NIA Progress Report

NIA_ENWL005
Asset Risk Optimisation

22 July 2016

VERSION HISTORY

Version	Date	Author	Status	Comments
v.1.0	20/07/2016	R A Wells	Final	Final version following internal review and comment

REVIEW

Name	Role	Date
A Howard	Programme Manager	21/07/2016
D Randles	Network Performance and Innovation Manager	21/07/2016
P Turner	Future Networks Delivery Manager	21/07/2016

APPROVAL

Name	Role	Date
Steve Cox	Head of Network Engineering	22/07/2016

CONTENTS

1 PROJECT BASICS

Project Tile	Asset Risk Optimisation
Project Reference	NIA_ENWL005
Funding Licensee(s)	Electricity North West Limited
Project Start Date	July 2015
Project Duration	2 years
Nominated Project Contact(s)	R A Wells Asset Management Modelling Manager

2 SCOPE

Carry out a trial optimisation of the following asset investment programmes for the RIIO-ED1 period:

- Grid transformers
- Distribution HV switchgear
- HV pole (supports)
- Underground link boxes.

Using data generated from Electricity North West Limited data sources. The trial application will be hosted by SEAMS.

3 OBJECTIVES

The project has the following objectives:

- Understand the data requirements to permit the optimisation of an existing programme of work
- Understand the techniques employed and how they may be customised to meet the industry's needs
- Vary parameters to understand the relative changes in overall delivery of the regulatory contract
- Understand the inputs required for a wider rollout of the technology to all asset groups modelled by CBRM
- Understand the IT technology implications of the models. Consider integration of the models to all corporate systems and the cost benefit
- Identify potential for optimising RIIO-ED2 submission to maximise benefits for customers while optimising investment.

4 SUCCESS CRITERIA

The project success criteria are:

- Development and enhancement of knowledge about the inter-dependencies of KPIs and constraints associated with inter-asset modelling and hence permit optimisation of programmes of work
- That the project permits the asset intervention programme to be varied in a manner which permits delivery of all KPIs in a more efficient manner
- That the model can be accessed to allow various criteria to be run and optimised by Electricity North West
- That the project outputs are scalable and other asset types can be added to the model, based on existing asset data sets.

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

The project is on plan against the original aims, objectives and criteria.

We have carried out a trial optimisation involving the four asset categories:

- 132kV transformer
- Distribution switchgear
- HV wood poles
- LV underground boxes.

Using the risk movements of an asset, as defined in the Common Network Asset Indices Methodologies 5 x 4 Matrix (Probability of Failure and Consequence of Failure) interventions can be identified which will result in movements from one cell to another. Using the Secondary Deliverable Improvement SDI requirements as stated in the RIIO ED1 RIGs Annex A, as a result of a replacement or refurbishment intervention the cost of the intervention and the impact on recorded asset risk can be estimated. This is provided to the model with the volumes of assets in each cell. The target risk reduction required is provided and an optimisation takes place. The output of the model provides volumes of assets to have an intervention with a cost for that work. The model is unable to provide a detailed list of assets by asset registry number to be intervened on.

Work continues on the development of the model so that it can recommend specific assets to which an intervention should be applied across all 21 assets for which an asset risk is reported in the RIIO ED1 network asset workbook; and consider the degree of integration this methodology could have within existing company systems.

A set of four prototype models were delivered in October 2015 which permitted the principles of the methodology to be demonstrated. These models showed that there is potential for the optimisation processes to be applied to any asset group which has an asset health score and hence risk. The learning to date identified an opportunity for additional learning in order to better match the original objectives of the project.

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

Following the completion of the prototype models (October 2015) it was identified that further learning would be beneficial to improve the quality of the final project findings. This learning will be delivered through a number of partner-led workshops with internal stakeholders and may result in additional project expenditure.

7 LESSONS LEARNT FOR FUTURE PROJECTS

Progress in the project has revealed the following lessons:

- For simple optimisation tasks the chosen methodology and optimisation methodology will permit potential savings in achieving a desired level of risk compared to methods previously used. However care must be exercised in the manner in which the scenarios to be studied are programmed as the system ignores cash flow and resources constraints unless these are programmed to prevent perverse programmes of work being proposed.

- Complex programmes of work such as replacing an overhead line for a cable, or replacing a three panel board with a ring main unit requires further development of the optimisation software. These activities take place on a regular basis and need to be modelled within any final production system.

- The integration of the optimisation tool needs to interact with the recently directed Common Network Asset Indices Methodology to ensure agreed targets are met.

- The system can be run either in an isolated manner or fully integrated with other existing company systems; we will be investigating the potential for this integration.

At this stage of the project the methodology has not discovered any difficulties in developing the prototype models and hence creating the expected learning as detailed in the initiation document.

8 THE OUTCOMES OF THE PROJECT

Not applicable.

9 PLANNED IMPLEMENTATION

Not applicable.

10 OTHER COMMENTS

Not applicable.