904 - DESIGN SELECTION OF MV SUBMARINE CABLES FOR A MORE RESILIENT DISTRIBUTION NETWORK

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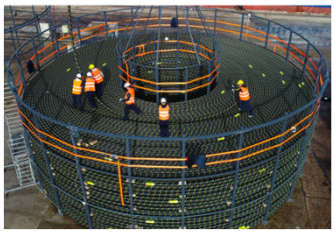
Introduction

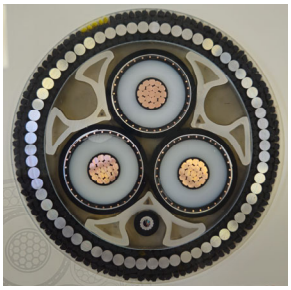
Submarine Cables Project within the National Recovery and Resilience Plan 2021-2026 (NRRP) of the Republic of Croatia:

- Project value €32.8 million for MV submarine cables with a total length of 120.5 km
- Replacement of 11 existing and construction of 2 new submarine cable sections by laying 65.78 km of 20.8/36(42) kV and 54.72 km of 12/20(24) kV submarine cables
- The project is implemented in five distribution areas from Rijeka in the north to Dubrovnik in the south



Cable selection criteria

- insulation and waterproofing layer design
  - *XLPE insulation with WTR*
  - *semi-dry design with Al PE foil bonded to the cable core sheath*
- mechanical cable armour design
  - *hot-dip galvanized steel wires 5 mm diameter*
  - *maximum tensile force > 90 kN*
- thermal cable design
- electrical cable design
- factory joint design



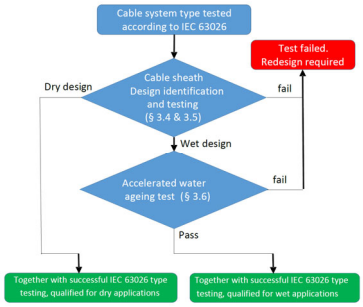
Quality assurance according to:

- IEC 63026:2019
- CIGRE Technical Brochure 722:2018
- ITU-T G.976:2014 recommendation for optical cable

Cable manufacturer's qualification

According to chapter 12 of IEC 63026 and chapters 3.4 and 3.5 of CIGRE TB 722:

- Qualification tests of cable core radial watertightness for dry design
- Mechanical type tests
- Electrical tests
- Longitudinal water penetration test
- Non-electrical tests
- Qualification tests according to the ITU-T G.976:2014 recommendation for optical cable



Quality control process

Testing according to chapters 9 to 11 of IEC 63026 and chapters 3.7 to 3.8 of CIGRE TB 722.

Inspection and Test Plan:

- Raw material certificates and testing
- Manufacturing inspection including testing during manufacturing
- Final inspection test requirements (FAT) and Cable tests on final shipment at Factory (Load out tests)

Conclusion

Key aspects to the long service life:

- design resistant to water and mechanical stress
- qualified selection of the cable system manufacturer and quality control during and after cable production, and during cable laying