

Beyond the simple matter of asset management...

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Transmission Systems Operators (TSOs) have to face a wide range of constraints in a fast unceasing moving context. The amount of assets is linked to huge investments to maintain and develop a grid whose the lifespan of equipment is greater than four decades. Challenges are increasing to adapt to new customer needs and to integrate renewable energy generation at a very large scale, while improving reliability and availability of the grid towards very high levels of quality.

The speaker will present experience of the French TSO and good practices shared with partners, which led to the present asset management. He will refer to numerous Jicable papers, from the design of a cable system up to maintenance and repair, because the asset management is more efficient if the total life cycle of the cable system is taken into account at early stages.

The presentation begins with one century old amazing pictures of the first cable systems in Paris, to remind the wide range of assets and to describe the technical evolutions up to the example of the 69 km 2 GVA underground link which will be in service in 2014 between France and Spain.

Specification of this world first is covered, in order to remind the expected performance of the future assets. Then, working out extension of qualification procedures for transmission cable systems is described to build upon existing experience, to speed up the availability of new products and to reduce the cost of their qualification process.

The main topic of WETS workshops is covered: several examples illustrate the evolution towards long distance cable systems (electrical studies to insert long AC cables, evolution of methods for bonding metal screen of cables, aluminum laminated screens, increasing cable drum delivery

length) or to mix and connect different generations of systems (transition joints).

Methods are presented to reflect the experience in improving the economical design of conductors (and limiting losses during operation) and in increasing the current rating by a statistical feedback approach.

The environmental aspect of buried techniques is discussed (follow-up of the ecological footprint of underground installation, mechanical laying of plastic duct, links across the fields). Investigations into the design of electromagnetic field mitigation techniques illustrate the approach of public consultation to improve the acceptability of high voltage systems when social concerns are met.

Several examples are discussed to manage existing systems (diagnostic and maintenance of HPPF cables, leak location, condition and life assessment through dissolved gas analysis, hydrogen elimination from pipe-type cables), followed by the description of a project of retrofitting of pipe-type cables.

Finally, main guidelines are presented for description data management, cable maintenance and repair. The method of “health index” illustrates the benefits that utilities can take from such decision-support tools.

Updated topics and prospects will be submitted to the next call of papers for Jicable'15.

References of Jicable communications:

Jicable 2003 - A10-6

Increasing cable drum lengths
LESUR Frédéric; EDF R&D; Moret-sur-Loing, France; ARGAUT P., SACHER J.; SAGEM; Montereau, France

Jicable 2007 - A8-3

Environmental impacts in rural area of a HV underground link
GOURIT Laurent, SERRES Etienne, CHEVALIER Peggy; RTE, National Centre for Grid Expertise; Paris, France
Jicable 2003 - A10-2
Mechanical laying of HDPE ducts in rural area
MARTY L., LE CORGUILLE J.L.; RTE France; France

Jicable 2003 - B3-5

Diagnostics and maintenance of high-pressure fluid-filled paper cable
LINOIS P., ROBINOT G., ROIZARD T.; RTE; France
MEURICE D., WELSCH E.; EDF R&D; France

Jicable 2007 - A1-4

French experience in aluminium laminated screens
LESUR Frédéric; EDF R&D; Moret-sur-Loing, France
ARGAUT Pierre; SILEC CABLE; Montereau, France
BENARD Laurent; PRYSMIAN; Paron, France
MIREBEAU Pierre; NEXANS France; Calais, France

Jicable 2007 - B4-1

Health index
DORISON Eric, LESUR Frédéric, MEURICE Dominique; EDF R&D; Moret-sur-Loing, France
ROINEL Giao; RTE; France

Jicable 2007 - B4-3

Upgrading and uprating of underground existing systems
LESUR Frédéric; EDF R&D; Moret-sur-Loing, France

Jicable 2007 - B8-4

Current rating of cables installed in plastic ducts
MOREAU Christophe; EDF R&D; Moret sur Loing, France
COURSET Ludovic; RTE CNER; Paris France

Jicable 2007 - C5-1-13

Transition joints
COURSET Ludovic; RTE CNER; Paris France
HONDAA Pierre; EDF R&D; Moret-sur-Loing, France

Jicable 2007 - C7-2-12

Leak location in oil paper cables
LANDUCCI Laurent; RTE; Courbevoie, France
LANZARONE Lucien; RTE; Vitry-sur-Seine, France
Dominique Meurice; EDF R&D; Moret-sur-Loing, France

Jicable 2007 - C7-2-13

Hydrogen elimination from a 225 kV HPOF pipe-type line
LINOIS Pierre; RTE-TENP - GIMR; Nanterre, France
BONNARDOT Gilles; RTE-TENP - GETSO; Guyancourt, France
GAZARIAN Serge; RTE-TENP; France

Jicable 2011-A2-1

Specification for extruded HVDC land cable systems
Rémi VATONNE, Nathalie BOUDINET, Jonathan BENETEAU, Pierre HONDAA, Frédéric LESUR - RTE, Paris; France
Gregorio DENCHE, José Manuel ARGUELLES ENJUANES - Red Eléctrica de España, S.A., Madrid; Spain

Jicable 2011-A4-1

Retrofitting of pipe-type cables
Pierre HONDAA, Martial GUILLEMIN, Frédéric LESUR - RTE, Paris; France

Jicable 2011-A9-1

Working out extension of qualification procedures for HV and VHV cable systems
Pierre HONDAA - RTE, Paris; France
Éric DORISON - EDF R&D, Moret-sur-Loing; France

Jicable 2011-B1-1

Impact of EMF on cable ratings and cable systems
Harry ORTON - OCEI, Vancouver, BC; Canada
Paolo MAIOLI - Prysmian Cables and Systems, Milan; Italy
Tim BARNES - Transgrid, Sydney; Australia
Heinrich BRAKELMANN - University Duisburg-Essen, Duisburg; Germany
Jarle BREMNES - Nexans Norway AS, Halden; Norway
Sudhakar CHERUKUPALLI - BC Hydro, Vancouver, BC; Canada
François COCHET - Nexans, Neuchatel; Switzerland
Jean HOEFFELMAN - Elia-Engineering, Brussels; Belgium
Frédéric LESUR - RTE-France, Paris; France
Julio LOPES - Inovatec Consultoria e Engenharia, Sao Paulo; Brazil
Josu ORELLA - IBERDROLA, Bilbao; Spain
Jacco SMIT - Liandon, Amsterdam; The Netherlands

Jicable 2011-B1-2

EMF conductor management of cable systems
Frédéric LESUR - RTE, Paris; France

Jicable 2011-B2-4

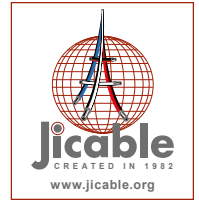
Underground links across fields
Alexandre IRLE, Jean ISOARD - RTE, Paris La Défense; France

Jicable 2011-B5-2

Electrical studies performed to insert long AC cables in the French grid - First conclusions
Sébastien DENNETIERE, Jonathan DUFOUR, Alexandre PARISOT, Jean-Pierre TAISNE, Yannick VERNAY - RTE, Paris la Défense; France

Jicable 2011-B7-2

Condition and life assessment of laminar dielectric cable systems through dissolved gas analysis based on field trials and extensive field data
Nirmal SINGH, Sandeep SINGH - DTE Energy, Detroit, MI; United States
Rommy REYES, Pierre LINOIS - RTE, Nanterre, Paris; France
Steve ECKROAD - EPRI, Charlotte, NC; United States



Jicable 2011-B10-2

Investigations into the design of EMF mitigation techniques
Matthieu CABAU, Nadja MARAZANOE, Frédéric LESUR, Nathalie BOUDINET, Anne CHAUVANCY, Rémi VATONNE - RTE, Paris; France

Jicable 2011-B10-4

Evolution in method and performance for bonding the metal screen of UG HV power cable
David DUBOIS, Pierre MIREBEAU, Pascal STREIT - Nexans, Calais; France
Mohamed MAMMERI - Silec Cable, Montereau; France
Franck MICHON - Prysmian, Sens; France
Aude BARRALON - RTE, Paris; France
Minh NGUYEN TUAN - Électricité de France, Paris; France

Jicable 2011-C9-1

Statistical feedback approach in cyclic rating factor sizing
Irina GARZULINO, Nicolas POUPARDIN, Anne CHAUVANCY, Frédéric LESUR, Xavier ROLLAND-NEVIERE - RTE, Paris; France

Jicable 2011-D1-5

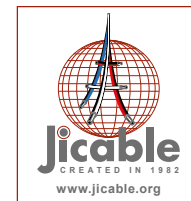
Economical design of cable conductors
Frédéric LESUR, Victor LEJOUR - RTE, Paris; France

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Underground cables maintenance and repair
Patrick DELCOURT, Joël BOUYER - RTE, Paris; France

Jicable 2011-E5-1-12

Underground cable description data management
Patrick DELCOURT, Joël BOUYER - RTE, Paris; France



Frédéric Lesur

Biography



Frederic Lesur graduated in power electronics in 1992 (Supélec, Paris).

He has been employed by Silec as a research engineer, involved in the development of 400 kV underground lines, in modeling and engineering tools design.

He moved to EDF utility in 1999, and was responsible for the cable system testing facility of Les Renardières.

He has been working for the engineering branch of RTE, the French Transmission System Operator, since 2007, on various topics as cable system design, current ratings, or EMF. His background led him to innovative technologies such as superconducting cables. He is involved in numerical simulation and R&D activities for land and offshore large projects.

Frédéric Lesur is involved in various Cigré, IEEE/ICC, IEC and Jicable activities.