3.4 QA/QC for the EHVDC cable systems

Technologies for Global Energy Grid

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Topics

- Introduction
- Why QA/QC important for EHVDC cable systems?
- What could we do for QA/QC?
- Discussion

Introduction

Insulation: MI (PPLP), Extruded

Application: Submarine/underground etc.

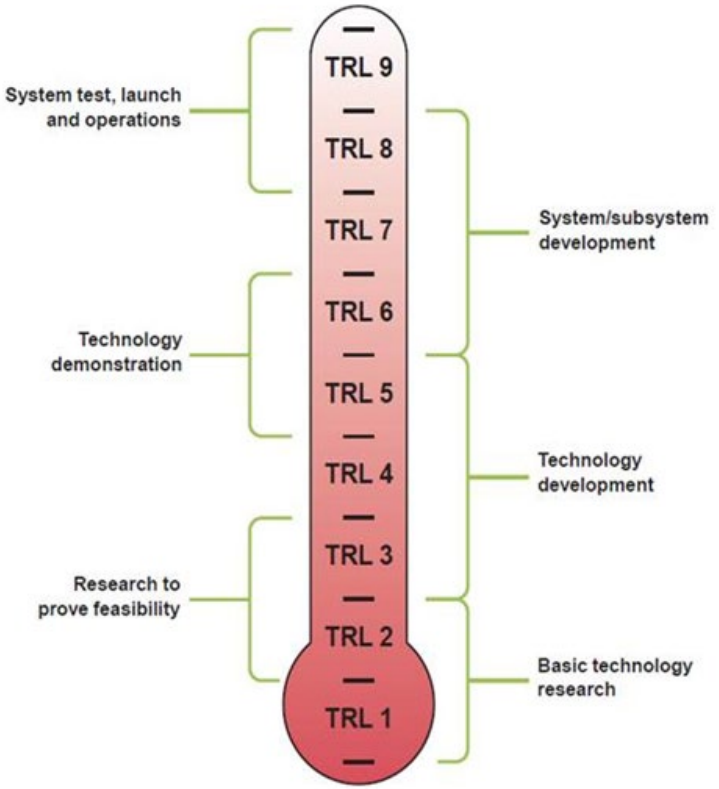
Source: ABB/nkt, Nexans

Why QA/QC important (1)

- Minimizing risks by the application of new technology without or with very limited operation experience, esp. for the “pilot project” with a route length of 700 km EHVDC cables
- Building the long-term partnership btw. TSOs and all EHVDC cable manufacturers regarding QA/QC, Win-Win-situation, possibly setting the benchmarks in this area
- Enhancing the reliability and availability of EHVDC cable systems
- Decreasing the failure rate, particularly avoiding the man-made failure, e.g. joint installation

Why QA/QC important (2)

- Avoiding the systematic failure/serial failure
- Reducing the re-dispatch cost due to the outage
- Saving the reputation
- Increasing TRL (Technical Readiness Level) of new technology
- Accelerating the energy transition



What to Do for QA/QC (1)

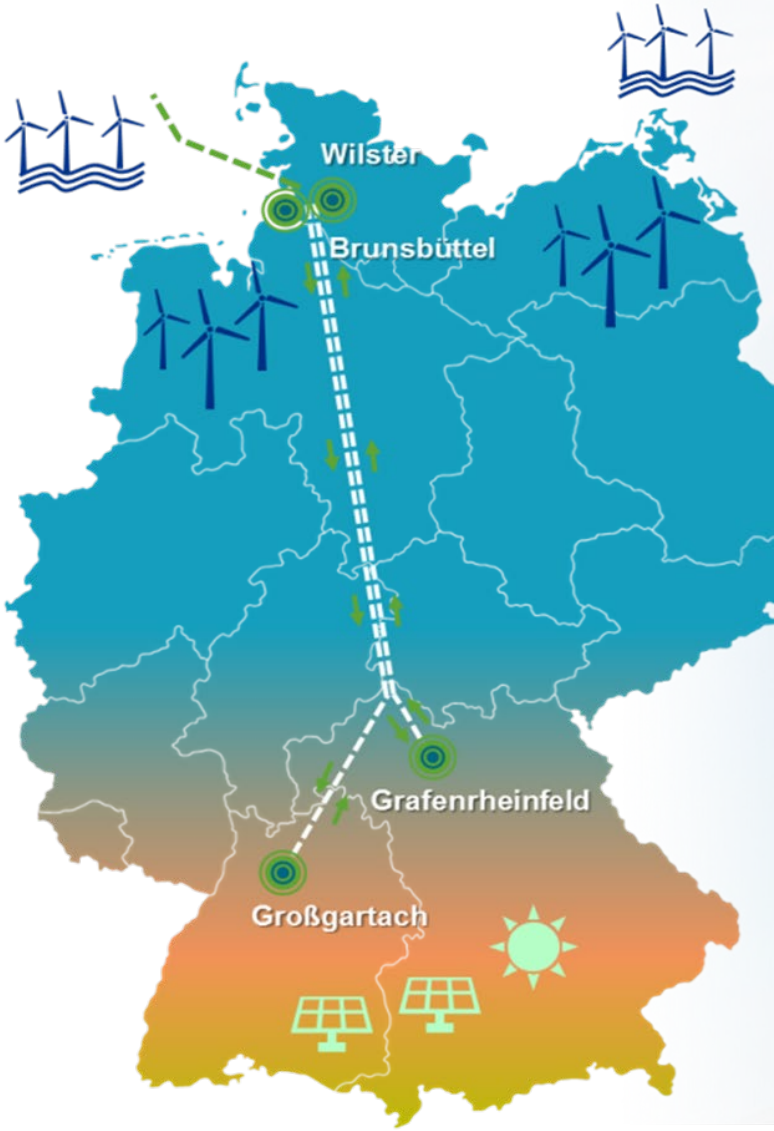
- **Design and Development:**
  - Verification of pre-performed tests, i.e. development tests, PQ/EQ, TT
  - Identification of new PQ, TT or EQ etc.
  - Control of ITP, Manufacturing Control Plan, QC-Plan, interface plan etc.
  - FMECA and risk assessment of design, installation, testing etc.
  - Sub-suppliers' qualification and verification
- **Manufacturing and Production**
  - Factory audit, checking the attitude of production (floor) staff to QA/QC
  - Material incoming check/control, traceability
  - Production supervision and witness of tests
  - Dealing with NC, Incident, RCA etc.

What to Do for QA/QC (2)

- **Installation**
  - supervision of cable laying/installation incl. trial installation
  - Supervision of jointing process, assembly the termination
  - HSE, SOLAS
- **Commissioning:**
  - SAT, Finger print measurements
  - Trial operation
  - Monitoring systems calibration and application
- **Operation:**
  - Maintenance plan incl. RPP and SLA
  - Health Index/Condition monitoring
  - Decommissioning plan

Discussion

- Generally, QA/QC for EHVDC cables shall be initialised and involved as **early** as possible by TSOs and by cable manufacturers, "**Thinking end at the beginning"**
- QA/QC → Balance of **risk/cost/performance** of EHVDC cable system
- **Cooperation/Knowledge sharing**




Thank you very much
for your attention!