INNOVATION STRATEGY CLOSE-OUT REPORT

PROJECT TITLE	Introduction of Fibre Glass Stay Blocks
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BRIEF OVERVIEW OF PROJECT & EXPECTED BENEFITS

At project start it was assumed that existing deployed wooden stay blocks showed signs of rot after being installed in the ground for 10 years. This was based on the assumption that ESB Networks was encountering problems with early life fungal decay caused by insufficient protection from preservatives such as Celcure AC 500 or Tanalith E.

The introduction of fibre glass material is being investigated as a substitute for wood material in the application of stay blocks used on angle and end overhead line poles. Those stay blocks are buried in a depth of 1 to 3 meters to secure the pole from falling over due to a range of mechanical pull forces those type of poles are subject to.

RESULTS

In regards to possible fungal decay on wooden stay blocks

Investigation of different wood types and various types of wood treatment (Creosote, Celcure AC500, Tanalith E)

ESB Networks have looked at various treatment methods versus types of wood. Preservatives such as Creosote, Celcure AC500 and Tanalith E have been reviewed regarding their effectiveness of protection. The stay blocks preservatives namely Celcure AC 500 or Tanalith E is not very effective in offering protection to the wood from fungal decay. Furthermore, there isn't another preservative on the market other than Creosote that offers better protection to the wood against fungi than Celcure AC 500 and or Tanalith E.

Different wood types such as Scots Pine, Douglas Fir and Larch and Spruce have been assessed in terms of suitability as wooden stay block material. As a result Spruce timber is not permitted in stocks from January 2016. ESB Networks have looked at various treatment methods versus types of wood. This means that Scots Pine, Larch and Douglas Fir when treated with the above mentioned preservatives should not be subjected to fungal decay assumed at project start. They provide us with sleepers and stay blocks that should last up to 30 years as opposed to 10 years. This can only be verified over time.

Additional outcome in regards to galvanised stay rod:

In addition to the investigation into assumed stay block fungal decay, ESB Networks discovered that there is a problem with corrosion of the galvanised stay rod where it is connected to the stay block. At this location the stay block is forced to bend by applying pressure on the rod to take up the angle of the stay. Unfortunately this bending can cause cracking of the galvanising which in turn leaves the steel exposed to elements which causes the steel to corrode prematurely. As a result ESB Networks have modified the stay rod design with the view to eliminating this problem by using a U shaped bolt and an eye arrangement.

In regards to introduction of fibre glass:

Investigation into material introduction of fibre glass as substitute for wood in stay blocks

During the investigations in relation to Alternatives to Creosote Wood poles ESB Networks came across a fibre glass material which is used as a decking or walk way in chemical plants and

substations. Similarly, the railway industry have been using fibre-reinforced foamed urethane to substitute rotten preservative treated wooden sleepers that are supporting the rail. Recently, Irish Rail used that approach on a bridge between Limerick and Ennis.

A sample of glass fibre material was taken back to Asset Management who agreed to further investigate the use of Fibre Glass Panels as Stay Blocks.

ESB Networks purchased eight circa 3m x 1m Fibre Glass slabs with the view to testing them as stay blocks used in the construction of 110kV Poleset Overhead Lines. ESB Networks have modified the stay rod with the view to testing them with the new fibre glass panels. It is worth noting that the above mentioned panels fit the size of the current stay block pads that are used to support 110kV polesets located in bogs and in bad ground. The Fibre Glass panels and stay rods were installed and load tested at ESB Training Centre Portlaoise.

LEARNINGS

Review of treatment types and wood types led to a ban of Spruce timber from stock and produced a combination of wood/treatment type for stay block application of a 30 year life span.

Changed design for galvanised stay rod to stop galvanising from cracking that would lead to premature corrosion.

Handling, installation and load testing of fibre glass stay blocks.

The advantages of fibre glass over wood can be summarised as follows:

- Fibre glass is easier to handle and install as lighter compared to treated wood
- Life span of 70-80 years for fibre glass stay blocks compared to treated wood stay blocks

BENEFITS REALISED/VALIDATED

Quality Assurance process (both pre-dispatch and post-delivery is being done) to reject bales/pallets where a deviation from standard (ESBN Small-Woods Specification 16111) is identified, e.g. decay, deviation in dimensions, wrong or missing marking, wane, is in place and fit for purpose.

Cost benefit analysis for fibre glass stay blocks show that capital expenditure in sourcing fibre glass material does not outweigh the financial advantages in installation, handling and operation of same when compared to the capital expenditure and operational cost of installing wooden type stay blocks. In fact, material costs for fibre glass stay blocks are multiples of wooden equivalents. There is no clear business case for their application.

NEXT STEPS – BAU, TRANSFER OF OWNERSHIP

Continuation to use preservative treated wood type stay blocks. They have been used in ESB Networks for the last 15 years and so far there has been no reported failure in field. With the expected lift time of 30 years for treated wood stay blocks there is an expectation to have headroom for another 15 years before problems will develop.

Monitoring of capital cost of fibre glass material going forward.

FINAL TIMELINES (REASONS FOR ANY DELAYS IF THEY OCCURRED)

No delays.

FINAL COSTS

No CAPEX costs. Time and expenses for ESB Networks Staff.