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REMINISCENCES OF ELECTRICITY GENERATION

by Member John Watts

John Watts, who lives in Salisbury, has spent a large part of his career involved with electricity machinery culminating in an enthusiasm for electric generation, so it is not surprising that he joined our Society. His exceptional and interesting story is related here.

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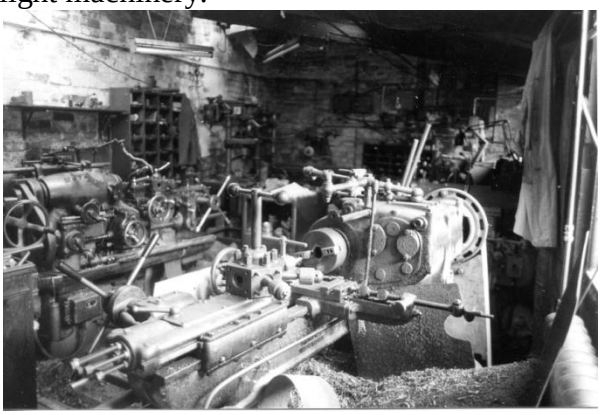
Back in 1949 I started work at the firm of Readheads Engineers in Salisbury. They were general engineers specialising in jobbing and contract work, almost entirely turning and milling, all on manual machinery, some quite venerable. The factory power demand was about 350 KVA, the greater part of which came from the public supply. They also generated their own 230V DC supply with two General Motors Detroit 150 HP diesel two-stroke engines driving dynamos. They were used one at a time on alternate days. They were very noisy with a high pitched whine. They were war surplus. They had a high power to weight ratio and had been used on landing craft and similar. The engineering firm Houchin used these engines to power portable generators which gave 80 KVA and were intended for standby use. They were rather thirsty on fuel.

There were also two Lister ex-WD generator sets rated at 230V, 22kW carrying the lighting load. The engines were four-cylinder medium-speed diesels running at 1000 to 1200 rpm and producing 39 BHP; simple, sturdy and reliable machines. The Government purchased a large number, a proportion being mounted on purpose-built trailers for military use as searchlight power supplies, others were power supplies for remote military establishments and standby plants for pumping stations etc. The island of Steep Holm, described later, had about seven for Army use, all removed long since. In the 1940s and 1950s there was a national power shortage. There were frequent voltage reductions and businesses were encouraged to supply and run their own generators at peak load times.

Readheads had quite a variety of generators. They installed a 66 KVA 2-cylinder two stroke Petter diesel, speed 300 rpm, obtained from a small town power station made surplus by a grid connection. This was not much good and was never used. Latterly they purchased a generator set from a redundant warship, reputedly HMS Ark Royal. Like all ships of that era it was DC because DC motors were more flexible for driving winches and cranes. Anyway, this generator provided power to a large DC motor driving an alternator. There was also a National diesel plant. Altogether there was about one megawatt generating capacity. The entire factory has subsequently been demolished and the site covered with houses.

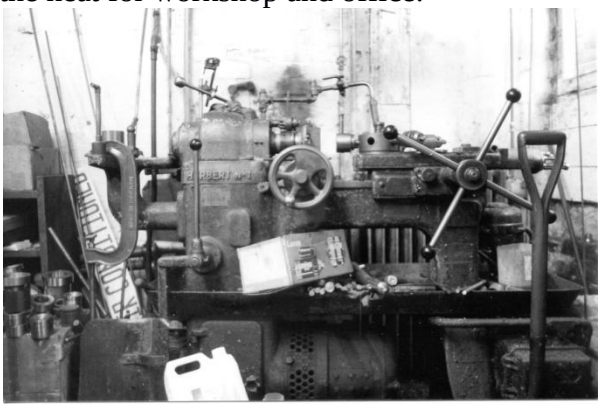
After Readheads I did my two years of National Service with the REME. My first posting was to the Canal Zone in Egypt where the REME workshops were in the Tel-el-Kebir garrison; a site with a perimeter fence eighteen miles long! My workshop was supplied with half 400V AC mains from the garrison power station and the other half from a Lister 110 V DC, 22 kW set. It was my job to maintain the Lister set as well as hand start it every day. After the Canal Zone I was posted to Tripoli in Libya. There we had a single phase 120V supply obtained from a municipal diesel power station a few miles out of town. As the unit was a mobile

workshop we also had our own small petrol generators supplying 110V DC to run the light machinery.



John Watts Workshop general view

I started a small engineering workshop in central Salisbury around 1960. All went well until the miners' strike of 1973. There was power rationing of the most inconvenient type. Short spells of power on, then longer spells with power off. I sped off to a local scrapyard and obtained a 1500cc diesel engine, a 15HP 3-phase slip-ring motor and an industrial 12V DC dynamo. I had learned that putting 12V DC across two slip-rings gave 400 V 3-phase with a good sine wave. I put the lot together. It worked well, so I was well prepared for the miners' strike next time. I then decided to do things properly so bought a Lister 20 KVA 3-phase generator, whose previous life was as the emergency supply for a London police station. Every winter it supplied not only electricity but the engine's cooling system and a home-made heat exchanger for the engine exhaust provided all the heat for workshop and office.



John Watts Workshop showing a large lathe

Perhaps it would be appropriate to explain what my business was all about. I specialised in turned parts, using centre lathes, capstan repetition lathes, a Cridan high speed threading lathe and the usual saws and drills. I concentrated on contract and jobbing work from a reasonable range of customers. I employed two men and four women as capstan operators. The women were first class, much better than the men at the job. I also worked on the machines myself when I had a chance. I ran a very tight ship, no loans, no hire purchase, no overdraft. I did all the paperwork, all bills were paid on time, all goods invoiced similarly. I also did all the wage sheets, VAT records etc. I deliberately avoided private work as it was more trouble than it was worth.

Everything went on the books. Around 1980, automatic lathes were coming in and took the capstan work. I did not want to go down this route, so I finished with production work and engaged a skilled machinist who sported an HNC in mechanics and an ONC in electronics. With him I specialised in one-off parts in high tensile steel for precision chucks used in work-holding fixtures. We carried on for some years but when we were both aged about seventy my customer wisely decided to find a younger supplier so I closed the business, removed the equipment from the largest workshop and let it for use as a pottery. I still have some machinery for emergency jobs, but it is run off the electric mains rather than the Lister generator which has gone to a new home.

Steep Holm Barracks

I have always been fascinated by islands and around the year 2000, I visited Steep Holm in the Bristol Channel. It covers 45 acres and the summit is at 250 feet. It was heavily

fortified from Victorian times, at one stage in WW2 it housed over 200 soldiers. There are artillery positions and central barracks and also the remains of a 2ft gauge railway. The vegetation is mainly scrub and it is an important nature reserve run by the Kenneth Allsopp Memorial Trust. On my first visit I learned that the two wardens were living there, using oil lamps and candles for illumination while doing vital restoration work. On my next visit I offered them a small generator, a Lister air-cooled model of 1kW. They nearly bit my hand off!

Steep Holm Lister Engine

I also had another generator that I had cobbled together. This time a Lister 5HP hand-start slow speed engine with heavy 'electric' flywheels, driving a 15 KVA 3 phase alternator. We used phase and neutral to get 240 volts. This was very welcome, a much more permanent arrangement. It is a heavy piece of machinery and I had to dismantle it into handleable portions. The two flywheels alone weighed a quarter of a ton. There were six assemblies to be packed in liftable form suitable for transport to the island in a boat followed by lifting up the hill on a Honda Carrier. I reassembled it in its own house and it has given reliable service for around ten years now. I visit at intervals to service it.

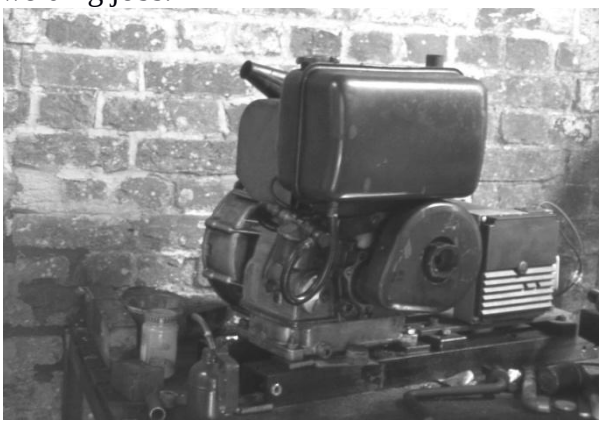
Steep Holm Generator Building

I also gave them a 1kW air cooled Petter as a standby. The Lister is very quiet, just a gentle chuffing exhaust. The Lister produces as much electricity in a year as Hinkley Point C will produce in nineteen seconds.

Some years ago I went to a country auction sale where I bought a small 5 KVA Petter air-cooled generating set. It was 200V AC 3-phase; 120 V across phase and neutral. I was, and still am, a member of the Kelly Mine Preservation Society.

Kelly Mine with Generator on the Trolley

This mine on Dartmoor used to produce an iron haematite, 'shiny ore', used in a very tough paint for battleships. The society members are restoring the mine to its original state and I donated the generating set to them as I had no use for it. They find it useful for the 120V heavy portable tools and for light welding jobs.



Petter Engine

The word most used by those I served throughout my working life was URGENT. Now I can enjoy my retirement including being a member of SWEHS (now WPEHS) and other worthy groups.