma is as follows:

Objectives:

- Assess the technical and legal feasibility of embedding flexibility on water networks within the latency of their internal pumping operational processes – in progress
 - o Stakeholder engagement for initial feedback on the technical and legal feasibility has been completed.
 - o Early stage gate milestones assessing if the initial feedback warranted continuation of the project have been completed and passed.
 - o The first report deliverable on the technical feasibility is in production.
- Quantify and map water latency flexibility capacity to understand the alignment between availability and network constraint zones – in progress
 - o WPD network and CMZ data and SWW half hourly demand data has been collected and a high-level assessment of the scale of the opportunity will be included in the technical feasibility report.
 - o The technical feasibility report will identify the types of flexibility opportunities that will be quantified and mapped in LFA 3.
- Determine the commercial arrangements necessary to procure flexibility capacity within water network processes – in progress
 - o Engagement with commercial stakeholders is ongoing and will continue the length of the project.
- Understand the technical and operational requirements of the system that would trigger latency flexibility – not started
 - o The technical feasibility report will identify the types of flexibility opportunities for which technical and operational requirements will be documented.

Success Criteria:

- A business case and cost-benefit analysis for using water network latency as a flexibility source will be created – in progress
 - o This is the planned output of work packages LFA 2 and LFA 5.
- The high-level specification of a latency flexibility system will be documented for implementation in an appropriate follow-on project – not started
 - o This is the planned output for work package LFA 4.
- The capacity for latency flexibility on SWW's network will be quantified, with a methodology that can be replicated by WPD or other DNOs for other water networks – in progress
 - o This is the planned output for work package LFA 3.
- A commercial proposal will be submitted to Ofgem and Ofwat for the implementation of the latency flexibility product – not started
 - o This is the planned output for work package LFA 2.

Required Modifications to the Planned Approach During the Course of the Project

Changes were made to the timescales of the planned approach due to a one month delay in starting the project. There were no changes to the methodology. This was managed within internal change management processes.

Lessons Learnt for Future Projects

Key points of learning from the Project so far have been:

- A potentially large unforeseen issue with modifying water network pumping capacity may be the infiltration of sea water into coastal water networks. In some cases, the condition of the pipes results in an estimated 90/10 ratio between sea water and waste water in water network pipes. As such, wastewater pumping in these areas is near constant and potential to vary this may be slim.
- South West Water's control room is entirely reactive, responding to alarms related to minimum and maximum set points for pumping stations, with no forward forecasting or proactive pumping. This presents an opportunity, as the introduction of proactive pumping could have electricity network triggers baked in, but would necessarily require additional software and equipment.
- There is an issue in water networks of pumps tripping when the electricity network is in abnormal running conditions. Key learning from the project will be made available in the closedown report which will be published on the project web page: <https://www.westernpower.co.uk/innovation/projects/flexible-operation-of-water-networks-enabling-response-services-flowers>

Findings from each work package will be summarised in the work package reports which will be published in the same location.

Note: The following sections are only required for those projects which have been completed since 1st April 2013, or since the previous Project Progress information was reported.

The Outcomes of the Project

No project outcomes have been reported yet. All reports will be made available on the project web page:

<https://www.westernpower.co.uk/innovation/projects/flexible-operation-of-water-networks-enabling-response-services-flowers>

Data Access

No new data has yet been gathered in the course of this project.

WPD detailed network plans which will be used are available via our Data Portal, which can be found here:

<https://www.westernpower.co.uk/our-network/network-plans-and-information>

Anonymised data will be available to share in accordance with WPD's data sharing policy

www.westernpower.co.uk/Innovation/Contact-us-and-more/Project-Data.aspx.

Foreground IPR

The Relevant Foreground IPR is:

- All report deliverables as described in section 2.2.
- A combined flexibility capacity and constraint map.

Relevant Background IPR required to produce this is:

- WPD network assets and constraint maps
- South West Water network maps
- South West Water MPAN demand data
- South West Water pumping process policy and techniques
- South West Water pumping asset information