Status of Superconducting cables and SFCLs in Korea

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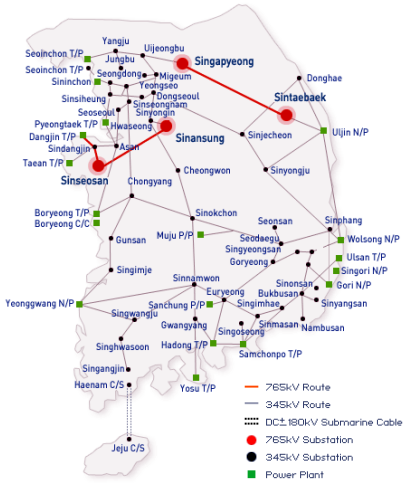
Background

Korea Electric Power Corporation (KEPCO)

- The sole distribution and transmission company in Korea (government-invested)
- 6 Brother companies: 5 thermal, and 1 nuclear and hydro generation company

Korean power systems

- 765, 345, 154 kV systems for transmission, and 22.9 kV for distribution



Issue

- Power demand is increasing steadily

→ Increasing fault current :

Exceeding the rating of CBs in some S/S's

Current measures

- Upgrading CBs

  Problem) Economically + technically not desirable
- Bus split

  Problem) Degrades system stability
- Air-core reactors

  Problem) Impedance during normal operation

Needs alternatives

With SFCLs,

- No need to upgrade CBs
- Can re-connect buses
- Don't need reactors

Superconducting cables in Korea

Development → **Demonstration** → **Commercial**

2001 — 2007 — 2009 — 2011 — 2012 — 2013 — 2014 — 2015 — 2016 — 2017 — 2018 — 2019

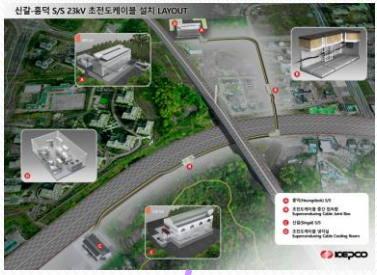
DAPAS project

- 22.9 kV cable, 50 MVA, 100 m — KERI, LS
- 154 kV cable, 1GVA, 100 m — KEPCO, LS, KERI
- 22.9kV Field test — KEPCO, LS

Icheon Project

- 22.9 kV cable, 50 MVA, 410 m
- 22.9 kV cable, 120 MVA, 100 m
- 22.9 kV, 50 MVA, 410 m, Cooling w/ cryocooler

KEPCO, LS



Singal Project

23kV, 50MVA, 1,000m

KEPCO

Jeju Project

- AC cable, 154 kV, 1 km
- DC cable, 80 kV, 500 m

KEPCO, LS

SFCLs in Korea

Development → **Demonstration**

2001 · 2007 · 2009 · 2011 · 2012 · 2013 · 2014 · 2015 · 2016 · 2017 · 2018 · 2019

DAPAS project

- 22.9 kV, 630 A development & field test
- 22.9 kV, 3,000 A devel.

KEPCO, LS산전

154 kV Project I

- 154 kV, 2000 A, 1Φ
- Development
- Field test

KEPCO

154 kV project II (planning)

- 154 kV, 2000 A, 3Φ
- Demonstration

KEPCO

Icheon Project

- 22.9 kV, 630 A
- Installation
- operation

KEPCO, KEPCO, LS산전