

# A few references - hospitals

## Mater Children's Hospital, Dublin (Ireland)

The 3,025 kVA SDMO® generator installed at the Mater Children's Hospital in Dublin is without a doubt the biggest generator to be installed in Ireland over the past 30 years! This back-up generator replaces two generators that were formerly installed at the hospital. It has an MTU V20 4000 engine.



► *St George's Hospital (Lebanon) - 6 x 1.500 kVA*

## St George's hospital, Beirut (Lebanon): 6 x 1.500 kVA

St George's Hospital in Beirut is equipped with a low voltage back-up power plant comprising six 1,500 kVA SDMO® generators. This power plant was installed on site in demanding conditions: outside temperatures of 45°C and a requirement for extremely low sound levels (installation of the power plant in the hospital itself).



► *J. Minjoz University Hospital, Besançon (France)*

## Besançon (France): 5 x 2,200 kVA at the J. Minjoz University Hospital

The Jean Minjoz Hospital in Besançon (France), has two emergency generators fitted with safety override units as well as five 2,200 kVA generators. These generators are fitted with MTU 16V4000 engines and commanded by a KERYS command/control unit.

## Sant-Pau Hospital, Madrid (Spain): 2 x 1,400 kVA

The Sant-Pau Hospital has two 1,400 kVA SDMO® generators. Located on the terrace, these generators are housed in Super Silent containers that reduce the noise level of the installation. The two generators operate in parallel with and as a back up to the grid.



The Institut Gustave Roussy, near Paris (France) fulfils three functions: hospital, research centre and training centre



## Institut Gustave Roussy (France): an SDMO power plant comprising 4 x 2,500 kVA to guarantee the safety of hospital patients

Located in the heart of Europe, just outside Paris, the Institut Gustave Roussy (IGR) is the leading European anti-cancer centre. On a single site, nearly 2,500 men and women dedicate themselves to caring for cancer patients, developing new therapies and sharing their knowledge with the medical and scientific communities, both in France and internationally. The Institut Gustave Roussy has an SDMO® power plant comprising four 2,500 kVA generators.

### Project analysis and overall management

SDMO® managed the project from start to finish: prior studies carried out by the engineering department, design and installation of generators, electricity and support work in all the trades and professions necessary for the replacement of the back-up electrical supply system. The work was carried out in a U-type building (category 1 operational HRB\*), which brought with it particular constraints, especially concerning fire safety.

\* High Rise Building (a building that, due to its height, is subject to specific procedures in terms of fire prevention and firefighting).



### Technical specifications

Each generator is fitted with an MTU 20V4000 engine, a Leroy Somer alternator and a Kerys Tactil command/control unit, which has a user-friendly navigation system that, amongst other things, enables the configuration of site-specific functions, and manual operation of the generator.

### Safety first!

Grid back-up: to prevent all risks, the power plant installed at the IGR was designed to guarantee:

- electrical energy back-up for the installation in the event of failure of the main power source. (Return to the grid can be achieved by temporary coupling with transfer of the load without cut-off).
- operation of generators via forced operation
- operation in EJP mode (Peak Day Withdrawal) or other tariffs.

Automatic start-up in the event of loss of the grid or in EJP mode: the Kerys unit not only enables the power plant to be started automatically in the event of grid failure, but also makes it possible for it to function permanently coupled to the grid for Peak Day Withdrawal.

### A project managed from start to finish...

- Dismantling of the existing power plant
- Installation of four 2,500 kVA generators for back-up and emergency service with temporary coupling at medium voltage upon return of mains power
- Low and high voltage electrical installation, supply of transformers and alternator connection
- Civil engineering works to adapt the existing project to the constraints of new materials
- Provision of a temporary back-up power plant for the entire duration of the works (four generators with total power of 6,850 kVA in containers), HV connection with coupling to the grid.



*The Esquirol "Val-de-Marne" Hospital is a listed site under the historic monument classification scheme*



## **Esquirol "Val-de-Marne" Hospital (France): the know-how and engineering expertise of SDMO® at work to offer an overall solution in accordance with the demands of the site**

The Esquirol Hospital in Saint-Maurice, near Paris (France) has strengthened its back-up mechanisms by installing two generators connected to the building's HV loop. Formerly known as the "Charenton Asylum", the site is subject to the ruling on historic monuments and comes under the regional organisation responsible for urban development and equipment, whose task is to maintain the country's architectural heritage as well as the open spaces of conservation areas. The power plant was therefore subject to stringent architectural recommendations.

For optimum integration of the power plant on the site, the Project Owner and the "Architecte des Bâtiments de France" demanded that the structure should be completely buried and fitted with two chimneys complying with High Environmental Quality standards and covered to mid-height with mesh able to support climbing plants.

Thanks to its engineering department and its partnership with the companies AML and SCHNEIDER, SDMO®, offered an overall solution (the carcass and electrical equipment) that met the demands of the site.

After studying the constraints associated with the site's classification, our teams designed a secure underground layout. The finished project is harmoniously integrated into the site and also guarantees the continuity of the electrical supply for medical and neonatal equipment in the event of failure of the main grid.

This back-up power plant is fitted with two 715 kVA generators connected to two HVA transformers in a block assembly. The power plant also houses the "HVA loop" station with its automatic controls, enabling temporary coupling to the EDF network.





▼ *The NHE, Clermont-Ferrand (France)*

## The NHE in Clermont-Ferrand (France) : A new institution equipped with cutting-edge technologies

The purpose of the Nouvel Hôpital d'Estaing is to give the town of Clermont-Ferrand and the Auvergne region a large, modern and efficient infrastructure dedicated to mothers, women and children, as well as certain adult medical and surgical procedures and clinical haematology. The design of the building is resolutely modern, and is conducive to the quality of patient medical care and comfort and enhances the conditions under which health professionals carry out their work.

With its 565 bed capacity, this institution covers a surface area of 68,000 m<sup>2</sup> and is completely computerised, open to the exterior and built with the environment in mind. Equipped with cutting-edge technologies, it has been one of the community's flagship facilities since it opened at the beginning of 2010.

The air conditioning system and electrical back-up for the site are provided by four 2,000 kVA SDMO<sup>®</sup> generators fitted with MTU 16V4000 engines.

The project was carried out as part of a call for tender under a Public Private Partnership scheme for the design, construction, layout, maintenance and repair of the installation and its equipment.

Thanks to the expertise of its engineering and design department, SDMO<sup>®</sup> supplied a high performance, turnkey power plant that guarantees the comfort and safety of patients 24 hours a day.



## SDMO<sup>®</sup> equips the new hospital complex in Olonne-sur-Mer (France)

In Olonne-sur-Mer, in the Vendée (France), the public hospital has joined forces with private healthcare. This agreement saw the creation of the "Pôle Santé" at the beginning of 2010, housing the Côte de Lumière Hospital, the Val d'Olonne Clinic, a medical centre and new departments all on a single site.

The power plant that equips the site is a remarkable testament to the know-how and experience of SDMO<sup>®</sup> in the health sector: in addition to a perfect quality of finish, this power plant, comprising three 1,000 kVA generators, is coupled to the LV grid for optimal site safety.





## 15,445 kVA installed: Model safety at the University Hospital in Rennes (France)



The University Hospital at Rennes comprises several establishments, spread over the whole town: the main hospital (Pontchaillou), Hôtel-Dieu (the oldest institution, which houses the geriatric departments, amongst others), la Tauvraie (a 240-bed institution specialising in care of the elderly), the dental care centre, Hôpital Sud and a Research Centre, that must not be subjected to the slightest interruption in electrical power. Equipped with SDMO® generators, these buildings enjoy a particularly high level of safety in terms of the electricity supply.

The main power plant, installed at Pontchaillou, comprises three 2,000 kVA generators fitted with MTU 20V4000 and 16V396 TB34 engines, and a 2,750 kVA generator fitted with a MTU 20V4000 engine. The 4 generators are coupled to each other and to the HV grid.

The Process I control consoles have been replaced by Kerys Tactil consoles, which are used not only for controlling the generators, but also for management and monitoring from a remote command station. The power plant was kept in operation while the consoles were upgraded, which proved a real technical challenge!

The other university hospital buildings are spread over the entire city, and are linked to the HV internal loop, in addition to being fitted with a low voltage back-up unit and an emergency generator that powers the hospital's priority circuits: various levels of back-up that demonstrate the exemplary nature

of the installation.

To sum up, a first level of emergency power is therefore provided by the high voltage power plant, and a second level by the low voltage generators guaranteeing back-up for the high voltage power plant in the event of failure of the HV internal loop or the main grid supply for the building concerned.

In all cases, the technical team responds immediately.



## University Hospital in Dijon (France): 6 x 2,000 kVA for back up and Peak Day Withdrawal.

A Health institution that meets the needs not only of the city of Dijon but of the whole Burgundy region, Dijon Hospital (France), carries out its activities on three main sites:

- the general hospital, housed in a building classified as a Historic Monument
- the Bocage complex, which houses a large number of institutions, such as the children's hospital, paediatric emergencies, the maternity unit, the cardiology centre and more...
- the Champmaillot geriatric centre: dedicated to receiving, caring for and housing the elderly (geriatric medicine and rehabilitation) this centre is a benchmark in its field.



The University Hospital has six 2,000 kVA generators used as back-up for mains power, and during Peak Day Withdrawal. The installation of this power plant (carried out to replace the former, obsolete plant) was conducted in strict adherence to the work schedule and the sound level constraints relevant to the site: the date of installation of each component and the timescales allocated for carrying out trials were scrupulously respected, so as to avoid any cuts in power or back-up

services within the institutions that could put patients' lives in danger.

As project sponsor and leader within a consortium, SDMO® managed the project from start to finish: civil engineering was undertaken according to plans drawn up by the engineering and design department of SDMO®, which also led the whole power plant installation (including the new HV substation).

## Goumelen Hospital, Quimper (France)

In Quimper (France), the public psychiatric hospital is equipped with three SDMO® generators providing normal/back-up operation: two generators are coupled together in order to supply the hospital with at least half power, enough for priority loads in the event of a power cut. The third generator operates independently on a separate LV outgoing line.



## Chinon Hospital (France): 2 x 1,540 kVA

Two 1,540 kVA generators fitted with MITSUBISHI engines ensure emergency power at the Hospital. Located in 40-foot containers with air coolers on the roof, these generators ensure emergency power for the institution via temporary coupling to the grid, with redundancy in the event of loss of one of them. Particular attention was given to the installation's sound level.



## Saumur Hospital (France): 2 x 2,200 kVA to guarantee back-up power for the institution in the event of a power cut.



In France, the hospital in Saumur can accommodate 455 patients. The site has a back-up power plant comprising two 2,200 kVA SDMO® generators.

Each generator is fitted with an MTU 16V4000 engine and LS51.2 M60 Leroy Somer alternator with a 0.4/20 kV (2,500 kVA) block assembly step-up transformer.

In order to overcome fire risks, each generator is located in an individual cell with a fire protection partition. Cooling by a low-speed air cooler installed on the building's terrace gives a sound level of 45 dB(A) at 20 metres. The 16-metre, free-standing chimney ducts have been fitted with beacons, due to the nearby heliport. The two generators, coupled together in HVA, provide back-up power to the entire

establishment in under 15 seconds. Depending on the output power, load shedding (or restoration) of one of the two generators is possible. Upon the return of power to the grid, the power plant re-establishes a temporary coupling to the HVA network with transfer of charge, so as to avoid a power cut to the building. The power plant also operates in Peak Day Withdrawal between 1st November and 31st March.



## A back-up power plant comprising 2 x 2,000 kVA at the Trousseau Regional University Hospital, Chambray-Lès-Tours (France)



The Regional University Hospital in Tours is a public health institution incorporating six hospitals, and has a privileged position in the Central region of France. With its 2,000 beds and places, it has the capacity to handle 375 new patients every day. The skills of its teams and the performance of its equipment contribute to the quality of its care, teaching and research services. Each year, more than 65,000 patients receive care there.

The Trousseau Hospital is equipped with two 2,000 kVA SDMO® generators coupled on shutdown with temporary coupling to the grid. This power plant can also be coupled to a former power plant that still exists on site (3 x 1,000 kVA) for back-up power for all premises. Two automatically interchangeable 50,000-litre fuel tanks give the site huge autonomy and optimal safety. The slow rotation speed of the air coolers (450 rpm) gives a sound level that complies with the constraints of the site

(50 dB(A) at 2 metres). The project was managed from start to finish: SDMO® carried out the civil engineering studies, monitored the entire installation and delivered a turnkey power plant. Kerys units provide the command/control function for the new power plant. Three Kerys command/control units can be used to check the former power plant is operating correctly, and can even be used to start up the plant.



# A few references - retirement homes

Between 2008 and 2010, SDMO® supplied more than 600 generators, ranging from 40 to 600 kVA, to medical and care institutions, retirement homes, housing for the dependent elderly, etc.

## **"Pastel de Loire" Specialist Care Home, Angers (France)**

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## **Jeanne d'Arc retirement home, Marseille (France)**

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## **Muret geriatric centre, Ambazac (France)**

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## **Kerampir retirement home, Brest (France)**

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