

# SHE Transmission

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New Suite of Transmission Structures: NeSTS (SSEN003)

Project Progress Report

June 2016

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# 1) Executive Summary

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## Overview of NeSTS

Scottish Hydro Electric Transmission (SHE Transmission) proposes to develop and deploy a New Suite of Transmission Structures (NeSTS).

Overhead lines (OHLs) built using transmission structures are the most visible element of the transmission network. The impact OHLs have on the environment can cause stakeholders concern.

The only available alternative to the steel lattice structures traditionally used in OHL construction is the T-Pylon. Developed by National Grid, the T-Pylon reduces the visual impact of OHLs but may be unsuited to areas with challenging terrain and propensity for severe weather events.

Establishing new infrastructure in these areas is essential to connect renewable generation, so there is a need for a new type of structure to address stakeholder concern.

The NeSTS project will develop innovative designs for OHL structures based on new technologies and techniques. The new suite of structures will then be deployed on the transmission network.

The NeSTS Project seeks to prove the following benefits:

- Improved OHL environmental performance by lowering visual and construction impacts; and
- Lower OHL whole life asset costs via reduced land, construction, maintenance and outage requirements.

## Progress within this Reporting Period

The Project commenced in January 2016 and is progressing satisfactorily.

During the period to date, the Project has focused on:

- Awarding contracts for the supply of Technical Assurance, OHL Design, Stakeholder Engagement Services, and Stakeholder Engagement Materials;
- Reviewing the outputs of the underlying NIA project (NIA\_SHET\_0010);
- Specifying the functional requirements for the new design;
- The engagement of stakeholders; and
- Communicating with Ofgem regarding the need, or otherwise, for a Customer Engagement Plan.

Project stakeholder contributions are being sought. Currently, consultees are being engaged to embody their inputs in the design process.

The following Stakeholder events have occurred:

- Internal Design Review, 4<sup>th</sup> February 2016; and
- Consultee Engagement, 19<sup>th</sup> May 2016.



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# 1) Executive Summary

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## SDRCs

The project is currently working towards its first SDRC, NeSTS Design Selection which is on schedule for delivery by 30<sup>th</sup> September 2016.

## Risks

The main risks to the Project are:

- That there is difficulty in combining multiple innovations on one single solution; and
- That there is a delay in connection of the NeSTS project due to site selection challenges or planning application issues.

## Events

An internal Design Review was held in February 2016 where the NIA project outputs were reviewed and the functional requirements for design were collated. A video profile of the event is published on the project website ([www.NeSTSPROJECT.COM](http://www.NeSTSPROJECT.COM)).

A consultee stakeholder workshop was held in May 2016 where statutory and other consultee responses to the design option were discussed and measured. A video profile of the event will be published on the project website by August 2016.

## Communications

During this reporting period, Project information has been shared directly with stakeholders and published on the Website.

Project Website

- [www.NeSTSPROJECT.COM](http://www.NeSTSPROJECT.COM)



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## 3) Progress Against Plan

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### Project Summary

The Project is managed via six work packages. An update on the progress made on each work package during this reporting period is provided below:

### Project Management

The Project team and internal stakeholders are engaged and holding monthly update meetings.

The Project Steering Group is engaged and holding monthly meetings.

External stakeholder engagement is underway. The first engagement with statutory authorities has been completed. The supply chain and transmission operator engagements have commenced. The engagements with landowners/managers and other interested members of the public are being planned.

Contracts have been awarded for the supply of;

- Technical Assurance on the NIA project outputs;
- Overhead Line Design;
- Stakeholder Engagement Services; and
- Stakeholder Engagement Materials.

The Project is currently in the 'Refinement' stage.

### Prototype and Initial Testing

This work package's main activities are scheduled to commence in 2017.

### Parallel Design Process

This work package's main activities are scheduled to commence in 2017.

### Full Scale Testing

This work package's main activities are scheduled to commence in 2018.

### Planning, Construction and Monitoring Processes

This work package's main activities are scheduled to commence in 2018.

### Knowledge Dissemination

The Project Website is live and is disseminating design information and updates on progress.

Stakeholders are engaged and are informing the development of the Project designs.



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## 3) Progress Against Plan

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### SDRCs

The Project is currently working towards its first SDRC, NeSTS Design Selection which is on schedule for delivery by 30<sup>th</sup> September 2016.

### Business Case Update

No changes have been made to the Business Case for the NeSTS Project, described in the NIC full submission document.

### Summary

The Project has made good progress over its first 5 months and is progressing on plan and within budget. Stakeholder engagement and design selection activities are underway.

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## 3) Progress Against Plan

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### Summary of Progress

Overall the project is progressing on plan and to budget.

### Risks

The key risks to the project are:

- That there is difficulty in combining multiple innovations on one single solution .The supply chain is being engaged to mitigate this risk; and
- That there is a delay in connection of the NeSTS project due to site selection challenges or planning application issues. Consultees are being engaged to mitigate this risk.

The risk register has been updated accordingly.

### Focus This Reporting Period

The focus over this reporting period has been on:

- Awarding contracts for the supply of Technical Assurance, OHL Design, Stakeholder Engagement Services, and Stakeholder Engagement Materials;
- Reviewing the outputs of the underlying NIA project;
- Specifying the functional requirements for the new design;
- The engagement of stakeholders; and
- Communicating with Ofgem regarding the need or otherwise for a Customer Engagement Plan.

### Key Activities in Next Reporting Period

The Key Activities between 20<sup>th</sup> June 2016 and 19<sup>th</sup> December 2016 planned are:

- Completing the first SDRC by 30<sup>th</sup> September 2016;
- Completing prototype design; and
- Appointing a main contractor for design of the NeSTS OHL.

## 4) Progress Against Budget

The table below details the spend to date against the project budget for each cost category.

Cost Category	Total Budget	Spend to Date	Comment
Labour			
Project team resource costs	£1,645.49k	£79.55k	On plan
Equipment			
Project team resource costs	£258.56k	£0k	On plan
Contractors			
Project team resource costs	£5,344.34k	£131.74k	On plan
IT			
IT Infrastructure	£204.79k	£0k	On plan
Travel & Expenses			
Travel & Expenses	£47.44k	£2.17k	On plan
<b>Total</b>	<b>£7,500.62k</b>	<b>£213.46k<sup>1</sup></b>	

### Notes:

- 1) Up to 30<sup>th</sup> May 2016, the project had spent £182.28k and this has been processed through the Project Bank Account. From 30<sup>th</sup> May 2016 to 17<sup>th</sup> June 2016 the project spent £31.18k (which has yet to be processed through the Project Bank Account) so the total project spend to 17<sup>th</sup> June 2016 is £213.46k as detailed in the above table.

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## 5) Bank Account

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**A copy of the current project bank account statement is provided in Appendix I.**



## 6) SDRCs

### An update on the Project's SDRCs is provided below.

NeSTS identified eight Successful Delivery Reward Criteria (SDRC) which span both the objectives and the lifecycle of the project.

The following table lists each SDRC in chronological order and details the project's progress towards their achievement.

SDRC	Due	Description	Evidence	Status
9.1	30/9/2016	<p><b>NeSTS Design Selection</b></p> <p>The completion of the development of the Support Assessment Matrix. This will be offered to TOs to compare different types of overhead line supports in a technically balanced manner, incorporating the electrical, mechanical, environmental and construction and operational factors of overhead lines design.</p> <p>Selection of the final support designs.</p>	<p>Publish the initial outputs of the Support Assessment Matrix. An accompanying report will provide the technical details of the selected designs by 30 September 2016.</p>	On Target
9.2	30/09/2017	<p><b>Output of Stakeholder Engagement</b></p> <p>Implement a programme of stakeholder engagement, supported by a suitable project supplier. This will include organised events and one to one interviews. Quantitative and qualitative analysis will be provided to understand key priorities. SHE Transmission will factor these viewpoints into the functional specification for NeSTS where practical.</p>	<p>Report to the Authority with an assessment on the need for a Customer Engagement Plan and/or data protection strategy by 30 June 2016.</p> <p>Publish a report describing the outputs from stakeholder engagement and demonstrate where these outputs have influenced the NeSTS designs by 30 September 2017.</p>	On Target

## 6) SDRCs

SDRC	Due	Description	Evidence	Status
9.3	30/8/2018	<p><b>Creation of Technical Specification</b></p> <p>The NeSTS overhead lines circuit will be designed in parallel with a traditional overhead lines support design - this is to create contingency in the event that NeSTS is not approved for demonstration at the stage gate process. The new technical specification for the supports will show how NeSTS design can be practically applied on a project, and is a key learning output for TOs and the supply chain. This will inform the procurement exercises for the initial deployment.</p>	<p>Publish a report on the outputs of the technical specifications of the NeSTS design stage by 30 August 2018.</p>	On Target
9.4	31/12/2018	<p><b>Decision Point / Review of business case</b></p> <p>Review the NeSTS business case to conclude whether or not the Project should continue to Phase 2.</p> <p>The learning gathered at this point will be assessed to ensure that NeSTS still has a positive business case - impacts of any energy policy developments regarding renewable generation and the results of stakeholder engagement will be considered as part of the decision process.</p> <p>It will involve SHE Transmission's Director of Transmission and the SHE Transmission Steering Board.</p>	<p>Submit an update to Section 3 and Appendix 6, the business case of the Full Submission, to the Authority evaluating the project and recommending whether or not to proceed to Phase 2 by 31 December 2018.</p>	On Target
9.5	30/09/2019	<p><b>Type Testing Agreement</b></p> <p>Within the first stage of Phase 2 (the demonstration part of the project), the detailed designs will enable the construction of a NeSTS overhead lines support structure, which will be tested at a dedicated testing facility.</p> <p>This is crucial in ensuring the design is supply chain ready and acceptable to other TOs.</p>	<p>A signed agreement with a dedicated testing facility by 30 September 2019.</p>	On Target

## 6) SDRCs


SDRC	Due	Description	Evidence	Status
9.6	20/02/2020	<p><b>Completion of Type Testing</b></p> <p>The overhead lines support will be put through a series of tests in order to ensure that it complies with the relevant standards and specifications including BS EN 60652 and BS EN 61773.</p> <p>The completed test results will provide clear analysis regarding NeSTS's capabilities.</p>	<p>Publish a report on the outputs of the type testing conclusions by 20 February 2020.</p>	On Target
9.7	29/1/2021	<p><b>Energisation of NeSTS Overhead Lines</b></p> <p>The energisation of the NeSTS overhead lines circuit is the culmination of the construction and commissioning of a section of the project is a key milestone.</p>	<p>Publish a full report detailing outputs and knowledge capture including an evaluation comparing NeSTS construction, commissioning and energisation with that of a typical steel lattice tower project by 29 January 2021.</p>	On Target
9.8	31/03/2022	<p><b>Publication of e-learning and visualisation tools and project closedown report</b></p> <p>Knowledge capture and dissemination is of high importance to the project and the acceleration of NeSTS into TOs' business as usual activities. SHE Transmission will develop an e-learning module to assist with training and familiarisation activities amongst TOs and the supply chain.</p> <p>A visualisation tool will also be created to assist TOs with network planning, and to share learning with stakeholders.</p> <p>At the end of the project, full evaluation and key learning points will be considered for inclusion in a comprehensive project closedown process. This will include learning gathered from knowledge events and the progress of the MASC substation during operation.</p>	<p>Complete development of both tools and share with TOs and deliver detailed closedown report to Ofgem by 31 March 2022.</p>	On Target

 Completed (SDRC met)

 Emerging issue, remains on target

 SDRC completed late

 On target

 Unresolved issue, off target

 Not completed and late

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## 7) Learning Outcomes

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### The following learning objectives have been set for the NeSTS project:

- **Develop a proven series of NeSTS design specifications:** The NeSTS project will further develop outputs from the NIA project and demonstrate these on the live transmission network. This will allow us to create the project's key output – a set of design specifications which can be shared with licensees and the supply chain. The specifications will take into account NeSTS's electrical, mechanical and civil engineering requirements.
- **Inform policy and procedure:** Each stage of the project will inform new policies and procedures for construction, operation, maintenance and safety. The development of these documents is fundamental to the successful adoption of NeSTS by other licensees.
- **Create future usage options:** NeSTS will be deployed and assessed against a range of terrain and climate scenarios that are representative of conditions found across GB. We will also implement a programme of prototype and component testing to measure NeSTS against severe weather events. This allows licensees and the supply chain to understand the conditions in which NeSTS is optimally suited, and creates confidence in the new designs.
- **Evaluate acceptance of alternative OHL supports by the consent and stakeholder processes:** During the project's first phase, a comprehensive stakeholder consultation will include discussion with licensees, landowners, statutory authorities and the supply chain. This allows us to understand and accommodate key priorities into the design where practical. Subsequent planning and consent for the planned OHL project will be evaluated to see the benefits of using NeSTS in comparison to conventional OHL methodology, and outputs from this learning objective will be shared with all stakeholders.
- **Develop and validate Support Assessment Matrix:** The Support Assessment Matrix (SAM) was developed through the NIA NeSTS project to evaluate and compare a series of OHL support designs against a set of Main Design Aspects (MDAs). The SAM will be developed further and validated by NeSTS to produce a highly useful matrix available to the supply chain and to licensees. This creates a centralised vehicle to evaluate and facilitate future OHL support innovations.
- **Create a transmission infrastructure working group:** The NeSTS project will form a working group to create and share best working practices for OHL supports, similar to the Energy Storage Operators' Forum. The OHL working group will review and share best practice worldwide to facilitate further improvements in OHL methodology.

These learning objectives will be met as the NeSTS Project progresses into the design phase through to installation and final operation.



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## 7) Learning Outcomes

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### Learning during this reporting period

Functional requirements for the NeSTS design have been documented in the first Project Design Review and will be shared with National Grid Electricity Transmission (NGET) and Scottish Power Transmission (SPT) as the first step towards establishing a Transmission Infrastructure Working group.

### IPR

No relevant IPR has been generated or registered during this reporting period.

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## 8) Risk Management

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### Risk Management Plan

The project has a Project Risk Management Plan that describes how project risks are managed throughout the project.

The project risk register is regularly reviewed by the project team and the key project risks are highlighted and discussed at the monthly steering group meetings, where mitigating actions are agreed.

### Risk Register

The current project Risk Register is provided in Appendix II.

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## 9) Accuracy Assurance Statement

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### PPR Preparation Steps

To ensure that the information contained in this report is accurate and completed, the following steps have been taken, the report has been:

- Prepared by the Project Manager;
- Reviewed by the Project Team;
- Reviewed by the Steering Group; and
- Approved by the Project Director and Regulation.

### Sign-off

As the senior manager responsible for the NeSTS project, I confirm that the processes in place and steps taken to prepare this PPR are sufficiently robust and that the information provided is accurate and complete.



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**Stewart A Reid**

Head of Asset Management & Innovation  
Scottish Hydro Electric Transmission

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## **Appendix I**

Project Bank Account Statement

## **Appendix II**

Risk Register

*Note: all the appendices are considered 'Confidential'*





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