

# news

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Energy generation  
and drive systems

## ISSUES AT STAKE

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energy-using products

## APPLICATIONS

Retrofit of 727  
wind turbines in Italy



  
**EMERSON**  
Industrial Automation

# The EuP directive and the eco-design of energy-using products

From 16<sup>th</sup> June, 2011, it will be compulsory for electric motors marketed in Europe to have efficiencies higher than or equal to IE2 level. Leroy-Somer has grasped this opportunity to conduct a complete overhaul of their IE2 range and to develop an entirely new IE3 range, which will be available from 2012, well in advance of the deadline set by the Directive.



## Eco-design of products

First of all, eco-design is a voluntary approach adopted by businesses that believe it is important to take the environmental impact of a product into consideration. This approach is applied to every stage of the product's life cycle.

The European Union has gradually incorporated this approach into a

regulatory framework by adopting various directives, the first of which came out in February 2003, and focused on the design of electrical and electronic equipment (RoHS directive) and the end of life of such equipment (WEEE directive). For further details, see LS News, No. 11, May 2003.

## The 2005/32/EC (EuP) directive

In July, 2005, Europe tackled the eco-design of energy-using products by adopting the EuP (Energy-using Products) directive, which was aimed at forcing manufacturers to take into consideration the amount of energy used throughout the life of a product, and at finding ways of reducing energy consumption.

These new European regulations define the principles, conditions and criteria that are to be used as a basis for setting the requirements that energy-using products covered by implementing measures must meet in order to be released on the European market.

In theory, they apply to all products that use energy to function. It is the

responsibility of manufacturers (or importers) to make sure that they can guarantee that products comply with the relevant implementing measures.

## Implementing measures

On the basis of this framework directive, the European Commission have adopted several regulations that apply to specifically targeted products. Regulation 640/2009, dated July 2009, sets out the rules to be applied to electric motors. It details the products covered and those that are exempt, and lays down a timescale for efficiency levels that must be reached by machines sold on the European market:

- ▶ from 16<sup>th</sup> June, 2011, motors must have efficiencies higher than or equal to level IE2;
- ▶ from 1<sup>st</sup> January, 2015, motors with a rated power of between 7.5 and 375 kW must either have efficiencies higher than or equal to level IE3, or have efficiencies equal to level IE2 and be equipped with a variable speed drive;
- ▶ from 1<sup>st</sup> January, 2017, the rated power range covered by the regulation will be extended downwards to include power levels as low as 0.75 kW.

The regulation also details requirements regarding the information supplied to consumers, and the methods of measurement and calculation that must be observed in order to ensure product conformity.

The directive bases the classification of motors with different efficiencies on standard IEC 60 034-30. For further information regarding this standard, see the data sheet in LS News, No. 22, April 2009.

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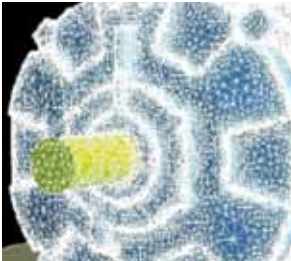
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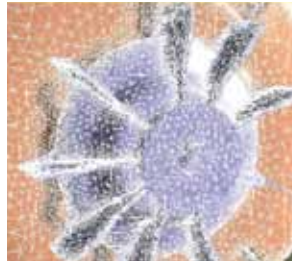
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# Leroy-Somer's new high-efficiency motor ranges



*New IE3 motor range - Representation of three-dimensional mesh*



*Detail of meshing close to housing*

## New range of Leroy-Somer IE2 motors

With immediate effect, Leroy-Somer is able to supply both 2 and 4-pole versions, IE2 class motors with power up to 375 kW, protection IP 55 or IP 23. This range is the successor to the old EFF1 range. The company is also lending support to their manufacturer clients, helping them to progress beyond IE2 classification as soon as possible, and thus move ahead of their competitors.

By making the new efficiency classifications compulsory and by imposing new methods for their measurement and calculation, the EuP directive has created a unique opportunity for major manufacturers to completely overhaul their ranges of high-efficiency motors.

Leroy-Somer's new IE2 range takes client expectations into consideration. Certain factors have been reworked, such as connector technology, the legibility of nameplates and improvement of delivery times by rationalising components...

Thanks to Leroy-Somer's international organisation, this streamlined IE2 range will be manufactured in every region of the world.

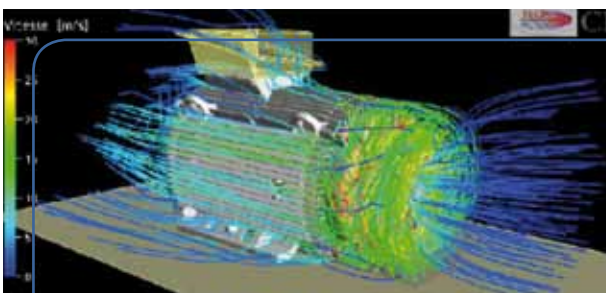
## The future range of IE3 motors

Leroy-Somer is already able to supply motors from their IE3 range. The company has collaborated with the top European universities to design the best possible IE3 range. This will be extremely competitive by 2012, and

already complies with the directive, even though the latter does not come into force until 2015.

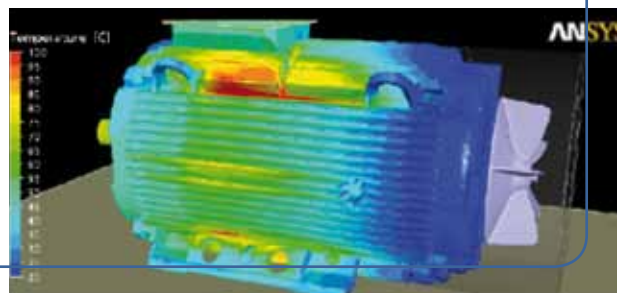
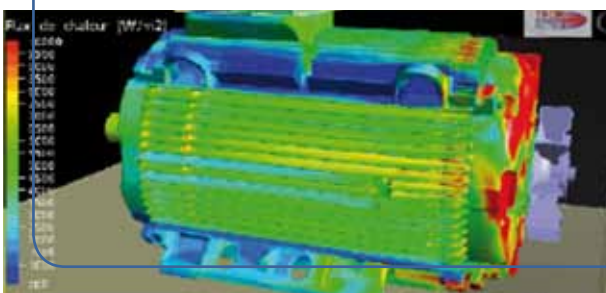
In order to ensure compliance with the directive, the tools for measuring efficiency have been completely replaced: use of a torque meter for precision measurement of motor torque, validation of thermal models, etc.

Leroy-Somer will do everything in their power to continue reducing their end users' energy consumption. With the creation of these new ranges of IE2 and IE3 high-efficiency motors, the company has just risen to yet another challenge.



- OPPOSITE; FROM TOP TO BOTTOM:**
1. Visual representation of flow (wavy lines)
  2. Distribution of thermal flows across housing

**BELOW:**  
Temperature distribution across housing



## Retrofit of 727 wind turbines in Italy

*International Power has decided to modernise its oldest wind farms and improve their productivity. In updating its existing production capacity, International Power has chosen Leroy-Somer as a partner for the retrofit of 727 generators.*



International Power, the leading producer of wind energy in Italy with more than 550 MW, has decided to modernise its 40 wind farms comprising 727 turbines. To see through this ambitious project to the end, International Power set out to find a reliable, successful and competitive partner. Leroy-Somer is one of the manufacturers selected to provide generators for the wind turbines.

Having received the specifications, Leroy-Somer's engineers rapidly organised various technical meetings in Rome with a view to presenting the companies' major strengths. With 9 factories spread over 5 continents producing Leroy-Somer alternators from 1kW to 20MW, the company is the world's leading manufacturer of alternators and has a dense network of subsidiaries and services.

Firstly, Leroy-Somer's teams clearly demonstrated the company's know-how in the field of renewable energy

sources: the wind turbine of course, but also cogeneration and hydroelectricity. Further to this, they presented the multiple technical evolutions applied to Leroy-Somer generators over the last three years, principally for those which generate a power of 660 kW and 850 kW, as well as the technological innovations developed by Leroy-Somer.

To meet exactly International Powers' specifications, Leroy-Somer has adapted the generators so that they respect the operating restrictions, be this at the level of security, reliability or of the generators' life cycle. It has also undertaken to adapt the production lines dedicated to this project and to increase the flow of production. Finally, all of the steps of the process have been validated by the different Leroy-Somer teams (raw materials, production, delivery, etc.) in order to ensure a smooth follow-up of the project.

## International Power

International Power, a British multinational company operating in Italy since 2006, is the leading wind energy generator in Italy. With more than 550 MW of capacity in operation, the company accounts for over 17% of Italy's wind power production. The assets are the most extensive and productive in Italy and they include: 40 wind farms spread over 34 municipalities (in Molise, Campania, Puglia, Basilicata, Sicilia and Sardegna) and 2 wind farms currently under construction in Calabria, for a total of 727 turbines.

The IP Group generates each year a cumulative renewable energy capacity of approximately 1.1 million MWh – equivalent to the energy demand of over 400,000 Italian families. IP's power generation from renewable sources reduces each year CO<sub>2</sub> emissions by about 600,000 tonnes and allows the country to save on the import of 1.4 million barrels of crude oil.

Over the next three years, International Power has planned to invest approximately 250 million euros to modernize and expand its current wind assets. And over the next two years, to implement new wind and solar projects, International Power will invest approximately 200 million euros, which will fund 2 wind farms in Calabria currently under construction and at an advanced stage of development, as well as other projects currently undergoing the authorization process.



# HB-Feinmechanik – new food paste extruder

*By coming up with an innovative solution, Leroy-Somer has played a part in perfecting a food paste extruder. The drive configuration chosen not only reduces the overall size of the machine but also saves energy by increasing efficiency.*



Measuring, mixing, blending, breaking up, dissolving, melting, kneading, cutting, compressing, sterilizing, aerating, encapsulating, separating solid and liquid stages and texturising are the main conversion processes performed using reactive extrusion technology.

This technology is termed reactive because the product undergoes physical and chemical changes as it is subjected to pressure, temperature variations and mechanical stresses. In fact, the extruder behaves like a chemical reactor, making it possible to blend all kinds of materials, a delicate operation given the multiplicity of external parameters.

The drive for the prototype was built in collaboration with Leroy-Somer, aims to reduce the effect of these external parameters and produce a stable, thoroughly blended product that exactly matches the user's requirements. It was presented at the Powtech Fair at the end of April 2010, and met with huge success. Currently, a research institute in Bremen is carrying out tests in order to perfect the various recipes used.

For the extruder drive, Leroy-Somer proposed a Compabloc 3333 geared motor with helical-toothed gearing from the 3000 in-line range with an LSRPM permanent magnet synchronous motor from the DYNEO® range combined with a Unidrive 11T drive.

Equipped with a speed sensor that is built into the winding, this configuration, which guarantees consistent torque across the entire speed range, has considerable advantages:

- it is exceptionally compact;
- it is extremely efficient, thanks to permanent magnet synchronous motorisation technology;
- it offers total compliance with hygiene requirements thanks to its screw products and paint having been specially designed for use in the food industry.



HB-Feinmechanik are specialists in the manufacture of counter-rotating twin screw extruders for a large number of markets such as the plastics industry, the food processing industry, the pharmaceuticals, cosmetics, and even the chemicals industry, etc.

The company, which employs 200 people and is based in Metten in Germany, is also well known for its activities in other fields: pressure technology, testing and measurement technology, mechanical engineering, automation, and medical equipment, such as measuring instruments.

# Power consumption down by 30%

The replacement of a Schrage motor with a power-saving permanent magnet motor reduced the power consumption by 30%. It simultaneously cut maintenance costs significantly.



The old, worn-out Schrage motor...



... was replaced by an energy-efficient LSRPM motor.

Primo Denmark is one of the leading plastic producers in the country, manufacturing, among other things, a large range of maintenance-free plastic mouldings which are used as finish in the construction industry in floors, walls, doors and windows.

The plastic mouldings and other plastic products are manufactured through extrusion processes involving the use of adjustable speed motors. For many years, the plastic industry has traditionally used three-phase Schrage commutator motors where the speed is adjusted in a simple, electromechanical way.

Technological development has, however, bypassed the Schrage motors. At the same time, they have very high maintenance costs and it is difficult, if not impossible, to obtain spare parts for Schrage motors nowadays.

## The newest motor technology recommended

Ølgod Elektro, which is Primo Denmark's electromechanical service partner, recommended, in connection with the necessary replacement of a Schrage motor, an adjustable speed PM motor from Leroy-Somer.

By using this newest motor technology, Primo Denmark was aiming to achieve a significantly higher efficiency and simultaneously cut the motor's maintenance costs at the extrusion plant. The original Schrage motor had an output of 22 kW and could be replaced without any problems by an LSRPM of only 15 kW.

Ølgod Elektro has subsequently measured the savings to be equal to a reduction of 30% of power consumed.

As regards the number of operating hours, the power savings were up to DKK 8,250 (£930) per year and Primo Denmark simultaneously saves between DKK 3,000 (£337) and DKK 5,000 (£562) per year in maintenance costs.

Primo Denmark has so far replaced the motor at one extrusion plant and the company is considering additional replacement at similar facilities, which are also equipped with Schrage motors.

# Oil & Gas: Leroy Somer UK fully registered on FPAL

Leroy Somer has developed a strong experience in the Oil and Gas market thanks to its dedicated centralised project pursuit team and its worldwide network.

Continuously increasing its presence on this market, Leroy Somer Ltd is now fully registered on the First Point Assessment Ltd (FPAL) database which is used by the Oil & Gas industry in the UK, Netherlands and Ireland to select and pre-qualify suppliers.

## ABOUT FPAL



Supplier number: 10041446

FPAL (part of Achilles) works to identify, qualify, evaluate and monitor suppliers on behalf of its purchasing members. They build and support buyer-supplier communities in the oil and gas industry, creating an effective Supply Chain network.

Established in 1996, FPAL is governed by an industry based Steering Committee which includes representatives by oil majors, main contractors and suppliers such as BP, Shell, Petrofac, ConocoPhillips, ... (companies representing the FPAL Steering Committee in January 2010).

[www.fpал.com](http://www.fpал.com)

## DRIVE SYSTEMS AND GENERATION OF ENERGY

FPAL purchasing members can easily check Leroy Somer solutions for the Oil and Gas industry:

- Drives systems with a full range of low voltage electrical motors and variable speed drives,
- Generation of energy with a complete low and high voltage alternators range.



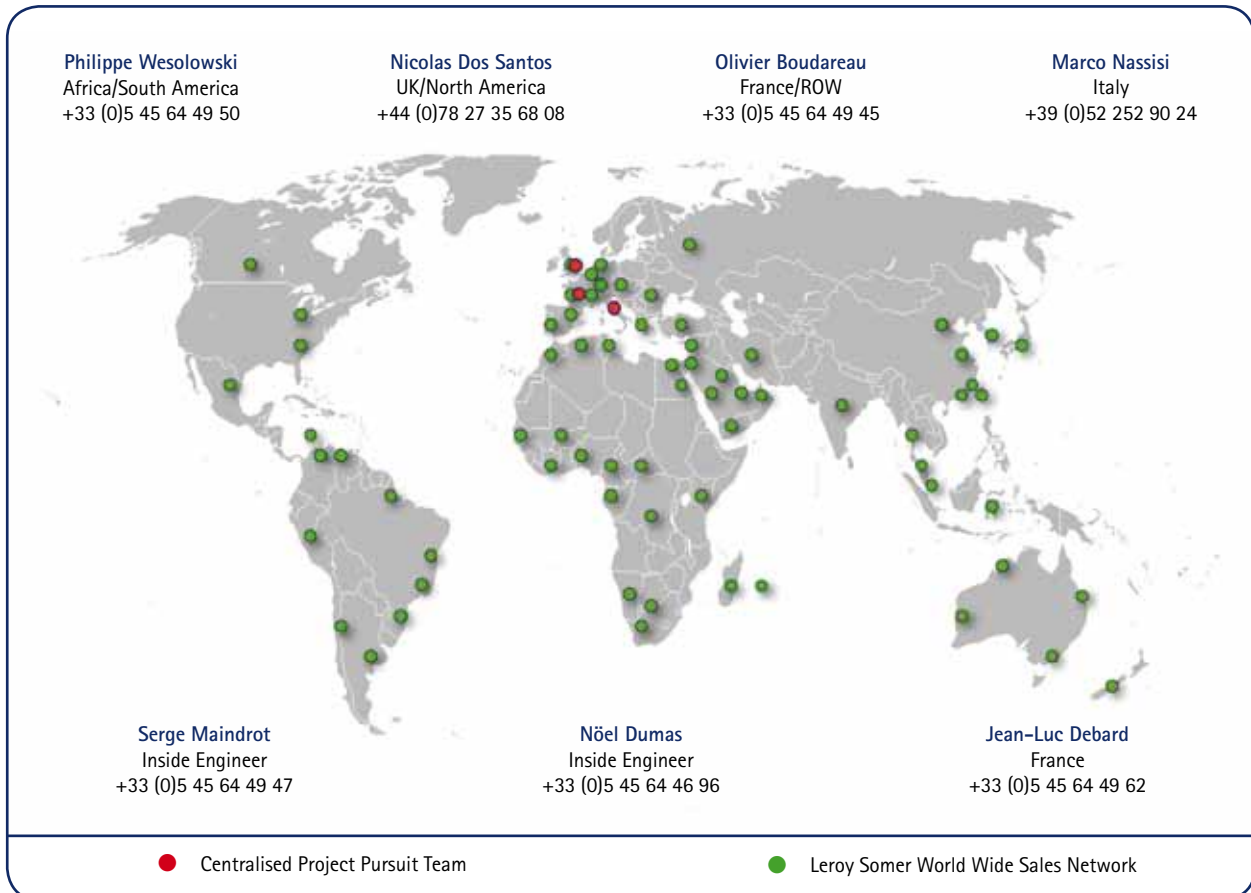
### NOTE

Another pre qualification called Joint Qualification System (JQS) empowered by Achilles also exist for Norway and Denmark. The Achilles JQS Certificate of Qualification was awarded to Leroy Somer Norway last April (Registration number: 556175-2949).



# Project management: Leroy Somer strategy

## DEDICATED AND CENTRALISED TEAM



Engineering Procurement and Construction (EPC) projects involves three decision levels: End Users, Engineering Procurement Contractors and the Original Equipment Manufacturers (OEM).

The dedicated and centralised team is the strongest asset of Leroy Somer to compete in the Oil & Gas (Artificial Lift, Floating Platform, Refinery, Petrochemical site, Liquid Natural Gas plant – LNG, Gas storage,...), Mining (Copper, Gold, Uranium, ...) and Energy markets (Solar, Power plant,...). Thanks to this organisation and with the support of its world wide sales network (see map), Leroy Somer can be close to the decision makers, advise

and support them during all the project phases from the definition of the technical specification through to commissioning.

**More than ever, Leroy Somer, part of Emerson Industrial Automation, is a solution provider.**

Leroy Somer does not only supply electrical motors, variable speed drives, gears or alternators...Leroy Somer provides complete and dedicated solutions and services in partnership with the customers as the project develops.



# ATEX security for the oil and gas industry

*The Danish company Marimatech is a global specialist in berthing aid systems and quick release hooks for the port facilities of the oil and gas industry.*

Quick release hooks are port-placed mooring systems used to ensure that oil and gas tankers are securely anchored to the quay. The industry places high requirements on security; for example, electric motors and accessories must be ATEX-certified and explosion-proof.

In the last couple of years, Marimatech has been very successful in introducing their newest VIKING Quick Release Hooks, which combine advanced technology with the well-known Danish design where security is given the highest priority.



The specially designed Leroy-Somer FLSD ATEX motors are designed for S4 operation where motors work for a relatively short time under a very high load.

Leroy-Somer has used the newest technology with "potted stators" where the coils are hermetically enclosed in epoxy and thereby protected against moisture and corrosion.

This design also has the advantage that it does not use any heating elements, which are otherwise included in other motor designs in order to prevent condensation. This is a contributing factor to the better protection, longer service life and, in particular, the competitiveness of Leroy-Somer's motors.

## Priority to quality and security

In this connection, Marimatech has invested strongly in new modern production facilities both at home and abroad where specially designed factories are dedicated to the production of nothing other than VIKING Quick Release Hooks.

All low-tech parts of the Quick Release Hooks are manufactured and assembled in accordance with the European standards and the standards of Lloyds Register of Shipping and Bureau Veritas at the steel factory in China. The hooks are then transported to the headquarters in Denmark, where all electric components and ATEX motors are installed.

After the installation of the motors and the electric parts, each individual Quick Release Hook is inspected and load tested and the equipment is calibrated before it is shipped to end-customers in the oil and gas industry in most parts of the world.

## Hermetically protected ATEX motors

Marimatech has used Leroy-Somer's ATEX motors in a number of projects and Leroy-Somer has delivered epoxy-coated ATEX motors for one of the latest ones, Quick Release Hooks, which will be used at the Port of Marseilles in France.



# Calculating the efficiency of an induction motor

## The efficiency of a machine

Efficiency is the ratio between output power (needed to drive a machine) and power absorbed (power consumed). It is therefore inevitably less than 1. The difference between output power and power absorbed can be accounted for by the electric machine's losses. It follows that 85% efficiency means losses of 15%.

## Direct measurement method

When using the direct method, efficiency is calculated on the basis of mechanical measurements (torque T and speed w) and electrical measurements (Power absorbed P<sub>abs</sub>). If the measuring tools are accurate (use of torque meter), this method has the advantage of being relatively easy to use. However, it provides no information regarding the machine's performance or the sources of potential losses.

$$\eta = \frac{P_{out}}{P_{abs}} \quad \text{with } P_{out} = T\omega$$

## Indirect measurement methods

These methods determine efficiency by establishing the machine's losses. Traditionally losses are divided into three different categories: joule losses (stator L<sub>js</sub> and rotor L<sub>jr</sub>), iron losses (L<sub>f</sub>) and mechanical losses (L<sub>m</sub>), which are relatively easy to measure. In addition to these losses, there are various losses known as additional losses, which are more difficult to establish.

Under the IEC 60034-2 standard of 1972, which will remain in force until November 2010, additional losses are fixed at 0.5% of the power absorbed.

$$\eta = \frac{P_{abs} - L_{js} - L_{jr} - L_f - L_m - L_{add}}{P_{abs}}$$

with  $L_{add} = 0.5\%P_{abs}$

The losses can be traced to a variety of sources: surface losses, inter-bar currents, high frequency losses, leakage flux losses, etc. They are specific to individual machines and play a part in reducing efficiency, but are very difficult to quantify mathematically.

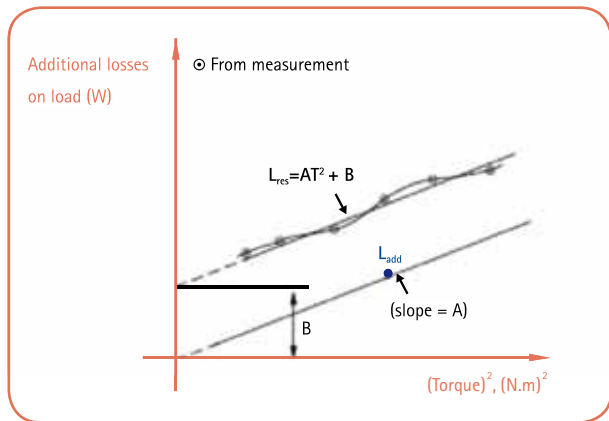
Under the new IEC 60034-2-1 standard of September 2007, these additional losses have to be measured accurately. This

approach is similar to that of the American IEEE112-B and Canadian CSA390 standards, which deduct additional losses from a thermally stabilized load curve.

Residual losses are calculated at each load point 25%, 50%, 75%, 100%, 115% and 125%:

$$L_{res} = P_{abs} - L_{js} - L_{jr} - L_f - L_m - P_{out}$$

with  $P_{out} = T\omega$



A straight line is drawn in the best possible alignment with the points on the curve. The measurement is acceptable if a correlation coefficient higher than or equal to 0.95 can be guaranteed.

When the straight line is brought back down to 0, it indicates the additional losses at the nominal point, i.e. at 100% load.

After that, the normal equation can be used to obtain efficiency:

$$\eta = \frac{P_{abs} - L_{js} - L_{jr} - L_f - L_m - L_{add}}{P_{abs}}$$

It should be noted that this method automatically corrects joule losses according to temperature and iron losses according to falls in the stator's resistive voltage.

Experience has shown that this measurement is extremely sensitive and requires the use of very accurate measuring tools. Also, the additional losses usually exceed the fixed 0.5% allowance, resulting in efficiency levels that are lower than those obtained under the old standard. For example, the efficiency of a 4P 22 kW motor measured according to the new standard falls from 92.6 to 92.3%.

# Harbour cranes: Energy generation and drive systems

*The unloading of containers and the handling of liquid and solid materials in bulk are among the many operations carried out in seaports on a daily basis. Leroy-Somer, who is very active in this market, is coming up with new solutions to the challenges of energy generation and harbour crane applications.*

## Seaports and container management

Container terminals are made up of distinct areas: a loading/unloading area in which, typically, "ship-to-shore" type cranes (STSs) or mobile harbour cranes are used; a storage area to which containers are transferred with the aid of RTG or "Straddle Carrier" handling cranes; a multimodal platform, combining several modes of transport and allowing containers to be forwarded to their final destinations by road, rail or river.

## Harbour cranes, port operators' expectations

Today port operators are on the lookout for cranes that are quieter, emit less CO<sub>2</sub>, consume less energy and have lower maintenance costs. These factors play a decisive role when it comes to choosing new equipment or upgrading old systems.

Because they can offer multi-technology packages covering everything from energy generation to crane movement applications, Leroy-Somer, working in close partnership with Control Techniques, are responding to the requirements of both operators and manufacturers of harbour cranes.

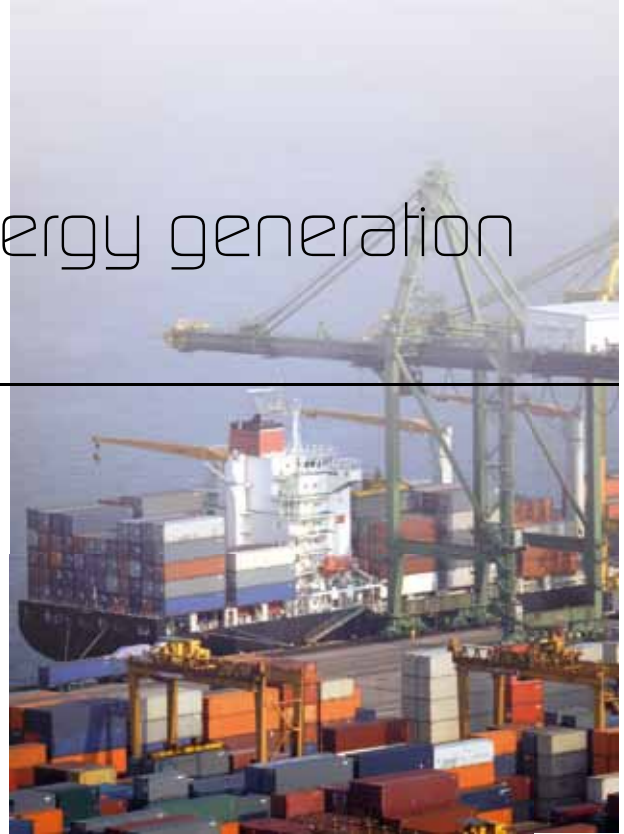
## Energy generation and variable speed

RTG or Straddle Carrier type handling cranes are fuelled by diesel-electric systems. On the one hand these systems supply the power needed for carrying out a range of movements, while on the other hand they also provide power for auxiliary functions such as lighting, air-conditioning or robots. Because their speed is fixed, a generator continues to supply maximum power even when a crane is in standby mode!

The use of variable speed is the principal means of reducing energy consumption and lowering a machine's noise levels.

Leroy-Somer can offer a highly competitive range of different solutions for variable speed energy generation:

- ▶ **THE RIS.GA SYSTEM** Even when the diesel generator is running on its lowest setting, the RIS.GA system ensures that a stable network of 400 V is maintained, guaranteeing



supply to auxiliary functions. This is an ideal solution where retrofitting is required, because it can be incorporated directly into existing cabinets and gives a rapid return on investment.

- ▶ **PERMANENT MAGNET GENERATOR OR ALTERNATOR** The alternative, which is using either a permanent magnet generator or a Leroy-Somer variable speed alternator, means that optimum electricity production is ensured and that the power produced will never exceed the actual needs of the machine. The choices made will be determined by the requirements of each application and the quantity of power needed for different crane movements.

- ▶ **REGENERATIVE DRIVES AND CABLE REELS** When a terminal is linked to a city's mains electricity or has its own land-based generating station, the electricity supply is fed through contacts passing over a rail or through motorized cable reels connected to each crane. The energy released during braking is returned directly to the network by using regenerative drives.

## Variable speed applications

Variable speeds are also used for all aspects of harbour crane movement. Leroy-Somer is able to offer a wide range of high-efficiency, asynchronous motors, and of extremely efficient permanent magnet synchronous motors combined with drives that are capable of supporting all the movements of a crane, i.e. raising the boom, hoisting loads, moving the trolley (transferring a container in the direction of the wharf) or displacement movements (of the crane itself).



## Xiamen Port (China): Installation of variable speed drive systems

The port of Xiamen is located in the province of Fujian, opposite Taiwan. It is 30 km long and comprises 74 landing stages, one of which is big enough to accommodate 100,000 tonne ships. This deep-water port is China's sixth port and has a capacity of 5 million TEUs (Twenty Equivalent Units), a TEU being the standard unit of measurement for ISO containers, which measure twenty feet in length.

Leroy-Somer has installed all the variable speed applications (hoisting, raising the boom head, crab, displacement...) on 6 STS and 6 RTG cranes.



## Innovation involving CVS Ferrari's Straddle Carrier (Italy)



Leroy-Somer has contributed to the development of a revolutionary electric straddle carrier, equipped with a complete set of electric command systems for the moving and hoisting of containers.

The drive system installed by Leroy-Somer comprises 4 HPM electric motors that are perfectly incorporated into the wheel hubs. Two HPM electric motors fitted into the winch reels control all the lifting functions. An electric generator based on HPM technology is connected to a combustion engine to ensure optimum electricity generation.



# The new Leroy-Somer website

*New topics, more intuitive ergonomics, constantly updated news items, a new graphics charter - the new Leroy-Somer website has been designed to match internet users' expectations even more closely, whatever their user profile.*

In recent years, Leroy-Somer's own profile has changed considerably. The company no longer simply manufactures products. Instead, its current focus is on offering solutions and services. It is familiar with its clients' businesses and can offer a comprehensive package developed for and tailored to the needs of the main industrial and tertiary markets.

The new **Solutions & Services** section is split into four parts: drive systems, power generation, services and training. In each part, up-to-the-minute topics are explored. For example, under **drive systems** topics such as energy savings, renewable energies or variable speed are tackled. It is easy to download supporting documents.

Further links give access to detailed summaries of the main product groups or to the configurator, a highly efficient tool for product selection.

A further aspect Leroy-Somer is keen to develop is the provision of detailed descriptions of our services. A veritable mine of information is made available to the end user: environmentally-friendly maintenance, energy evaluations, repairs on site or in the workshop... To take advantage of these services or simply to obtain further information, all you need to do is click on the link and find the contact details for your nearest commercial agency.

A **Markets** section has also been created. This forward-looking section gives access to specific solutions put forward in response to the requirements of certain markets, or applications.

The new **Downloads** section makes all downloadable documents available to internet users in pdf format: leaflets, brochures, start-up and maintenance instructions, and now the full range of our technical catalogues. It also offers downloadable software updates.

With the arrival of this new site, Leroy-Somer has taken its place at the heart of Emerson Electric's Industrial Automation Division communications. A website that is worth looking into again!



# Quiz and distance learning with Leroy-Somer



The rise in multi-media internet technologies has opened the way for online learning (e-learning). This form of learning has remarkable advantages: learning opportunities anywhere in the world, 24 hour subject access for individuals or groups, individually tailored learning plans, reduced travel costs...



## First stage: attractive quizzes

The number of people taking part in Leroy-Somer quizzes is an indication of how successful they have been since they were first introduced online in 2008.

Anyone can access these quizzes via the Leroy-Somer internet site. They provide coverage of subjects in an enjoyable and entertaining way, and are either in questionnaire or in presentation form. Once you have completed a questionnaire, you can ask to see the quiz again together with the correct answers, or ask for your score.

The first quiz was on the subject of energy savings and was followed by others on electromechanics, electricity and electronics, and variable speed. The latest quiz deals with eco-design.

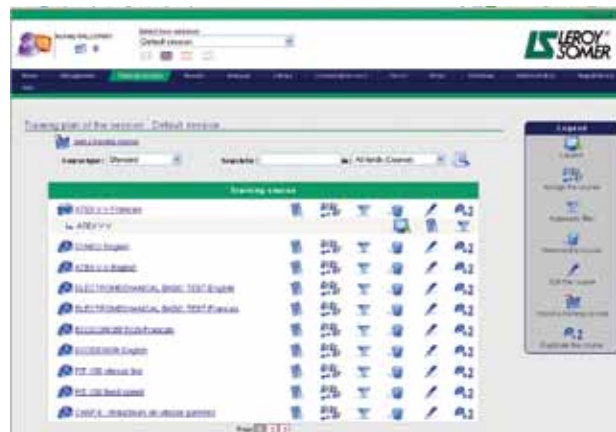
## Second stage: distance learning for employees

On the strength of this experience, Leroy-Somer decided to launch a fully-fledged internet learning centre and make it available primarily to their own staff worldwide and to their service partners. The Leroy-Somer "Learning Management System" is a comprehensive e-learning system which delivers information and training, but also tests those taking part. Various internet technologies are fully exploited to strengthen the quality of the training: individualized e-mail follow-up, creation of discussion forums for participants, tracking of results, bookshop facilities, drawing up of personalized learning plans...

Working closely with the learning centre, factories and sales representatives, the teaching staff offer employees distance learning that can help to improve their various skills and areas of expertise still further.

## Third stage: sales of distance learning

For many years now Leroy-Somer has been organizing training as well as basic and advanced courses for its user clients. Today, the company is developing a full-scale academy of online training. What we are actually doing is taking things a stage further by offering user clients online sessions in place of the classes currently delivered by the Leroy-Somer Training Centre (CFE) in south-western France.



# Leading the way in Electric Power Generation

- Comprehensive Range
- Global Presence
- Innovative Solution



*Pure energy*

New LSA 40  
10 – 23 kW alternator

Leroy-Somer's EPG (Electric Power Generation Division), world leader in Low and Medium Voltage alternators, has the most extensive range on the market, suitable for a wide variety of applications. Leroy-Somer EPG's expertise which is recognized throughout the Power Generation business, demonstrates its capacity to meet the needs of OEM's worldwide. Leroy-Somer EPG is proud to present the new LSA 40 alternator, a significant advancement in alternator design.

For more information on LSA 40 or the EPG Alternator range, you will find your local partner on [www.leroy-somer.com](http://www.leroy-somer.com)

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