INDUSTRIAL PAPERS

**Biography:** Jean-François HAMELIN, 57, joined EDF in 1980 after graduating from École Nationale Supérieure des Télécommunications, Paris in 1979. From 2011, technical director - EDF Nuclear PLM project, held a number of research management positions before joining EDF Nuclear Engineering division in 2011. Main focus on IT and Information Systems for electricity generation. Involvement in the first digital I&C systems on N4 nuclear units and the first high performance computing and simulation programme for electricity generation.

Jean-Claude LEROUX is responsible of the Nuclear Power Plant Life Cycle Management initiative in AREVA. He has an engineering degree from Institut National des Sciences Appliquées de Lyon (1973). He started his career in Framatome in the mechanical design of reactor internal equipments, then moved to the thermo-mechanical design of the fuel assemblies and fuel rods. Early 2000, interested in information management issues, he set up a Configuration Management unit aiming at managing the fuel assemblies’ technical data for the AREVA Fuel worldwide organization; he took his current position in 2009.

**Title:** PLM approach in a nuclear engineering

**Abstract:** Product Lifecycle Management (PLM) is the devoted term for a business strategic approach that most of big companies are currently developing. But whatever is the industry sector domain, implementing a PLM system requires a large effort to think and draw the required methods and tools. From the middle of the eighties, the complexity of the nuclear power plants led nuclear engineering teams to develop specific information systems, rather close to PLM concept. Today, the information systems currently used in the nuclear engineering and construction still must be extended and unified; the data control must be reinforced. It is easy to understand that building a Product Lifecycle Management system is a complex and vital project for the nuclear industry, to leverage the knowledge preservation and to fulfill the increasing level of safety requirements, as well as keeping a strong control of the costs. We will present our global view of the PLM approach, the main specificities of the product “Nuclear Power Plant” and what are the main issues we are facing to implement such an approach.

**Biography:** Hajer CHOUIREF has received her Engineer Diploma (Master) in Information Systems Engineering in 2012 from the INSA Lyon, a french Engineering School (Grande Ecole d’Ingénieur). Since her graduation, she joined EDF and its Nuclear PLM Project. She is in charge of leading an on-going research work with Arts & Métier ParisTech about how to address interoperability issues in Nuclear PLM context.

**Title:** The contribution of standards and norms to the exchange of technical data within the Nuclear Industry: experimenting the ISO 15926

**Abstract:** The ISO 15926 standard was initiated fifteen years ago. Multiple papers about it have been issued, most software vendors acting in the domain tools for nuclear plants engineering claim they deliver converters complying with the norm, some large actors in the nuclear sector
(OEMs, AECs and Utilities) are publishing about adapting the norm to their needs. However the norm is not complete to date and still evolving, and actual implementations of the norm by software vendors are not fully convincing. The norm has established concepts and standard implementation schemes, but is currently not sufficiently ready to support the semantics used in the nuclear. In addition, the norm modeling has been based on an innovative set of tools that both industry and academic world must better take over and master.

This contrasted situation leads to assess which relevant use of the ISO 19526 can be targeted by the nuclear industry sector to exchange plant technical data. The presentation will demonstrate the approach taken:

- Mastering the concepts of the norm for modeling and for implementation
- Defining a Reference Data Library (RDL) that is able to support the exchange of technical data describing a nuclear power plant between co-designers, with suppliers (the extended company)
- Demonstrate feasibility of implementing such a nuclear RDL and of operational features as data mapping/matching, conversions, exchanges

**Biography:** Mr. Fernando MAS MORATE is Industrial Engineer and EADS Senior Expert in Advanced Manufacturing Processes Methods & Tools and Information & Software Technologies. He is in charge of the PLM Processes & Tool Solutions Department of Airbus Military. He is associate professor at the University of Sevilla and owns patents in the EU and US. He is author or co-author of more than 20 research papers in international journals and congress and has been speaker at several conferences. As recent projects, he is involved on EADS RTG (Research and Technology Groups) and EADS TRANSpher Project for PLM harmonization.

**Title:** Collaborative engineering paradigm applied to the aerospace industry

**Abstract:** Airbus successfully designs and industrializes aircrafts using Concurrent Engineering techniques since decades. The introduction of new PLM methodologies, procedures and tools, and the need to reduce time-to-market, led Airbus Military to pursue new working methods. Traditional Engineering works sequentially. Concurrent Engineering basically overlaps tasks between teams. Collaborative Engineering promotes teamwork to develop product, processes and resources from the conceptual phase to the start of the serial production. A pilot project, CALIPSOneo, was launched to support the industrialization process of a medium size aerostructure. The aim is to implement the industrial Digital Mock-Up (iDMU) concept and its exploitation to create shop floor documentation. In a framework of a collaborative engineering strategy, the project is part of the efforts to deploy Digital Manufacturing as a key technology for the industrialization of aircraft assembly lines. This paper presents the context, the conceptual approach and methodology adopted.

**Biography:** Denis DEBAECKER is currently Partner of Vinci Consulting, independent consultancy specialized in PLM, lean engineering, operations and management. Denis Debaecker has a double experience of 10 years at Dassault Systems as Project manager and Product Manager, and 18 years in consulting mainly in PLM. His experience covers many verticals such as shipbuilding, aerospace & Defense, automotive, High Tech, Energy. He is Vice President of the PLM Lab. He is the author of "PLM - Gestion collaborative du cycle de vie des
Produits" (Hermes 2004) and coauthor of "Gestao de projeto do produto" (Elsevier, 2012)

**Title:** PLM vs. Lean Engineering: antagonisms and synergies - Finding the best practices to combine these approaches

**Abstract:** Conflicts between disciplines may be considered as a way to avoid routine in product development, and challenge engineering decisions at critical projects milestones. This lean engineering lesson learned led R&D organizations, such as Toyota Engineering System, to underline the key role of Chief Engineer as empowered man able to arbitrate these conflicts in a positive, "Schumpeter" way.

Is there such a conflict between PLM and Lean Engineering? Before answering “of course no”, we have to understand the pitfalls lean engineering is facing day after day. Lean approach aims at streamlining the processes, removing waste, and going straight to the point...

However seeking waste in the supply chain is far more tangible than in product development. In a R&D office, engineering waste may be hidden: multiple validations, over controlling, over specification due to defaults in previous projects,... Typical quality issues come with increased pressure on cost or lead times. As a result, processes must be more rigorous and PLM helps. But people have more to develop, with shorter lead times, and what happens? By-passes, drawbacks, and the loop is closed.

So is PLM there to install bureaucracy? A leitmotiv of lean is: "Simple, visible, trust your people". So Lean business processes should be put in place as a cornerstone of PLM, using Value Stream mapping and other techniques to hunt the wastes.

PLM could also pave the way to advanced lean engineering perspectives such as Set Based design, or Key Interfaces Data management, which have their functional counterparts in PLM capabilities such as product diversity management, multi-representation, maturity control, baselining, and so on.

Balancing lean approach and PLM underlying processes should then enable a better grasp on industrial performance.

**Biography:** Frédéric CHAMBOLLE received the B.S. and M.S. degrees in mechanical engineering from Orléans University, and Ph.D degree in industrial engineering from Ecole Centrale Paris, Chatenay Malabry, France in 1999. His research interests were the development of an automotive product model based on the STEP AP214 standard, along with proposals for data exploitation processes.

Since 1999, he works in the Information Technology Department of PSA Peugeot Citroën. From 1999 to 2009, he worked on projects related to Product Data Quality, CAD/PDM Data Exchange, international IT Product-Process project coordination (Slovakia, Brazil, Argentina). He was also involved in global automotive standardization activities through the development of ISO STEP AP214, and projects, driven by the automotive workgroup GALIA/Odette/SASIG, for the development of recommendations in the domain of Product Data Quality, PDM Data Exchange and Long Term Archival and Retrieval.

He currently has a position of IT specialist covering the domains of CAD data exchange and visualization, PDM data exchange and sharing, and Long Term Archiving.
Title: The Usage of the Standards into the Long Term Archiving and Retrieval, and the Exchange of Engineering Design Data

Abstract: Standards have been developed to provide means of exchange and archival of engineering design data within automotive industry. In most cases, the simple use of these standards is not enough. Indeed, the usage of such standards requires the development of recommendations and methodologies providing specific rules and processes that will guide the user on how the standard is to be used in a given context.

This paper will present:

- examples of data exchange problems with some examples of methodologies developed to solve them.
- automotive recommendations developed in several domains such as PDM data exchange, Product Data Quality, Long Term Archiving and Retrieval, etc, how they are used within the industrial processes.

Biography: With over 25 years helping companies build their information system product, Kamal CHEBALLAH holds a degree in Mechanical Engineering and a Ph.D. in computer science from the Ecole Centrale de Lyon. He now runs the Audros group. Audros Technology publishes a suite of software dedicated to the industrial know-how management. Now, the company employs 40 people in three subsidiaries in Europe and Africa. Audros continues to pursue its international development, and is used by just over 10,000 people employed by 160 clients, most of whom are internationally renowned.

Aurélie BISSAY Works as Research Manager at Greenlight-IT a private research company based in Lyon. She holds a Ph.D. in computer science and more particularly on the knowledge capitalization in a PLM system. During her Ph.D, she worked as a PLM project manager in a company producing plastic parts for the automotive world. In 2010, she joined the present company as research engineer, she is also in charge to build partnerships with universities.

Title: Methods and tools for driving change to simplify the deployment of PLM

Abstract: Change management is the crucial step for the success of a PLM system deployment. Two approaches of change management methods are mainly used. Adaptive method and built method. These methods are built around project plans developed between the different actors of PLM deployment. There are many risks with these methods to fail the PLM deployment, due sometimes to poor integration of Team Change Management, to a limited training, or a poor effort in the communication around the PLM project. We think It is necessary to take into account the potential to ownership of the system by users. To make easy the appropriation of a new system, we think that it is necessary to bring complementary tools to the change management approach: functional workshop, serious games, training and also user interfaces like audrosBox which target really the user’s need.
**Biography:** Mr. Mohamed Ali El Hani is an enterprise data management expert with wide experience in PLM implementation projects for Aerospace, AEC, Shipbuilding industries.

He has a large knowledge of PLM process & tools from requirements management to aftermarket processes. He helped large scale aerospace customers to solve critical problems related to PLM process & tools such as Manufacturing process planning, Requirements management framework & relationships with the design process, Design process integration with manufacturing process, Partner collaboration and Data exchange (CAD & Non-CAD data), Quality management processes, Business Value Management for PLM implementations, Data reuse strategies... He's also a speaker in most of the International world events and participated with scientific papers.

Mr. Mathieu RIGAUD is a PLM business analyst with experiences in engineering services for different industries such as shipbuilding, automotive and aerospace in Europe. In 2012 he decided to move to Canada to upgrade his skills in program, project and process management. He had the chance to be coached and trained by one to PLM Experts in Canada Mr. Mohamed Ali El-Hani. He is currently working as PLM pre-sales consultant in aerospace and in charge of developing the branch of SGIP Group specialised in PLM for Architecture Engineering and Construction sector called IMPARIA SOLUTIONS.

**Title:** PLM for AEC (Architecture Engineering & Construction)

**Abstract:** This presentation provides an overview of what’s PLM (Product LifeCycle Management) for AEC (Architecture Engineering & Construction) as well as differences with the concept of BIM (Building Information Modeling). Analogy between Aircraft and Building products is presented. PLM definition and main PLM processes are presented. Limitations of the BIM concept are highlighted. Selected PLM and BIM cases study are described.

**Biography:** After graduation as industrial engineer at Ecole Centrale de Lille, Xavier FOUGER started his career in 1986 as Attaché for Science and Technology at the French Embassy in Austria in charge of science and technology cooperation. With Dassault Systemes since 1990, he spent several years developing new digital processes to enhance collective innovation in the automotive industry. In this role, he acted as principal advisor to engineering and business leaders in various countries with a focus on Germany, Korea and Japan. In 2003, he created Dassault Systemes’ Academy, the corporate organization supporting skills, producing educational innovation and encouraging transformative learning initiatives related to the use of the company’s software.

**Engineering Education activities for secondary education:** In France he introduced and developed with the University of Versailles, a nationwide program – “Course en Cours”- which after five years of operation involves 11500 high school students, mentored by 500 engineering students in designing, building and racing electric model cars. Measurable impact on enrolment in science and technology was observed as a consequence of this ongoing initiative, endorsed by the Ministry of Education and awarded the national entrepreneurship prize within the European Year of Creativity and Innovation 2009. These efforts to promote the engineering profession led him to implement various cutting edge educational activities for secondary and vocational education in the USA, Malaysia, and Canada.
Engineering Education activities for higher education: His focus is on facilitating multidisciplinary learning, industry cooperation and international activities. With the aim to build educators skills in Product Lifecycle Management (PLM), he initiated competency centres in India, China, Brazil, Mexico, Colombia and South Africa and established in 2009 the Dassault Systemes’ chair for PLM at KIIT University, Bhubaneswar. He regularly provides advanced seminars in collaborative innovation in several institutions, including the French Ecole Polytechnique and the HEC business school.

Engineering Education activities at international level: Working with policy makers, he has developed educational programs at country scale, in support of national priorities, particularly in Tunisia and the United Arab Emirates. A founding member of the International Federation of Engineering Education Societies, active member of the Bureau of the European Society for Engineering Education, Xavier Fouger was instrumental in the creation of the Global Engineering Deans Council. His international work also includes the promotion of Grand Challenges for Engineering in the global student’s community.

Research: Xavier Fouger is driving corporate research on virtual labs, teaching co-creation in product innovation, crowd-based curriculum creation and virtualization of textbooks and learning devices. He has led a joint DARPA funded research project in collaborative innovation for secondary level students with the Georgia Institute of Technology (Atlanta) and currently conducts Dassault Systemes’ participation in a French government funded development of a new curriculum in collaborative systems engineering.

Affiliations: Member of the “Association pour la Valorisation des Relations Internationales Scientifiques et Techniques” (AVRIST), the “American Society for Engineering Education” (ASEE), the “Indian Society for Technical Education” (ISTE), the ”>Global Engineering Deans Council” (GEDC), Vice-president of the ”European Society for Engineering Education” (SEFI) and of the ”Cartagena Network of Engineering” (RCI)

Title: From cost of education to digital learning experiences

Abstract: The development of flip learning practices, the rapid emergence of Massive Open Online Courses (MOOCs) and the educational promises of co-learning are seen as instruments to control rising cost of education and colossal student’s debt. Simultaneously, these evolutions also generate measurable improvements in learning performance. The presentation examines how recent extensions of PLM technology enable such practices through richer learning experiences, including digital labs, cyber-physical virtualization of learning devices, 3D extended textbooks, social networks and dispersed collaborative projects.

Biography: Sergej BONDAR, Cristoph RUPPERT and Josip STJEPANDIC

Title: Securing Data Quality along the Supply Chain

Abstract: In the supply chain of automotive industry, the supplier is generally under a contractual obligation to provide customers with the product relevant data in the required format and within predefined intervals. For the suppliers, a massive need for action results from this, being performed by extensive measures including the installation of specific communication software. This process is subject to continuous optimization especially if automobile manufacturers realize extensive amendments at their IT landscape.
Being in a continuous state of flux during their life cycle, the CAD data keep the key position here. They are filed and – in different states (designs, change, release, validation) - continued to be processed by users in diverse roles in different companies/departments at various locations.

A highly complex process resulted from this, having to be controlled and monitored analogous to other business processes. The safekeeping of an appropriate CAD data quality by means of recommendations and standard specifications has already established as an independent discipline years ago, being supervised by national and international committees like VDA and SASIG.

Recently, as a result of the changeover of big automobile manufacturers from CAD to NX system, major changes occurred in this process, also leading to reforms in the quality concept of CAD data.

This paper illustrates the problems, methods and solutions to ensure data quality along the supply chain. The record is completed by examples from the industrial practice in different branches (automotive OEM, automobile suppliers, engineering).

**Biography:** MSc Niko SALONEN has over 13 years experience of different engineering and data management systems, especially design, configuration and product management systems in Rolls-Royce Marine. He worked almost 10 years as systems manager in product management organisation and now over 3 years as PLM architect in central marine PLM organisation. His responsibilities have been during his career management, development and deployment of data management systems, including PDM and PLM systems, starting from business requirement capture through feasibility and tool selection to process development and future improvements. Additionally Mr Salonen has been chief engineer, developing new modular and configurable propulsion product family. Mr Salonen is also consultant and owner of independent business information and innovation management consultation company BIIM Oy and he is preparing PhD thesis in area of data modelling and marine classification society management in Rolls-Royce.

**Title:** Improving development of PLM systems using systems thinking and system dynamics modelling and simulation

**Abstract:** There is need to understand better business dynamics influencing development of business critical data systems, including PLM and ERP. Delays and other disturbances and process loops in business processes create complex data model and data flow, and overall data management requirements. System thinking and systems engineering studying business dynamics by systems modelling and simulation is research area of its own used for solving complex system cases. The simulation has in recent years become more used and useful approach to discover why even simple looking processes behave unexpectedly.

This study was started after a systems thinking and systems engineering program kept in Finland by group of universities and educational learning centre, Edutech. The program inspired to think could system modelling techniques and especially simulation of these models give new ways of solving, proving and improving PLM/ERP systems combined with more general techniques of UML modelling and other types of uses case and data flow map type presentation methods, and by using improvement tools provided by lean six sigma 'toolbox'.

This study concentrates to identify specific Marine industry classification society management requirements and processes, which are known, but create extensive landscape of various
certification processes influencing operational management of design, manufacturing, procurement and financial transactions. This study includes modelling of certification process for project specific components by using Vensim software. Vensim is industrial strength simulation software for improving the performance of real systems. This study is scoped only to build a static model with Vensim without simulation.

The outcome of this study is setting a framework of studies carried out in next coming 2-3 years trying to describe specific Marine business process areas from classification society processes, project management and engineering change management to engineering to order logistical planning requirements for customized configurable products. Primary focus for this study is building first model of classification society business process using Vensim system modelling tool.

**Biography:** Jean PATUREL, 30 years of Experience in Pre-Sales and Sales Departments in large IT companies such as NCR and Matra was moving towards CAD & PLM perimeter in 1987 in Computervision company then took an active part in the creation and development of Matrix One in France, Benelux and Switzerland, before joining Siemens PLM in 2003 as regional Sales Manager. Nominated Sales Director in 2008, his expertise has enabled him leveraging Siemens PLM Solutions in large industrial groups and has contributed to the success of their deployment.

Denis GOUDSTIKKER is Energy & Utilities Market Leader at Siemens PLM Software France. After been Graduated of Ecole Centrale de Nantes in 1986, he joins Olivetti-Logabax as CAD Sales engineer, then Control Data in 1989 where he held number of sales executives positions. After the creation of Metaphase Technologies in 1992, he join the new PLM dedicated business unit and since then, was involved as Large Accounts Sales Executive in Defense, Automotive, CPG and Energy Markets.

**Title:** PLM Support for Business Transformation: Collaborative Product Development at Siemens Energy Fossil.

**Abstract:** Global energy consumption is driving the demand for new power generating equipment and processes, as well as initiatives to build and retrofit new plants. But Power Generation equipments provider are under market pressure to make it more productive, safe and sustainable. To meet these various customer requirements, Siemens Energy might be more flexible, but need to maintain their internal processes in order to maintain project control and costs. A major pain point was not the adoption and use of 3D design, but rather integrating 3D design with construction disciplines such as electrical, HVAC, piping, etc., and other work processes. Presentation will highlighted how they put in place a better collaborative platform that connected the stakeholders across their various engineering organization and customers.

**Biography:** Frédéric FERU is a PLM Senior Expert who joined the EADS Group in 1996.

From 1996 to 2007, he belonged to EADS Innovation Works (EADS Research Centre) and managed successfully different National and European research
projects such as DIECoM, ENHANCE or VIVACE where he developed new paradigm for Engineering & Simulation data management.

From 2007 to 2011, he was member of the Scientific Council and part of the EADS PHENIX core team for which he developed the PLM Architecture Framework to support the harmonization of PLM processes, methods and tools within all EADS Divisions.

Late 2011, he joined Airbus to manage PLM projects common to all aircrafts programs and to define PLM solutions roadmap supporting the Airbus strategy.

Title: Obsolescence Management for a sustainable PLM

Abstract: PLM Methods and Tools are largely spread within AIRBUS to support the business processes for designing, manufacturing and supporting.

A large set of methods and tools, inherited from the history of the different Aircraft programs are still in operation today.

Obsolescence of the tools is a major concern in terms of costs, data migration and data security. However, obsolescence is also a trigger and opportunity to rationalize the PLM system and to draw lessons for the future PLM.

The presentation aims at sharing with the academic and industrial PLM communities some views on how technological obsolescence is managed inside AIRBUS and how it could be improved in the future.

Biography: Can Cangelir received his BS degree in Mechanical Engineering from Middle East Technical University (METU) in 2003. He has four years Production Engineering experience in automotive industry. He has started to work in Turkish Aerospace Industries Concurrent Engineering Department in 2008. Since 2010, he is acting as the Chief of that department. He has experience in assembly planning, line balancing, lean production and production time analysis methods. He also has a significant amount of experience in end to end PLM solutions to manage all the design and development data in different phases which starts with a concept idea and ends with service life.

Title: Lessons learned for better management of master geometry

Abstract: When an aircraft is thought as a final product, it has a complex structure with numerous parts to be managed. Complexity requires multifunctional design activities, and multifunctional design needs collaborative way of working for continuous success. This cooperated approach could only be accomplished by the help of concurrent engineering techniques. Currently, several distinctive design activities are performed at digital environment of CAD tools. Position information and interrelations between parts of a product are provided by the help of associative physical CAD links. Requirement of CAD links during design activities paves the way for the usage of Master Geometry models as an official source of aircraft shape and a geometrical reference for all actors involved. Master Geometry models have to be managed in Product Lifecycle Management tools in order to provide effective implementation and usage of models from conception, through design and manufacture, to service and disposal of product. Some improper cases could be observed when a correlation is tried to be generated between Master Geometry models and 3D models of product at CAD environment. In this paper,
these cases will be examined and potential solutions, which are the results of lessons learned activities, will be proposed with concrete examples.