NORWICH – TILBURY UPGRADE PROPOSAL

FINAL SUBMISSION

As a statutory consultee, Layham Parish Council makes the following comments on the proposal to "Upgrade the transmission network between the existing substations at Norwich Main in Norfolk, Bramford in Suffolk and Tilbury in Essex" (The NT Proposal)

1. **General Comments**
   - 1.1 Given the new proposed North Sea offshore and Sizewell generation projects due to be commissioned in the next 10 years, Layham Parish Council (LPC) recognise the need to upgrade the 400kV network, but does not feel that the proposal is the best way to meet this need.
   - 1.2 National Grid (NG) has stated that, due to increased demand nationally to meet the net zero targets set by UK Government, there is a need to upgrade the whole of its extra high voltage (EHV) network and LPC questions the piecemeal approach to meet this requirement for extra power.
   - 1.3 The 132kV network was first built in the 1920s. Big increases in electricity demand resulted in the need for upgrades to 275kV and 400kV network in the 1960s. Now the projected step increase in electricity demand due to the electric vehicle (EV) requirements and the move away from gas boilers to heat pumps will result in a similar big increase and LPC questions why NG is not considering increasing the voltage of the network instead of their proposals to increase the number of power line routes?
   - 1.4 Kazakhstan has some of its electricity network operating at 1150kV, China at 1000kV, Brazil at 600kV and Quebec at 735kV so the technology required is not new. Why is NG not considering this option?
   - 1.5 Increasing the voltage can more than double the power flow capacities and existing routes can be used rather than further spoiling the countryside by installing additional pylon routes.
   - 1.6 Increasing the voltage will mean changing the 400kV transformers to larger ones but given the projected extra power requirements for all vehicles to be EV, and heat pumps instead of gas boilers, a lot of additional capacity will be required anyway. Using existing routes rather than having new ones should also save costs and make planning consents easier.

2. **Pylon design**
   - 2.1 The current lattice tower design for pylons dates back to the 1920s - there have been improvements in design, but the basic structure has remained the same for 100 years.
   - 2.2 Because of safety clearances (the distance between the lowest electrical conductor and the ground) a 400kV lattice tower pylon necessitates a height of approximately 50 metres which dominates the skyline for miles.
   - 2.3 New design "T Pylons" do not have the three cross-arms shape and do not have the conductors one above the other, so even by upgrading to a higher voltage the height of the pylons should be less than 50 metres making the skyline view less visible.
   - 2.4 NG are already starting to upgrade 275kV pylons to 400kV by using a system called RICA so the principles for upgrading using established pylon routes are already established.

3. **Undersea Options.**
   - 3.1 Undersea cabling is not in its infancy with numerous cable routes existing between Europe and the UK and others around the world.
   - 3.2 NG have published another proposal "Sea Link" (SL) which is to lay an undersea cable from Sizewell to Pegwell Bay as a means of providing a 2GW link for power from Sizewell and the offshore windfarms and to join up with the Richborough undersea cable link to Belgium (NEMO).
   - 3.3 Richborough is not far from Tilbury and Sizewell not far from Norwich and LPC questions why NG is not installing additional undersea cables along the same SL route

for the Norwich to Tilbury circuits instead of all pylons/underground cables? The undersea section is common to both proposals for along most of its length. There would only be a short distance at each end for pylons/underground cables rather than 159kM of pylons.

3.4 Installing the SL cable will require surveying the seabed and numerous other activities. These operations will only need to be carried out once resulting in cost savings if extra cables are installed. There is thus a synergy cost saving by laying multiple cables.

3.5 NG have stated that heat dissipation from 400kV underground cables has been a problem to overcome and results in expensive very wide trenches to ensure that the cables do not get too hot and deteriorate. Clearly, any heat dissipation problems using undersea cabling are nullified using the sea as an excellent cooling medium.

4. Conclusions

4.1 Layham Parish Council objects to the whole concept of the Norwich – Bramford -Tilbury route as we believe that it is a piecemeal solution to the problems facing the whole grid.

4.2 LPC believes that NG have been very conservative with its thinking and need now to look at the bigger picture and take a holistic approach.

4.3 LPC believes that NG need to consider a combination of raising the voltage along existing pylon routes and overlaying the undersea "Sea Link" as the means for reinforcement for Norwich to Tilbury.

4.4 Whilst not part of this proposal, LPC questions the need for the Bramford to Twinsted upgrade of the 132kV pylon line to 400kV if the existing 400kV network as a whole is upgraded to a higher voltage.

4.5 New style pylons are less intrusive on the skyline, and these should be considered for any upgrades.

4.6 The suggested alternatives to the current proposal do not require any new technology as all the suggestions in this document are existing practices, either in the UK or around the world, so there should be no delay in implementing any changes due to the need to wait for new inventions.

4.7 Finally - LPC supports the conclusion in the the Hiorons review (published in September 2023) that as the need for the NT proposal is based on "Contracted Generation, and that the ESO have noted that 70% of Generation projects listed in the Generation Contracted may never be built, there should be a delay of 5 years before the need is determined.

John Curran * and Terry Angland **

**** John Curran, vice-chair of Layham Parish Council, is a retired Electrical Power System Engineer. He was employed by Eastern Electricity (EE) for 30 years as a supervisor/manager working at all voltages up to and including 132kV. He then became a director of British Power International and worked on electrical projects in Holland, Iran, Nigeria, Spain and Turkey.***

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