

New Civil Engineer

Could Great Grid Upgrade present opportunity for Geodetic Transmission Tower of 1966?

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Public outcry at the appearance of transmission towers across the countryside in UK goes back generations and was a key factor behind the development of this revolutionary design of tower that was thought to be less visible and structurally more economic.



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After the prototype was test assembled it was taken down and taken to a test site where it was re-assembled and load tested at full scale, following industry practice. It indicated serious commercial viability.

Then, the British government shut the project down in the course of nationalising the steel industry in 1966.

Please take a look at the picture of the 46.3m tall 400kv prototype, test assembled to see how the geodetic tower would look in use - and compare how visible it is compared to the traditional angle iron structures in everyday use - pictured in *NCE* and elsewhere. This was the prototype that was submitted to that full scale test program at the Monkey Hole test site in Derbyshire which successfully proved the design in 1966.

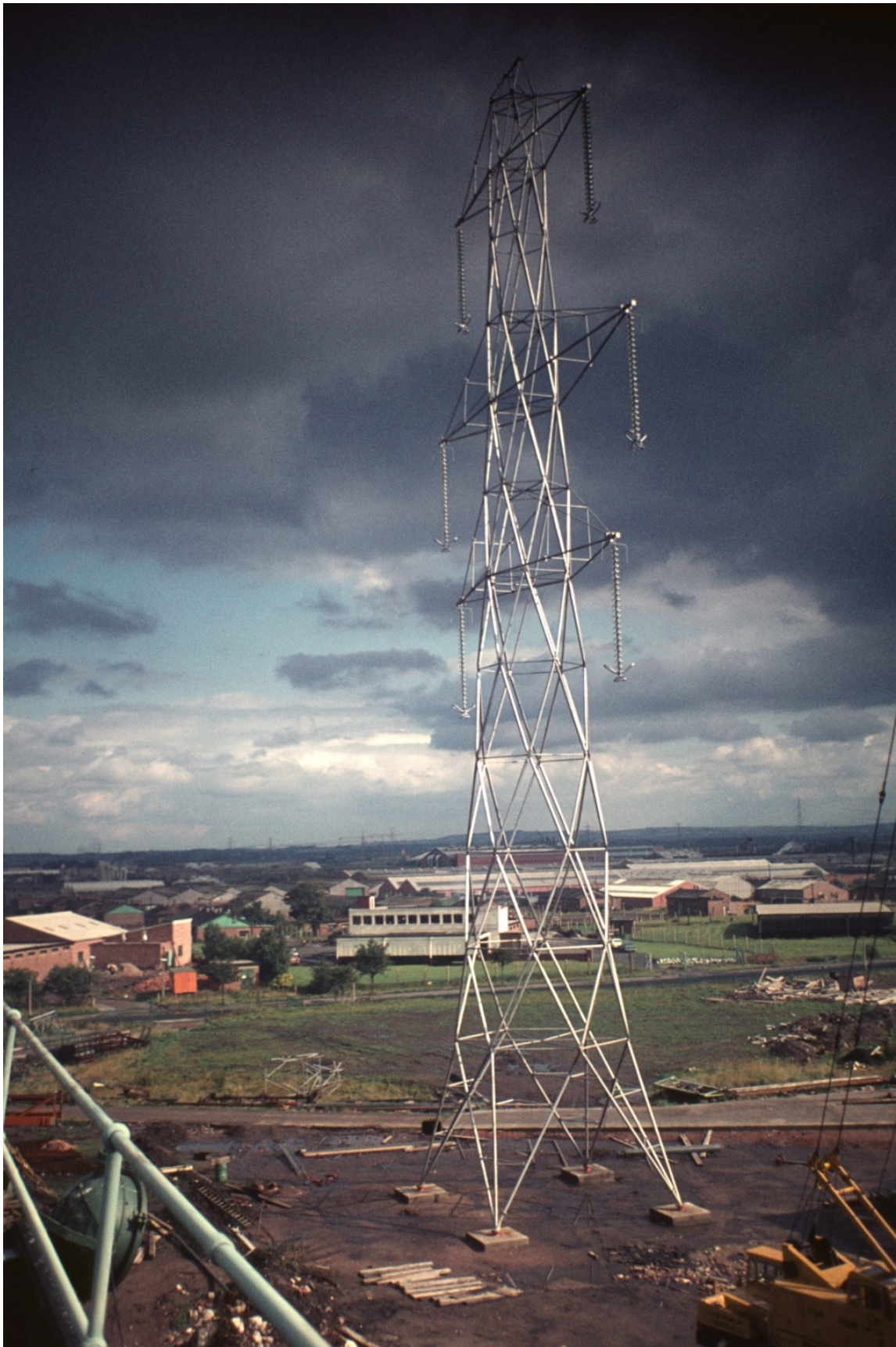
The project was the initiative of Tubewrights, a unit of British steel giant Stewarts & Lloyds. It was forgotten for years until an inquiry last year caused the assembly of long forgotten slides, document, experiences and basic thinking.

A memoir on the project was written over several months, pulling together data, personal recollections and the realisation that this design could be vastly easier to do in 2024 in contrast to what the developers had to go through with the state of the art computer resources and University of Surrey assistance in 1965. The information exists now to make it possible for a modern transmission line operator to re-create the design today using current design codes and loading combinations.

Stewarts & Lloyds has done the heavy lifting, taking all the pioneering business risks 58 years ago! The fundamental basic design of the prototype was done in Liverpool in the first part of 1965

Each structural member had a joint piece welded on at each end. In mass production joint pieces would be welded on in a jig system powered by computer calculated settings for each level in the structure. However, for the prototype it was all manual. Everything was done at a breakneck speed by crews at the plant of Tubewrights at Kirkby Industrial Estate outside Liverpool.

The jointing system was a difficult practical detail, yet crucial to the whole project. In 1964 some ideas had been thought of for the jointing system – and cited in a patent application - but none of these early ideas was felt to be practical and economic. The entire tower was to be bolted together using these joints.



Tubewrights Geodetic Tower, 1966

I came up with the joint design actually used, but then a load test for the jointing system was deemed critical since this new joint was completely novel and unproven. That load test was an 'X' arrangement of tubes with the joint in the centre. Fortunately, tests showed the jointing system would perform as required. So, the project went ahead.

I served as project engineer on the venture, fresh out of grad school at University of Virginia. My design of the final jointing system put my name on an update to the patent, along with the original inventors: Stanley Rice (Managing Director), Kenneth Scholfield (Operations Director) and Francis Somerset (Technical Director). Patent filings were made in 27 countries but now they have all expired.

Later I was assigned to report on it all via a paper on the project and its results were presented at the International Conference on Space Structures in London in 1966 – which today provides a useful record.

As you may gather the story behind the geodetic transmission tower is unusual! Now the time may be right to reincarnate this design to satisfy national needs in [the Great Grid Upgrade](#) and worldwide.

In 1965-1966, The Beatles were playing at the Cavern in Liverpool while people at Tubewrights designed and built their revolutionary geodetic tower. There must have been as something creative in the air around Liverpool back then!

I am now retired but fascinated by the potential for UK use of the geodetic transmission tower and the potential to give long overdue credit to all that worked on it in England in 1966.