

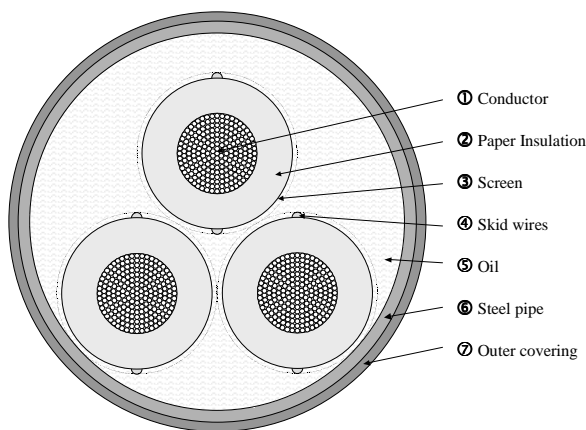
RETROFITTING OF PIPE-TYPE CABLES

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The authors review and discuss the development process within RTE, the French Transmission System Operator, which enables with the manufacturer's collaboration to take up the technical challenge of reusing steel conduits of pipe-type cables in order to install an extruded cable circuit.

Context

RTE is operating among other underground lines a set of 48 circuits of pipe-type cables, meaning 250km of circuits. These power links are mainly involved in the backbone of the 225kV transmission system of French big cities.



Pipe-type cables are designed with a paper insulated 805mm² copper conductor. Three phases are laid in a steel pipe under a 15 bar external pressure.

They were installed between 1957 and 1988. Even if the reliability of this technology is considered as satisfactory, the maintenance of knowledge and skills, as well as the supply of spare components in case of a breakdown, become a real issue and may cause unmanageable repair deadlines and unacceptable unavailability.

Stakes

Starting from Dissolved Gas Analysis, the end of technical life span of pipe-type cables has been assessed at 2013/2015 for the first power links. A

replacement programme should consequently start in the meantime, and be followed by a generalised deployment within 2015-2040 period.

Retrofitting is one of the techniques investigated by RTE for the refurbishment with synthetic insulated cables. In addition to light maintenance and environmental impact, this technique brings the prospect of many advantages:

- A strong mechanical protection against third-party damages, and secondarily a mitigation of 50Hz electromagnetic fields above ground,
- A simplification of the studies of cable route optimisation and administrative procedures,
- A reduction of temporary disturbances to residents linked to civil works,
- Substantial savings due to absence of trenching works.