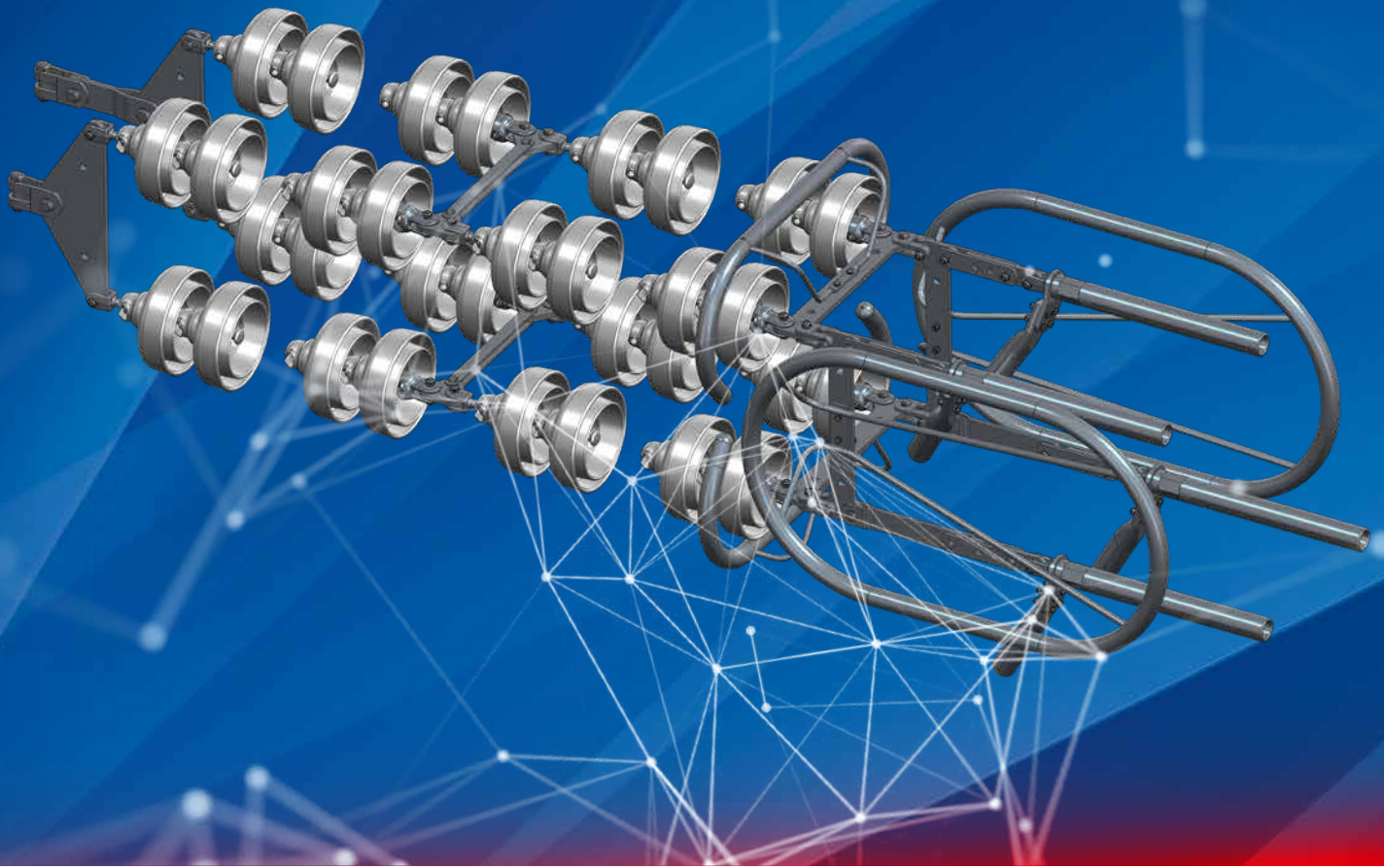


# ENERGY

WE ENERGIZE  
THE WORLD

# HVDC TECHNOLOGY

TRANSFORMING THE FUTURE OF  
TRANSMISSION LINE SYSTEMS



**MOSDORFER**  
KNILL GRUPPE

# THE IMPACT OF HVDC TECHNOLOGY

ON EFFICIENCY AND A SUSTAINABLE FUTURE

# BENEFITS

02

**There is no doubt that the ever-increasing demand for energy requires new technologies to ensure efficient, reliable and sustainable energy transmission.**



Today, High Voltage Direct Current (HVDC) technology is revolutionising the way electrical energy is transmitted over long distances.

As the power grid is a global system, new lines are often interconnected between neighbouring countries or even continents to ensure reliable and stable global operation. The new decentralised generation of electricity from renewable sources such as wind and solar power is also changing the planning and construction of new overhead transmission lines.

In addition, to be prepared for future emerging generation technologies, the backbone lines or interconnections are often built using HVDC technology. The new DC converter technology helps Transmission System Operators (TSOs) to switch from AC to DC lines, providing a number of technical and economic benefits.

03



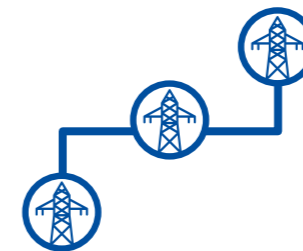
### Reduced Right of Way (ROW)

Compared to a 3-phase system in AC technology, DC requires only one pole. This fact allows the contractors to compact the complete tower design and thereby save costs.



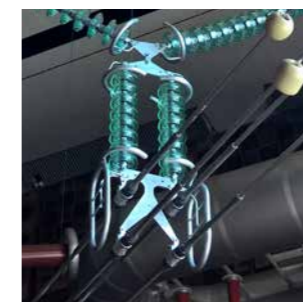
### Efficiency over long distances

HVDC is more efficient than traditional AC systems for transmitting electricity over long distances due to reduced lines losses in operation. This even compensates the higher investment costs as additional converters are required. Despite the increase in the voltage level up to 800 kV, these lines could bridge distances from the generation to the end consumer of more than 1,000 km.



### Connecting asynchronous grids

HVDC enables the connection of different AC grids that operate at different frequencies. This allows for the transfer of power between regions that would otherwise be incompatible.



Overall, HVDC technology plays a vital role in creating a more efficient, reliable, and sustainable energy grid.

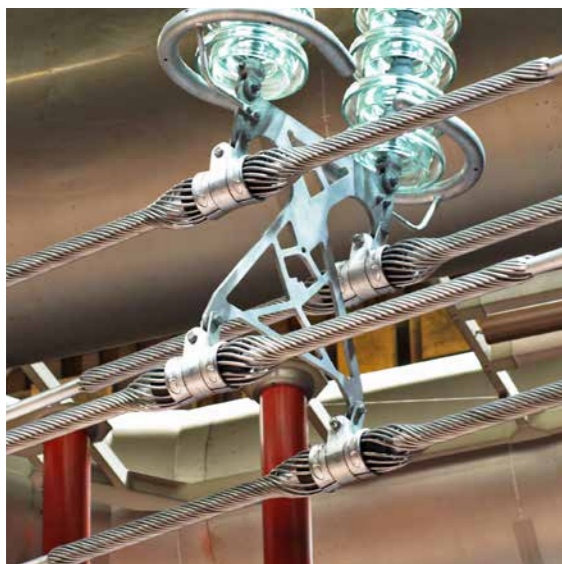
# TRANSMISSION LINE SYSTEMS

PIONEERING SUSTAINABLE HVDC SOLUTIONS

# ONLINE

04

**Our system solutions and fittings ensure that overhead lines perform as they should with advanced technologies and materials for the efficient transmission of electricity, whether in HVDC or HVAC.**



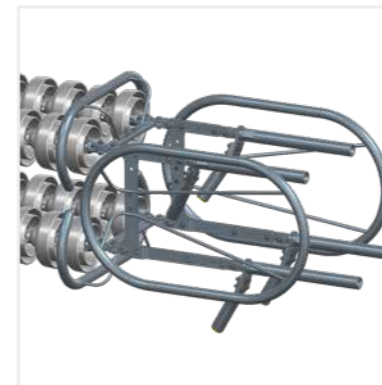
For worry-free transmission – in the tropics and deserts with their extreme heat, in coastal regions or in northern latitudes with extremely low temperatures. Our advanced HVDC solutions meet the highest standards and ensure reliable performance with all types of insulators including glass, polymer and porcelain.

DC Technology requires some modifications and adaptations for insulator strings, and we have the know-how and experience to do so. From mechanical point of view the insulator strings are easy to handle, the challenge at the engineering centre in Austria starts with the electrical design.

#### **Innovative Corona protection for DC strings**

DC strings need an adopted corona protection system. Corona rings themselves require bigger radii to control the increased voltage gradient. For special applications, like the side corona rings for tension strings, aluminium tubes substitute the usual galvanized steel material. Mosdorfer production engineers adapted the existing processes to provide light products with a smooth surface. To suspend the pole conductors comfortably at the hot end of the suspension string, corona free suspension clamps, made of corrosion resistant aluminium alloy are the preferred solution, designed with smooth bending radii to reduce the mechanical stress onto the conductor, thus guaranteeing a long lifetime for the conductor.

05



#### **Enhanced insulation solutions for challenging environments**

DC strings for polluted areas, running in deserts or close to the sea, in the worst case a combination of both, need an increased insulation level. This means an increased number of cap and pin insulators or an increased length of individual single insulators, i.e. composite type. Mosdorfer provides technical solutions based on the customers specification but also offers consultancy support on request. From individual product adaptations till the development of new individual products or innovative insulator string solutions.



#### **Durable, low-maintenance solutions for extreme conditions**

For a long and reliable lifetime, paired with low maintenance demand, forces the use of special metallic materials with high ductility over a wide temperature range. For extremely high polluted areas Mosdorfer offers steel hardware with an increased zinc layer thickness, taking the experience out of its own galvanising plant. If the top level of corrosion protection is required we provide premium fittings made of stainless steel.



#### **Protection against wind induced oscillations**

Protecting the conductors, one of the biggest assets of an overhead transmission line, against damages forced by wind induced vibrations, is another important topic. For bundled configurations spacer dampers are the preferred solutions – we know how to adapt them for DC applications.

# EXPERIENCED IN HVDC

FOR 20 YEARS

# CONTENT

Within our Mosdorfer 75 years of experience in Overhead Transmission Solutions, we have been active in the HVDC segment for over 20 years. Already in 2001 we supplied the first customized HVDC spacer damper to New Zealand. Since then, we have supported 525 kV projects in China, Sweden, Germany, Canada, and Norway with insulator strings and continued innovation.

Saudi Arabia has dominated the HVDC transmission market in the GCC Region, and we are proud to say that today Mosdorfer is the main strategic hardware and damping supplier for all HVDC projects currently underway in Saudi Arabia.

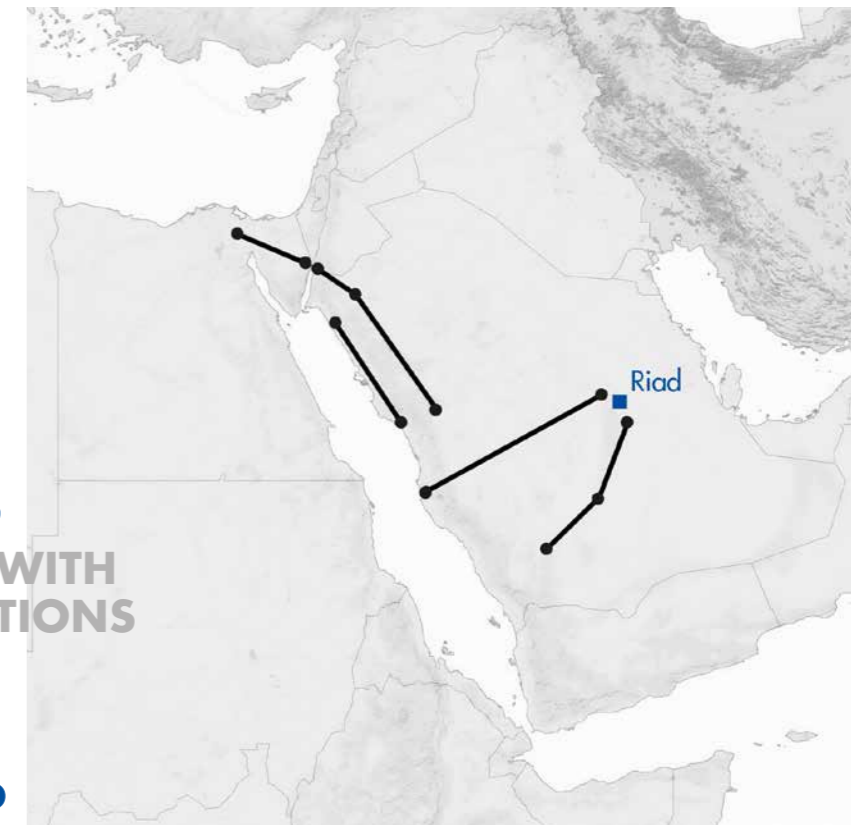
| Year of Delivery | Project  | Customer                  | Country of Destination |
|------------------|--|---------------------------|------------------------|
| 2001             | 500/350 kV Transpower  | Transpower                | New Zealand            |
| 2003             | 750 kV China Suspension string for line trap                                 | LAPP Germany              | China                  |
| 2011             | 500 kV Sweden/Finland  | Svenska Kraftnät          | Sweden                 |
| 2013             | 500 kV HVDC Edmonton to Calgary (WATL)                                       | SNC Lavalin T&D/ Altalink | Canada                 |
| 2014             | 500 kV HVDC EATL 506109P-7120-120605   | SNC Lavalin INC.          | Canada                 |
| 2016             | 525 kV DC Ertsmyra-Vollesfjord   | Statnett SF               | Norway                 |
| 2022             | ± 500 KV DC Mahdina – Tabuk (Interconnection between Saudi Arabia and Egypt) | NCC, SSEM, Hyundai        | Saudi Arabia – Egypt   |
| 2023             | ± 525 kV SEC-WOA 4000072481 – NIC South – YCNT                               | Hyundai, Aetcon, L&T      | Saudi Arabia           |
| 2024             | ±525 kV SEC-WOA 4000077826 – Interconnection link Bahrain – Dhuruma          | SSEM, L&T                 | Saudi Arabia           |
| 2024             | ± 525 kV SEC-SOA 4000077829 – Interconnection link                           | SSEM, L&T                 | Saudi Arabia           |

## Saudi HVDC Reference Factbox

**>2,777 KILOMETERS LINES** EQUIPPED WITH OUR SOLUTIONS

**81% MARKET SHARE** OF ALL BUILT HVDC LINES

**> 5,000 TONS** DELIVERED HVDC TRANSMISSION SYSTEM SOLUTIONS



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THE WORLD

03-2025

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