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# TECHNOLOGIES ALERT

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## Development of the Large-sized 154kV XLPE triplex cable

Recently, there was a large-scale plan of uprating of underground transmission cables for thermal power plant enhancement in Tokyo Bay area.

But large space for snaking installation was needed for usual single core XLPE cable laying in tunnel for absorbing the thermal expansion. With the triplex cable, however, such expansion can be absorbed by change in the triplex cable diameter. This twisted flexure saves expansion space, and, also allows for more efficient use of underground space

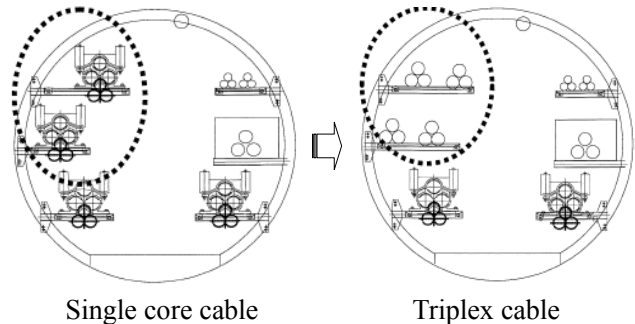
Therefore TEPCO developed the large-sized (800-1000mm<sup>2</sup>) 154kV XLPE triplex cable.

By applying this new cable at first in Japan, we could use existing tunnels and saved the construction cost and the term drastically by avoiding large-scale civil engineering work for tunnel.

We mainly conducted the following mechanical characteristic experiments for development.

1. We implemented the bending test, and checked that there was no disarray of the inner cable structure.
2. By measuring the Young's modulus, we found the difference of the thermal-mechanical characteristic between the usual single core cable and the triplex cable. So we can estimate the axial force of the triplex cable, therefore we are able to save the number of cable cleat and assess the thermal expansion of the cable.

3. We conducted the full scale experiment of tunnel installation of the cable, and made sure the self-absorbing characteristic of thermal expansion even in the large-sized triplex cable.



**Fig.1 The comparison of cable space in cross section of tunnel**

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