

Nº



at

EGGBOROUGH POWER STATION
on **JULY 11th and 12th 1992**

Admission by

programme £ 2-50

**FOR EITHER OR BOTH
DAYS**

The LEEDS SOCIETY of MODEL ENGINEERS

welcome you to their track

for the 24th

INTERNATIONAL MODEL LOCOMOTIVE

EFFICIENCY COMPETITION

for the

MARTIN EVANS CHALLENGE TROPHY



A Sunday morning working party

Calculation of Results.

Both the Bristol and the Birmingham Dynamometer cars record 'Total work done' (in ft lbs) and 'Total distance travelled' (in feet). The 'Overall run time' (in minutes) and 'Weight of coal used' (in pounds) and the 'Calorific Value' (Btu per lb) are all known values and there are 778 ft.lbs of work in one British thermal unit (Btu), so a calculation of Thermal Efficiency can be made thus:-

$$\text{Thermal Efficiency (\%)} = \frac{\text{work done} \times 100}{\text{weight of coal used} \times \text{C.V.} \times 778}$$

The winner of this competition is the locomotive that returns the highest value of Thermal Efficiency.

Other calculations that can be made are:-

$$\text{Average Draw-bar Horse power} = \frac{\text{Total work done (ft lbs)}}{\text{Overall run time (mins)} \times 33\,000}$$

(There are 33 000 ft lbs of work in a horse power-----James Watt)

$$\text{Rate of coal consumption per hour} = \frac{\text{Weight of coal used (lbs)} \times 60 \text{ (mins)}}{\text{Overall run time (mins)}}$$

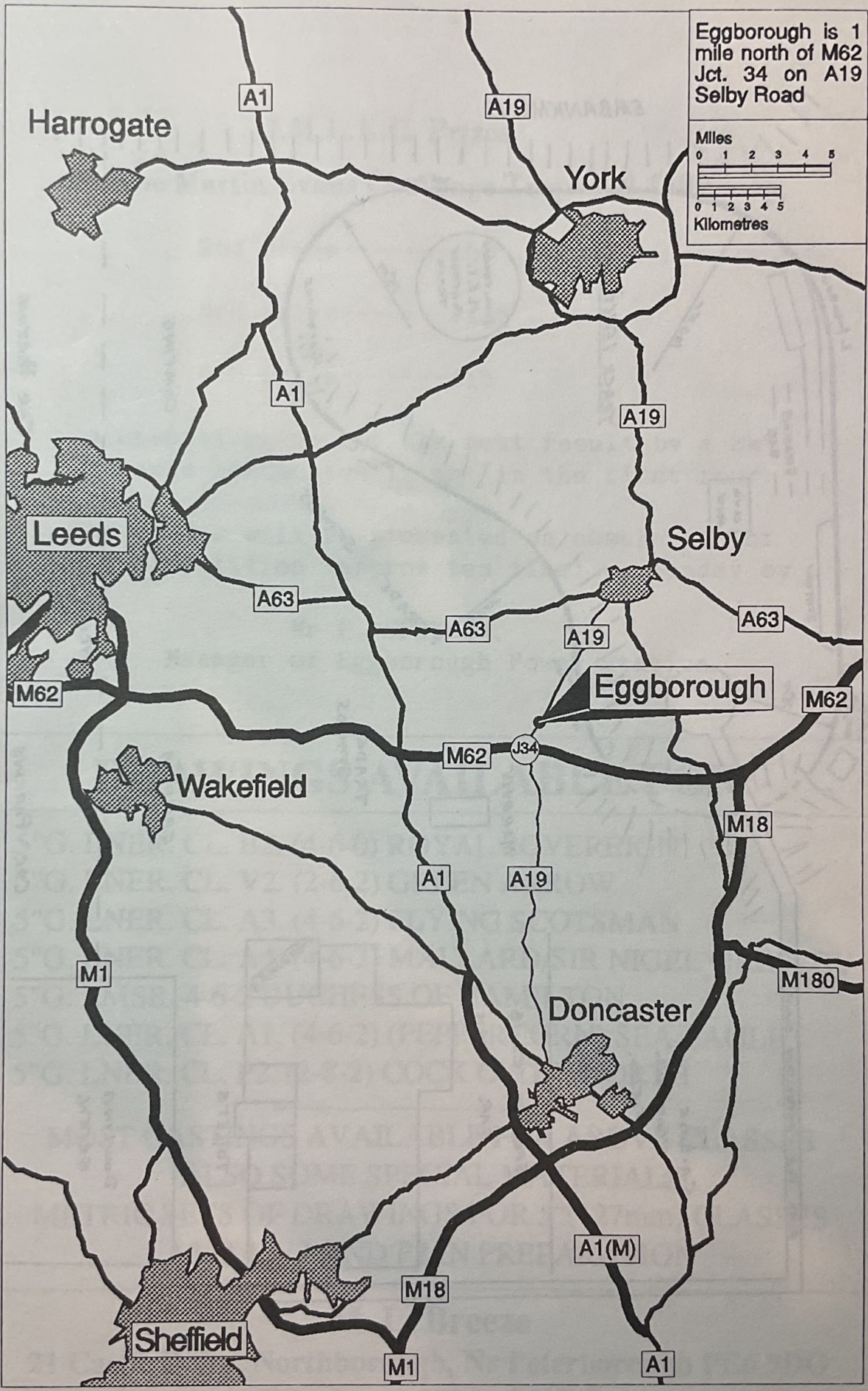
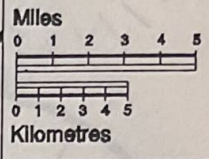
$$\text{Specific fuel consumption} = \frac{\text{Coal consumption rate}}{\text{Average draw-bar horse power}}$$

$$\text{Average draw-bar pull} = \frac{\text{Total work done}}{\text{Total distance travelled}}$$

The Calorific Value of the coal used today has been determined in the National Power plc Laboratories and has 14 455 B.T.U.s per Pound.

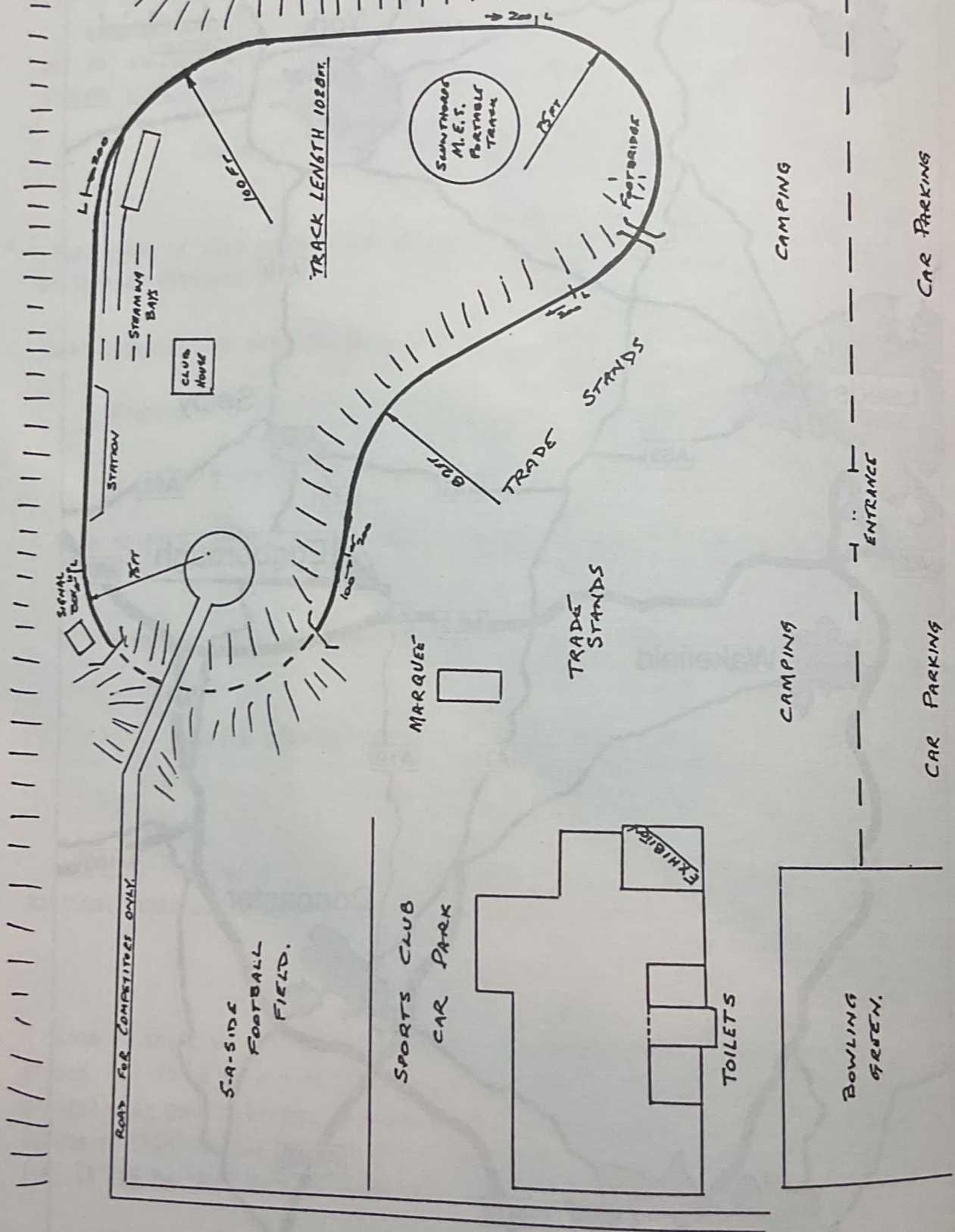
Come to think of it. What is coal? Yes Black stuff that is dug out of the ground, but to be more precise, it is mainly Carbon and Ash (which is metal oxides) with some Nitrogen, Oxygen, Sulphur and Hydrogen as well. Sometimes Sodium or Chlorine are present and this spells trouble as quite small amounts i.e. 1% can be the cause of slag and clinker formation. So beware!

Eggborough is 1 mile north of M62 Jct. 34 on A19 Selby Road



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ENTRANCE

LEEDS S.M.E.E. MINIATURE RAILWAY AT IGGBOROUGH.

I.M.L.E.C. Prizes

1st The Martin Evans Challenge Trophy & £100

2nd prize-----£50

3rd prize-----££25

4th prize-----£15

a Special prize for the best result by a 3½"
"gauge locomotive if not in the first four.

The prizes will be presented on completion of
the competition (approx tea time) on Sunday by

Mr P. SPENCER,
Manager of Eggborough Power Station.

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5"G. LNER. CL. A4. (4-6-2) MALLARD/SIR NIGEL GRESLEY
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Officials for I.M.L.E.C. 1992

Chief Judge	Ted Tait.
Secretary	Janet Pearson.
Publicity and public address	Arthur Bellamy
Station Master	Les Davis
	assisted by M. Keeton & A. Bootland
Timekeeper	David Beale
Calculators	Judith & David Bellamy
Weighing Attendant	Gordon Neal
Display Board Attendants	G. Williamson & J. Brady
Steaming Bay Assistants	A. Hunt and R. Keeton.
Coal store attendants	T. Wall & I. Saunderson
Camping and Caravan Stewards	Val and Jonny Johnston
Exhibition Organisation	Nigel Bennett
Observers.	J. Hunt, D. Lawson, E. Hughes, S. Russell, R. Hibbitt.
Liason with National Power,	John Hunt.
Permanant Way Inspector	Tim Pearson.

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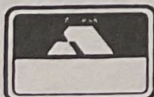
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HEMINGWAY

We asked Martin Evans to write a note about I.M.L.E.C. , here it is:-

It was around 1964, that I first had the idea that an efficiency competition might be staged for model steam locomotives. I was then working for 'Model Engineer' as an editorial assistant and I put the idea to Leslie Howard the Editor, he was immediately enthusiastic and agreed to publish the suggestion. However nothing further was done until early 1968, when I was appointed Editor of Model Engineer and was able to get things moving.

One problem was to find a Model Engineering Society which was willing to accept as 'host'. Clearly, the Society had to be one having a suitable track, and just as important, space for the number of cars that might have to be accommodated. In the event, the Birmingham Society volunteered to stage the first Competition on their Illshaw Heath track.

The next problem was to produce a suitable trophy to be awarded to the winner. I decided that the competition warranted a really fine trophy, so I paid a visit to Messrs Garrards, the Crown Jewellers in Regent St, to see what they might suggest. As is now well known, they produced a very fine trophy and to make it appear "railway-like" I got them to engrave a "General Arrangement" of one of my favourite locomotives on the side. The trophy was of course to be offered as first prize. All this of course was costing me quite a bit as the company was not at this time too keen on taking care of the bill, so I decided to finance the whole affair by selling my 3½" gauge locomotive "Jubilee". (It was sold to the Hamburg Society in Germany).

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Whilst the preparations were going ahead, members of the Birmingham Society, under the energetic leadership of Brian Hughes, built a Dynamometer Car, which could be hauled behind the competing locomotive, to record speed, drawbar pull, etc. so that comparison could be made between each competitor.

It was decided to allow the competitors to choose the load he thought most suitable for his locomotive, and to allow him to run for 30 minutes, which with the possibility of there being 15 or more entrants, was as long as thought wise.

Most fortunately, the weather turned out to be exceptionally fine and warm, and well over 600 visitors turned up to watch the fun. The Birmingham Society did a wonderful job, and perhaps it was entirely appropriate that the winner turned out to be one of their own members.

The Competition has gone from strength to strength, and has attracted several Overseas competitors. This year will see the 24th. running of I.M.L.E.C. and I hope and believe that it will once again prove an outstanding success.

In conclusion I should like to emphasise that I.M.L.E.C. is not a "scientific" competition-- it cannot be in the time available--but it does give some idea of the prowess of competing locomotives. It is, however, quite a stern test of the drivers; in fact many observers think that the skill of the driver counts for more than the efficiency or otherwise of the locomotive. More importantly, the competitions are great fun, and as one visitor has put it-- "it's a great gathering of the clans!"

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About the Power Station.

Eggborough was one of a series of large modern power stations built in the 1960's close to the Yorkshire coalfield and close to a river. In this case the River Aire. The main generating plant consists of four turbo-alternator units each with an output capacity of 500,000 kw and each linked to a pulverised coal fired boiler. There are also four 17.500kw gas turbine generators.

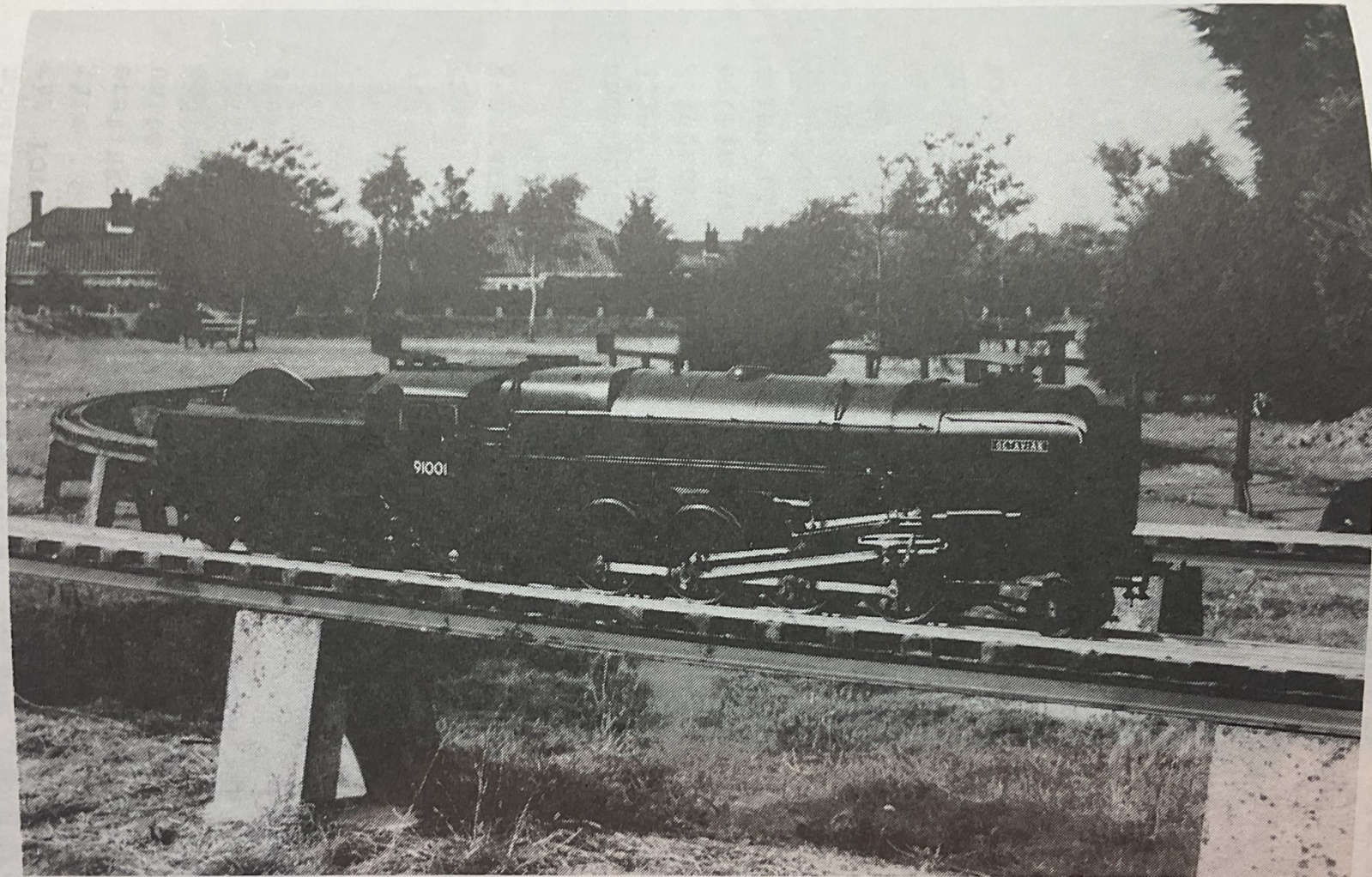
The main generators run at 3,000 Rpm and the stationary windings are cooled by very pure water, and the rotating windings by Hydrogen. The generator itself weighs in at 210tons, the capacity of the engine room cranes, with the generator rotor an additional 90 tons.

The boilers at full load use almost 20,000 tons of coal a day, ground into a fine powder and blown into into the furnace to produce 3,350,000lbs of steam per hour at a pressure of 2,400psi and a temperature of 568 degrees C. The boiler and superheater are made up of a total of 13 miles of carbon and stainless steel tubes up to 2½" bore and 3/8" wall thickness. Each boiler drum is 122ft long, 6ft diam and 6ins thick! At the time of delivery (June 1965) the first boiler drum was the heaviest single load carried by British Railways at 240tons and was brought from Wolverhampton on two special 24 wheel waggons.

The chimney is 650 feet high and 70 feet diameter at the base, it has 4 separate flues and a passenger lift up the centre to give access to the top and to the four levels at which aircraft warning lights are fitted. The cooling towers are 375ft high and 275ft diameter at the base, and one can handle 6,750,000 gallons of water per hour. Up to 13,000,000 gallons per day is lost by evaporation and replaced by river water.

Efficiency values in these days of commercial competition are a guarded secret, but the manager is not pleased if it falls to 37%.

Good job 'Eggborough' cannot enter IMLEC.!



'OCTAVIAN' last years winner

The Leeds Society of Model Engineers,

There are notes in the Model Engineer of a club in Leeds as far back as 1902 but the present club can trace its origins to a meeting on 5th December 1935, where Officials were appointed and an annual subscription of five shillings was agreed, together with 22 clauses of rules. An extract of the minutes of this meeting is framed in the clubhouse.

In 1937 it was agreed to build a 3½" L.N.E.R. Pacific using Bassett Lowke drawings, as a club locomotive and during the war years there are reports of track events and exhibitions held in aid of charity. A permanent track was erected at Temple Newsam, (one of the Leeds parks), in 1960 using precast concrete pillars and beams (to the club specification) this gave good service until it recieved the attention of vandals so the whole outfit was then dismantled and stored awaiting a new site. The present site was selected and the track re-erected using the usual Sunday morning volunteer labour and was formally opened by the then Power Station Manager in 1982.

Since then, we have hosted a Southern Federation Rally, IMLEC in 1988 and again this year. Each year we have the 'Leeds Rally' where members and visitors are encouraged to camp out for the weekend and run their locomotives just for the fun of it. Several years ago the power station management hosted 'Open Days', when the public were invited to take a tour of the 'plant' and then to visit some other attractions on the site including of course, our railway. We still have a portable track and use it for outside runctions, such as garden parties, and Exhibitions etc.,

We are a small club of some 65 members of which one third are Senior Citizens, and also about one third are active members. Some members are in both groups and I suppose this is the national average.

This years entrants, but not in Running order.

1. The mystery engine representing the Birmingham club, the owner and driver will not be known until their own mini-IMLEC has been held.

2. Brian G. Holland, represents the Oxford club and is running "Fair Rosamund II" based on "Metre Maid" but with tall cab and chimney similar to "Sweet Pea". Brian works in light engineering.

3. David Gregson, has entered his slightly larger boilered 0-4-0 saddle tank locomotive "APEX" based on the "AJAX" design. David is not related to any other competitor running this year and is entered as a private entry.

4. Dave Cutts, has brought his 3 $\frac{1}{2}$ " gauge Stanier 4P 2-6-4 tank better known as Martin Evans Jubilee, this loco came 9th at Bristol last year. Dave represents the Ipswich club and is now building another Jubilee, the 5XP!

5. Charles Whiterod, a private entry from Southampton, brings a "SIMPLEX" to Martin Evans original drawings, the large hole in the front of the frame stretcher gives access to the eccentric for oiling. The engine is driven by Brian Collyer who drove his own engine in Bristol last year.

6. David Sutcliffe, of the Ribble Valley Live Steamers, (LBSC would have loved that title), brings a Somerset and Dorset 7F freight engine completed in 1990 using a general arrangement drawing from O.P.C. Castings are from home made patterns. David has been modelling now for 36 years.

7. Keith Pardey, carries the hopes of the Sunderland club and competes with the A4 "Seagull" to Don Young's drawings. Kylchap exhaust equipment is fitted, Rings on both pistons and valves, and ballraces are fitted to expansion link pivots and the Return Cranks. Keith and his father, Robert started building the engine in 1986.

8. Nigel Gregson, is a private entry with his Rhodesian Railways Class 14A Garratt fitted with a Hadfield power reverser and Turbogenerator. The boiler runs at 120psi and the complete locomotive weighs 700 lbs. and competed at Guildford in 1990.

9. David Kerry carries the flag of the Chesterfield club, and runs a "SIMPLEX" with slight alteration to cab and water tanks.

10. Steven Eaton, another private entry comes from Mansfield Woodhouse, and he is running a Juliet, the 0-4-0 tank engine in 3½" gauge, designed by LBSC way back in 1946. Steven competed at Bristol last year.

11. Micheal and Edward Parrott, represent the Swansea club and enter a 3½" gauge Hunslet to the "Lilla" design. Micheal built the engine for his son Edward as a birthday present (don't ask which one), and has detail added from works drawings. Dad will be driving today, his other engine is a 'LION'.

12. Thomas Jones is a retired engineer and enters a 3½" gauge "Britannia" built to LBSC's drawings supplemented with a BR drawing for details of ashpan and tender. Mr Jones runs the engine regularly and represents the Tyneside club. He organised IMLEC in 1972 when it was held in Newcastle.

13. Bev Fallows is a private entry with another "AJAX". Started at evening class and took 5 years to build as a first attempt. Bev is a member at Leyland and works as a project Manager on Service tool development

14. Francis Halshaw is the Club representative from Leyland with a Black Five, to Don Young' design with the addition of needle roller bearings to all axleboxes and an axle pump. All the platework is Stainless Steel! The Driver is Mr. Alf Chadwell, perhaps the most senior driver of all.

15. Edward Gibbons of the Chester-le-Street Club took the prize for 3½" gauge locos at Eggborough four years ago and again at Leyland the following year. Can he repeat with his 3½" Maisie, a G.N.R. large boilered Atlantic?

16. Bruce Ellis started building his freelance engine as a good practical 'club' engine. The 2"x2½" cylinders are fitted to 5/8" thick frames and the boiler has a 7"x7,1/4" firebox. He started modelling 3 years ago and retired from work 18 months ago. He spends much time in his workshop to the 'relief' of his wife!

17. Geoff Gregson runs for the Urmston club with the well known "DUCHESS of ABERCORN", built to a combination of works drawings and a published design. Geoff tells us that the engine is just like her big sister ie Difficult to start when heavily loaded but once under way acceleration is alarming. Geoff is employed as an engineer in the pipework industry.

18. Richard Sourbutts is from the Llanelli club. His engine is a DHOLPUR with a steel boiler and has minor changes to the published valve gear drawing, but distinctive changes to the tanks cab etc. Dick is a jobbing builder and will drive the locomotive himself.

19. Richard Knapman also from Llanelli but as a private entry, brings a "SIMPLEX" built as standard straight from the drawings.

20. Anthony Herbert of Knypersley, is a member of the Stockport Club and runs a 5" gauge 'Royal Scot' built to Martin Evans drawings and details off 'Scots Gaurdsman'. This loco competed at Leyland in 1989 but did not complete the run due to boiler priming.

21. David Caseley has lent his 1895 Beyer-Peacock, Simplex, to Barbara Milton to drive. Barbara represents the Bristol club and has entered previously at Guildford and Bristol where she came 4th. The engine was built 13 years ago and uses the same boiler, cylinders and valve gear as Martin Evan's design with additional wheels and a modified frame.

22. Fred Winsall of the Northampton Club has entered IMLEC many times but has not yet taken the 'Cup'. This year he brings his 3½" gauge 'Mountaineer' Built to Don Youngs Drawings but with 2 Radiant superheaters instead of 3 of the flue type. The engine has just had a rebuild after 16 years use. It competed at Bristol in 1979. Today the engine is driven by his son Glyn.

23, John Heslop, of the Ryedale Club enters a class 4 2-6-4 Tank, which is a scaled up version of Martin Evan's 'Jubilee'. John won a Bronze medal with it at the 1960 M.E. Exhibition and it had a 'heavy repair' in 1988, including new boiler and fittings, axle boxes and piston valves. John used to work for I.C.I. and now works in light engineering. His third engine is a delight, a P2, 2-8-2 Earl Marischal with a single casting incorporating 4 cylinders and piston valve chests with cored ports and the smokebox saddle.

24, Don Marshall with a S.E. class K Tank (River Adur) is supported by the Worthing Club and the Loco was awarded a silver medal at the M.E. Exhibition in 1988. The loco ran in the previous event at Eggborough but was forced to withdraw early in the run. Don is now retired after many years in railway service.

1st Reserve, 'Biff' Riley is a Leeds member but today he represents the Scunthorpe club with his Rebuilt Royal Scot 'Kings Own'. The engine is a first attempt and took 4 years in construction with a further year for the tender.

2nd Reserve, Gerry Mole, of the Warrington club has another 'Rebuilt Royal Scot', called 'The East Lancashire Regiment', and is fitted with a working vacuum ejector and syphon lubrication to many parts.

3rd Reserve Ron Painter of the North Staffs club has a narrow gauge 2-4-2 loco fitted with an Atkinson Uniflow engine with chain and sprocket drive to the axles. If the engine is called to run it will be driven by Mike Barnett.

25th I. M. L. E. C. 1993.

will be hosted by the

Leyland S. M. E. E.

at Worden Park on July 10th & 11th 1993

The usual formula will be used, i.e, track running for all and barbeque on Saturday Evening, Caravan and Tents allowed on site.

Watch M. E. for details

Rules and Organisation

1. On arrival, Competitors should report to the Competition Secretary who will have all the necessary information concerning the day's events including finalised run times.
2. One hour before the start of each run, the driver will be called to prepare his locomotive in the presence of an Official Observer who will also be on hand to offer any assistance required.
3. Two sizes of Anthracite are available in pre-weighed bags. You will be required to select the size and quantity you need and the weight will be checked in your presence. Note, you may take as much coal as you like, only that burnt will be debited to the run.
4. As much charcoal, wood and paraffin as required will be provided for raising steam. The change to weighed coal will be at the drivers discretion but he must have a good coal fire before starting the run.
5. The train with the dynamometer car will be prepared to the competitors requirement and must be connected to the locomotive with a solid connection bar. The number of passengers carried will be completely at the discretion of the competitor. Tickets for each run will be issued by the Competitions Secretary. A maximum of five people will be allowed on each car and competitors must nominate the number of cars required to the Competition Secretary on arrival at the track. Variations to the number will be by arrangement with the Station Master up to half an hour before run time, after this time no changes will be made.
6. The duration of the run will be a nominal 30 minutes. When 25 minutes of the run have elapsed the driver may, at his discretion, decide to finish his run at the conclusion of that lap. No penalty will be incurred should the driver choose to adopt this course of action. No time allowance will be made for any stops other than derailments. The timekeeper will keep competitors informed of their progress and indicate when on the last lap. The run must finish at the station to unload passengers. Should a driver stop short of the station due to shortage of steam even though he has been running for the full 30 minutes, he must "blow up" and complete the run to within 2 metres of the station starting signal.

7. Should the load prove too much for the locomotive, one or more of the passengers may be offloaded wherever it is safe to do so. Additional passengers may not be added at any time.
8. Water will be handed to competitors as required in suitable containers so that they may top up without stopping. The amount of water used is not recorded or limited in any way.
9. At the end of the run, the locomotive will return to the steaming bay, where all unused coal will be collected and weighed in the presence of the driver. No allowance will be made for unburned coal left in the firebox.
10. The results will be calculated by the Society's officials and displayed as soon as possible.
11. A maximum speed limit of 10 m.p.h. will be in operation for the competition. The official observer will advise drivers if this speed is exceeded. Three such warnings may result in disqualification.
12. During the measured run, trains must not be assisted externally in any way, all work must be provided by the locomotive. Competitors must not lean on the locomotive or tender in such a way as to increase drawbar pull. The use of the handpump is not permitted. However it may be used in emergencies, when all other means of water feed have failed, in which case the locomotive must be retired and the run terminated.
13. The use of sand is permitted only at the start of the run. An infringement of this rule will result in disqualification.
14. All drivers are requested to ensure that all their locomotive wheels are clean to enable a good start. These will be checked in the steaming bay before leaving. Remember this is for your benefit.
15. The adding of ballast including water added externally to the scale outline or likely outline of a freelance model is not allowed.
16. The decision of the Chief Judge is final.

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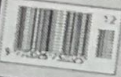
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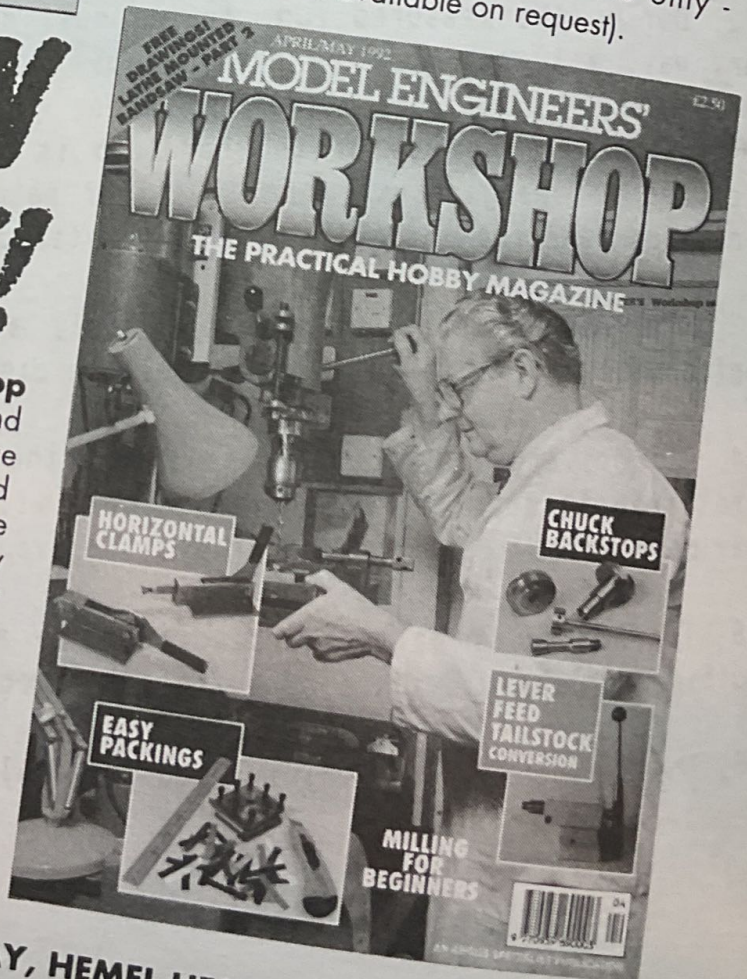
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ARGUS HOUSE, BOUNDARY WAY, HEMEL HEMPSTEAD,
HERTS. HP2 7ST (Tel: 0442 66551)

It may be remembered that the IMLEC event was hosted by the Leeds SMEE at their Eggborough Track in 1988 and that the thermal efficiency figures were considered high. In 1988 first and second places each returned figures of over 4% and four others were over 2%. In the previous 16 years only six competitors exceeded 2%, one of which was Les Pritchard who achieved 3.66% in 1984. During the Saturday of the 1988 event (Lionel Flippance ran on Saturday afternoon) there was doubt as to the accuracy of the results so one job on Saturday evening was to do checks. The Bristol and Birmingham Dynamometer cars were available so they were coupled up normal front to normal front so the 'drawbar pull' was equal. The trucks were hauled around the track together (with another couple of trucks as a trailing load) with a Charleton so distance travelled was equal. The recorded values were almost identical so the results stand. Lionel Flippance demonstrated in 1989 at Leyland and again in 1990 at Guildford that results over 3% are possible.

One variable factor at Eggborough was the coal. Each competitor had a choice of coal i.e. anthracite or Welsh steam coal (and also a choice of size, peas or beans) and BOTH the calorific values were measured by a competent chemist before the event. This then should not affect the result.

The winning competitor has a theory "Eggborough is the only track he knows which is uphill all the way and was able to keep the drawbar coupling tight all the time".

Note:- a video is being made of this years event
so

smile please!

Previous I. M. L. E. C. Winners.

1969	Birmingham	Royal Scot	5"	?	J. Drury of Birmingham
1970	Whitney	Firefly	5"	?	L. Labram of Birmingham
1971	Southampton	Dean Single	5"	?	A. Haydon of Newton Abbott
1972	Tyneside	GWR 57XX	5"	1,066%	N. Spink of Chesterfield
1973	Chingford	LNER L1 Tank	5"	1,60%	B. Longstaff of S. Durham
1974	Bristol	'Nigel Gresley'	5"	2,54%	F. Winsall of Rugby
1975	Tyneside	GWR King	3½"	1,55%	L. Joyce of Chingford
1976	Kinver	'Speedy'	5"	1,58%	B. Perrett of Southampton
1977	Chingford	'Speedy'	5"	2,32%	B. Perrett of Southampton
1978	Guildford	'Maid of Kent'	5"	1,61%	P. Wood of Chingford
1979	Bristol	Stirling Single	5"	2,17%	D. Morris of Urmston
1980	Bedford	B.R. Class 7	3½"	1,37%	P. Wood, a private entry
1981	Bournemouth	LNER J39	5"	2,41%	P. Wood of Chingford
1982	Leyland	GWR de Glen Compound	5"	1,50%	R. Amsbury of Derby
1983	Guildford	Royal Scot	5"	1,35%	L. Pritchard of Harlington
1984	Bristol	Royal Scot	5"	3,66%	L. Pritchard of Haylington
1985	Urmston	'Nigel Gresley'	5"	1,85%	A. Crossfield, private entry
1986	Bournemouth	'Nigel Gresley'	5"	1,64%	A. Crossfield, private entry
1987	Birmingham	LSWR Adams Tank	5"	2,29%	K. Moonie of Chingford
1988	Leeds	BR Proposed	2-8-2 5"	4,392%	L. Flippance of Guildford
1989	Leyland	BR Proposed	2-8-2 5"	3,02%	L. Flippance of Guildford
1990	Guildford	BR Proposed	2-8-2 5"	3,317	L. Flippance of Guildford
1991	Bristol	BR Proposed	2-8-2 5"	1,733%	K. Ayling of Worthing

Acknowledgements.

Firstly our thanks to National Power Plc for allowing us to use the site this weekend and throughout the year, for providing the Marquee, temporary fencing and many other services.

Again to National Power Plc for the donation of a Vernier caliper gauge to be used as a prize.

To both the Bristol and the Birmingham Societies of Model Engineers, for the loan of their Dynamometer cars. ----- No Dynamometer cars, No IMLEC !

To Ron Marsden for producing the 'How to find Eggborough' map. ---He does this for a full time job.

To the Scunthorpe SMEE for bringing and operating their portable track for the benefit of the children.

To the Bristol Club for their description on how to calculate the results.

To several people who are filming the event in order to make a video of the weekend.

To Kevan Ayling for the picture of 'Octavian' last years winning Locomotive.

To the IMLEC 92 committee for the time freely given over several months to organise the event.

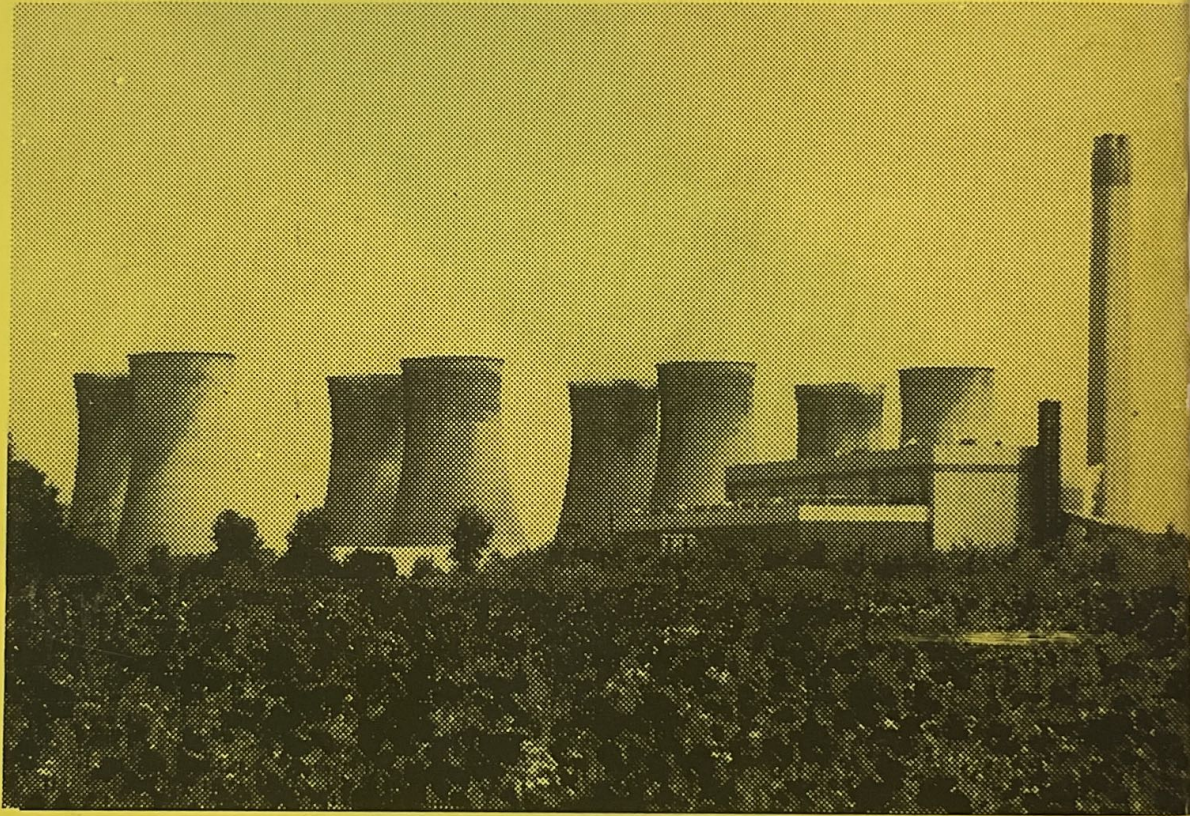
To the members of Leeds SMEE, and their wives, many of whom have been asked to do rather mundane jobs when they would rather be running engines.

To Ted Jolliffe and 'Model Engineer' who asked us to organise the event, and Martin Evans who thought of the idea in the first place.

To the competitors for coming and running their locomotives.

And so to Next Year when the event will be held at Leyland. -----see you there! with an engine?

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*Eggborough Power Station
is proud to host the
IMLEC 1992 event.*



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