CV – Johan Karlstrand

Personal

Name:	**Johan Karlstrand**
Date of birth:	5th of April 1962
Nationality:	Swedish
Position:	Senior Consultant
Address:	JK **CableGrid** Consulting AB
	Ö. Vittusgatan 30
	371 33 Karlskrona
	Sweden
Telephone:	+46 721 550504
E-mail:	karlstrand@cablegrid.com
Skype:	johan.karlstrand

Summary

- *M.Sc*. in *Electrical Engineering* and *B.A*. in *Theoretical Philosophy*
- Experience from electrical engineering and power systems since 1990
- Experience from land- and submarine cable systems as well as high voltage engineering since 1993
- Consultant experience from Sydkraft Konsult and SWECO
- Manager and technical expert at ABB AB High Voltage Cables AB within the areas of:
    - High Voltage Engineering
    - Cable Accessories
    - Cable System Design
- Engaged as technical expert in many Cigré working groups.
- Ex-member of IEC TC20/WG16 – international working group
- Ex-member of SAG (Strategic Advisory Group) within SC B1(Insulated Cables) in Cigré
- Ex-convener of TAG (Tutorial Advisory Group) within SC B1(Insulated Cables) in Cigré

Languages

- Swedish - mother tongue
- English - fluent
- German – intermediate
- Russian - basic

Education

- M.Sc. - Electrical Power Systems, High Voltage Engineering) – Chalmers University of Technology 1986 - 1990. (278 ECTS)
- B.A. - Theoretical Philosophy, Lund University (90 ECTS) and Music and Music Theory – University of Gothenburg 1983 – 1985 (120 ECTS)
- Russian language – University of Gotland 2006 (15 ECTS)
- Mathematical methods for physics 7.5 ECTS – 2015
- Trainee at Sydkraft (Power Utility) 1990 – 1991
- Additional courses corresponding to 55-60 days within areas of project management, general management, mathematical statistics, insulation coordination, dielectric diagnostics, MATLAB, FEM-tools, etc.
- FEM calculation methods - COMSOL. 3 days of advanced courses - 2012.
- FEM calculation methods - COMSOL. 2 days AC DC module - 2015.
- MATLAB Fundamentals, programming, visualization etc courses
- Reliability and Weibull Statistics – Accelerated Aging 5 days – 2013

Awards

- 2014: The CIGRE Technical Committee Award – in recognition of outstanding contribution to the work of Study Committee B1 – Insulated Cables

Positions

- 1990 – 1991: Sydkraft - Trainee and Electrical Network Engineer
- 1991 – 1993: Sydkraft Konsult – Consultant, Electrical Power and Distribution Systems
- 1993 – 1994: ABB High Voltage Cables AB – R&D Engineer and Cable Designer of Land and Submarine Cable Systems
- 1995 – 1998: ABB High Voltage Cables AB – Manager for High Voltage Laboratory
- 1998 – 1999: SWECO (BECO) Consultant – Power System Specialist
- 1999 – 2002: ABB High Voltage Cables AB – Technical Coordinator and Project Leader for Feasibility Studies
- 2002 – 2005: ABB High Voltage Cables AB – Product Manager
- 2005 – 2006: Education
- 2006 – 2011: ABB High Voltage Cables AB – Manager System Design (Land & Submarine Cable Systems)
- 2011 – XXXX: JK Cablegrid Consulting AB – Senior Consultant

Working Experience

- 1990 – 1993: Sydkraft (Power Utility)
    - Master Thesis: Selectivity Plans for Electrical Systems
    - Trainee-program. Theoretical and Practical work within Electrical Power Systems
    - Technically responsible for the project planning of electrical network connections to a wind farm on Öland-Sweden
    - Investigation on the requirements of surge arresters for the overhead line system
    - Economical – technical investigations/pre-studies/investment analysis of power stations, overhead lines, cables, high voltage equipment in the voltage range of 10 – 130 kV

- 1993-1998: ABB AB High Voltage Cables
    - Responsible for the development of factory joints for submarine cables
    - Heat conduction and electrical calculations for cable grids
    - Technical proposals for land – and submarine cable systems
    - Lead Engineer for submarine cable project - Croatia Cross Island Project
    - Head of the testing in Swepol och Bakun MI cable projects
    - Head of the reconstruction and new construction of the High Voltage Laboratory
    - Appointed as member of WG 21.16 – "Partial discharge detection in installed HV extruded cable systems"
    - Head of procurement of new test equipment for High Voltage Laboratory
    - Project Manager for an R&D project in cooperation with EPRI och ConEd/New York. Replacement of 345 kV HPFF cable system with XLPE cable systems (4 years)

- 1998 – 1999: SWECO
    - Continuation as Project Manager for 345 kV EPRI/ConEd project
    - Investigation of new design concepts for cable termination for XLPE cables

- 1999 – 2002: ABB AB High Voltage Cables
    - Project Manager for "Undergrounding". This project lasted for three years and included many feasibility studies comparing OH-lines with cables. The following parts were included in the studies:
        - Total cost (Investments/maintenance/power loss/land values etc.)
        - Differences in the way OH-lines/cables are dimensioned thermally/mechanically during continuous load, short circuit, overload etc.
        - Environmental impact and EMF
        - Availability, land cable installation, HDD concepts and maintenance

The project was conducted in close cooperation with many customers of which the following may be listed:

- Swedish TSO-Svenska Kraftnät . Investigations of 400 kV-lines: Södra Sandby, Stenkullen-Lindome, Hagsätra-Danderyd etc.
- Stora Enso –investigations for undergrouding 130 kV- grids
- Landsvirkjun – Large project in cooperation with ABB Facts looking at the possibility to strengthen the Icelandic network via a cable across Iceland. A Cigré-paper was written. The investigation focused on continuous ratings, overload capacity, short circuit characteristics, dynamic stability, inrush currents, reactive shunt compensation etc.
- Investigation about magnetic shielding of cables and joint pits in a 130 cable grid in Copenhagen
- Additional papers were written and published in the subject

- Appointed to member of WG B1.19 – "General guidelines for the integration of new cable systems in the network"
  - Investigations about reactive shunt compensation for cables introduced in the OH line network
  - Design of "transition compounds" – (transitions between cables/OH-lines)
  - Magnetic shielding of cable systems
- Project leader for a study in cooperation with STRI/Vattenfall. Comparison of OH-lines and cables from a perspective of current ratings, overloads, short circuit currents, availability, reliability, over-voltages etc.)

- 2002 – 2005: ABB High Voltage Cables
  - Responsible for internal technical advice and system calculations as well as market release of new developed products for cable systems
    - Many customer contacts, technical marketing, educations and presentations
  - Appointed to member of WG B1.07 –" Statistics on underground cable in transmission networks"
  - Appointed to member of WG B1.25 – "Advanced design of laminated metallic coverings"

- 2006 – 2011: ABB High Voltage Cables
    - Head of technical proposals and technical lead engineering for all ac/dc land – and submarine cable systems, for example:

        - NorNed, 450 kV DC MI- submarine cable
        - BritNed, 450 kV DC MI- submarine cable
        - EWIP, 200 kV HVDC extruded submarine cable
        - Borwin I, 150 kV HVDC extruded submarine cable
        - Lolland – Zealand, 132 kV, three-core submarine cable
        - Bayonne, 345 kV AC, single-core submarine cable
        - Gjöa, 115 kV Dynamic and static 115 kV, three-core submarine cable
        - Dolwin I – 320 kV HVDC extruded submarine cable
        - Western Link – 2 GW/ MI – submarine cable (Feasibility study)

        This responsibility together with hand-on technical work gave a good insight into the projects and technical details. The work is performed in close relation with installation, marketing and production departments

    - Appointed to member of WG B1.06 – "Revision of qualification procedures for HV and EHV AC extruded underground cable systems"
    - Appointed to member of IEC TC20/WG16 –" High voltage cables (1kV and above), their accessories and cable systems"
    - Appointed to secretary of WG B1.27 – "Recommendations for testing of long AC submarine cables for extruded insulation for system voltage above 30 (36) to 500 (550) kV"
    - Appointed to member of SAG – "Strategic Advisory Group" within Cigré B1 (Insulated Cables)
    - Appointed to convener of TAG – "Tutorial Advisory Group" within Cigré B1

- 2011- 2022: Senior Consultant, JK Cablegrid Consulting AB
    - Nexans – Norway. Åsgard Subsea Compression Project. Lead Engineering for design, development, manufacturing and testing of cables connecting offshore gas compression unit at 330 m water depth. HVDC Development, Development of Direct Electrical Heating concepts, …
    - Nexans- Development of new advanced cable rating tool for submarine and land cables. Kernel calculations have been made in Python and many different cable rating concepts have been validated in FEM (Comsol)
    - Energinet – Denmark. Quality Assurance of manufacturing, testing and installation of Lille Belt 420 kV three-core land and submarine cables.
      Viking Link - HV/EHV DC extruded cable systems, risk analysis, test requirements
    - Vattenfall – United Kingdom. Failure analysis and technical reporting of HV three-core export cables to Thanet offshore windfarm.
    - Vattenfall – Sweden. Testing philosophy of 16.7 Hz export cables
    - WindMW - Germany. Quality Assurance of manufacturing, testing and installation of infield cables to MeerWind offshore windfarm.

    - Kinectrics – Canada. Technical support and report about market trends for DC cables.
    - HighVolt – Germany. Technical support and report about DC testing.
    - Fortum Distribution - Sweden. FEM (Comsol) Calculations for 245 kV XLPE Cables installed in rock, Wind farm dynamic ratings in FEM (Comsol) etc
    - DUCAB – Dubai. Rating Calculations
    - Maillefer Extrusion Oy – Finland, Development of Submarine Cable Accessories, Selling support etc,
    - TKF – Holland, Design and Testing of submarine cables
    - Borealis – HVDC compentences
    - Lower Churchill Project – MI cable competences
    - NKT – Technical Investigations and Analysis
    - Clayton Utz – FEM-modelling of Basslink HVDC Cable (Australia – Tasmania)
    - Ellevio/Craftor – FEM-modelling and Rating Calculations of Stockhlom Ring
    - WSP/SvK – Project engineering cable design and calculations for Hansa PowerBridge HVDC link
    -
- 2012 – 2023: Education and Courses given by JK Cablegrid Consulting AB
    - SCW – China. DC Cable Systems.
    - Borealis – Sweden. Cable Accessories.
    - Alstom – United Kingdom. Cable rating, overload rating, induced voltages and short circuit current rating.
    - Maillefer/Boruoge – China. Submarine Cable Design
    - Nexans – Norway. Cable rating, overload rating, induced voltages and short circuit current rating. 2013 – 2022, several occasions. HVAC and HVDC
    - AriNet – Poland. Seminar in Cable installation and Accessories
    - Maillefer – Finland. Cable Accessories
    - WSP - Project planning offshore windfarm connections in Baltic Sea
    - WSP – Cable expert towards SvK (Svenska Kraftnät) in Hansa Powerbridge Project
    - Basslink/Clayton UTZ Australia – Cable expert in FEM calculations for the Basslink cable failure between Australia and Tasmania
    - Baltic Offshore – Failure analysis of FOC testing
    - … and more …

In addition, presentations at conferences and tutorial sessions organized by Cigre’ and other organisations.

Conference Papers

1. High Voltage XLPErformance Cable Technology. (ABB Review 2000, B. Delby, G.Bergman, A. Ericsson, J. Karlstrand)
2. Cost-efficient XLPE Cable Systems, (IEE Conference, London 2001, J. Karlstrand, G. Bergman, H-Å. Jönsson)
3. A novel approach to long buried AC transmission system, (Cigre conference Paris 2002, P. Halvarsson, J. Karlstrand, D. Larsson, M. Larsson, K. Reinholdsdottir, E. Sigurdsson)
4. Water-cooled 345 kV Solid-Dielectric Cable System, (Cigre conference 2002, J. Karlstrand, P. Sunnegårdh, R. Ghafurian, R. Boggia)
5. Comparison of 130 kV XLPE cable systems and OH lines - loading capability, reliability and planning criteria, (Cigre Conference 2002, D. Karlsson, J. Lundqvist, F.J. Sollerkvist, J. Karlstrand, P. Norberg)
6. Technical issues regarding the integration of HVAC underground cable systems in the network (Cigré Conference 2002, P. Argaut, Johan Karlstrand, …)
7. Factory Testing of long submarine XLPE cables using frequency-tuned resonant systems, (Cired Conference 2005 Turin, J. Karlstrand, G. Henning, S. Schierig, P. Coors)
8. AC Cable Solutions for Offshore Wind Energy (S. Johansson, L. Liljestrand, F. Krogh, J. Karlstrand, J. Hansson)
9. Three-core HV XLPE Submarine Cables for offshore applications (Cigre Conference in Paris 2006, J. Karlstrand, G. Henning, M. Sjöberg, A. Ericsson)
10. AC and DC Extruded Cable Systems - Adopted to replace OH-lines (Cigre' Osaka 2007, J. Karlstrand, K. Johannesson, H-Å. Jönsson)
11. FEM Tools – An example of cables installed in duct-banks (Jicable -07, J. Karlstrand, G. Henning)
12. Facts for optimum utilisation in cable networks in power systems (Jicable -07, R. Grünbaum, J. Karlstrand)
13. HVDC Light Cables for long distance grid connection (European Offshore Wind Conference 2009, K. Johannesson, A. Gustafsson, J. Karlstrand, M. Jeroense)
14. The Experience of using Distributed Temperature Sensing (DTS) in XLPE Power Cables (Cigre/Cired Slovenia -2009, D. Palmgren, J. Karlstrand, L. Hammarson)
15. Qualification of 345 kV Submarine XLPE Cable System (Jicable -2011, J. Karlstrand, D. Palmgren, J. Johansson, J. Antonischki, B. Zettervall)
16. Armour loss in three-core XLPE cables (Jicable 2011, D. Palmgren, J. Karlstrand, G. Henning)
17. On the optimum burial depth of submarine cables (Jicable 2011, T. Worzyk, J. Karlstrand)
18. Design, Testing, Installation and Operation of Three-core Export Cables for Offshore Applications (Wind Integration Workshop 2013 Berlin, J. Karlstrand, O. Unosson)
19. Wet designs for HV submarine power cables (Jicable 2015, Versailles, J. Karlstrand et al)
20. Accurate analytical formula for calculation of sheath and armour losses of three core submarine cables (Jicable 2015 – Versailles, M. Hatlo, E. Olsen, J. Karlstrand)
21. AC transmission systems for large scale and remote offshore wind farm (Jicable 2015 – Versailles, E. Olsen, M. Hatlo, R. Stølan, J. Karlstrand)
22. Electromagnetic coupling in HV and EHV three-core submarine cables during test and operation (Jicable 2019 – Versailles, J. Karlstrand, E. Olsen, M. Hatlo)
23. Evaluation of thermal resistances T3 and T4 for touching formations in IEC 60287-2-1 (Jicable 2023 – Lyon, J. Karlstrand, M. Hatlo, M Hovde)