National Grid Saudi Arabia and Dow Are Powering the Future Together

National Grid Saudi Arabia (NGSA), a subsidiary of Saudi Electricity Company (SEC), is seeing rapid progress in upgrading its power grid infrastructure with the help of national and international cable manufacturers. This is being achieved by replacing the old High Voltage (HV) cable underground network consisting of oil filled cables with XLPE cables. It is being further boosted up by the induction of XLPE cables at Extra High Voltage (EHV) level.

NGSA has come a long way since its four formerly separate grids were interconnected. The company has built power links with many neighboring countries including a High Voltage Discontinued Courant (HVDC) back-to-back converter station to connect 50 and 60 Hertz networks. In tandem with Dawiyat, also a subsidiary of SEC, the fiber optic network grew significantly with the expansion of its overhead transmission network. Now, submarine telecom cables at the landing stations in Jeddah, Al Khobar and Yanbu are connected to a high-performance data network with the help of optical ground wire from overhead transmission lines (OHL).

Both the power transmission network and the fiber optic data network are powerful domestic infrastructure but also serve as international interconnectors. A major building block, besides upgrading overhead transmission from 230 kV to 380 kV, is the enhancement of networks with HV and EHV power cables. EHV cables avoid overhead lines near airports and waterways, cross under rivers and straits, connect islands but also speed up construction processes significantly by simpler and faster rights of way. It is one of the easiest ways to supply bulk power to densely populated areas. They are indispensable components for building compact substations and interconnecting substations in urban areas. EHV cables also protect natural landscapes, a key element to touristic development.

A home-grown success story: Dow and Saudi cable manufacturers

Dow has a long history of close collaborations in the Kingdom, just to highlight two examples, first the academic-research-industry partnership in form of the Dow Middle East Innovation Centre (Dow MEIC) and the King Abdullah University of Science and Technology (KAUST) and second, the alliance between Dow and Saudi Aramco forming the Sadara Chemical Company.

Dow has been one of the strong proponents of innovative product solutions required to fulfil the growing energy demand in the Middle East, particularly the KSA. Pioneers of fruitful collaborations with cable manufacturers in the Kingdom, they have successfully conducted pre-qualification testing of 380 kV cables produced within the KSA. For a successful pre-qualification test, the entire system, including cables and accessories, needs to pass strict testing and requires a high

level of processing acumen proven by the cable manufacturer as well as the utilization of materials of exceptional quality. International standards organizations such as the International Electrotechnical Commission (IEC) regulate EHV participation and only approve high performance cables with long service life.

ENDURANCE™, Dow's insulation system for power cables, has been used globally for the past 50 years for cables ranging from 66 kV to 500 kV. It has been one of the preferred products by Saudi cable manufacturers due to its high electrical breakdown strength, low dissapation factor, improved processability, robust additive stability and excellent customer support.

Inspired by the efforts of NGSA, very powerful collaborations have been developed throughout the value chain and culminated in successful deployment of electrical infrastructure to support the further economic growth of the Kingdom.

Highlights of EHV cable installations

- Connection of new power plants
- Construction of compact EHV substations and interconnections in new administrative and residential districts
- Replacing the OHL by underground cables which come within the city boundaries, as the city expands
- Neom City, a futuristic mega-city that is being planned on the Red Sea coast, the northwestern Saudi province of Tabuk
- "Beautification" of infrastructure at Red Sea tourist project spreading over islands, beaches, desert, mountains and volcanic areas
- Power supply for 2nd stage of Riyadh Public Transport Project (RPTP) metro system
- Connection of Fadhili co-generation gas plant which has a capacity of 1,500 MW

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About Dow

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