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ISLES OF SCILLY ELECTRIFICATION

By Member John Haynes

This is a fascinating recent history for which we have a considerable material in our archives, and we are delighted that John, who was personally involved as will be revealed, has written up the story for us and for posterity..

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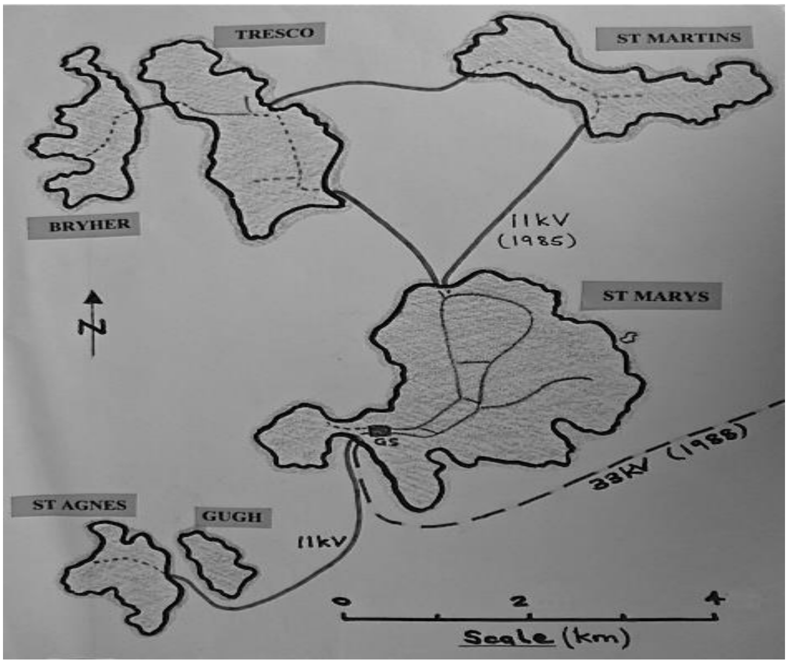
The Isles of Scilly comprise a group of islands 28 miles (45 km) off Lands End. The five largest islands are inhabited, these being by name St Mary's, St Martins, St Agnes, Tresco and Bryher. As at 1985 the only island with a public electricity supply was the largest of the islands, St Mary's, which had its own generating station, owned and operated by the South Western Electricity Board. The Station housed seven diesel generator sets, with a total installed capacity of 5.5 MW. Fuel supplies were shipped from the Cornish mainland via the "Scillonian 3" ferry vessel and stored in tanks at the Station. Due to this costly operation the price of electricity on St Mary's was approximately 30% higher than on the mainland.

The four other islands had minimal supplies of electricity provided by small private generators, typically located in back-garden sheds. Fuel for these had to be purchased by individual islanders and moved between St Mary's and the 4 'off-islands' by means of small motor-boats.

In 1983 a group of islanders got together and requested that SWEB reduce their charges to match mainland prices.They asked that this be done by installing a mains supply to the four 'off-islands' in accordance with the 'Electric Lighting (Clauses) Act 1899'. This little known Act stated that if six or more premises submitted a requisition to their area Electricity Board for a supply, they were bound to comply unless the Secretary of State considered it unreasonable.

This prompted SWEB to carry out a feasibility study into supplying the 4 'off-islands' from the generating station, by means of 11kV submarine cables laid between St Mary's and the other inhabited islands.



In March 1984 I was asked to supervise a hydrographic survey of the seabed between the five islands. This month long project was carried out by Wimpol of Swindon and involved the survey of 5 corridors of the seabed between the islands.

In September 1984 SWEB received the Government approval for the scheme to go-ahead. The estimated cost of the £3 million was to be split between the European Regional Development Fund, (who contributed £1 million, SWEB, The Duchy of Cornwall, the Countryside Commission and the Islands property owners, who each paid £1000 to be connected.

Now that the 'go-ahead' was given, contracts were awarded to Balfour Kilpatrick and AEI cables for the manufacturing and laying of the 11kV submarine cables. The cable selected was 3-core, 50 sq. mm, paper-insulated and lead-sheathed. It was protected by two layers of galvanised steel-wire armour, of a total length of 16km and weighed some 370 tonnes.

In order to provide 240volt supplies to the 200 islanders, 20 ground-mounted substations were planned, each provided with an 11kV switch controlling an 11kV / 415.240 Volt transformer. The substations were linked using 50 sq.mm. aluminium 11kV underground cables supplied by Crompton Parkinson. On the island of Tresco, where the granite rock was particularly difficult to excavate, a 1500 metre section of wood-pole 11kV overhead line was planned. This supplied six pole-mounted transformers. Low -voltage 95 sq.mm. Consac underground cables supplied by Crompton Parkinson were laid from the substations to the islanders' properties.

Following the Board's decision to proceed, I was invited to become the project engineer for the whole scheme. I walked the islands and selected the sites for the ground mounted and pole mounted substations together with cable underground cable and the Tresco overhead line route.

I also looked at the island facilities relating to the heavy engineering works that would be necessary to complete the scheme. It was immediately apparent that the jetties on all 4 off-shore islands were very primitive and could not be used to unload vehicles, transformers and cable drums. This problem was overcome by contracting to use a 'Clyde Puffer' boat from Penzance named the "Crazy Diamond". This type of boat, developed on the River Clyde in Scotland, is built strongly enough to be beached at low tide. It was therefore suitable to sit on the beaches and lower heavy plant and equipment over the side onto firm, dried out sand.

The lack of accommodation for the SWEB workforce was also a major problem as all the islands except St Mary's had very little accommodation for tourists and were filled to overflowing during the holiday season. In order to house the workforce, a suite of temporary portable buildings were taken out from the mainland and assembled on each island in turn. These buildings comprised sleeping, kitchen, toilet and office units.

The work on site was started in May 1985 and progressed from island to island, starting on St Martins and ending on St Agnes. It was completed by December of that year.

At the same time as the work was proceeding on land, the inter-island submarine cables were being laid. This was achieved by employing a converted cargo vessel, the "Gardience".

The vessel was converted into a cable layer by adding two large cable tanks in her hold, and a stern skid over which the cable was to be laid on the sea bed.

As the Islands are owned by the Duchy of Cornwall, HRH Prince Charles, as Duke of Cornwall, made a visit to St Martins in June 1985 to view the work in progress. He spent half an hour talking to the SWEB Project Engineer, John Haynes and the Foreman, Len Heard. The Prince was introduced to several members of the workforce, including cable jointers and meter-fixers.

On the same day, members of the Cornwall Archaeological Unit showed the Prince various items of interest recovered from the cable trench excavations. The diggings were a unique opportunity to watch for artefacts, and many flint scrapers, coins, bone fragments and medieval pottery were unearthed.

The Commissioning Ceremony for the "Isles of Scilly Off Islands Mains Electricity Scheme" was performed by Prince Charles on the 3rd April 1986 on the island of St Martins. It was attended by the SWEB chairman and members of his Board. Representatives of the planning team and the site engineers were also present. John Haynes had the honour of being presented to HRH for the second time. The Switch-0n Ceremony was followed by a buffet lunch on the island of Tresco.

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Mainland Link.

Following the success of the inter-island project, plans were drawn up for the connections of the isles of Scilly to the mainland, at an estimated cost of £7 million. The ERDF provided over half of this amount, with contributions from the Duchy of Cornwall, and the Countryside Commission.

In January 1988 SWEB approved the placing of contracts for the manufacture and installation of a 33kV submarine cable to link the Isles of Scilly with the Board's mainland network in Cornwall. The manufacturers were Pirelli General, and the cable layers were Balfour Kilpatrick.

The cable for one of the longest submarine links in the UK, some 55km in length and weighing 1,300 tons, was to link Whitesands Bay on the Lands End peninsula to St Mary's on the Isles of Scilly. The cable comprised three 70 sq.mm copper cores, with EPR insulation and steel wire armouring. I understand that John Heath from SWEB's Head Office was involved in the design of the cable.

In August 1988 the cable was laid using a converted cargo ship, the 'Star Hercules", which steamed at around 1.5 knots from Whitesands Bay to Porthcressa Bay. John Heath from SWEB's Bristol Head Office was assigned as Project Engineer for the 33kV submarine cable laying, remaining on board throughout the voyage.

From Porthcressa Beach a 33kV land cable was laid to the Generating Station. A new 33kV switch and a 7.5/15 MVA transformer were installed at the Station, together with a replacement 11kV switchboard.

While this work was in progress a 33kV overhead line more than 4 km long, was erected on the mainland between St Buryan 33/11 kV substation and Whitesands Bay. Two new 33kV circuit breakers and a 33kV voltage transformer were also installed at St Buryan.

An interesting feature of the mainland link was that it gave the option of providing a limited backfeed (4 MW) in the event of a major outage in West Cornwall. However, due to the capacitance of the submarine cable and associated voltage-rise problems, relays are installed to prevent the cable being energised from St Mary's with the mainland cable-end 33kV circuit breaker open.

The work on St Mary's and on the Cornish mainland was supervised by Project Engineer John Haynes, who had also performed a similar role for the 1985 Inter-island Scheme.

All aspects of the mainland link project were completed by March 1989.

The Commissioning Ceremony for the Mainland link was performed by HRH Prince Charles at St Mary's Generating Station on the 3rd of June 1989. He operated display consisting of two large voltmeters, one showing the output from the Generating Station and the other the incoming supply from the Cornish mainland. As the voltage fell on one meter, the second picked up and all was well!

SWEB

The Chairman Mr. A. W. Nicol
and the
Members of the South Western Electricity Board
have the honour to invite
Mr J. E. Heath
to the Commissioning Ceremony
for the
Isles of Scilly Mains Electricity Connection
by
His Royal Highness
The Duke of Cornwall
on
Saturday 3rd June 1989 at 2.30 p.m. at St. Mary's Generating Station
Buffet Luncheon at Tregarthen's Hotel at 12.30 p.m.
R.S.V.P. The Chairman, South Western Electricity, 800 Park Avenue, Aztec West, Almondsbury, Bristol BS12 4SE

The ceremony was followed by a buffet lunch at the Tregarten's Hotel, which both John Heath and myself were pleased to attend.

So ended a very interesting period of my career with SWEB. Since privatization in 1990 and further developments, the SWEB Area is now successfully operated by Western Power Distribution.

John Haynes , CEng.,MIET