



The Newsletter of Laurence, Scott & Electromotors

PART OF THE  FKI GROUP OF COMPANIES

Welcome to LSE

Welcome to the Laurence, Scott & Electromotors newsletter.

The last year has been one of significant developments for LSE in Norwich. Highlights include the release of a new range of TEFC motors (the M-Series, described below), the transfer of all traction motors new build and refurbishment (from our sister company Brush Electrical Machines) and, the completion by a further 5 apprentices of their engineering training (part of the 30-strong trainee group at LSE). On top of that, we have completely revised our machine shop layout, installed a state-of-the-art automated motor lamination production line and brought on-line a completely new integrated ERP system.

LSE has never been so fired up about the future, with continuing product development programmes for high voltage motors and the benefits from a major investment programme beginning to show through.

We are looking forward to the coming year and hope that we will be able to count you amongst our supporters and favoured customers.

Andy Jobbins - Managing Director



Exhibition

New motor series shown at *Drives & Controls* and *Hannover* shows



Drives & Controls Stand



Hannover Messe Exhibition

Taking pride of place on the FKI Rotating Machines Division stands at *Drives & Controls* and *Hannover Messe* has been the new M-Series high voltage TEFC induction motor range. These motors represent a milestone in their design for high efficiency and low whole-life cost, providing excellent power-to-weight ratios while minimising running noise & vibration. Covering 355-500 frame sizes in 3.3kV to 13.8kV, the M-Series can provide 150kW to 1.5MW of output capacity.

As a replacement for the LSE R series TEFC machines, the M-Series takes best design and manufacturing practices from two internationally-recognised makers of high quality electrical machines within FKI Rotating Machines Division. The whole range was developed in conjunction with FKI RMD partners Marelli Motori of Italy and these motors benefit from a concerted effort to harmonise components across the range and procure/manufacture parts via the most cost-effective channels. LSE are manufacturing the MV/HV versions of this range and Marelli Motori are to make the LV versions, so as to capitalise on the experience base of both factories in their respective areas.

LSE traditional markets are the oil & gas, petro-chem and chemical manufacturing industries where hazardous area approvals and experience are critical in gaining user acceptance. The M-Series has been designed from the outset with hazardous area users in mind and standard machines are suitable for EExn/IP56 applications without project-specific design reviews.

In fact, the main thrust of the M-Series is to improve availability through the concept of mass customisation – the base motor is standard, but a list of 'standard' options are available to suit the requirement of individual end-users.

The aggressive cost reduction programme and rationalised component sourcing programme that formed the basis of the entire re-design process also permits the M-Series to be offered at prices competitive with the very best in the industrial marketplace. There is no doubt that these new motors represent a new era for LSE in high voltage motor manufacturing and sales.



TASC drives motorway safety

When ESM Ringway needed a variable speed pump drive for a special road safety vehicle, they approached LSE for an eddy current drive system. The ESM Roadgrip vehicle sprays an anti-skid coating onto the surface of road sections such as motorway entry/exit slip roads and dangerous junctions. A metering pump delivers the coating solution to a spray head mounted at the rear of the vehicle. The spray head incorporates 8 separate nozzles which can be selected in any combination dependant on the spray pattern required. The ESM Roadgrip vehicle houses all of the equipment necessary to fulfil this function, including chemical holding tanks, pumps, power generation and controls.

The overall pumping operation has to offer variable application rates and be suitable for the rigors of use on a moving road vehicle. Mechanical robustness, precise control and simple set-up & maintenance was

vital, and ESM selected a TASC eddy current coupling to achieve these aims.

This new system uses a diesel engine as prime mover, driving the material feed pump through a TASC eddy current variable speed coupling and EPG gearbox. Previous designs had used a larger diesel-driven alternator with a standard induction motor & inverter for the variable speed material pump – more complex, more costly and less efficient. The eddy current solution included standard TASC electronics, controlling pump speed automatically in proportion to the number of nozzles in use on the spray head. In the event that none of the nozzles are open, the drive goes into a pre-set speed operating in a re-circulation mode to prevent pipe blockages.

Dave Kilner (Design Engineer, ESM) said "The installation and set-up was very straightforward



ESM Ringway spraying anti-skid coating

compared to previous arrangements, and we are very pleased with the result. In its first year, the vehicle has completed several thousand sq.m of Roadgrip safety improvements without any problems."

Customer Services

In response to growing customer demand, LSE are pleased to announce additional payment facilities by credit card through VISA.

This new facility will enable us to speed up despatch of service engineers and spare parts with a single telephone call, e-mail or fax, subject to credit status.



FKI Rotating Machines' Centres of Excellence

FKI Rotating Machines Division now includes HMA Power Systems of Ridderkerk, NL (formerly Holec Machines and Apparaten) since their acquisition in March this year. Rotating Machines Division clearly encompasses a significant proportion of the global electrical machines business, bringing together 6 companies with a combined history approaching 700 years and a product range spanning all sizes of industrial motors, generators, electronic drives and rotating test equipment.

In order to provide the best solutions for customer applications, Rotating Machines Division companies have been re-organised into appropriate **Centres of Excellence**, concentrating particular expertise and product capability to those locations best suited. Laurence, Scott & Electromotors has enormous experience and capability in asynchronous induction motors, and as such, LSE is the **Centre of Excellence for Induction Motors (HV)**. LSE will continue to service and manufacture the NORAC and NS machines, plus Brush and HMA induction motors, as direct repeats for existing machines. It is also a tremendous opportunity for FKI Rotating Machines Division to combine the design engineering improvements developed over many years by previously competing design teams, making our machines significantly better than standalone competitors.

Slip-ring machines resurrected

State Water Projects (a business unit of the Department of Natural Resources, Queensland, Australia) chose Thompsons, Kelly & Lewis Pty pumps with LSE motors for a pump stations upgrade on the Awoonga-Callide pipeline.

New generating capacity being built at Callide Power Station at Biloela, Central Queensland required the existing 54km Awoonga – Callide water pipeline to be substantially enhanced, uprating pumping capacity and duplicating about 33km of pipeline. First commissioned in 1988, the pipeline conveys raw water from the Awoonga Dam to an outlet on the Calliope Range where the water gravitates to Callide Dam along natural waterways. The upgrade is due for completion in September 2000.

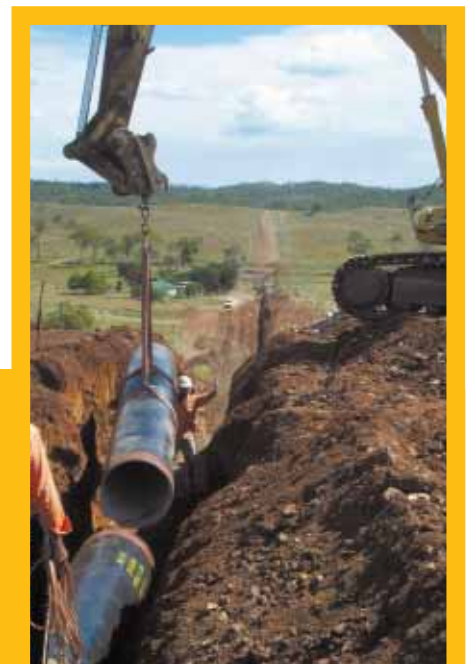
The pump package includes 2 x 3.1MW motors with vertical split case centrifugal pumps, 3 x 1.5MW horizontal multistage centrifugal pumps and 3 x 2.1MW horizontal multistage centrifugal pumps. State Water Projects chose the TKL pumps with LSE motors due to whole life efficiencies.

The original machines used in the pump sets were Brush slip-ring machines, which were therefore

able to be precisely-matched to the pump load characteristics for greatest efficiency. As FKI Rotating Machines' **Centre of Excellence for HV Induction Motors**, LSE were able to provide new slip-ring machines based on the BEM designs. It is a fine testament to the flexibility and co-operation within FKI Rotating Machines Division that these machines were built to specification to a very tight programme and commissioned in Australia, on schedule.



A slip-ring machine based on the BEM design



Awoonga – Callide water pipeline

New automated notching line comes alive

One of the major investment projects at LSE this year has been the automated press shop with the robotic notching line. The old press shop and store was dismantled and rebuilt to house the press shop, with 400 and 150 tonne blanking presses and a 5-press notching line fed by robot arms from W S Atkins of Thetford, Norfolk. Despite some appalling weather conditions and the need to continually pump out river water during the foundation reconstruction work, the project was completed to schedule and to budget.

The new press shop produces both more and better quality laminations for all our motors, stamping the rotor and stator laminations at the same time, and eliminating opportunities for mis-alignments and lamination damage through handling.



The automated press shop

Apprentices take on new heights (and depths)

Teambuilding and activities weekend



LSE is a major force in manufacturing technology training in Norfolk, with something like 30 apprentices being trained by the Company at any one time. The Modern Apprenticeship Scheme run by the Company takes on 4 or 5 young people every year for a 4-year programme including both classroom and on-the-job training.

This year, practically every apprentice also went on a teambuilding and activities weekend in the Peak District. They participated in orienteering, caving, abseiling, rock weaseling and raft building, with praise for the organisation of food & accommodation, but some criticism of the weather – somehow, no-one told them that it was cold & wet in the Peak District in March.

Walking to Work?

Open cast mining for coal, phosphates and other valuable mineral deposits requires accurate stripping of the topsoil for efficient production access, and to allow proper site restoration after site exhaustion. Bucyrus Europe Ltd of Lincoln, UK (formerly Ruston-Bucyrus) have been producing dragline excavators with enormous buckets (up to 140m) for over 100 years and also bought out Ransomes & Rapier Ltd in 1988. Bucyrus has specialised in designs which allow these huge machines to 'walk' along the extraction face under their own power.

LSE's contribution to these huge machines has been the auxiliary controls, with SLENDIAUR 6.6kV switchboards controlling the main motor / generator sets, which in turn feed the various electric motors and slave functions of the dragline.

There are twelve of these W2000 Draglines (machine shown opposite) operational in India and three new machines are currently being



Walking to work, anyone?

manufactured with a bucket capacity of up to 34.4m and a walking weight of 1830 tons.

Traction takes the train to Norwich

As part of the FKI Rotating Machines' redistribution of product to appropriate Centres of Excellence, LSE has recently opened a dedicated bay for the manufacture and refurbishment of traction motors to support our associate company Brush Traction of Loughborough.

Many pieces of specialist equipment dedicated to traction motors (commutator-seasoning units, VPI impregnation system and curing ovens, armature balancing sets and dedicated traction motor test bays have been installed at Norwich. In addition to ongoing contracts for refurbishment of existing units in the field, current new-build orders include motor/alternators for Hong Kong Railways, and 24-off traction motors for use on new railcars on London's Docklands Light Railway. The propulsion system has two separately-excited traction motors with individual field and armature choppers, controlled by a hybrid microprocessor/conventional electronics control system. Brake choppers and resistors provide rheostatic braking.



Shown above is a Class 57 Freightliner heavy duty freight engine refurbished by Brush Traction at Loughborough with the onboard motor/generator set rebuilt by LSE. Trainspotters amongst LSE staff were a little disappointed in that only the motors rather than the locomotive, gets refurbished at Norwich. However, a trip was organised to Loughborough so that all involved could see the locomotives and other rolling stock first hand (and sit in the drivers seat!).

Y2K Performance

After all the hype and worry caused by the fears over world-wide systems failures as the date clicked over at the end of 1999, LSE can report no reported failures attributed to any Y2K problem. Our IS team were, however, successful in implementing a new integrated ERP system, UNIX servers and site-wide fast Ethernet network, together with a significant number of other internal systems upgrades and changes to previously non-compliant systems in HR, CAD and Office Automation.

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- DC motors to 120kW
- Generators to 4,000KVA
- Flameproof motors

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- Flameproof motors
- Range of Power Transmission Products

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Website

LSE on the WWW

Everybody's doing it and LSE are no exception!

As part of the FKI Electrical Engineering Group, LSE have taken over a section of the fki-eng.com web-site. The whole group is represented on this site and the inter-relation between Group members becomes quite clear on inspection of the site map.

The product pages are driven by a database engine, rather than being static pages which are uploaded individually.

The power of the database engine makes for easier updating and reorganisation whenever required, which simplifies life considerably for the LSE webmaster, bearing in mind the very diverse LSE product line!

Look us up at www.fki-eng.com/lse

