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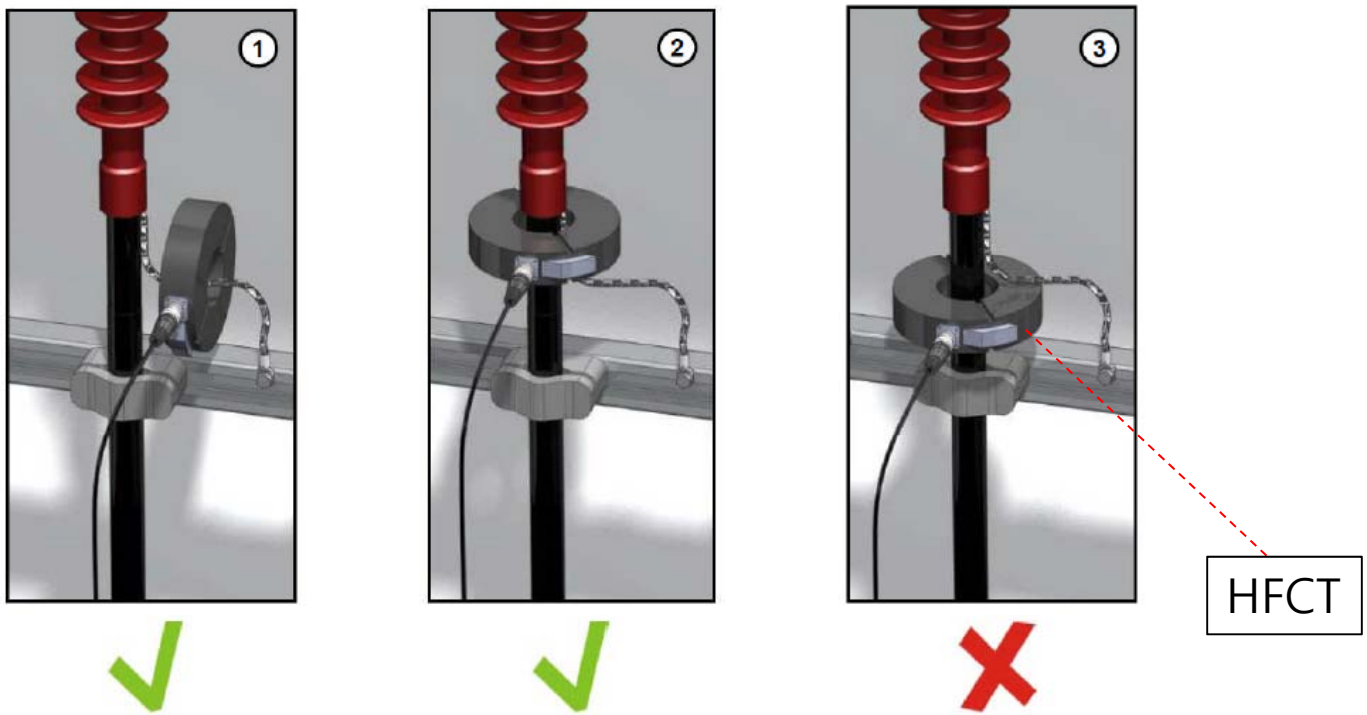
HFCT PD Sensor Attachment Options on Transformer Cables

There are 2x options for attaching split-core, HFCT sensors to hv cables for the On-line PD Testing of in-service transformers as shown below:



Option 1 **Option 2** **Option 3**

Option 1 – Attach the HFCT sensor around earth/ground or plant earth/ground bar
Option 2 – Ideally, the earth/ground should be looped through the HFCT to give the clearest signals.
Option 3 –If the HFCT is attached on an earthed cable, two opposing PD current signals will travel in parallel, effectively cancelling each other out at the point of measurement. This connection cannot be used

의견: HFCT설치위치는 ZCT의 설치위치와 같은 개념으로 생각해야

(※ 절연체에서 PD발생시 PD신호는 core와 sheath 양쪽으로 전파되기 때문)

By 김보경 (2015.08.24)

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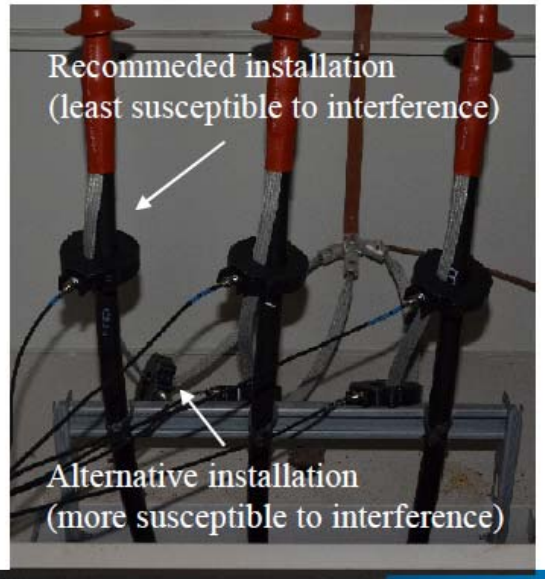
sgem
Smart Grids and Energy Markets

High priority cables

- Primary method: continuous on-line PD measurement
- Secondary methods: periodic thermal imaging, analysis of disturbance records (see Task 6.12)
- Supporting methods: continuous or periodic ultrasonic monitoring
  - discrimination between internal (harmful) and external discharges in terminations
- Preferred PD measurement method
  - Inductive PD sensor installed permanently at the cable terminations above the ground strap (see figure) to measure PD pulses in the phase conductor
  - 50 Hz synchronization of the PD data
    - From MV busbar voltage transformer secondary (primary substations) or voltage sensor integrated into the cable termination
    - From the LV phase voltages (if MV measurement is not available)



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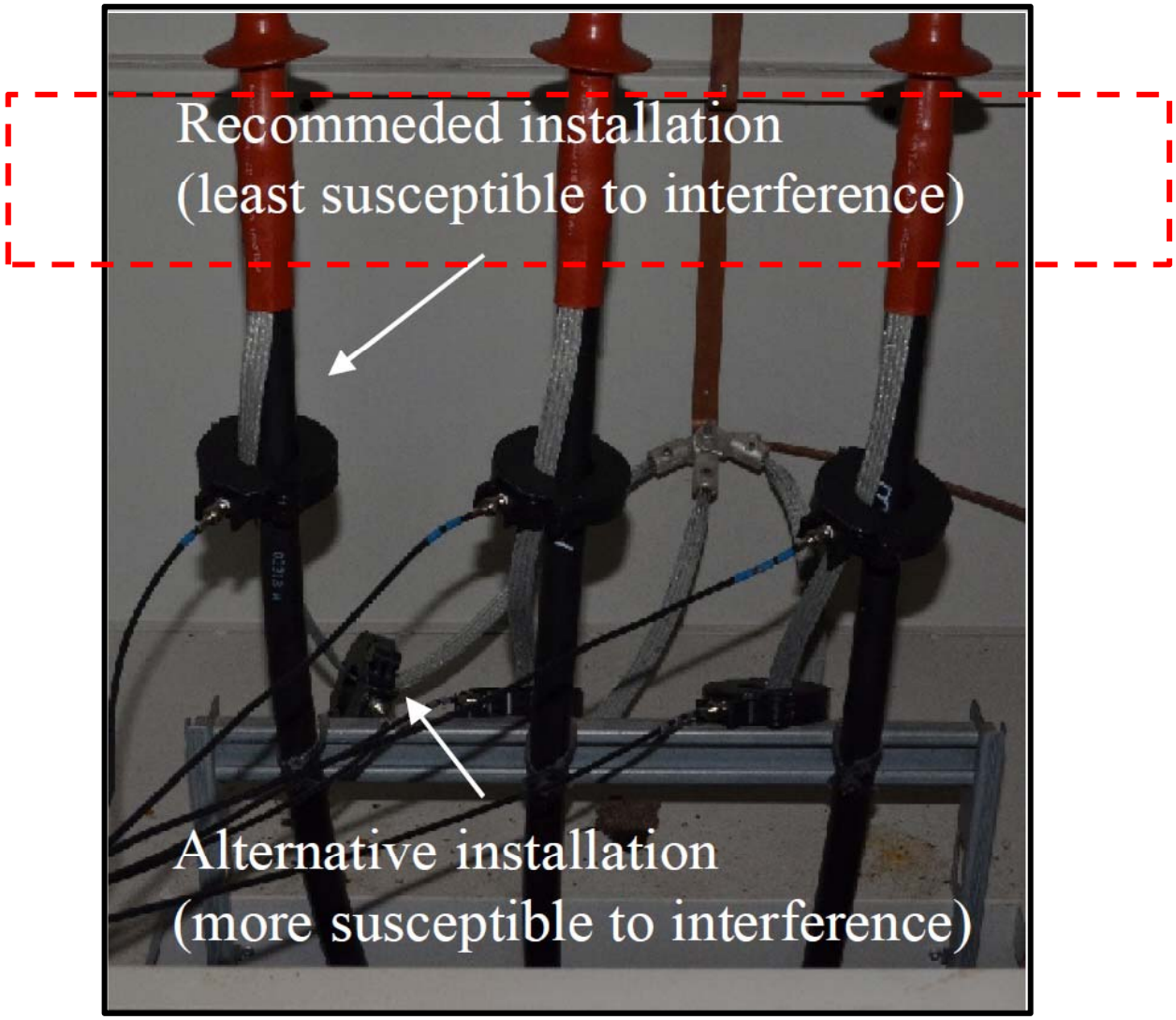

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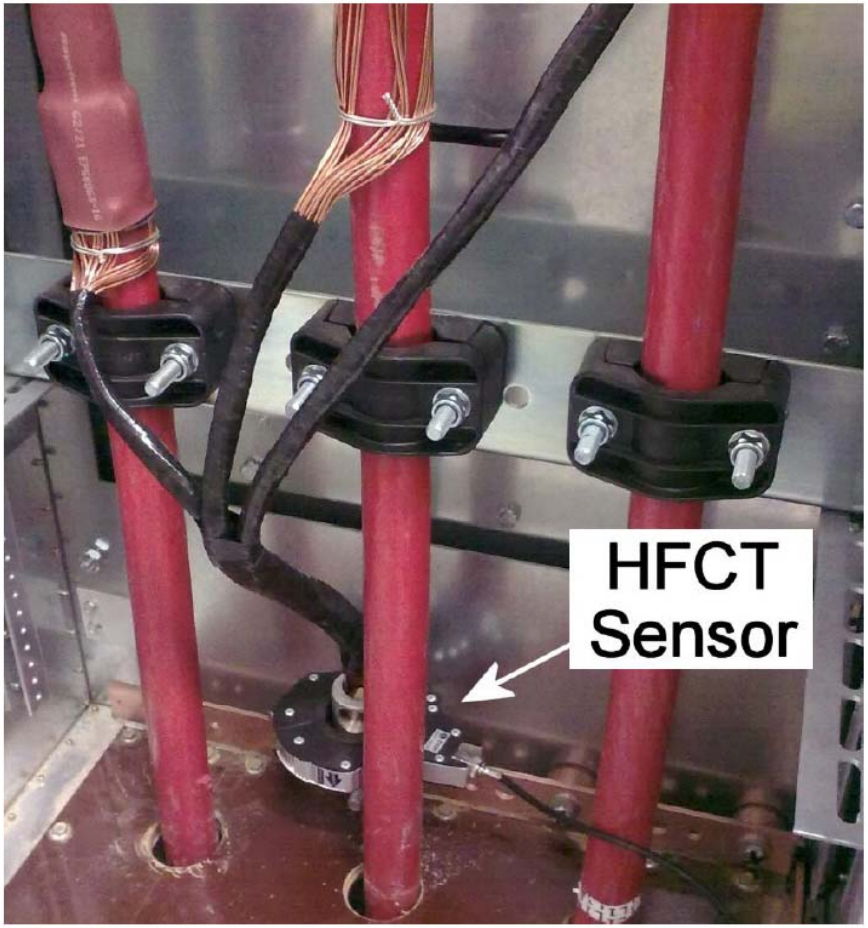

Figure 1: HFCT coupled to cable sheath

본 case는 3상 일괄 sheath접지선에
HFCT 1개 설치된 경우

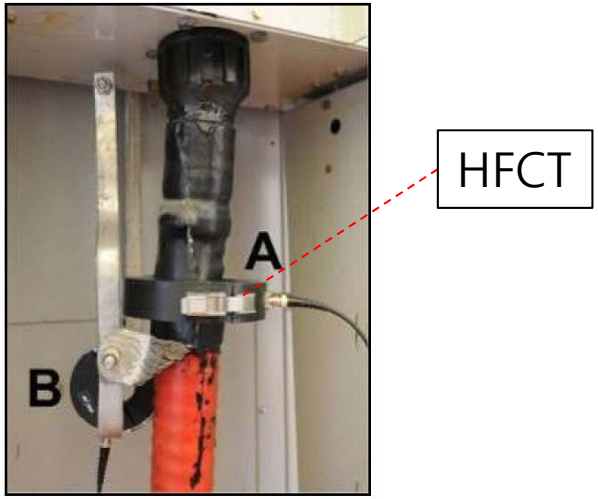

Fig. 2: HFCT sensors attached to a 3 core 11kV cable
A: Cable with metallic sheath brought back through
B: Cable sheath connection to ground

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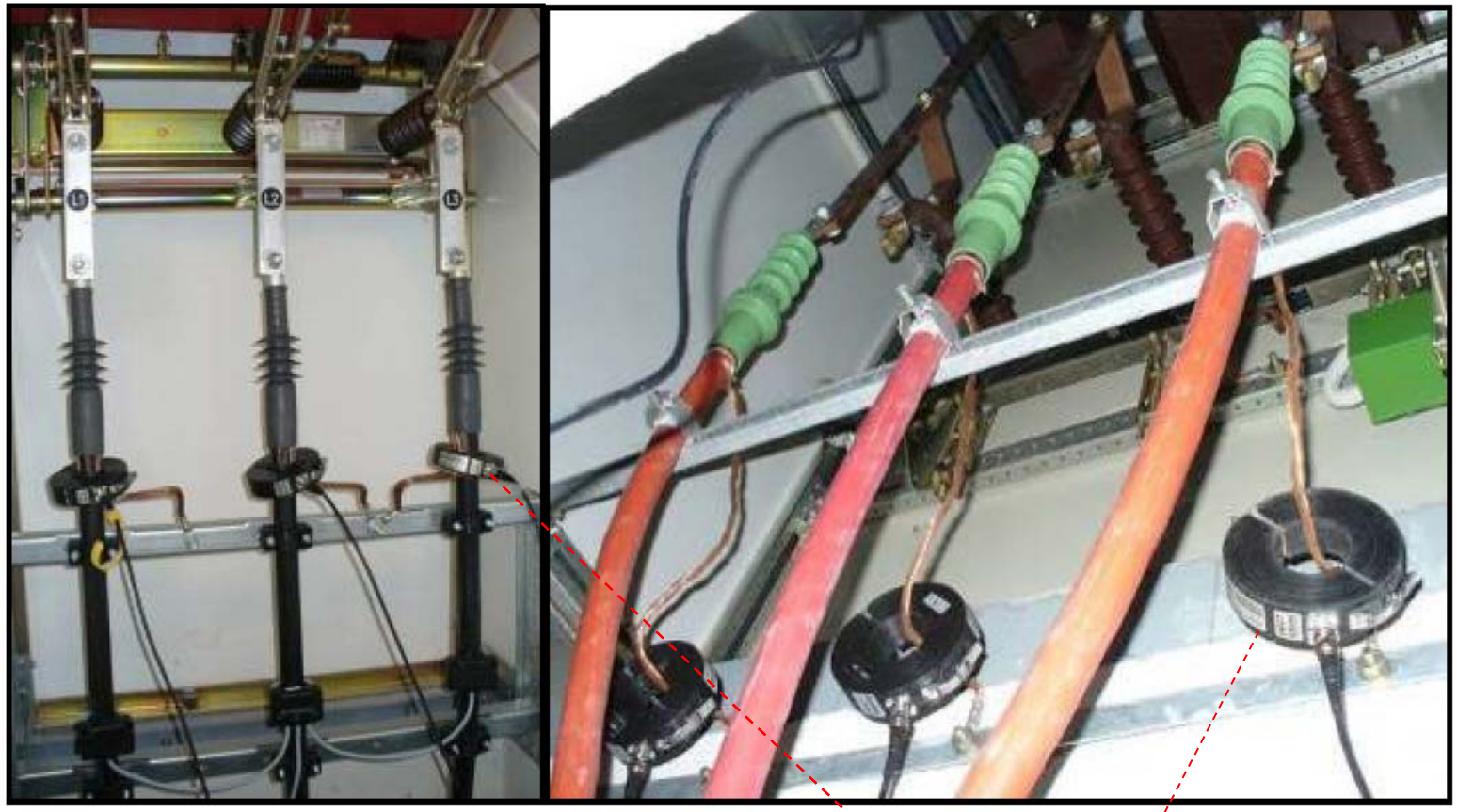

Fig. 3: HFCT sensor attachment inside of switchgear

Sensors at Cable Mid-points

HFCT

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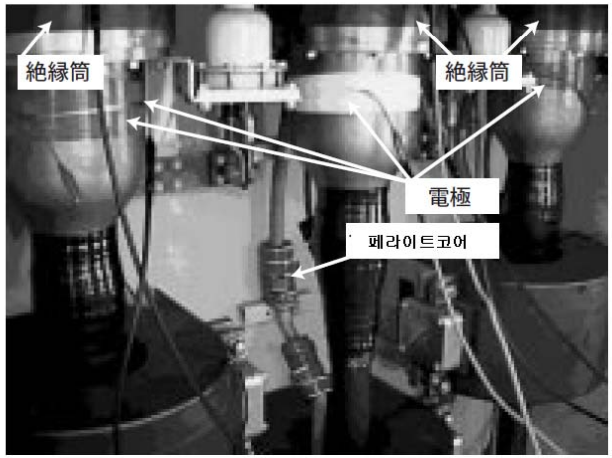

図1　終端接続箱の検出例
Typical arrangements for detection at a terminal

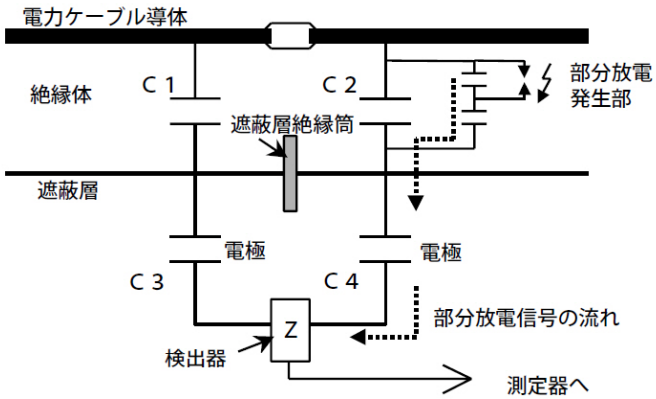

図3　検出部の等価回路
Equivalent circuit of detection head portion

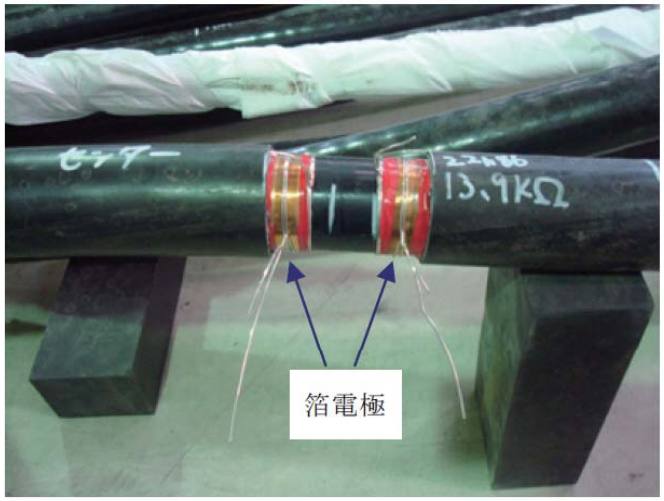

図 2.2　本手法で使用する箔電極

Fig. 2.2 Foil electrodes attached on the slit for the proposed method.

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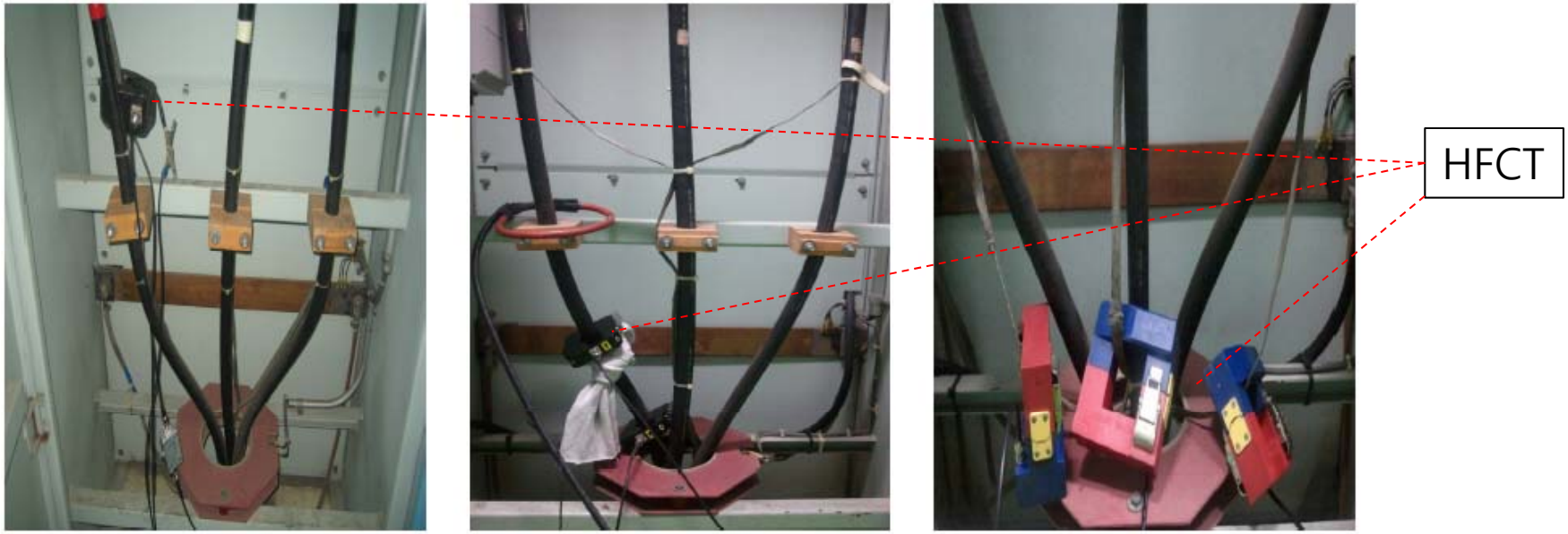

(a) LS-SPD50 (b) PD-Base I (c) MPD 600

그림 6 부분방전 측정 현장

Fig. 6 Measurement field of partial discharge

<출전: 원자력발전소 전력케이블 부분방전 진단사례,전기학회 2011년 8월>