

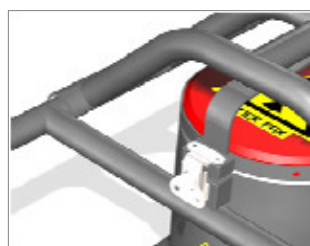
LEMER PAX

since 1970

OVER 40 YEARS OF INNOVATION



at the service of
radiation protection



"... Innovate together to protect life... "

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I - INTRODUCTION

- For over **40 years**, Lemer Pax has applied its guiding line to **Nantes / Carquefou** - **"... Innovate together to protect life..."** – in the management and development of its activities **in the protection of humans against ionising X-rays and gamma rays... in the medical and civil domains as well as in research.**
- **With the passing decades**, the company has gained genuine **renown** thanks to its relevance, the constantly **innovative quality of its products** and indeed **their uniqueness**. Driven by a college of experts and unique expertise in radiation protection – backed up by over 40 years experience – it is now aiming to seriously **develop** its **international set-up**.
- **Pierre-Marie Lemer, CEO of Lemer Pax:** *"... looking back on these past 40 years or so, we have noticed that our main concern has been the protection of human life, in many different fields, and that our products have all been innovative: to date we have more than 50 international patents! Thus, to be honoured by Oseo (French Government) around our 40th anniversary year and join the community of excellence which comprises the top 2,000 most innovative French companies, to receive the Siemens Innovation Grand Prix/ Jury's special distinction, comes at a perfect time to acknowledge our involvement in the permanent creation of new products and encourages us and our teams on this path over the coming years..."*



Pierre-Marie Lemer

II – KEY DATES

1970. Creation of Lemer Pax

- Issued from a lead foundry dating right back to 1872 – lead being the most effective material at the time for preventing the transfer of X-rays and Gamma rays – Lemer Pax was created in 1970. It relied on over 25 years expertise* in lead applications for blinding out ionising radiation, Pax meaning ‘Protection Anti – X’ (X-ray Protection).

** For example, in 1959, the Lemer group created the first shielded glove box and cabinet for iodine 131 manipulation, which was designed for use by Professor Maurice Tubiana / Director of the Institut de cancérologie Gustave Roussy (the leading cancer research centre), and marked the start of radioactive protection in the medical field.*



Lead bricks in a format specially designed to create shielded barriers for containing Gamma emitting sources, which formed the first radiation protection product



Shielded hot cells equipped with liquid portholes by Lemer Pax

- In the **ensuing decades**, Lemer Pax developed and confirmed its notoriety through **research, medical imaging** markets – **scintigraphy via Gamma rays** -, and **radiation protection** in the **civil** domain.

1983. *Standardisation of the first shielded hot cells*

- With the development of medical imaging via scintigraphy, Lemer Pax intensified its radiation protection activity in this field and offered the **first standardisations of shielded hot cells** for the preparation of radioisotopes*.



** Radioisotopes or radionuclides are atoms whose nuclei are unstable and emit radioactivity. In medicine, they are predominantly used for diagnostic or therapeutic purposes. Introduced into the body in its combined form with an organic molecule, they are concentrated into certain cells and emit rays which, after detection and data handling, provide information on how specific organs and tissues are functioning. According to the type of radioactivity implemented, they can be very effective in dealing with certain diseases such as cancer.*

2005. *Pierre-Marie Lemer becomes CEO of Lemer Pax*

- After moving up through the **Lemer Group** for **20 years**, as **Director of the Research and Development hub**, then **Executive Officer of Lemer Pax**, **Pierre-Marie Lemer bought this company** from his family, thus carrying on tradition by becoming the 5th generation of Lemers at the head of the eponymous company. Back then **Lemer Pax** comprised **16 employees** and had a **turnover of 2.7 million Euros**.



Pierre-Marie Lemer

2008. Pierre-Marie Lemer is joined by Valérie Chevreul

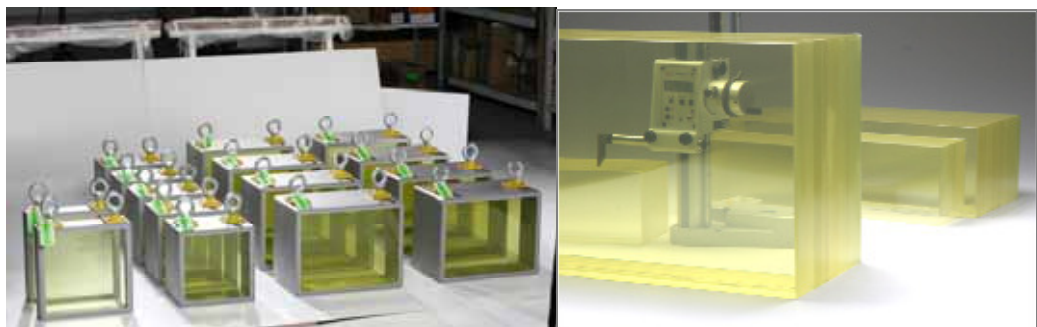
- in the post of **Executive Officer**. Her first mission was to set up a restructuring programme – computer tooling, quality approach and internal auditing – over 18 months, accompanied by Oséo. **In 2008, Lemer Pax** racked up a **consolidated turnover of 14-million Euros**, and boasted **47 staff at Lemer Pax**.



Valérie Chevreul and Pierre-Marie Lemer

2009. Development of activity in the civil domain

- Lemer Pax continued **development** of its activity in **radiation protection** in the **civil** domain, centred around programmes for the **construction of new power stations** or the **dismantling** of old infrastructure. The company landed **several markets** in France and South Korea, for the supply of **lead glass portholes** designed to protect operators working near radiation. Some high-tech products came into being which bordered on 5 tonnes per unit and incorporated lead glass and mechanical welded frames.
- **At the same time**, after numerous years of research, **Lemer Pax** became the **first company in the world** to **industrialise** production of **optical X-ray protective laminated glass**.



Portholes and X-ray protective laminated glass

2010. Lemer Pax given Oseo Excellence seal of approval

- Through its **constant innovations**, **Lemer Pax** is renowned as being an omnipresent **company** which is **internationally recognised** in the sectors of **interventional cardiology**, **molecular imaging** and **research** in the **civil domain**.
- Furthermore, it is also a **pioneer** in the **creation** and **manufacture** of **revolutionary new materials** related to **environmentally friendly lead free radiation protection** like X-ray protective glass **LFX9**, **Novashield** / thermoplastic material to contain X-rays better than lead, whilst remaining environmentally friendly; as well as **Densiplast**.
- Such **truly innovative activity** earned **Lemer Pax** a **selection** in **2010** (done by **French Government**) to form part of the **top 2,000 most innovative French companies** and a chance to **join the Oséo Excellence community**.



oseo EXCELLENCE 2010

2011. September / Lemer Pax elected by an overwhelming majority

- **The Siemens Innovation Grand Prix** – in cooperation with OSEO and the Pacte Pme (Sme Pact) – has annually awarded the **most innovative SMEs** for the **past 11 years**, with standings split into 3 categories: Jeunes Pousses (New Talents), Ville de Demain (City of Tomorrow) and Grand Prix.
- **2011** was to see them make an **exception** with the creation of a **special "Coup de Cœur du Jury" category (Jury's Favourite)**, which was created to reward Lemer Pax and its **Posijet® innovation**, a device for the **preparation and injection of radiotracers** (tracers), whose various uses include the detection and therapy of cancers using **medical imaging**. This device is the **only radiotracer injector on the market** which is **totally X-ray protective**.
- Beyond its technological pertinence, it **enables a real human relationship** during a worrisome medical procedure, with the **proximity of the operator** reassuring the **patient**.

Special Jury's Prize awarded to Valérie Chevreul Executive Officer at Lemer Pax, by the Executive Officer of Siemens François Gerin (opposite) in the presence of astronaut Claudie Haigneré (below), President of the jury.



The Posijet

2011. November / Lemer Pax signs up with Japan

- Lemer Pax signed its first right to supply to Japan*, a prelude to an ambitious development in the Archipelago
- **Canvassing** in the land of the rising sun was **initiated in the autumn of 2010**. The pace picked up considerably after the accident in **Fukushima**. In the days following the catastrophe, **Lemer Pax** was **sought** by the French state authorities to **urgently create** the prototypes and supply **radiation protection equipment** (clothing, portholes). **Lemer Pax** was in a position to **satisfy** these requests in **one week**.
- Nearly **nine months after the accident**, the company continued to receive appeals from Japanese professionals interested in its expertise in radiation protection for the civil domain. Two **rights to supply were pending** signing and were set to cover several technologies linked to this domain, amounting to **several million Euros**. Furthermore Lemer Pax continues to seek Japanese partners for its other applications and medical imaging in particular.



Pierre-Marie Lemer in Tokyo, Japan, at the end of 2011 (5th from the right)

** Lemer Pax has actually had a presence in Japan since 1973 (38 years) through a special agreement with NEG (Nippon Electric Glass), for the supply of X-ray protective glass.*

III – NEXT FUTURE. 2012 and tomorrow

- Whatever their technological level and their area of application, the **activities** or **products created by Lemer Pax** all answer to the same **objective: to protect human life and the environment**. The projects or creations in the pipeline in 2012 and tomorrow don't escape this process.

Interventional cardiology

- Lemer Pax is fleshing out its range of Cathpax® radiation protection cabins** for operations using X-rays, with the creation of a new cabinet for **fitting a pacemaker**. The prototype for this new device is currently undergoing validation at Haut Levesque de Pessac Hospital (33) in the service of **Professor Haissaguerre**. Thanks to its comfort of use and optimum radiation protection (Alara* principle), it definitively does away with lead aprons, which are tiresome to wear and not very protective.



* *Alara principle stands for 'As Low As Reasonably Achievable'. This describes the evaluation which medics have to conduct before supplying an X-ray, or other procedure emitting radiation.*

Development of molecular imaging in Nantes

- Quanticardi**. The FUI project won approval from **Atlanpole Biotherapies** and, **coordinated** by the **Lemer Pax** company, features partners such as Keosys, Arronax and the University of Nantes (Subatech, IRCCyn and CRCNA). QuantiCardi is involved in **developing use of the PET scan** (Positron emission tomography) in the domain of **cardiology in Europe**.
- It **aims to develop innovative tools** for the **production of Strontium-82** and its **transformation into Rubidium** for injection into patients. The **Arronax** (Accelerator for Research in Radiochemistry and Oncology at Nantes Atlantic) **cyclotron** (particle accelerator), which is behind the project, is the **only machine**

in western Europe capable of manufacturing radionuclide and the only one capable of producing sufficient quantities for the radiopharmaceutical industry. Lemer Pax – a quality specialist - is in charge of production by the generator and the associated injector.

- Beyond the significant competitive benefit and the increased international visibility which the QuantiCardi project provides France's *Pays de Loire* region, **Quanticardi provides**, above all, **a real benefit to public health** and will enable **scores of lives to be saved** each year.

<http://www.atlanpolebiotherapies.com/>



Strengthening of Lemer Pax's presence in the USA

- After the creation of its subsidiary in New York in 2010, Lemer Pax began work on its **physical set-up** in the **state of Indiana** (2nd largest American state in the production of medical equipment and number one in the production of orthopaedic equipment), which goes by the nickname "*Crossroads of America*". The chosen location was **Scottsburg**, a city close to Atlanta and Louisville, some 3 hours from Chicago. It was **Mayor Bill Graham**, who holds the highest public office there and did the honour of travelling to Nantes for Lemer Pax's 40th anniversary.



State of Indiana, Bill Graham to the right

- This expansion to **export** is in line with Lemer Pax's **indispensable development strategy**, the French market being too narrow for high-tech products. Lemer Pax is still aiming to **stretch the current 15% of its turnover from export to some 70% for 2016**, across its target zones of India, the Middle East, Japan, Europe and of course the USA.

Regional mutualisation around radioisotopes

- **Creation of ISOTOP4Life® / "The Radiopharmaceutical" Hub.** ISOTOP4Life® is a **unique French consortium**, which aims to actively **mutualise the companies and Institutions** set up in the **Pays de la Loire region** around **use of radioisotopes for health** as well as **to become a reference overseas**. Its founder members include Arronax, Atlab, Chelatech, Ico CHU, Keosys and Lemer Pax. **ISOTOP4Life®** made its **first public presentation** in **Washington** on 1 & 2 February 2012 within the context of the **World Radio Immuno Conjugate Summit** (association of an isotope on a biological vector /antibodies for diagnostic or therapeutic application).



The Solar Odyssey Programme

- **An electro-solar trimaran of the future to carry Lemer Pax's values and its private and institutional partners across the world, it won't produce any pollutant** during its record attempts across all the oceans of the globe. In addition to being a laboratory for technologies under development at Lemer Pax, it is focusing its energies on the environment and **preparing future technologies for our children**.
- To date, the **platform is sailing** and has **amassed over 2,000 miles (3,700 km) in hydrodynamic sea trials**.



- Though **Lemer Pax** is the **project's initiator and messenger**, the company remains focused on the **search for partners** to continue the development.

20,000 leagues across the sea, in the wake of Jules Verne

- In conjunction with this quest is a recognised "**Odyssey'nergy**" Endowment for the **community** and its aim of **developing clean sources of energy** has been created by Lemer Pax.

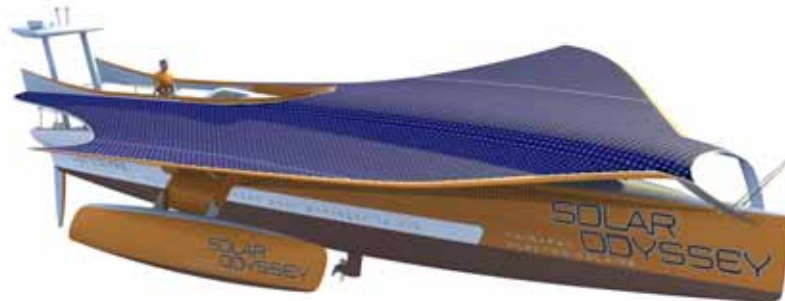
Endowment

ODYSSEY '**NERGY**



- **Hosted at the Jules Verne Museum in Nantes** (3 Rue de l'Hermitage 44100), its first mission will be the **chartering of Solar Odyssey**, the **3rd experimental ship** to be officially **registered** by the French Maritime Minister **in the wake** of the **Alcyone** / Turbo Voile of **Captain Cousteau** (1985) and **Hydroptère** thought up by **Eric Tabarly** and developed by **Alain Thébault** (1995). This latest craft is designed to **develop** and **trial** the most **comprehensive electro-solar propulsion systems** (photovoltaic cells, high modulus storage cell, engine, transmission and propeller), in order to reach **average speeds which can genuinely be applied to working boats** (fishing, dual purpose, transport of passengers). In this way, the project will **actively contribute** towards the **protection of the Earth** by achieving '**clean**' sailing with no CO2 emissions whatsoever.
- **Solar Odyssey** will let its **data** be **freely accessed by the science community** so as to help with the popularisation of solar maritime propulsion systems (more than 80% of the planet's trading is done via the sea), to **show the way**, to create emulation and to **prepare future technologies for our children**.
- **Children** will be the primary focus through **educational programmes** such as **exhibitions and partnerships** with some **science institutes** (i.e. Cité des Sciences in Paris (Europe's biggest science museum), as well as **school packs** about how **solar energy** works and how to **use** it rationally.

- The crew of **Solar Odyssey** will also set themselves the mission of **observing and documenting** the condition of the **marine fauna and flora** along the ‘solar’ **routes**, in the same way as their famous ancestors navigated the wind routes on their journeys along the legendary wool, tea, spice or even gold routes!



To participate in the ODYSSEY'NERGY endowment visit
www.solar-odyssey.com

- **Stopover on the Nantilus.**

A genuine, albeit **motionless ocean liner**, designed by the naval architect **Olivier Flahault**, and an unusual place for the hosting of receptions, seminars and events, the Nantilus is moored on the island of Nantes, a district undergoing massive changes in the Atlantic metropolis, opposite Quai de la Fosse and Nantes' historic centre. The boat owner and developer, La Compagnie des Rivages, **Stopover Partners**, have invited Solar Odyssey to take up winter residence there.

www.compagniedesrivages.com



Lemer Pax in the Olympic Games in London 2012

- For the past 6 years running, Lemer Pax has backed Pierre Le Boucher and Vincent Garos in their quest for the Olympic Grail as part of France's sailing team on the high performance 470 dinghy.
- After an **11-year struggle**, the youngsters from Nantes have got their ticket to **London 2012**. Lemer Pax will be alongside them. Such **tenacity** and **perseverance** are a reflection of the developments at Lemer Pax, which require pugnacity and often a great deal of long-term investment before reaching a positive conclusion.

www.470partnerteam.org



Vincent Garos & Pierre Le Boucher

IV – LEMER PAX / BENCHMARKS

- **Workforce** > 50 employees
- **R&D** > 10% of the workforce
- **Subcontractors** > Over 200
- **Consolidated turnover 2011** > €14-million
- **Export share** > 15% of the turnover
- **Patents** > Over 50 in France and overseas
- **Set-up** > present in 5 continents (in over 20 countries)
- **Certification** > Iso 9001 and Iso 13485
- **Classification** > Strategic undertaking by the French government
- **The following companies trust in Lemer Pax**

Areva (Novashield), **Cea** (Shielded cell ball joints), **Vinci/Cegelec** (Portholes), **Cern** (lead bricks), **Cisbio** (protective cyclotron (circular particle accelerator of reduced size) enclosures), **Cnrs** (activimeter), **Cyclopharma** (radiation protection material), **EADS** (specific protection), **EDF** (protection for nuclear power stations), **Inserm** (enclosures for injected mice), **Philips** (radiation protection material), **Sanofi Adventis** (radiation protection material), **Snecma** (radiation protection cabinets for non-destructive control, giant shielded door, Mirage 2000 control), **Thomson** (protection cabinet for the control of electronic components), **Total** (shielding for oil rigs) ...



Production of Posijet

Production of shielded hot cells



V - CONTACTS

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