THE WHITTLE

WYCLIFFE LUTTERWORTH U3A

ENGINEERING, SCIENCE AND TECHNOLOGY GROUP

Engineering Science &Technology Group
Wycliffe Lutterworth u3a

DECEMBER 2021

THE WHITTLE

The Monthly Newsletter of the Wycliffe Lutterworth U3A Engineering, Science and Technology Group

THOUGHT OF THE MONTH

Seasons Greetings and 2022 - Chris Ridley

MEETING REPORT

A report on our first 'live' meeting since early 2020.

MEMBERS MISCELLANY

MG Cars - 1939 Onwards - the final instalment of the story started by Geoff Dean in our April 2021 issue.

My "BSA" – 1967 BSA A65 Spitfire Mk III - Colin Beadle recounts the trials and tribulations of restoring a British motorcycling classic.

Purchasing A Potential Bargain! - experiences of owning an early BSA Gold Star – Chris Ridley gives us a salutory tale of owning an old British motorcycle and a "near death" experience.

Small Modular Reactors – Michael Bates describes a technology that could help to reduce our CO_2 emissions and still keep the lights on.

This Months Cover

As this is our Christmas issue, in addition to our main picture of the Gloster Whittle E 28/39 we feature three different modes of transport. In the top picture Santa is delivering presents in a late model MG TC a present we all would probably like to receive. The centre picture is a 1967 BSA A65 Spitfire Mk III owned and refurbished by our own Colin Beadle . The bottom picture refers to an article about Small Modular Reactors (SMRs) a possible way of reducing our CO_2 production by using small Nuclear power generators. The picture shows the main reactor being transported to site, as visualised by Rolls-Royce one of the companies concerned with developing the technology in the UK .

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THOUGHT OF THE MONTH

Seasons Greetings and 2022 - Chris Ridley

Firstly, from Michael and myself I would like to wish everyone, a Merry Christmas and a Happy New Year. A very traditional sentiment, but possibly this year a more heartfelt wish as we all are having to cope with a lot of uncertainty, yet again, in our lives.

But here, nearly at the end of 2021, I cannot believe that we still have an Engineering, Science and Technology Group, given all the false starts and speculation about being able to get together during 2021. I think it was lucky that we managed to have a proper meeting in November and I cannot tell you how much I enjoyed seeing everyone face to face after months of Zoom meetings. I am conscious that in 2021 there have not been as many meetings, including our Zoom events, as I would have liked, but we always seemed, certainly from about May onward, to be on the cusp of normality. How naive that now sounds with the Covid Omicrom variant causing a massive second wave of infection.

Hopefully, if some of the more optimistic forecasts come to pass, we may find that further restrictions on getting together will not be required, so just keep the date of our next meeting, the 18th January 2022, in your diary and I will let you know if the meeting is going ahead 'live' or that we have to resort to a Zoom meeting.

I am also surprised that this is our first Whittle since April of this year but we always said we would only publish when we have enough content, so by saving the few articles received during the year we we are able publish this end of year edition. Looking into 2022, can I ask you all to dig a little deeper and let us have some more articles, either complete or just ideas for a bit of research, we don't mind. If being able to meet does become restrictive at least the Whittle keeps everyone in touch rather than just the "Zoom die hard's".

Finally, a big thank you to all of you who have kept the group going by attending our meetings, real and virtual, and let us hope that we finally do start to get back to the 'new normal' in 2022, whatever that looks like.

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MEETING REPORT

Tuesday 9th November

This was the first proper meeting since the beginning of the Covid pandemic at the start of 2020. Although we have managed to keep in touch via monthly 'Zoom' meetings it is clear that virtual meetings did not suit everyone.

So, it was with some trepidation that the 9th November meeting was arranged at a new venue, The Lutterworth Rugby Club, just outside Bitteswell.

The venue seemed to work quite well and hopefully we will be able to continue there for our meetings in 2022.

The highlight of the meeting, apart from meeting everyone in person, was the return of an old friend of the group, Christopher Tarratt. Christopher deserted the snowy wastes of Antarctica for warmer climes of North Kent with the story of a Dutch raid in the River Medway. A disaster for the English due to unpreparedness and lack of money, maybe nothing ever changes.

ESTG Monthly Meeting - Tuesday 9th November 2021

On the 9th November we had our first 'face to face' meeting at the Lutterworth Rugby ground. There was a good turn out and it was great to see everyone again, in person. I hope this will mark a return to some normality for many of us. At the meeting we enjoyed the return of Christopher Tarratt, one of our favourite guest speakers who recounted the story of the Dutch Raid on the Royal Dockyard at Chatham in Kent. Below is a short precis of the story. I understand that Christopher is preparing another story of a relatively unknown Arctic explorer, so hopefully Christopher will be able to come and visit us again in 2022.

The Dutch Raid in the Medway 1667 – Christopher Tarratt

Christopher told us about a raid by the Dutch Navy on English ships moored up in the River Medway adjacent to the Royal Dockyard in Chatham. The raid in 1667 took part during the second Anglo Dutch War (1665-1667) and was a complete disaster for the Royal Navy. From the mid-17th Century until the late 18th Century there were four Anglo-Dutch wars (a further two wars occurred in the early part of the 19th Century when the Netherlandswas a satellite state of Napoleonic France).

The Dutch developed many trading areas around the world, mainly in North America, Asia, and southern Africa. This brought them into competition with the English and various local disputes led to war between the nations when governments became involved. Over the years as the size and quality of Dutch and English navies varied, battles were won and lost by both sides. Prior to the raid in the Medway, in 1666 there were two battles, the 'Four Days Battle', a Dutch victory and the 'St. James's Day Battle' an English victory.

Back to 1667, and due to a lack of money many of the English capital ships were moored in the Medway laid up awaiting re-commissioning when funds allowed. The Dutch became aware of the situation and planned a raid to capture or disable what ships they could. Christopher described the complacency of the English as the moorings were protected by the guns of Upnor Castle and a chain across the river at Gillingham. They also felt that navigating the Medway, a notorious fairly narrow river with shoals of constantly moving mud, would be a deterrent in itself. Unfortunately, they had underestimated the skill of the Dutch sailors who also had the advantage of two disgruntled English pilots who had defected to the Dutch. The English defences around the area was quite strong but neglect, no pay and poor command structures meant that no countermeasures were taken even though it took the Dutch five days to navigate the river from Sheerness (where the Medway joins the Thames Estuary) to Chatham.

Christopher explained how despite resistance from the English the Dutch managed to destroy thirteen English ships and captured two, the ***Royal Charles***, an 80 gun first rate ship (although it was un-commissioned at the time) and the ***Unity***, a 32 gun ship which originally had been the Dutch ship ***Eendracht***. Christopher also mentions that this raid was just part of a number of raids and skirmishes all along the Essex and Suffolk coast but the raid in the Medway was by far the most successful.

Our thanks to Christopher for a most enjoyable and informative talk.

Chris Ridley

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MEMBERS MISCELLANY

MG Cars 1939 - Onwards

Michael Bates

Following on from Geoff Dean's insight into MG up to 1939 we continue the story to the present day.

The MG Car Company, formed from Morris Garages in 1930, was subsequently sold to Morris Motors in 1935. In 1940 MG ceased car production and their engineering skills were redirected as part of the British war effort. Car production restarted in 1945 but in 1952, as part of Morris Motors they were absorbed into the British Motor Corporation.

Gradually their design independence was eroded and by 1962 the thread of the original company was lost. In 1962 the MG name, as a recognisable brand was resurrected with the MGB which continued until about 1980 when production ceased. The name was used on a number of short lived models until the Rover Group went into receivership in 2005.

The MG 'brand' is now owned by the Chinese state motor manufacturer SAIC Motor Corporation and used on a a range of Chinese designed and built SUV's.

MG Cars – 1939 Onwards

Geoff Dean's account of the MG marque left us in 1939 with MG producing a range of saloon models and possibly their most recognisable car, the TB sports car. In 1940 the MG Car Company, along with many other automotive companies, switched to manufacturing aircraft components and modifying tanks.

1945 - 1950

In 1945 MG returned to manufacturing cars using their pre-war designs and commenced with an upgrade to the pre-war TB and designated it as an MG TC. The car retained the 1250 cc OHV XPAG engine which was available in various states of tune. The body was 4 inches (100 mm) wider to provide more space within the cockpit. After the war, industry was directed, by government, to concentrate on manufacturing for export. Much of the MG TC production was exported to North America and created the 'craze' for sports cars. Between 1945 and 1947, 10,000 units were built.

In 1939 MG were developing a mid-sized car based on a Morris series M saloon but it did not make it into production before MG had to stop car production in 1940. In 1947 MG resurrected and developed the design to produce the MG-YA Type saloon. The car used the 1250 cc XPAG engine, had independent front suspension and was 'very well appointed' inside. In 1948 a few YA chassis, engines and some body parts were exported to Switzerland and given cabriolet bodywork by various coach builders. MG decided to build a similar vehicle and the MG-YT 'Tourer' was born. Unfortunately, these did not prove a success and production ceased in 1950. The TA was superseded by the TB in 1951 and remained in production until 1953. Between 1947 and 1953 8,336 Y-Type chassis were built, 6131 TA's, 904 YT's and 1301 YB's.

1950

In 1950 the TC was replaced with the TD which used the Y-Type chassis including the independent front suspension and some upgrades to the transmission. The TD's width was increased by 5 inches (130 mm) making the cars 9 inches (230 mm) wider than the pre-war cars. MG continued with the 1250 cc XPAG engine which, in a mild state of tune had an output of approximately 54 bhp (40.2 kW). The TD was focused on the North American market and later in 1950 a Mk II competition model was introduced with a higher compression ratio engine with an output just over 57 bhp (42.5 kW), quite a modest increase even by the standard of the day. The Mk II model was not offered on the home market as Britain was still using wartime 72 Octane 'poor petrol'. By the end of 1953, 30,000 Type TD models had been manufactured, 1,656 for the home market, 23,488 for the North American market and 4,856 for export elsewhere in the world.

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MG Cars – 1939 Onwards (continued)

1953 - 54

In October 1953 MG introduced the TF model which was essentially a TD with some cosmetic bodywork changes, such as faired headlamps and a pressurised cooling system. The external radiator cap was consequently redundant, but a 'dummy' cap was retained to maintain the 'look' of the previous types. The 1250 cc engine was uprated to provide 57.5 bhp (42.9 kW).

In 1954 the TF 1500 Midget was introduced and as the name suggests the engine capacity was increased to 1466 cc and had an output of 63 bhp (47 kW). The only change to the body was the addition of a badge on each side of the bonnet with 'TF'- 1500 inscribed in black on a cream background. The TF was the last in the T series cars which could trace its 'heritage' back to the 1936 MG TA. In April 1955 the TF production came to an end by which time 9,602 TFs had been manufactured, including two prototypes and 3,400 TF 1500s.

In October 1953 MG announced the MG Magnette ZA, a large four door family car with a contemporary body style. The ZA and the later ZB versions of the Magnette were original MG designs by Gerald Palmer, designer of the Jowett Javelin and were the first monocoque cars to bear the MG badge. Being part of the British Motor Corporation (BMC), the Magnette used the four-cylinder 1489 cc B-Series I4 engine with a pair of $1\frac{1}{4}$ in (32 mm)-bore twin-choke SU carburettors. The engine delivered 60 bhp (44.7 kW) driving the rear wheels through BMC's new four speed manual gearbox with synchromesh on the top three ratios. Suspension was independent at the front, using coil springs and had a live axle with half elliptic leaf springs at the rear. The steering was by rack and pinion. Hydraulically operated Lockheed 10 in (254 mm) drum brakes were fitted to front and rear wheels. Tested in 1955, the ZA recorded a top speed of 79.7 mph and a 0-60 mph time of 23.1 seconds with a fuel consumption of 24.9 mpg.

In 1956 the ZA was replaced by the ZB. Power was increased to 64 bhp (48 kW) with $1\frac{1}{2}$ in (38 mm)-bore carburettors, increasing the compression ratio from 7.5 to 8.3 and modifying the manifold. The extra power increased the top speed to 86 mph and reduced the 0–60 mph time to 18.5 seconds. When production of the ZA ceased in 1956, 18,076 ZA's had been built and when production of the ZB ended in 1958, 18,524 had been built.

Between 1959 and 1968 Mk III and IV version of the MG Magnette were available, but these were upmarket 'badged' versions of the Pininfarina designed BMC saloons sold as Austin A55 and Morris Oxford.

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MG Cars – 1939 Onwards (continued)

1955

In 1955 MG announced the MGA as a successor to the TF 1500. The MGA is probably the last 'true' MG design and dates to 1951, when MG designer Syd Enever created a streamlined body for George Philips' TD Le Mans car. The new bodywork traded the MG TF's articulated fenders and running board for "pontoon" styling with a body envelope fully enclosing the width and uninterrupted length of a car. The MGA had a new chassis, designed with the side members further apart and the floor attached to the bottom rather than the top of the frame sections.

As MG were a company within the British Motor Corporation (BMC) all new models needed the approval of the BMC Board and in particular the BMC Chairman Leonard Lord. Just two weeks before MG were to present the prototype MGA to the BMC Board, BMC signed a deal with Donald Healey to produce Austin Healey sports cars. Consequently, Lord rejected the idea of producing the MGA but subsequently changed his mind as sales of the traditional MG models was falling rapidly.

As part of BMC, MG had access to a range of engines and instead of continuing with the MG XPAG engine the car was fitted the BMC 1489 cc 'B Series' four-cylinder I4 engine with twin H4 1½ inch (38 mm) SU carburettors and produced 68 hp (51 kW) but was quickly uprated to produce 72 hp (54 kW). Transmission was via BMC's four-speed gearbox driving the rear wheels. Suspension was independent with coil springs and wishbones at the front and a rigid axle with semi-elliptic springs at the rear. Steering was by rack and pinion and Lockheed drum brakes were fitted on all wheels. Tested in 1955, top speed was 97.8 mph, a 0-60 mph time of 16.0 secs with a fuel consumption of 26.7 mpg. In addition to the soft top a coupé version was produced; the overall total production of standard MGA's was 58,750.

1958 - 62

In 1958 a high-performance Twin-Cam model was added to the range. It used a high-compression (9.9:1 later 8.3:1) DOHC aluminium cylinder head version of the B-Series engine producing 108 hp (81 kW). Due to detonation problems, a 100 bhp (75 kW) low-compression version was introduced later. Four-wheel disc brakes by Dunlop were fitted, along with Dunlop peg drive knock-off steel wheels similar to those used on racing Jaguars. These wheels and brakes were unique to the Twin-Cam and the later "Deluxe" MGA 1600 and 1600 MkII roadsters. Apart from the wheels, the only other external difference was a "Twin-Cam" logo near the vent on the bonnet.

The new engine was very temperamental and notorious for warranty problems and consequently sales dropped quickly. The engine suffered from detonation and burnt oil. Most of the problems with the Twin-Cam engine were rectified with the low-compression version, but the reputation of the engine never recovered. Tested in 1958 the car had a top speed of 113 mph, a 0-60 mph time of 9.1 secs (other testers could only manage a time of 13.1 secs) with a fuel consumption of 27.6 mpg. The Twin-Cam ceased production in 1960 with about 2,210 units being produced.

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MG Cars – 1939 Onwards (continued)

1958 - 62 (Continued)

Continuing the MG A story, in May 1959 the standard cars were updated using a 1588 cc I4 B series engine with an output of 79.5 bhp (59 kW). Disc brakes were fitted to the front wheels while drums remained in the rear. Externally the car is very similar to the 1500 with differences including: amber or white (depending on market) front turn indicators shared with white parking lamps, separate stop/tail and turn lamps in the rear, and 1600 badging on the boot and the cowl.

A number of 1600 'Deluxe' versions were produced with leftover special wheels and four-wheel disc brakes from Twin-Cam, and in some cases, using complete redundant modified Twin-cam chassis. Overall, 31,501 1600 (standard and Deluxe models) cars were built including 70 soft top specials and 12 coupé specials. Tested in 1959 a 1600 soft top car had a top speed of 96.1 mph and a 0–60 mph time of 13.3 seconds with a fuel consumption of 29.7 miles mpg.

In 1961 the I4 B series engine capacity was further increased to 1622 cc and the car was designated as a 1600 Mark II MGA. The cylinder head was also revised with larger valves and re-engineered combustion chambers. Output was increased to 90 bhp (67 kW). It also had a higher ratio 4:1 rear axle, which made for more relaxed high-speed driving. An inset grille and Morris Mini tail lamps appearing horizontally below the boot lid were the most obvious visual changes. Production of the 1600 Mark II amounted to 8,198 soft tops and 521 coupés. Tested in 1961 a 1600 Mark II had an 'estimated' top speed of 105 mph and a 0-60 mph time of 12.8 seconds.

In 1962 production of the MGA ended by which time 106,950 cars had been manufactured, 101,081 for export and 5,869 sold on the home market.

1962 - 1980

With the demise of the MGA design links with the original MG car company virtually disappeared. In 1962 the MG 'brand' was given a new lease of life by BMC when they introduced the MGB in 1962. Although a product of the British Motor Corporation (BMC) and subsequent owners, its character as a British sports car can be linked back to the MG Car Company and therefore worthy of mention in relation to the history of MG.

The car was a progressive, modern design (for 1962), utilising a unitary structure, instead of the traditional body-on-frame construction used on earlier MG cars. Components such as brakes and suspension were developments of the earlier 1955 MGA and it also used the I4 B-Series engine. The lightweight design reduced manufacturing costs while adding to overall vehicle strength.

The car was a soft top but had wind-up windows as standard, and a comfortable driver's compartment offering plenty of legroom. A parcel shelf was fitted behind the seats. The MGB was one of the first cars to feature controlled crumple zones designed to protect the driver and passenger in a 30-mph impact with an immovable barrier (200 ton). Despite this innovation the MGB, like many of its contemporaries, are not considered 'safe' cars by today's standard. For US cars, rubber bumpers and an increased ride height were required to meet US safety regulations.

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MG Cars – 1939 Onwards (continued)

1962 - 1980 (Continued)

All MGB's (except the V8 version) used a variant of the 1798 cc B series engine as it was developed. In 1964 the three-bearing crankshaft 18G-series engine was upgraded to an 18GA with positive crankcase breathing but in October of that year the engine was further up-rated to a five-bearing design with the designation of 18GB. Other developments were often associated with meeting lower emissions. Power outputs varied; 1971 UK spec engines produced 95 bhp (71 kW), but by 1975 output had reduced to 85 bhp (63.5 kW). In California some engines only produced outputs of 70 bhp (52 kW).

The transmission was the standard BMC four speed unit with a few minor improvements to cope with the increased power and continued until 1968. Overdrive was offered as an extra cost option, was electrically actuated and worked on third and fourth gears (later, on fourth gear only). Despite being a useful option, they were selected on less than 20% of the cars sold.

In 1967, MG announced the MGC which looked like the MGB but was heavily modified internally to accommodate the bulk and power of a new 2,912 cc, straight-six, seven bearing engine developed by Morris Engines and was designated as a C-series engine. For the MGC the engine was provided with twin SU carburettors and had an output of 145 bhp (108 kW). The body shell needed considerable revisions around the engine bay and to the floor pan, but externally the only differences were a distinctive bonnet bulge to accommodate the relocated radiator and a teardrop for carburettor clearance. It had different brakes from the MGB, 15-inch wheels with Pirelli Cinturato 165HR15 tyres, a lower geared rack and pinion and special torsion bar suspension with telescopic dampers. The car was tested and was capable of 120 mph (193 km/h) and a 0–60 mph time of 10.0 seconds.

Unfortunately, changes made to the suspension to accommodate the heavier engine were detrimental to the handling. This problem was made worse on the BMC press fleet when the wrong tyre pressures were used, and the car never recovered from poor press reviews. With less than two years in production the MGC was cancelled in 1969.

In 1968, MG announced the MG GT, a Pininfarina designed three door 2+2 coupé using the same engines and transmissions as the soft top. The GT offered much more practicality in ownership and although is had slower acceleration its superior aerodynamics improved the top speed by 5 mph over the soft top. The gearbox was a new unit developed for the MGC and had full synchromesh on all gears and internals designed to handle up to 150 bhp.

In 1973 MG began offering the MGB GT V8, powered by the aluminium block 3,528 cc Rover V8 engine. Developed by GM in America the engine was the lightest mass-produced V8 in the world. By the time Rover had made webbing modifications to strengthen the block, the engine was considerably heavier, but the engine found a long-lived niche in the British motor industry.

The MGB GT V8 was like those already being produced in significant volume by tuner Ken Costello and MG even contracted Costello to build them a prototype MGB GT V8. However, the powerful 180 bhp (134 kW) engine used by Costello for his conversions was replaced for production by MG with a more modestly tuned version producing only 137 bhp (102 kW) at 5,000 rpm. Despite the detuning, the car had a top speed of 125 mph and a 0-60 mph time of 7.7 seconds. This performance however was not without cost with fuel consumption of just under 20 mpg.

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MG Cars – 1939 Onwards (continued)

1962 - 1980 (continued)

By virtue of its aluminium cylinder block and heads, the Rover V8 engine weighed approximately 40 lbs less than MG's iron B-series four-cylinder. Unlike the MGC, the V8 required no significant chassis changes and maintained the handling characteristics of the lower powered models. Interestingly Rover did not build any MGB GT V8's for export. Production ceased in 1976. During MGB production between 1962 and 1980, a total of 538,836 cars (of all variants) had been manufactured.

1992

In 1992 Rover launched the MG RV8 which used MGB body shell and up-rated running gear (including a new limited slip differential) and was powered by a 3,900 cc version of the aluminium Rover V8. Rover were able to offer this version as their subsidiary company, British Motor Heritage had restarted manufacturing new MGB body shells for the restoration market. British Motor Heritage prepared the bodies, shipped them to another Rover Group company who completed the assembly. All the cars were hand built with luxury finishes such as veneered bur elm woodwork and Connolly leather trim. The engine produced 190 bhp (142 kW) providing a top speed of over 125 mph and a 0-60 mph time of 5.9 secs. Before production ceased in 1995, 1,983 cars were built with 1,573 of them exported to Japan. A significant number of these cars were re-imported back to Britain and Australia between 200 and 2010. There are nearly 500 MG RV8 cars still registered in the UK.

1995 to 2021

Sadly, the MG badge was used on variants of standard cars manufactured by BMC, British Leyland, Austin Cars, Rover Group and finally MG Rover offering a 'sporty' upmarket option. Rather than enhancing the standard car, it somewhat demeaned the MG badge and heritage. This 'badge engineering' persisted until the demise of the MG Rover Group in 2006.

In 1995 the Rover Group (owned by BMW) announced a mid-engined sports car and designated it as the MG F (later designated as the MG TF). The car was powered by a 1796 cc (1800) K-Series 16-valve engine, the basic having 118 bhp (87 kW) while the more powerful VVC (variable valve control) had 143 bhp (107 kW). Later models also used the 1589 cc K-series engine as the 'base' model and three versions of the 1796 cc with different power outputs.

Although popular across Rover's model range, when fitted to the MGF, the K-series engine was plagued by head gasket failure, often attributed to the complex nature of cooling a mid-engine car. The coolant system was prone to developing air pockets around the cylinder head if not properly bled. Rover did little to address this, leaving owners to bear the cost of expensive repairs early in the life of their vehicles. Rover had to employ an outside specialist design team to resolve the problems, but it was too late to save the reputation of the model.

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MG Cars – 1939 Onwards (continued)

1995 to 2021 (Continued)

Despite the reliability problems the MG TF was quite popular and on the road was a match for the Mazda MX-5 and the BMW Z-5 but the poor reliability and build quality dogged the car throughout its production life. These problems are hardly surprising as the car was built by three different companies between 1995 and 2011, The Rover Group, MG Rover, and finally MG Motors as part of the Nanjing Automobile Group. In its final years under Chinese ownership the car was assembled in Longbridge as complete knockdown (CKD) kits imported from Nanjing Automobile Group's Nanjing factory.

The MG name and badge is now used as a 'brand' for a range of cars wholly designed and built by the Chinese SAIC Motor Corporation (Nanjing Automobile's parent company). On SAIC's MG website they refer, somewhat cynically, to the original MG Car Company and the old Longbridge factory. However, most of the site has now been sold off for housing and only a small factory unit remains for MG Cars sales and technical development. This is probably another demonstration as to the decline of manufacturing in the UK and the attitude of our politicians to the engineering sector in general.

Fortunately, as you can see from the pictures in this article, there remains a great following for 'proper' MG cars with a thriving restoration market and of course great support from the MG Owners Club.

Thanks to Geoff Dean for the first instalment of this story and inspiration to bring the story of MG up to date.

Michael Bates

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MEMBERS MISCELLANY

My “BSA” - 1967 BSA A65 Spitfire Mk III Colin Beadle

Colin gives an insight into the history and restoration of his famous British motorcycle. BSA’s were a very popular brand of motorcycle but while innovative in many ways, often were viewed as a little conservative. They never had the same cachet of the larger Triumph motorcycle or the racing pedigree of Norton machines. Sadly, BSA did not survive the onslaught of the more sophisticated Japanese machines.

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My interest in motorcycles started in the mid 1960’s when a couple of my Dads work mates visited the house – all festooned in “rocker” gear of the period. The bikes were polished to perfection – from what I can remember one was a BSA A10 and the other a Triumph Bonneville. I was deemed too young to be allowed a ride on the pillion but my older brother was!!

Move forward to 1973 when I could obtain my motorcycle licence. I unfortunately got “caught” by the year the government raised the age for obtaining a motorcycle licence from age 16 to 17. I could have obtained a licence for a 50cc moped a year earlier but that was never going to be an option. I stuck to my pushbike!

So, in March 1973 I had my first BSA – a 1964 250cc C15. Being 16 had not been wasted – I had learnt to ride a motorcycle under the guidance of an RAC/ACU scheme and had planned a driving test. So, within a few weeks of turning 17 I had passed my test and could now legally ride an unlimited capacity motorcycle – madness? (*the picture is the Editors BSA C-15, also his first motorcycle*)

I had my eye on a specific motorcycle – it was owned by a friend of my older brother. So, working every hour I could through the school holidays of 1973 I saved enough to buy “my” BSA A65 Spitfire MKIII, this occurred in September 1973.

The Development of “My A65”

The background of BSA (ignoring arms production etc.) shows it was a company producing solid motorcycles for all round transportation. Before WWII BSA’s staple machines were single and V-twin configuration. The company had a claim that one in four motorcycles was a BSA.

In the late 1930’s things were to change. In 1937 Triumph introduced the Edward Turner designed Speed Twin motorcycle. A design that became a standard motorcycle configuration for many decades. Today Triumph still produce an impressive Speed Twin motorcycle with lines that can be drawn from 1937.

BSA had been experimenting a twin cylinder design from as early as 1920/25. There was a four-stroke twin cylinder in line design (as per Sunbeam in the S7), a four stroke flat twin (as per Douglas and others), plus a two stroke (150cc) vertical twin (Ariel). Perhaps these designs were perceived too radical for a public wanting simple reliable transportation. Who knows what may have happened if the two-stroke vertical twin had been fully developed from 1925 through to 1972? Perhaps BSA may still have been producing motorcycles?

In response to the Triumph Speed Twin - by 1938 BSA had a prototype OHV 350cc vertical twin. Into 1939 the machine had developed into the forerunner of the A7 twin. The A7 (500cc) machine finally reached the public in 1946. The design was worked on by Edward Turner when he was at BSA in the early 1940’s. Some of the design features of this engine lasted through to BSA’s conclusion in 1973.

In 1949 BSA introduced the A10 – a larger capacity 650cc machine that was shortly followed by a “new” A7-500 cc. There was a commonality of parts between the two new models – a theme that would follow through to the later A50 / A65 models. Many features of these earlier A7/ A10 machines were adopted in the later A50 / A65.

The BSA A50 and A65 models were introduced in 1962. These were unit construction engines (gearbox being an integral part of the engine housing), integral rocker box and improved electrics amongst other changes. The machines had an alternator and coil ignition. Both models had dry sump lubrication with the oil tank being located behind the right-hand side panel. Later models (1971) would progress to an Oil In Frame (OIF) design.

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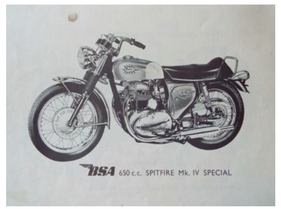
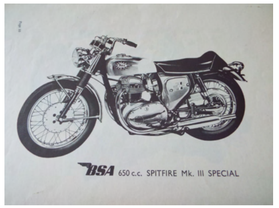
The A50 had a capacity of 499cc and the A65- 654cc. Both engines had a stroke of 74mm. The compression ratio for both models was the same at 7.5 to 1. The crankshaft was fitted with a ball race bearing on the drive side and a plain bearing on the timing side. Was this an inherent poor design issue? (Reference to this later).

Most perhaps can remember the Thunderbolt (single carburettor head) and Lightning (twin carburettor head) as the staple models of the A65 range. As may be anticipated there were various other models with enhancement to performance and styling. The Clubman, the A65R Rocket (not to be confused with the later A75 Rocket III 750cc Triple), Star Twin, Hornet, Firebird, Royal Star, and the "Spitfire" in its MkII, MkIII and MkIV guises. There was never an A65 Spitfire MkI. In 1957 a Spitfire Scrambler was sold on export markets - this model was a single carburettor A10 650 cc twin cylinder with the old separate gearbox configuration.





The A65 model lasted until the demise of BSA in 1972. In terms of any competition / racing success by 1972 this had been largely overtaken by the A75 750cc Triples. However, the A65 did have some final factory development work. In 1971 the A70L 750cc version was produced, 202 machines for American AMA Class C racing Homologation purposes. A change in the AMA rules Class C in 1969 allowed 750cc OHV engine production based bikes to compete. Whilst the newer A75 Triple met the rules the lighter "A70" was deemed a better option for the flat track races. The A70L machines had a longer throw crank (85mm stroke and 75mm bore) to give a displacement of 751cc. The timing side crankshaft bush was "revised". Information available suggests this remained a plain bearing configuration opposed to needle bearing. All machines were exported to US dealers and few examples of the A70L seem to survive today.

The A65 was used very successfully in sidecar racing – many engines modified with big bore 750cc barrels and crankshaft roller bearing conversions. Chris Vincent is amongst many who won British Championships aboard an A65 based outfit.

Now this is where "my" BSA story really starts!!

So "My BSA" was registered in 1967 (E Plate) which places registration between 1st January and 1st August 1967. The engine and frame have matching numbers – prefix A65SA – which shows designated as a Spitfire MkIII. The original workshop manual has photo confirming the styling of my bike. However -little features such as a heatsink for the Zener diode (base of steering head), a passenger grab rail is fitted on my bike but only appear on the photo of the 1968 Spitfire MkIV. The side panels had decals of Spitfire MkIV when I purchased the bike – so who knows!!

In 1967 the Spitfire MkIII incorporated the following features. A 190mm front brake (Gold Stars had these 10 years earlier), 10.5 to 1 compression ratio pistons, 30mm Amal Concentric carburettors. The handlebars were "Westerner" design raised bars. The fuel tanks available were two-gallon standard with a four gallon optional. Both were of fibreglass construction. Styling was arguably aimed at or influenced by the American market? The 190mm front brake was arguably an improvement on earlier stopping power but the 1968 models with twin leading shoe design are deemed to be better.

The high compression ratio necessitated the use of five-star (101 Octane) fuel if 'pinking' (pre-ignition) was to be avoided. The two-gallon tank gave a range of about 75 miles between fuel stops. And those raised bars – not that great for high-speed riding.

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The routine service intervals included an engine oil change at 2000-mile intervals. The oil tank capacity is modest at five pints. Filtration is very basic with a fine metal tubular gauze filter in the base of oil tank that feeds the supply pipe plus a similar gauze filter in the crankcase by the scavenge pipe. BSA recommended the use of straight grade oils – 30 SAE in winter and 40 SAE in summer. The crankshaft of the A65 is mounted with a ball race bearing on the drive side and a plain main bearing bush on the timing side. Oil is fed from the oil pump through the timing side bearing. Then through drilled holes in the crankshaft past a sludge trap to the big ends.

The following observation about wear (and premature failure) of the plain main bearing on the timing side of the crankshaft has seen much debate over the years – many claiming there is no major issue if oil changes (and use of straight grade oils) adhered to. Some advocate oil changes at 1000 miles. Troubles arise out of wear and end float in the main bearing bush. This allows an escape of oil from the bearing and creates a reduced flow of oil through the crankshaft to the big ends. Result is failed main and big end bearings.

By 1976 I had been working for a few years and funds were available to "improve" the engine. Devimead Ltd who were based in Wilnecote, Tamworth, was well known for crankshaft roller bearing conversions and bolt on "big bore" cylinder kits. The dismantled engine was entrusted to Devimead to have a crankshaft roller bearing conversion. The timing side crankshaft is machined to accept a collar. In turn this fits a needle roller bearing with an end thrust race to eliminate end float on the crank. An oil feed quill is incorporated into the end of the crankshaft to supply the big ends. The inner timing cover (alloy) is built up to accept a revised oil way feed from the oil pump. The alloy oil pump was replaced with a higher capacity iron bodied unit. All of this sits under the outer timing cover in a very inconspicuous way.

The opportunity was also taken to fit the 750 big bore kit. (738.75cc to be exact). The big bore kit could also be fitted to the A50 engine as it has the same 74mm stroke – although a new cylinder head required. The cylinder head was replaced (the old head had succumbed to too many blown head gaskets from the high compression pistons). The new head was gas flowed and ports opened to accommodate 32mm Amal Carbs. Boyer Bransden electronic ignition was fitted in place of the Lucas 4CA contacts and coils. A few other items were included – crank balanced (dynamic), balanced con rods, lightweight rocker gear and alloy clutch pressure plate. The work certainly transformed the engine. However, from a visual perspective there was very little to see.

Come the early 1990's a full restoration of paint and chrome was required. Some I had done professionally. The engine went to SRM based in Aberystwyth (they had taken over the business of Devimead). Little was done to the engine other than replacing the pistons with lower 8.75 to 1 compression ratio. The bike has now remained the same since 1993. I may investigate fitting the twin leading show front brake from the Mk IV model. Alternatively, I could incorporate ABS to present set up. ABS – *'Anticipate Braking Sometime'*.

To the purist "My BSA" can only be described as a "Bitsa". It would not win any event based on originality. I once took the bike for an MOT to Chris Vincent motorcycles in Earl Shilton and was greeted with observations – "That is not original". (Chris Vincent is six times British Sidecar champion using BSA A65 engines).

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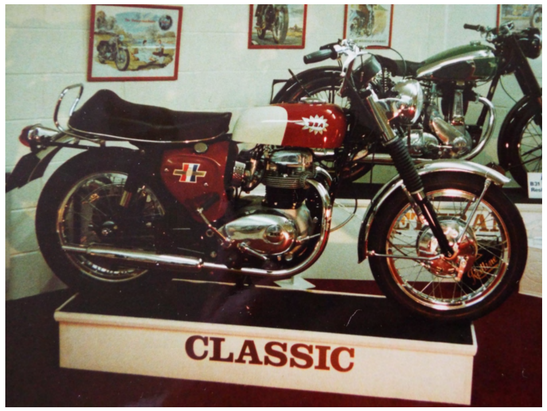
However, “My BSA” looks reasonably original which is all that matters to me. I visited a classic car and bike show a few years back. From a distance there appeared to be an A65 Spitfire (or Lightning – or Thunderbolt – or whatever?) The decals on side panels indicated it to be a Spitfire MKIV. The engine number showed crankcases were from a Lightning. The cylinder head was single carburettor – probably a Thunderbolt. There was a rev counter drive from the crankcase – but no cable - no rev counter on handlebars. Now that is a “Bitsa” but, the bike worked ; it had been ridden to the show; and what really mattered is that it was still running and obviously cherished.



Rebuilding of the BSA seemed quite a daunting task at times with all the bits strewn across the garage floor. However I was determined to get it on the road again and it even survived a house move in many boxes without losing any parts.

My “BSA” is now a complete motorcycle again and shares my garage with a modern Honda. While my motorcycles are far apart in age and sophistication they both offer the same joy, riding a motorcycle on the open road.

If my article inspires you to refurbish a hidden motorcycle in your garage or you just like talking about motorcycles, you can find like minded people within the Wycliffe Lutterworth U3A motorcycle group. Just contact me via our U3A website special interest groups page.

Colin Beadle

Engineering Science &Technology Group
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MEMBERS MISCELLANY

Purchasing A Potential Bargain! Experiences of owning an early BSA Gold Star Chris Ridley

Staying with motorcycles, Chris relates his experiences and privilege of owning a British classic, although he probably did see it that way at the time.

Chris has not revealed when he bought the machine but judging from the purchase price and his income it must have been in the early 1960's (those were the days!). It was fortunate that Chris was working in engineering at the time as it gave him an understanding of the "mechanicals" enabling him to make the beast a little more tractable.

Even Chris's engineering skills could not ward of the final incident that ended his love affair with a Gold Star. With other interests, Val mainly, starting to intrude the safer and more comfortable option of a car became irresistible.

Don't worry Chris, we all had to make similar sacrifices ……

Purchasing A Potential Bargain! - experiences of owning an early BSA Gold Star – Chris Ridley

In 1947 BSA brought out a sports bike calling it 'Gold Star' being available in both a 350cc and 500cc capacities – model numbers, ZB32 and 34 respectively.

I had the good (or bad fortune, as it turned out) to purchase a second hand 1951 350cc ZB32 version on Irish plates in around 1964. The bike had plunger suspension on the rear, a sort of homemade racing seat, nicely upholstered, hydraulic telescopic front forks etc. other than the seat it all looked standard.

I discovered riding it home from Rugby, where money had changed hands that it had a close ratio gearbox (as I was about to find out) something the guy had failed to tell me, in fact he failed to tell me lots of things. I began to realise that he'd never ridden the bike but bought it for a song and sold it to me for the price of an album …. well, an EP anyway, I can't remember the exact price paid but seem to recall it was advertised at circa £25. At the time I was earning £4.15s per week as an apprentice so this purchase represented about 1 month's wage plus a bit …….

A 1949 BSA Gold Star. This is a 500 cc ZB34, visually similar to my machine. There are very few surviving ZB32 350 cc models.

Driving away I was thinking that I must be in second or maybe third gear instead of first as selected, but when I finally let the clutch fully out, with lots of revs to keep it going, I was convinced I had a knackered box and had bought a "Dog". I then found I had a further three gears and for a short while felt a little better about my purchase. First gear was so high that you had to be doing 18-20 mph before you could release the clutch lever, engaging the three following gears made little difference in engine revs, and I realised the machine was fitted with a close ratio gearbox.

Today, this would seem to be a desirable feature and much sort after but back in 1964 it was just a pain to ride in any sort of traffic as you had to slip the clutch and balance it all on the throttle until 20 mph road speed when it chugged on unhappily until it reached about 2500rpm where the engine became much more responsive.

The other discovery soon came to light by way of my nose, that wonderful aroma of Castrol R Castor oil coming from the slightly smokey exhaust. This, of course, had a big downside, Castrol R has the consistency of treacle when cold, making kick starting seriously difficult and dangerous if you did not have 'the knack'.

Riding Experience

Assuming one could eventually start the bike and get it to tick-over, you had several things to check like the advance and retard position for the ignition, before engaging the ridiculously high first gear and setting off. I had been warned by people about the early BSA Front brakes or the complete lack of braking would be a better way to describe it, if it hadn't been for the engine braking + rear brake + token front, slowing down could be a serious problem.

'Handling' could be described as mis-handling except in a straight line which is all the bike ever wanted to do, at corners, one had to physically push the bike down by counter steering the handle bars to make it "fall" into the bend, then having gone round, one had to physically haul it back up again to carry on, this was somewhat typical of the bikes of that era but not as dramatic as this Gold Star.

Clutch cork inserts lasted just months due to slipping it all the time in first and I got fed up with changing them. The engine power, 28 bhp, may not sound a lot by todays standard but it would achieve a top speed of about 95 mph given a decent run up and a following wind.

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Purchasing A Potential Bargain! - experiences of owning an early BSA Gold Star – Chris Ridley (continued)

Making It "Ridable"

For those of you who are still reading this, you may wonder why I didn't just resell it. Well not wanting to admit to buying a 'pup' was one reason and the other was it posed a challenge to get it more pleasurable to own and after all it was a 'Gold Star'.

After some research and letters/calls to BSA and the Gold Star club, I found the bike had originally been ordered for short circuit racing in Ireland (hence the plates) and BSA sent me a copy of the original Dynamometer graph of the engine which turned out a creditable 28.9 bhp. I discovered that it had also been fitted with Hi lift cams which is why it wouldn't pull under 2500rpm. After advice, I purchased from Jack Gunall, the BSA Agents in Leicester, a different profiled inlet cam, mainly used in scrambling versions of the engine, which made it more tractable at the top end and more torque lower in the revs.

I flushed out and cleaned all the residue of Castrol R from the inside of the engine, and used thinner mineral oil to help starting swings, but to get that aroma I used to put a drop in the petrol tank! After a bit of bartering at work I 'won' a twin leading shoe front break drum from a friend which after re-building into the large front wheel, made it stopping slightly better, still nothing compared to today's twin front disk brakes now fitted to almost all bikes on sale. I also fitted a new seat for comfort and a new GP Amal carburettor, costing a week's wage, but it was worth it. I had had the inlet port chambered and opened out in the cylinder head (care of the jig borer in the works training school) which helped on power delivery in the mid-range and didn't dribble petrol everywhere, so with these modifications all seemed good.

The Final Blow

By 1966 I had met my future wife, Val and was in a position of having a car for transport. Consequently, the bike was being used mainly for thrills but on one trip coming back through Broughton Astley to Dunton, I hit a grid on the apex of a bend which showed up the one thing I hadn't changed or refurbished – the steering damper! Hitting the grid sent the steering into a violent tank slapping wobble which could only be stopped by dropping a gear and accelerating hard which I did. Although now in control of the bike I was travelling too fast for the next corner which was coming up rather quickly and although I got round it, braking as gently as I could, I only just managed to keep it out of the ditch by luck!

Stopping just after the corner, I had to lower the bike to the ground as my legs had gone!!! This was the defining moment and I decided to sell the bike there and then and apart from showing potential buyers I never rode it properly after that incident.

I sold the bike for £15, a bit of a loss, as everyone wanted the DB34 and DBD34 which was more tractable being 500cc. The DB34 also had a better frame and suspension etc. being a lot more expensive. Today, in good condition, a ZB32 can fetch as much as £11-14k and later 1955/6 DB and DBD34 machines about £22-25k.

Do I wish I still had it, NO! I probably wouldn't be here now if I had kept it.

Chris Ridley

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Small Modular Reactors

Michael Bates

With interest in Global Warming mitigation, Michael looks at developments in electrical power generation by small factory built nuclear reactors.

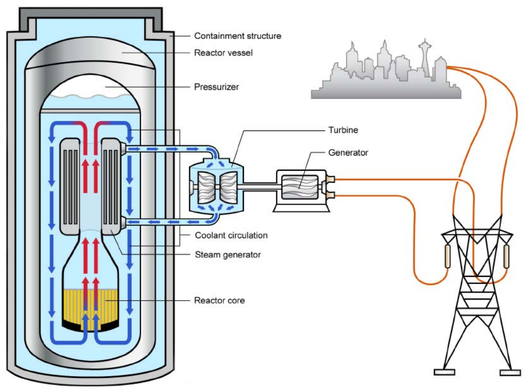
Small reactors are currently used in submarines and warships and to fill the base load gap, when renewables are unavailable, small reactors seem a good zero CO_2 option. Obviously there is a lot of public concern at the proliferation of nuclear power plants but the manufactures claim they are inherently safer than conventional nuclear power plants.

Manufacturers suggest that manufacture and installation will be much quicker than conventional builds, but they seem to be in similar situations with fund raising, development and licensing.

In the UK Rolls-Royce has formed a broad consortium of interested partners but getting to a point of manufacturer still seems a long way off and there is always the possibility that we let a manufacturing opportunity to slip away.

Small Modular Reactors – Michael Bates

The news reports of the recent COP 26 (Conference of Parties) in Glasgow, reviewing progress on the Paris Agreement to reduce global warming, has probably made us more aware of the impending disaster likely to overtake millions of people unless we accelerate our ability to reduce global warming. Here in the UK, we may be forgiven for thinking about our more immediate problems of Covid and the full effect of leaving the EEC. While the UK will be affected by global warming the consequences look manageable, possibly making us a little complacent. Fortunately, on this occasion, global warming has become quite politicised so our government, whatever it's colour will have to maintain a programme to achieve reduction in 'greenhouse gases' mainly the production of CO_2.



The primary source of CO_2 production in the UK is the burning of fossil fuels (coal, gas, and oil) for power generation, industrial processes, domestic heating, and motor vehicles with internal combustion engines. Existing technology suggests that electricity is the most effective way of distributing and using energy, but at the moment a high percentage of the electricity we use comes from burning fossil fuels, mainly gas. Progress towards replacing these fuels with renewable energy, wind, solar tidal and hydro is increasing but the problem, in the UK at least, is that output is dependent on the random effect of weather patterns around our part of the globe. Additionally, as we try to reduce our reliance on fossil fuels, generation capacity will have to be increased. The question is, will we be able to find enough space on and around the UK to accommodate the wind and solar 'farms' to match the demand reliably, 24/7, 365 days a year, and possibly, the answer is no, so we will have to find another technology that will fill the gaps left by the 'renewable' sources.

The 'holy grail' of energy generation is **fusion**, where atoms, together in a controlled way, release nearly four million times more energy than a chemical reaction such as the burning of fossil fuels and four times as much as nuclear fission reactions (at equal mass). Fusion is the same process the Sun uses to generate its energy and is a safer process than **fission**. Industry has realised that achieving a working fusion 'tokamak' generator will be hugely lucrative and instead of poorly funded national programmes there are now many small companies, with private investors, researching this technology. So, without a practical fusion generator the only available technology to 'fill the gap' is nuclear fission, a process that is currently in use around the world including here in the UK. The problems surrounding nuclear energy are well known, accidents such as Chernobyl, Three Mile Island and Fukushima and cleaning up nuclear waste facilities such as Sellafield here in the UK are well known and consequently there is a lot of resistance to the expansion of nuclear power plants.

In the UK renewable generation of electrical power can provide a significant percentage of our demand but, it is not fully reliable as generation is at the vagaries of the weather. Consequently coal, gas and nuclear power stations are still required. However, as governments are under pressure to reduce CO_2 the only alternative is to replace coal and gas generation with nuclear power. This does 'kick down the road' the problem of disposing of dangerous waste, but politicians don't often look too far into the future, possibly hoping that future technology will solve the problem.

The problem with building new nuclear power plants is one of funding, project lead and construction times and finding suitable sites, generally near a large body of water. One option being looked at is the use of Small Modular Reactors (SMRs) an idea that has been around for some time and indeed we have such plants powering submarines, warships, and ice breaker ships in Russia. A list published by the International Atomic Energy Agency (IAEA) prepared in 2014 indicated, there were 51 reactor designs around the world in various stages of progress, 4 in operation, 4 in construction, 5 at licensing stage, 11 detailed designs, 24 conceptual designs and 3 cancelled projects. Since 2014 more projects are being undertaken but the IAEA does not appear to have updated their report.

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Small Modular Reactors – Michael Bates (continued)

Small Modular Reactors (SMRs) are nuclear fission reactors that are smaller than conventional nuclear reactors and typically have an electrical power output of less than 300 MW_e or a thermal power output of less than 1000 MW.

They are designed to be manufactured at a plant and transported to a site to be installed. SMRs manufacturers claim that their designs reduce on-site construction, increase containment efficiency, and have enhanced safety. The greater safety claimed comes via the use of passive safety features that operate without human intervention, a concept already implemented in some conventional nuclear reactor types. It is also claimed that SMRs will reduce staffing versus conventional nuclear reactors. SMRs are claimed to cross financial and safety barriers that inhibit the construction of conventional reactors.

The term SMR refers to the size, capacity, and modular construction only, not to the reactor type and the nuclear process which is applied. Designs range from scaled down versions of existing designs to generation IV designs. Both thermal-neutron reactors and fast-neutron reactors have been proposed, along with molten salt and gas cooled reactor models.

While there are dozens of modular reactor designs and yet unfinished demonstration projects, the floating nuclear power plant Akademik Lomonosov, operating in Pevek in Russia's Far East, was as of the end of 2019 the first and only completed working prototype in the world connected to the grid. The plant has two reactors, each with a capacity of 35 MW_e. The concept was based on the design of nuclear icebreakers. The construction of the world's first commercial land-based SMR started in July 2021 with the Chinese power plant Linglong One. The operation of this prototype is due to start by the end of 2026.

One hindrance to commercial use may be licensing since current regulatory regimes are adapted to conventional designs. SMRs differ in terms of staffing, security, and deployment time. Licensing time, cost and risks are critical success factors. US government studies to evaluate SMR-associated risks have slowed licensing. One concern with SMRs is preventing nuclear proliferation although this must be balanced by the need to secure reliable and increased demand sources of electrical power generation.

In 2016 it was reported that the UK Government was assessing Welsh SMR sites - including the former Trawsfynydd nuclear power station - and on the sites of former nuclear or coal-fired power stations in Northern England. Existing nuclear sites including Bradwell, Hartlepool, Heysham, Oldbury, Sizewell, Sellafield and Wylfa were stated to be possibilities.

Rolls-Royce have set up Rolls-Royce SMR to design and manufacture small modular reactors and have formed a consortium to promote SMR's in the UK. With the reduction in demand for aero engines in 2020 the need to diversify is critical. Rolls-Royce have experience in developing and building SMR's for the British nuclear submarine fleet, Resolution class boats having 20.5 MW_e reactors so using that knowledge they propose to upscale reactors to 470 MW_e with a target cost per unit of £1.8 billion for the fifth unit built, earlier units being more expensive (undisclosed) to recover development costs. Currently, conventional nuclear power stations have a capacity in excess of 1600 MW_e. In 2020 it was reported that Rolls-Royce had plans to construct up to 16 SMRs in the UK. In 2019, the company received £18 million to begin designing the modular system. An additional £210 million was awarded to Rolls-Royce by the British government in 2021, complemented by a £195 million contribution from private firms.

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Small Modular Reactors

Michael Bates

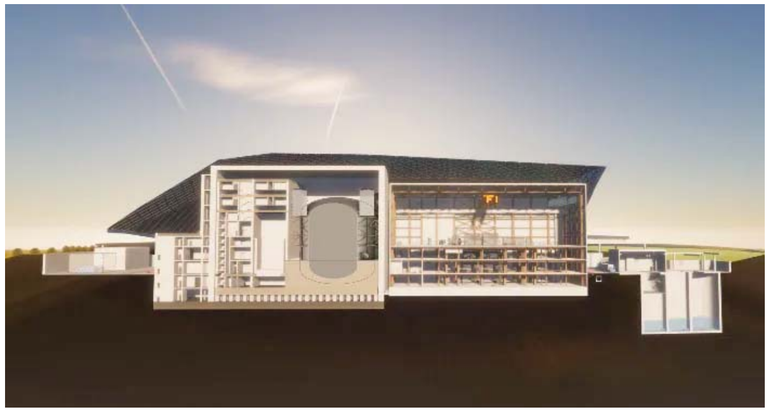
With interest in Global Warming mitigation, Michael looks at developments in electrical power generation by small factory built nuclear reactors.

Small reactors are currently used in submarines and warships and to fill the base load gap, when renewables are unavailable, small reactors seem a good zero CO_2 option. Obviously there is a lot of public concern at the proliferation of nuclear power plants but the manufactures claim they are inherently safer than conventional nuclear power plants.

Manufacturers suggest that manufacture and installation will be much quicker than conventional builds, but they seem to be in similar situations with fund raising, development and licensing.

In the UK Rolls-Royce has formed a broad consortium of interested partners but getting to a point of manufacturer still seems a long way off and there is always the possibility that we let a manufacturing opportunity to slip away.

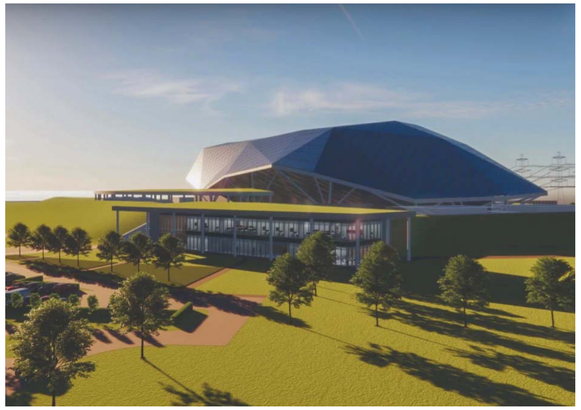
Small Modular Reactors – Michael Bates (continued)



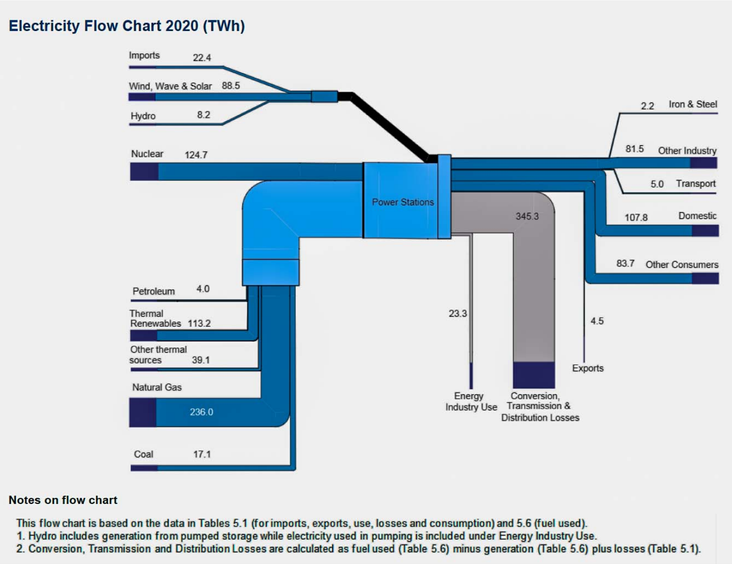
Rolls-Royce suggest that typical installations would occupy a footprint equal to two football stadiums, clearly making them easy to accommodate on parts of old generation sites even if they are inland such as disused coal and gas fired stations. Presumably existing grid connections could be used saving costly adaptions and upgrading.

Looking through some of the press releases, it sounds very encouraging, but it is all about future studies, proposals, reviews etc. with no timetable as to when they will have operating plants feeding the grid. Cynically, given the vagaries of politics and government indecision, interest in SMR's could easily evaporate in favour of extending the period of phasing out CO_2 producing generation. Interestingly, the demand for electricity has been declining since 2015 with a record low of 330 TWh (Terawatt hours) in 2020 presumably because of the Covid pandemic.

In 2020 43% of power generation was from renewable sources with gas being the predominant non-renewable fuel. Ignoring 2020, the reduction in consumption since 2015 is attributed to the use of more efficient electrical appliances and lighting sources. As we are being encouraged to use more electricity, via cars heating etc. it is easy to see that the trend in electricity use will rise quite steadily.



If the UK does embrace the use of SMR's, Rolls-Royce has forecast that the programme will generate up to 40,000 high quality jobs and a huge export market. Let us hope that the UK has learnt the lessons of previous industrial innovations and that we retain and develop manufacturing within the UK rather than exporting intellectual rights to Asia, America, or Europe.



Obviously, the information in this article is from different sources which I have interpreted and drawn some of my own conclusions. If any of our group has more specific information or were involved in the power generation industry then I welcome any corrections to this article, possibly instigating a discussion in further editions of the Whittle or as a topic at our meetings in 2022.

Michael Bates

Chart Sourced from UK.gov website

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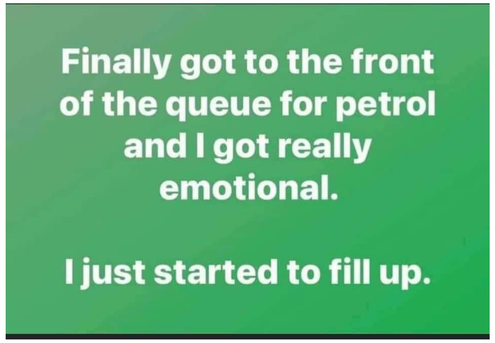
CORNER NINETEEN

19

If you come across some tasteful, related humour, send it to Chris and we will publish it next month.

Some would say, "if only"

Remember the 'fuel crisis' - the result of a minor regional shortage reported by the national media.



And if this is how we respond, will it be a return to