

Jicable-HVDC'17

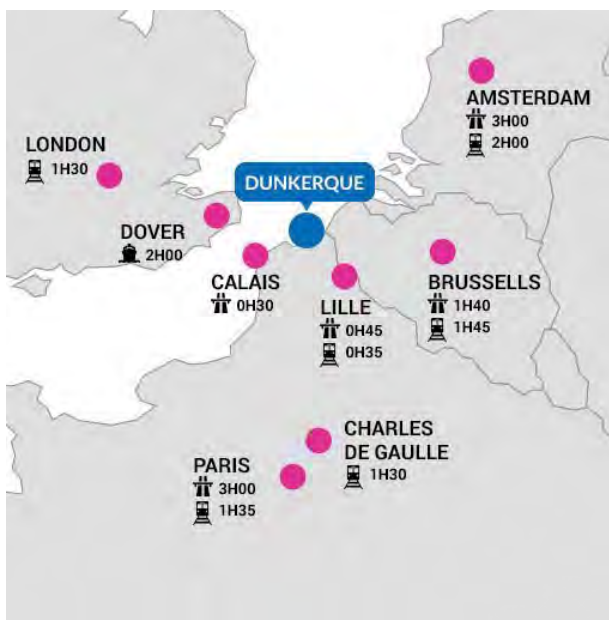
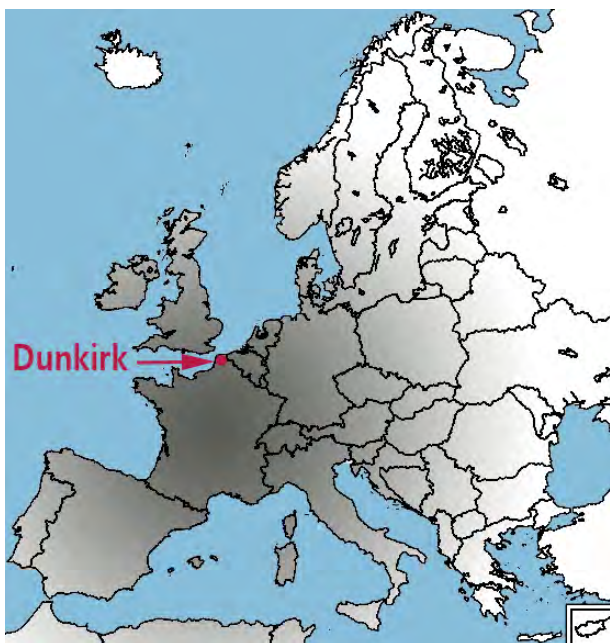
International Symposium on HVDC Cable Systems



Program

Dunkirk, France
November 20 - 22, 2017

Location of Dunkirk on the map of Europe



Access to Dunkirk (Dunkerque)

Summary

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Old rigs in the port of Dunkirk



City hall of Dunkirk



The harbor jetty

Jicable HVDC'17

International Symposium on HVDC cable systems

Dunkirk, France - November 20-22, 2017

Organized by

- **Jicable**, International Conference on Insulated Power Cables
- **SEE**, Société de l'Électricité, de l'Électronique et des Technologies de l'Information et de la Communication
- **SYCABEL**, Syndicat Professionnel des Fabricants de Fils et Câbles Électriques et de Communication
- **ENEDIS**, L'Électricité en Réseau
- **RTE**, Réseau de Transport d'Électricité
- **SERCE**, Syndicat des Entreprises de Génie Électrique et Climatique
- **CIGRÉ**, International Council on Large Electric Systems
- **AGP21**, Association Grand Projects 21

With the Technical and Scientific Support of

- **AGP21**, Association Grand Projects 21, France
- **BNC CIGRÉ** (Brazilian National Committee), Brazil
- **CIGRÉ**, International Council on Large Electric Systems (International and French National Committee)
- **CIRED**, International Conference on Electricity Distribution
- **CSEE**, Chinese Society for Electrical Engineering, China
- **ELECTROSUISSE**, Switzerland
- **ENTSO-E**, European Network of Transmission Systems Operators for Electricity
- **EUROPACABLE**, The European Confederation of National Associations of Manufacturers of Insulated Wire and Cables
- **IEC**, International Electrotechnical Commission
- **IEEE ICC**, Insulated conductors committee, USA *
- **IEEJ**, Institute of Electrical Engineers of Japan
- **SEE**, Société de l'Électricité, de l'Électronique et des Technologies de l'Information et de la Communication, France
- **SRBE/KBVE**, Société Royale Belge des Electriciens, Belgium

* tbc

Patronages

With the gold patronage of:

- **PRYSMIAN Câbles et Systèmes France**
- **NEXANS**

With the silver patronage of:

- **GENERAL CABLE**
- **ENERGIE 2020 - Pôle d'excellence Régional**
- **Le PÔLE MEDEE - Maîtrise Energétiques des Entraînements Electriques**
- **ULCO - L'Université Littoral Côte d'Opale**

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- **ZHONG** Lisheng, Xi'an Jiatong University, China



General Objectives and Topics

HVDC power links are growing in numbers and are now increasingly used for land or submarine applications including connection of offshore wind farms. HVDC cable systems are becoming key components of sustainable energy systems to provide large capacity of electricity transmission over long distances, across or between countries and for renewable energy delivery. Recent breakthrough innovations in the field of HVDC extruded cable systems have shown rated voltages reaching the range 400 to 700 kV, power transmission up to 3 GW and suitability not only for VSC converters types, but also for LCC converters.

The objective of the symposium Jicable HVDC'17 is to address and discuss the following topics:

1. Research and current knowledge on the behavior of materials for HVDC cables and accessories: new materials, dielectric behavior, space charges, interfaces, ageing, reliability.
2. State-of-the-Art of the development of extra high voltage DC extruded cables systems in the range 400 to 700 kV: development, testing and standardization.
3. Technical coordination between converters and cable systems: insulation coordination, transient over-voltages, DC circuit breakers.
4. Large transmission corridors: reliability of very long links including many joints, future technology alternative.
5. Submarine cables installation: lessons learned from experience, installation in harsh environment.
6. Submarine asset management & submarine cable repairs in case of faults.

Technical Visits

V1: The IFA 2000 HVDC interconnector

Wednesday, November 22, 2017 - 13:30 - 18:30

Limited number of participants.

IFA2000 (also called HVDC Cross-Channel) is a 2000 MW interconnector between France and Britain in operation since 1986, operated by RTE and National Grid plc.

The energy conversion is done by two LCC type bipoles (semiconductor thyristor valves) operating under +/- 270 kV DC voltage and the power transmits through 8 x 75 km-long DC cables, including 45 km of submarine cables.

The technical visit will take place at the converter station near Calais (France) and will include:

- A description of the IFA 2000 converter station: history, energy conversion equipment
- A visit of the converter station
- A description of the HVDC cables with a special focus on the refurbishment of land oil filled cables by XLPE cables (a world premiere together with LCC converters at 270 kV)
- A visit of the connection between submarine cables and land cables.

V2: The Channel Tunnel and the project ElecLink

Wednesday, November 22, 2017 - 14:00 - 18:00

Limited number of participants.

The ElecLink project, which will enable the installation of a 1000 MW Interconnector between the French and the British electricity markets via the Channel Tunnel, has just been launched at the beginning of the year (2017) with an estimated commissioning date for January 2020.

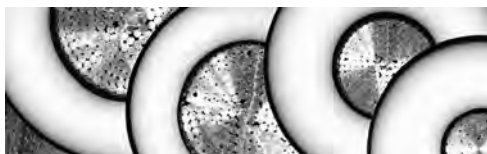
This Interconnector will be built on the Eurotunnel Concession site in France, in United Kingdom and in one of the Railway Tunnel.

This Interconnector will a be 69 km long connection with 52 km inside The Channel Tunnel.

Eurotunnel is the fastest, most reliable, easiest and the most environmentally friendly transport system to cross the Pas-de-Calais / Dover strait. It is also the most widely used in the world combining freight and tourists traffic with more than 350 trains a day, 7 days a week and 365 days per year.

This single landline has become a vital link between the continent and the United Kingdom.

The visit will be a combination between 2 presentations: the Eurotunnel system and the ElecLink interconnector.



Tutorials

Monday, November 20, 2017

15:00 - 18:30 (break from 16:30 to 17:00)

Three high-level tutorials will be given as a prelude to the symposium by professors for a limited number of participants.

T1: Updated characteristics of materials for HVDC cables and new materials

by **Petru NOTHINGER**, IES Montpellier, France and **Gilbert TEYSSEDRE**, Laplace CNRS Toulouse, France

The demand and challenges for materials to be used in HVDC cable development are mainly focused on synthetic insulation. Polyethylene materials have been successful in replacing other cable technologies for HVAC undersea or underground cables, and the challenge is presently to adapt materials and find new solutions for HVDC cable insulations.

In this tutorial, the constraints driven by the DC cable conditions and construction on the materials constituting cables, being insulation as well as field grading materials, will be given, with consideration of cable junctions and the differences with AC stress. Despite a generally higher dielectric strength under AC than DC stress, issues related to resistive field grading and to space charge phenomena under DC stress mark the real challenges for the reliability of HVDC links. The behaviour under polarity reversal is a further challenge.

As background, we will revisit dielectric physics, highlighting the nature of charge carriers involved in transport processes (conductivity), and the nature of sites providing charge stabilization and trapping in materials. The approaches for understanding and evaluation of materials behaviour ranging from molecular scale approaches to experimental characterization in flat specimen and to cable scale testing will be addressed. Current strategies for materials ranging from crosslinked materials to nanocomposites and to thermoplastics will be reviewed.

T2: Converters operation and consequences on cable system in case of fault

by **Hani SAAD** and **Samuel NGUEFEU**, RTE, France

The inclusion of High Voltage Direct Current (HVDC) transmission link in AC grids is expanding rapidly worldwide. The use of voltage source converters (VSCs) based on Modular Multi-level Converter (MMC) topology is becoming more attractive

mainly due to their higher performances, absence of commutation failures, ability of independently controlling the active and reactive power, etc. VSC technology does not require the inversion of the voltage polarity when reversing the direction of power flow. This has made the use of extruded insulation cables easier for DC applications. Since then, the number of extruded insulation cables, used in combination with VSCs, has increased for HVDC power transmission applications. Even if VSC does not require the inversion of the voltage polarity, several events can generate transients on cables that are not well covered by standard tests and may stress the cable.

The presentation will illustrate the typical events that lead to voltage fluctuation on cables connected to VSC converters. DC faults or internal converters faults can result in significant over-voltages at the DC cables which persist even after the system has been disconnected from the AC networks. These transients will be described, analyzed and compared against the standard tests for lightning and switching impulses. Technical solutions to limit stresses on cables will be also proposed and discussed.

T3: CIGRE recommendations for electrical and mechanical testing of HVDC cable systems.

by **Marc JEROENSE**, NKT HV Cables AB, Sweden

HVDC cable systems have been in service for a long time, already since 1954. Now, more than 60 years later thousands of kilometers of HVDC underground and submarine cables have been put in service and are being contracted. The suitability of technologies and technical solutions of these cable systems have been proven by performing internationally agreed tests covering development, qualification, manufacturing and installation.

Mass impregnated and oil-filled cable systems have for many years been the only types of HVDC cables systems. The last 20 years, though, we have witnessed a dramatic catching-up of extruded cables systems for HVDC applications.

During the course of development of all these cable systems CIGRE has published recommendations that cover tests that address the stresses that a cable system is exposed to during its life cycle. These stresses are thermal, electrical and mechanical.

The electrical and thermal tests cover both extruded and lapped cable systems and are described in two different Technical Brochures published by CIGRE, Electra 189 and TB 496.

Mechanical stresses that these cable system are experiencing during installation, operation and recovery are very different for underground and submarine cable systems. For that reason the recommendations describing mechanical tests for underground and submarine cable systems are different. The use of submarine cable systems has increased dramatically the last decades and the future promises rather an increase than a decrease in these cable systems. Installation conditions also become increasingly challenging. These facts have resulted in the newest recommendations covering mechanical tests for submarine cable systems: TB 623.

During the tutorial a historical view on the development of the tests related to the birth of new technologies and applications will be presented. The content of the relevant recommendations will be given and explained. Thoughts about future need of new or updated recommendations will be shared based on the observation and fact of an increased pace in project complexity and technology development.

Young Researchers Contest

The Organizers of Jicable HVDC'17 are setting up a **Young Researchers Contest** to encourage the participation of students and young researchers.

Students and researchers whose abstracts are selected will be invited to present their papers, explain their poster and answer questions at Jicable HVDC'17

The Call for papers sent to engineering schools and universities was based on the following topics:

- 1) Progress on the understanding of physical phenomena and on materials for use in HVDC.
- 2) Very high DC voltage: 500 kV extruded power insulated cables, current standardization,
- 3) HVDC corridor projects in Europe for underground links, hybrid possible systems.
- 4) Submarine HVDC links: state of the art of extruded and paper power insulated cables, power transmitted,
- 5) Converters: Technical coordination for the connection « cable / converters ».

Authors of selected papers will be exempt from conference registration fees; they will also receive a grant to help their participation. The authors of the three best papers / posters, will receive prizes respectively of € 1,500 (first prize), € 1,000 (second prize) and € 500 (third prize).

All selected papers will appear in the Jicable publications.

Social Program

- **Welcome cocktail dinner**

Monday, November 20 at 19:00

The **Welcome cocktail dinner** will be held at the Kursaal Congress Center of Dunkirk (ground floor).

The cocktail is included in your registration fees.

- **Jicable-HVDC'17 dinner**

Tuesday, November 21 at 20:00

The Jicable-HVDC'17 **dinner** will be held at the **Casino**.

The dinner is not included in your registration fees. As an option you have the possibility to buy one or several vouchers.



Let's enjoy the Jicable-HVDC'17 private dinner in the sumptuous decor and modern Art Deco of the Dunkirk Casino!

At only fifty meters from the Kursaal, the dinner in which the **young researchers' prizes** will be awarded will start at 20:00 and end around 23:00.

Afterwards why not visiting the ground floor which provides the more low-risk betting options, with 200 slot machines or go upstairs to discover behind the heavy wooden doors, a luxurious interior where more serious games such as poker, roulette and blackjack are played. The casino has English-speaking staff.

Important: please do not forget your dinner voucher. It will be requested.

General Information

Date and venue

Jicable-HVDC'17 will be held at the Kurssaal Congress Center of Dunkirk



Address:

DUNKERQUE KURSAAL

7bis place du Casino - 59140 DUNKERQUE

France

N 51°02'56.44" / E 2°23'19.15"

The symposium will be held inside the Congress Center from November 20 to 22.

Monday 20: Tutorials at the first floor and Welcome cocktail at the ground floor

Tuesday 21 and Wednesday 22: Lunches will take place at the first floor, technical sessions at the ground floor in auditorium Jean Bart and technical visits (on the 22 only) meeting point at the ground floor.

Official language

The official language at Jicable-HVDC'17 will be English.

Proceedings

On arrival at the Welcome Desk, each participant will receive a symposium bag, the program, and a USB flash drive containing the program and the text of the papers presented during the symposium (both oral and poster sessions).

The DVD of Jicable HVDC'13 proceedings is available for sale! as well as the Jicable'15 proceedings (on paper books, digital tablet or SD Card). If interested just ask for more information to: organization@jicable-hvdc17.fr

Badges

An admission badge will be delivered to each participant, giving access to the symposium sessions and to the audiovisual presentation room. It must be worn throughout the symposium period at all times.

Practical Information

Meals

The two planned lunches will be organized inside the Congress Center itself at the 1st floor.

The Welcome cocktail dinner will take place at the ground floor on Monday night.

WiFi space

Free Wifi access in the Congress Center

Insurance

The organizers cannot be held liable for any personal accident or for damage to, or for the loss of any personal property, howsoever caused. Participants should therefore make their own insurance arrangements.

Useful tips

In the month of November, the average temperature in Dunkirk is of 8 degrees Celsius.

In France, the electric current is 220 V / 50 Hz. It is advised to consider the use of an electric adaptor.

Hotel bookings

You have the possibility to book your hotel directly through the website in the menu “accommodation”.

In order to get more choice, we advise you to book your hotel as soon as possible.

Getting to Dunkirk

Located at the heart of Europe, less than three hours from 5 major European capitals (London, Paris, Brussels, Amsterdam and Luxembourg), Dunkerque Flandre Côte d'Opale is easily accessible by road, rail or boat.

By train

From Paris Gare du Nord, 6 direct TGV trains on Monday, November 20th.

Duration : 1.37 hour or 2.12 hours

6:46 – 8:23

7:46 – 9:23

7:52 – 10:04

11:46 – 13:23

12:52 – 15:04

14:52 – 17:04

From Lille: direct TGV train (duration 30 minutes) or 1 hour (Intercités train)

From Dunkirk to Paris Gare du Nord on Wednesday, November 22nd : Last train to Paris 18:34 – 20:14

By Sea

You can also get here through the Channel Tunnel and by ferry to Calais, 40 km from Dunkirk.

Dover-Dunkirk by ferry with DFDS Seaway:

www.dfdseaways.com

Dover or Folkestone – Calais by ferry with P&O Ferries or Euro-tunnel Le Shuttle on: www.directferries.co.uk

By plane

Lille-Lesquin airport 85 km away. More information online at: www.lille.aeroport.fr

Brussels airport (Zaventem) 160 km away. More information online at: www.brusselsairport.be/fr

Paris airports, Roissy Charles de Gaulle 280 km away or Orly 300 km away. More information online at: www.parisaeroport.fr

By car to Dunkirk

- From Channel Tunnel: 20 min
- From Lille: 45 min
- From Brussels: 1.30 hour
- From Paris: 2.30 hours
- From Reims: 2.30 hours
- From London: 2.30 hours

Getting to Dunkirk Kursaal

By car:

- GPS N 51°02'56.44" / E 2°23'19.15"

From the train station to Dunkirk Kursaal by bus:

- Line 3 or 8

15 minutes, from stop **GARE** (Dunkerque) to stop **MALO Plage** (Dunkerque)

Car parks

- P2, P3, P4, P5, P6, P7 and P8 are free public car parks less than 10 minutes' walk from the Kursaal.



Parking	Nb of places	Time walking	Rate
P1	200	0 min	not free
P2	275	2 min	free
P3	136	5 min	free
P4	216	10 min	free
P5	50	3 min	free
P6	25	3 min	free
P7	28	3 min	free
P8	80	10 min	free



Registration Procedure & Fees

Registration fees for the entire symposium are as follow:

	Rates up to Sept 30 th 2017	Rates from Oct 1 st 2017
Standard rate	360 €	420 €
Member of supporting organization	310 €	360 €
University staff <i>non member of a supporting organization</i>	310 €	360 €
University staff <i>member of a supporting organization*</i>	270 €	310 €
Invited speaker (<i>First author only</i>)	Free of charge	Free of charge
Young researcher (<i>first author only</i>) <i>Students ≤ 28 years old**</i>	Free of charge	Free of charge

Supporting organizations: SEE, CIGRÉ, AGP21, CNB CIGRE, CIREN, CSEE, ELECTROSUISSE, ENTSO-E, EUROPACABLE, IEC, IEEE, SRBE/KBVE

*a copy of ID membership should be sent by email when you register

**a copy of identity card is required for students and should be sent by email when you register

These fees include:

- Access to the conference (with badge, symposium bag and program)
- The program and the texts of all the papers (both oral and poster sessions) on a USB flash drive
- All meals (welcome reception, lunches on 20th and 21st and the coffee breaks) except the Jicable-HVDC'17 dinner which is optionnal.

Optional activities (with a limited number of places):

TUTORIALS (T) on Monday, November 20th (15:00-18:30)	
T1: Updated characteristics of materials for HVDC cables and new materials	190 €
T2: Converters operation and consequences on cable system in case of fault	190 €
T3: CIGRE recommendations for electrical and mechanical testing of HVDC cable systems	190 €

TECHNICAL VISITS (V) on Wednesday, November 22th	
V1: Visit of The IFA 2000 HVDC interconnector (13:30 - 18:30)	70 €
V2: Visit of The Channel Tunnel and the project Eleclink (14:00 - 18:00)	70 €

Jicable-HVDC'17 DINNER AT THE CASINO on Tuesday, November 21st (20:00)	
Contribution to the dinner at the Casino of Dunkirk	45 €

TOURISTIC VISIT OF DUNKIRK on Wednesday, November 22th	
DV1: The Port museum of Dunkirk At the heart of an impressively restored maritime warehouse dating back to 1868, the Port Museum portrays the history and professions of the port. During this visit you will have the opportunity to discover the three masts Duchesse Anne, a former school ship and the largest sailboat open to visitors in France. <i>Time: 14:00 - 15:30 - English speaking guide</i>	22 € /person
DV2: Operation Dynamo and the « Dunkirk spirit » Operation Dynamo is the largest evacuation effort in World War II military history, a real “miracle” that allowed 338,226 allied soldiers to escape the hell of Dunkirk and reach Great Britain. Our guide will introduce you to the essential sites of Operation Dynamo and also the shooting places of Dunkirk, film directed by the world famous director, Christopher Nolan (released in July 2017) <i>Time: 14:00 - 16:45 - (after the visit, possibility to be dropped at the train station) - English speaking guide</i>	28 € /person

We invite you to visit www.jicable-hvdc17.fr to register immediately and benefit of the reduced rates.

Authors (except the 1st author of each communication) and committees members are not exempt from paying registration fees.

Registration is valid only after the payment is received by the SEE HVDC'17. If the payment has been made by bank transfer, the participants are kindly required to bring with them the proof of payment at the conference venue.

On-line registration will be closed on November 16th. Badges withdraw and on-site registration will start on Monday 20th from 14:00, at the Kursaal of Dunkirk.

Cancellation policy: refund of all prepaid fees will be made provided that an advance written notification is submitted by October 20th 2017. No refund will be made for cancellation received after this date.

Formalities

All foreign nationals wanting to come to France must be able to submit statutory documentary evidence at the border for the reasons for their stay, their means of support and accommodation arrangements.

As a rule, unless you are exempt, you are required to have a visa. It must be applied for from the relevant French embassy or consulate in the applicant's country of residence.

For business trips or stays of less than or not exceeding 90 days (3 months), you need to apply for a short-stay «Schengen» visa.

The official form to obtain a visa can be downloaded from:



Sightseeing Suggestions

The world's northernmost Francophone city is just minutes from the border with Belgium. Life in Dunkirk has always been oriented towards the sea, whether through historic whaling and fishing or trade. The port remains active today and also shuttles passengers across the Channel to Dover (UK).

The name "Dunkirk" is also synonymous with the withdrawal of the Allied armies from France in 1940, and there's a top-notch museum set right where this operation was coordinated.

In the city don't miss the UNESCO-listed belfry and museum of the port with its historic ships.

Let's explore the best things to do in and around Dunkirk:

Musée Portuaire

Dunkirk's 19th-century tobacco warehouse is one of the few historic buildings spared by the war and offers an evocative home for a museum that will tell you the long and absorbing story of the port.

Among the many exhibits are those devoted to the city's whaling and cod fishing industries in the 19th-century that required six-month expeditions to the waters around Iceland.

There are three heritage ships moored at the quay next to the museum, the largest of which is the three-mast Duchesse Anne, built at Bremerhaven in Germany in 1901 and the only tall ship you can board for a tour in France.

Beffroi de Dunkerque

All the belfries of Flanders are protected as on UNESCO site, and Dunkirk's is no exception.

It was built in the 15th century to replace an old watchtower and was originally the campanile of Saint-Eloi church, which is next door.

The church was destroyed in a French attack on the city in the 1500's, and only this tower remained.

It's almost 60 metres tall and you can go to the top for a fabulous panorama of the city.

You'll see the carillon of 48 bells up here, and the mechanics controlling them. They chime every 15 minutes and on the hour they play a snippet of La Cantate à Jean Bart, a song with special meaning for Dunkirk.



Dunkirk Carnival



The port museum
of Dunkirk



The beach



The bell tower of
Dunkirk



Gravelines



St Omer

Plage de Malo-les-Bains

Located in front of the Kursaal, one of the greatest sandy beach in the north of France and a must on summer days.

Malo-les-Bains behind it was once a different town but has been part of Dunkirk since the 1960's.

Dunkirk 1940 Museum

Bastion 32 was a coastal defence constructed in 1874 after the Franco-Prussian war to strengthen France's border.

And so it was that the Allied forces coordinated Operation Dynamo from this structure in May and June of 1940, when more than 330,000 soldiers were evacuated from France.

The galleries tell you everything you need to know about how the operation was planned and executed, and some of the events that took place in a dramatic chapter of the Second World War.

A film using dramatic period footage, with a duration of approximately 15 minutes, gives an excellent overall view of the events of May-June 1940.

Dunkirk Carnival

Dunkirk's bonkers carnival has a reputation that goes far beyond Dunkirk.

The party runs from mid-January to the end of March, but the time to be here is for the three days before Ash Wednesday.

These are the "Trois Joyeuses", when 40,000 revellers take to the streets in crazy costumes (normally unflattering drag for men). On Sunday the "visscherbende" band parades through Dunkirk wearing yellow rain hats, playing songs for people to join in and dance.

They represent the fishermen who used to embark on trips to Iceland to catch herring.

And to commemorate this the mayor throws almost half a ton's worth of smoked herrings (wrapped, thankfully) onto the gathered crowd from the crowd on the Sunday afternoon.

Gravelines

In the 17th century the town of Gravelines was on the border between France and Flanders, then under the control of the Spanish.

After being captured and then liberated it became heavily fortified, and most of this architecture is still visible.

Inevitably, the man called upon to beef up the town's defences was the esteemed engineer Vauban, who turned Gravelines into a citadel, setting up bastions and digging a network of moats that continues to bear the shape of a star today.

The fun of Gravelines is walking the ramparts and checking out the arsenal, now a museum for drawing and engraving.

The town's belfry is one of the 23 on UNESCO's list.

Saint-Omer

Visiting this city 40 kilometers from Dunkirk you'll be in no doubt that it has always been an affluent place.

The centre is one of Flemish-style mansions and pilastered neo-classical townhouses.

The museum inside the 18th-century Hôtel Sandelin makes clear the wealth enjoyed by the city's merchant class and nobility, with copious paintings and period ceramics.

Then there's the sublime gothic cathedral, regarded as one of the most richly-decorated in France.

The astronomical clock inside has a mechanism from 1558 and an organ designed by the 19th century master organ-maker Aristide Cavaillé-Coll.

Cuisine

The traditional food in Dunkirk has a Belgian flavour and is all the more delicious for it. Beer comes into play for a lot of dishes, like coq à la bière (chicken cooked in beer) and carbonnade flamande, the popular braised beef and onion stew. Potjevleesch is a pork, rabbit and chicken terrine in jelly served cold. Always a crowd-pleaser is mussels, simmered either with onions and white wine or in a provençal sauce. All of the meals above go great with French fries, accompanied with a big dollop of mayonnaise.

Sightseeing Reservations

Office de Tourisme et des congrès de Dunkerque Dunes de Flandre

4 place Charles Valentin - 59140 Dunkerque France

Tél: +33 (0)3 28 26 27 27 / Fax: +33 (0)3 28 26 27 80

E-mail: tourisme.dunesdeflandre@ot-dunkerque.fr

Addresses to note

► Before the symposium

Jicable-HVDC'17 registration:

SEE - Jicable-HVDC'17

17 rue de l'Amiral Hamelin

75783 PARIS Cedex 16 - France

E-mail: organization@jicable-hvdc17.fr

Phone: +33 (0)1 56 90 37 02

Web Site: <http://www.jicable-hvdc17.fr>

► During the symposium

All services will be transferred to:

Dunkerque Kursaal

7bis place du Casino - 59140 DUNKERQUE, France

Symposium Welcome Desk - Opening Hours

Monday November 20 th :	14:00-18:00
Tuesday November 21 st :	07:30-18:30
Wednesday November 22 nd :	08:00-14:00





Jicable- HVDC'17 at a glance

Monday, November 20 th	Tuesday, November 21 st	Wednesday, November 22 nd
7:30 - 8:30	Registration (ground floor, Hall)	
8:30 9:00	Opening Ceremony	
9:00 - 10:30	Session 1: Materials, space-charges, interfaces (auditorium Jean BART)	Session 5: Corridors projects for HVDC Links
10:30 11:00	Coffee break	Coffee break
11:00 12:00	Session 2: EHV DC Extruded Insulated Cable Systems for VSC & LCC Power Transmission	Session 6: Submarine Cables: Asset management and repairs
12:00 12:30		Round table and Closing session
12:30 - 14:00	Lunch break	Lunch break

14:00 15:00	Registration (14:00-18:00) Ground floor	Session 3: Technical coordination between converters and cable systems	Technical Visits V1 (13:30-18:30) and V2 (14:00-18:00) Touristic Visits DV1 (14:00 - 15:30) and DV2 (14:00 - 16:45)	
15:00 15:30	Tutorials T1, T2 and T3 (first floor)			Coffee break
15:30 16:00				Session 4: Submarine Cables: Installation
16:00 16:30				
16:30 17:00	Coffee break	“Young researchers” poster Session		
17:00 17:15	Tutorials T1, T2 and T3 (first floor)			
17:15 17:30				
17:30 17:45				
17:45 18:00				
18:00 18:15				
18:15 18:30				
18:30 19:00	Cocktail Dinner (Ground floor)			
19:00 19:15				
19:15 20:00				
20:00 21:00			Jicable dinner and young researcher awards at the Casino of Dunkirk	
21:00 22:00				

All sessions take place in auditorium Jean Bart (Ground Floor) - Tutorials and lunches in rooms Neptune and Poséïdon level 1 - Breaks and Cocktail dinner Ground 0

Program of the symposium

Monday, November 20th 2017

Registration

14:00 - 18:00 - (ground floor, hall)

Tutorials

15:00 - 18:30 - (1st floor)

T1: Updated characteristics of materials for HVDC cables and new materials

by **Petru NOTHINGER**, IES Montpellier, France and **Gilbert TEYSSEDRE**, Laplace CNRS Toulouse, France

T2: Converters operation and consequences on cable system in case of fault

by **Hani SAAD** and **Samuel NGUEFEU**, RTE, France

T3: CIGRE recommendations for electrical and mechanical testing of HVDC cable systems.

by **Marc JEROENSE**, NKT HV Cables AB, Sweden

Coffee break from 16:30 to 17:00

Welcome Dinner Cocktail

19:00 - 21:00 - Welcome dinner cocktail (ground floor)



Program of the symposium

Tuesday, November 21st 2017

Registration

7:30 - 8:30 - (ground floor, hall)

Opening Ceremony and Official Welcome Addresses

8:30 - 9:00 - (ground floor, auditorium)

Session 1: Materials, Space-charges, Interfaces

9:00 - 10:30 - (auditorium Jean BART)

Chairman: **Lisheng ZHONG**, Xi'an Jiatong University, China

Rapporteur: **Jérôme CASTELLON**, CIGRE D1, IES, France

1.1 Challenges and Opportunities with interfaces and materials for HVDC cable systems

by Prof **Alun VAUGHAN**, University of Southampton, UK

and Prof **Gian Carlo MONTANARI**, University of Bologna, Italy

1.2 Specific Considerations for HVDC Extruded Cable Insulation Evaluation Under Temperature Gradient

by **Jinghui GAO**, Xi'an Jiaotong University, China

1.3 The development route towards Extra high voltage DC - materials and testing

by **Villgot ENGLUND**, Borealis, Sweden

Coffee break from 10:30 to 11:00



Session 2: EHV DC Extruded Insulated Cable Systems for VSC & LCC Power Transmission

11:00 - 12:30 - (auditorium Jean BART)

Chairman: **Roland Dongping ZHANG**, Tennet TSO GmbH, Germany

Rapporteur: **Mohamed MAMMERI**, General Cable, France

2.1 System performance and demonstration of 400 kV - 525 kV DC-XLPE cable and accessories

by **Igi TSUYOSHI**, Sumitomo Electric Industries., Ltd, Japan

2.2 Definition and measurement of parameters for HVDC cables and accessories

by **Ivan TROIA**, **Marco ALBERTINI** and **Massimo BECHIS**, Prysmian, Italy

2.3 Assessing the impacts of VSC converter configurations on performance and testing of up to 640 kV extruded cable systems

by **Tanumay KARMOKAR**, NKT, Sweden

Lunch break from 12:30 to 14:00

Session 3: Technical Coordination between Converters and Cable Systems

14:00 - 15:30 - (auditorium Jean BART)

Chairman: **Harry ORTON**, Orton Consulting Ing, Canada

Rapporteur: **Mandana TALEB**, RTE, France

3.1 Fault clearance strategy and simulation of VSC-HVDC by DC breaker

by **Allen LI**, NR Electric Co., Ltd, China

3.2 Future VSC-HVDC converter topologies and their coordination with extruded HVDC cables

by **Antonios TZIMAS**, GE Grid Solutions, HVDC Business, Stafford, UK

3.3 Surge and extended overvoltage testing of HVDC cable systems

by **Markus SALTZER**, EDF R&D, group Cigré JWG B4/B1/C4.73

Coffee break from 15:30 to 16:00

Session 4: Submarine Cables: Installation

16:00 - 17:00 - (auditorium Jean BART)

Chairman: **Hideo TANAKA**, Furukawa Electric, Japan

Rapporteur: **Christian RÉMY**, Prysmian, France

4.1 Lessons learned from HVDC submarine cable installation from a TSO perspective

by **Volker BOSBACH**, TenneT Offshore GmbH, Germany

4.2 Installation of HVDC submarine cables in harsh environments: Focus on Strait of Belle Isle project, Canada

by **Joachim BAKKE** Nexans, Canada

"Young researchers" Poster Session

17:15 - 19:15 - (ground floor)

Chairman: **Stanislaw GUBANSKI**, Chalmers University of Technology, Sweden

Rapporteur: **Gilbert TEYSSEDER**, Laplace CNRS, Toulouse, France

YRC 02) Impact of surface preparation on electrical withstand in HVDC XLPE cable interfaces

by **Espens DOEDENS**, Nexans, Norway, et al

YRC 03) Ageing Study of XLPE submitted to long-term thermo-electrical dc stress for HVDC cables

by **Hanen YAHYAOU**, IES, Montpellier, France, et al

YRC 04) Investigation on silicone polymer and epoxy resin breakdown under AC, DC and combined AC/DC voltages

by **Hassan SAADATI**, Leibniz Universität Hannover Germany, et al

YRC 05) Development Status of HVDC XLPE Cable System in Korea

by **Soo-bong LEE**, LS Cable and Systems, Korea, et al

YRC 06) Evaluation of space charge accumulation characteristics in double-layered samples to simulate the behaviour of transmission cable joints under DC voltage

by **Tsuyoshi TOHMINE**, Tokyo City Univ, Japan, et al

YRC 07) HVDC Cable condition monitoring technology based on line impedance resonance method (LIRA)

by **Anthony MANET**, Wirescan, Norway et al

YRC 08) Finite element simulation for HVDC performance tests parameters setting

by **Basil SALAMÉ**, Nexans, France et al

YRC 09) Space charge accumulation characteristics of modified XLPE for direct current usage at polarity reversal

by **Hiroki KASUGA**, Tokyo City University, Japan, et al

YRC 11) Polypropylene/SiO₂ nano-composite with improved dielectric properties for DC cables

by **Paolo SERI**, UNIBO, Italy, et al

YRC 15) Characteristics Investigation for Space Charge in Coaxial Cable under Temperature Gradient with Improved Measurement System and New Algorithm

by **Chi CHEN**, Xi'an Jiaotong University, China, et al

YRC 17) Effect of Interface Chemistry on Charge injection and Trapping in Polyethylene blends

by **Somyot TANTIPATTARAKUL**, The university of Southampton, United Kingdom, et al

YRC 18) Progress on the understanding of physical phenomena and materials for DC applications,

by **Alexandra CONSTANTIN**, University Polytechnics of Bucharest, Romania, et al

YRC 19) Characterizations of Solid-Liquid Interface used in Wet-Mate Subsea HVDC Connector,

by **Mattewos TEFFERI**, University of Connecticut, USA, et al

YRC 20) The effect of field caused by space charge on aging exponent of XLPE and nano-XLPE under temperature gradient

by **Rui SU**, Xi'an Jiaotong University, China, et al

YRC 21) Direct Current Gas-Insulated Transmission Lines: Development and testing of the ± 550 kV DC GIL

by **Michael TENZER**, Siemens AG, Germany, et al

YRC 22) 525 KV HVDC Cables with HTPE insulation

by **F. PELLE**, Prysmian, France, et al

YRC 23) Modelling space charge distribution in coaxial insulation

by **Yunpeng Zhan**, University of Southampton, UK, et al

YRC 24) Space charge dynamic in the laminated insulation under different temperature condition by **Zhiqiang Xu**, University of Southampton, UK, et al

Jicable Dinner and Young Researcher Awards

The Jicable-HVDC'17 dinner will be held at the Casino of Dunkirk at 20:00

Please do not forget your dinner voucher. It will be requested.



Program of the symposium

Wednesday, November 22nd 2017

Session 5: Corridors Projects for HVDC Links

9:00 - 10:30 - (auditorium Jean BART)

Chairman: **Søren Damsgaard MIKKELSEN**, Energinet.dk, Denmark

Rapporteur: **Pierre MIREBEAU**, Nexans, France

5.1 Reliability on existing HVDC links feedback

by **Jussi RANTANEN**, ENTSO-E, WG AIM / HVDC Reliability Task Force FinGrid, Finland

5.2 MgB2 superconductor: a 3.2 GW demonstrator for bulk HVDC underground transmission

by **Frédéric LESUR**, Nexans, France

5.3 TenneT's HVDC Cable Projects in Germany and Quality Assurance of HVDC cables

by Dr. **Roland D. ZHANG**, AMG-ST cables, TenneT, Germany

Coffee break from 10:30 to 11:00

Session 6: Submarine Cables: Asset management and repairs

11:00 - 12:00 - (auditorium Jean BART)

Chairman: **Dirk RITTINGHAUS**, Energycableconsult, Germany

Rapporteur: **Fanny SBRAGGIA**, RTE, France

6.1 Asset management of submarine cables and lessons learned from a repair

by **Jean CHARVET**, RTE, France

6.2 Fault Location on Land and Submarine Links (AC & DC)

by **Robert DONAGHY**, ESB International, Ireland (convenor CIGRÉ group B1.52)

Closing Session

Wednesday 12:00 - 12:30

Chairman: Jean Philippe ROUDIL, RTE, France

Rapporteur: Jean CHARVET, RTE, France

Feedback on faults and repairs of submarine cables, conclusion.

Round table with the participation of different TSOs and repair providers.

Lunch break from 12:30 to 14:00

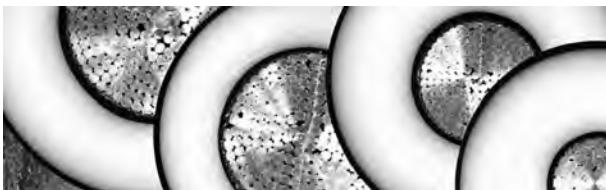
Technical Visits

13:30 - 18:30 - (Departure from the Kursaal)

V1: The IFA 2000 HVDC interconnector

14:00 - 18:00 - (Departure from the Kursaal)

V2: The Channel Tunnel and the project Eleclink



The Jicable'15 proceedings are now edited and available for sale!

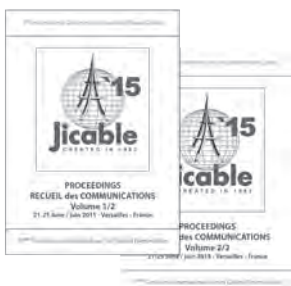
Jicable'15, held in Versailles in 2015, provided an in-depth analysis of the state of the art and the future prospects of AC and DC insulated power cables:

New materials, evolution of technologies, manufacturing process, maintenance policies and condition assessment, upgrading, refurbishment, lessons learnt from service, dielectric phenomena, thermal and thermo-mechanical behaviour, new innovative technical solutions for high power transmission: new superconducting materials as well as a closer look at major submarine cable projects connecting High Voltage networks in many countries.

326 papers by 1000 authors from 36 countries affiliated with more than 250 different organizations were discussed.

The proceedings are available in 2 volumes: 1852 pages.

On the occasion of the symposium Jicable HVDC'17 these proceedings are proposed to the participants with the exceptional price of 180 € instead of 200 €, with in addition graciously the DVD of the symposium Jicable HVDC'13 on materials for DC cables and accessories of Perpignan, 2013



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