Topics of HVDC insulated cable systems from Japan

Hideo Tanaka

VISCAS Corporation

JAPAN
HVDC power cable links under operation in Japan

- DC250kV Hokkaido-Honshu link (600MW / ca.50km)
- DC500kV Anan-Kihoku link (2800MW / ca.50km)

- Both links by Oil Filled (SCFF) cable system
- LCC system
Challenge history on HVDC extruded cable system development

- Development of HVDC extruded cable system
  - Initial challenge to apply normal XLPE to HVDC in early 1970’s
    - Unsuccessful results due to many BDs. → Abandoned!
  - Challenge to develop filled XLPE insulation for HVDC in middle 1980’s (Improvement of charge property, etc.)
    - Success of DC 250kV system development in middle 1990’s
    - Success of DC 500kV system development in early 2000’s
    - Both with molded type joints and wet type terminations.
  - Special aspects in above HVDC extruded systems
    - XLPE insulation for excellent electric and mechanical property
    - LCC operation, Max conductor temp. 90 degC
Recent challenge on HVDC XLPE system development

- Development of new design accessories
  - Environment friendly, easy fitting, land application, …
    - Non oil-impregnated paper type termination.
      - EPR cone type, pre-fabricated type
      - Trial on dry type termination
    - Non site-molded type joints
      - PMJ and PFJ
    - Qualification tests on 320kV and above
Current and future prospects on HVDC project in Japan

- New DC 250kV XLPE cable additional installation in Honshu-Hokkaido link (Laying planned)
Current and future expectations on HVDC project in Japan

- Grid reinforcement by HVDC cable links to be expected in the (near) future
  - 50Hz / 60Hz interconnection
  - Upgrading of existing HVDC links
  - International interconnection (South Korea, Russia, …)
Thank you very much for your attention!