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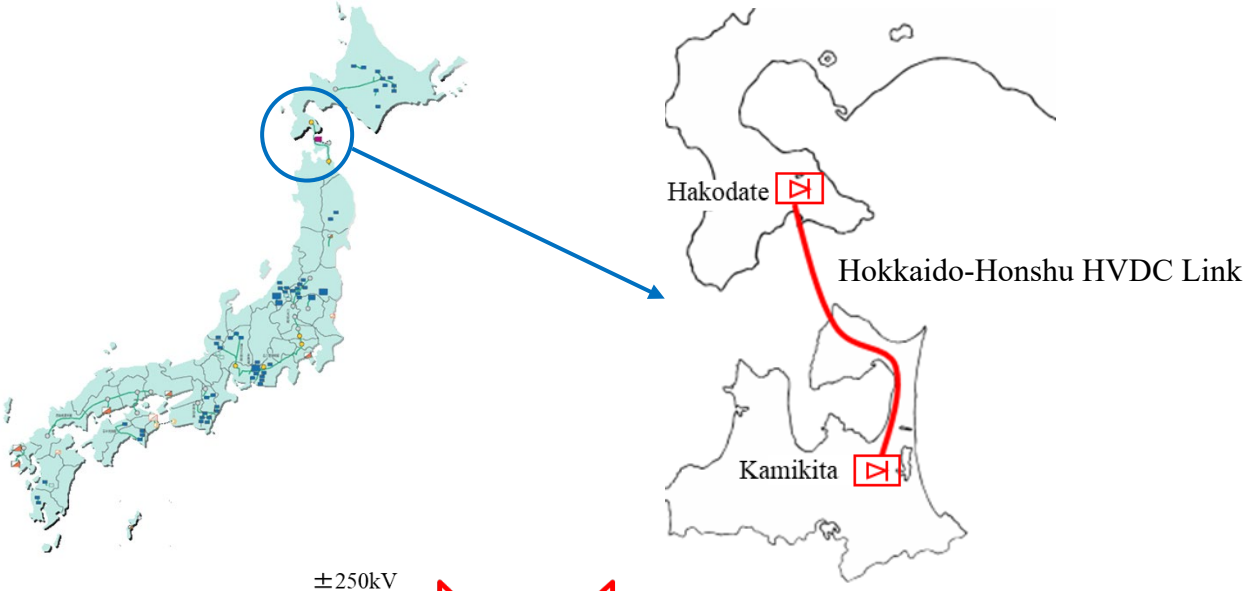
COUNTRY :	JAPAN	PREF. SUBJECT :PS1
REGISTRATION NUMBER : 6218		QUESTION N° : Q1.5

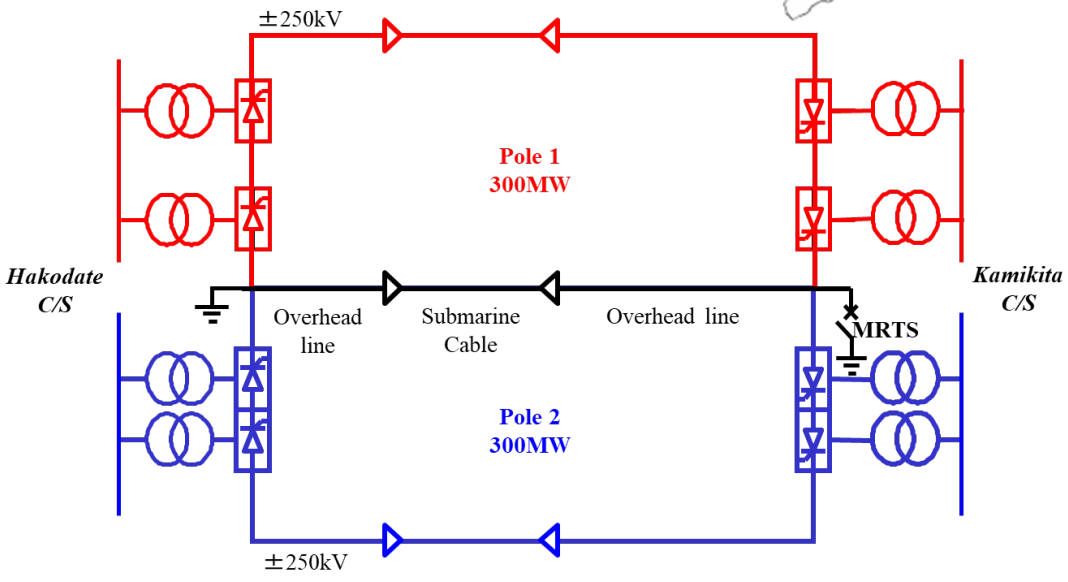
Q1.5 How should the existing HVDC installations manage the security issues and updates? How can the lifetime of control systems be extended?

Facility maintenance measures of Pole 1 of the Hokkaido-Honshu HVDC Link

The Hokkaido-Honshu LCC HVDC Link started operation in 1979 from the Hakodate converter station in Hokkaido area to the Kamikita converter station in Honshu area. This HVDC system is for interchanging the power in each area and frequency control.

Main features
- Capacity: 600MW Bipole HVDC
- DC Voltage: ±250kV
- DC transmission line: 167km (Overhead line 124km, Submarine cable line 43km)
- Converters: 6 pulse (Pole 1), 12 pulse (Pole 2)
- Commissioning year: Pole 1 1979 and 1980, Pole 2 1993



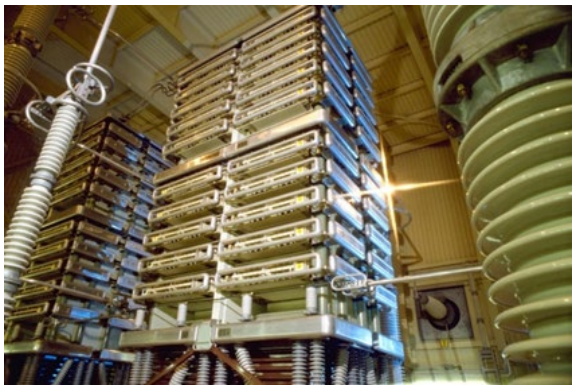


More than 40 years have passed since this link started operation, the oldest HVDC system in Japan.

The control and protection system of pole 1 was replaced in 2008. These system are normally replaced after around 25-30 years due to lack of spares, increased failure rates, survice support end and so on.

The thyristors and some part of thyristor-related equipment have been used continuously without being replaced since operation started in 1979. Therefore, failures of thyristor-related equipment occur due to ageing related issues recent year.

Since the number of spare parts is limited, we have just started considering the life extension or replaced before the spare parts run out, Life extension or Replacement.
Now under consideration, When, Cost, Outage.



Thyristor valve tower
(Pole 1 of Hakodate C/S)

Hakodate converter station

Kamikita converter station