

Case Study

Turnkey capacity augmentation at 500 kV grid station

Client:	National Transmission and Dispatch Company (NTDC), Pakistan
Level:	500 kV
Commissioned:	2019
Scope:	Turnkey

Introduction

The National Transmission & Despatch Company (NTDC) is Pakistan's national transmission system operator, managing 500 kV and 220 kV power transmission networks. The company operates fourteen 500 kV and forty-three 220 kV grid stations, 5,893 km of 500 kV transmission lines, and 10,963 km of 220 kV transmission lines across Pakistan. In 1985, the SCADA system was introduced by establishing the National Power Control Center (NPCC) to control the 500 kV and 220 kV transmission system throughout the country via eight Regional Control Centers (RCCs).

Problem Statement

In the months prior to the summer of 2019, NTDC anticipated an unprecedented power demand for domestic and industrial consumption, requiring it to urgently increase its 500 kV transmission capacity in Faisalabad, a major industrial region in Pakistan. Given the critical nature of the 500 kV system and the urgency of the situation, NTDC turned to EPENAM to address the pressing need. EPENAM was required to complete the entire project on a war footing. This included manufacturing and supplying protection and control panels, AC and DC distribution panels, and marshalling kiosks, as well as providing a comprehensive range of services. These services encompassed everything from cable laying to panel interfacing, modifications to the existing busbar protection scheme, and the modifications to integrate existing breaker failure, line protection, and other panels. All of these efforts were necessary to seamlessly commission and augment the new diameter and bays at the 500 kV Gatti Grid Station.

Solution

EPENAM provided a complete capacity augmentation solution for this 500 kV grid station. A total of one diameter in 500 kV and one bay in 220 kV were added. EPENAM supplied, installed, interfaced, modified, and commissioned all the protection & control panels, marshalling kiosks, and auxiliary supply panels, in addition to undertaking the necessary modifications in existing systems, especially in the busbar protection at 500 kV and 220 kV busbars, as well as breaker failure protection. The panels supplied included:

1. R13 – 500/220 kV Trafo Main Panel Set-I
2. R14 – 500/220 kV Trafo Main Panel Set-II
3. R15 – 500 kV Breaker Failure Protection Panel
4. R16 – 500 kV Trip Circuit Supervision Panel
5. WC1 – 500 kV Line + Trafo Control Panel
6. WC7 – 500 kV Synchronizing Panel
7. S1 and S2 – 500 kV and 220 kV Local Control Cubicals
8. R5 – 220 kV Breaker Failure Protection Panel
9. R6 – 220 kV Trip Circuit Supervision Panel
10. R7 – 220 kV Busbar Protection Panel
11. C2 – 220 kV Line Control Panel

Conclusion

The intervention offered by EPENAM saved the 500 kV network of NTDC from congestion during peak summer loads. This resulted in a direct increase in industrial productivity in the region's special economic zones. NTDC was praised by public leaders for the quality and proficiency of the engineering, design, manufacturing, and indigenization offered by EPENAM.



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