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Isolation transformer status and plans

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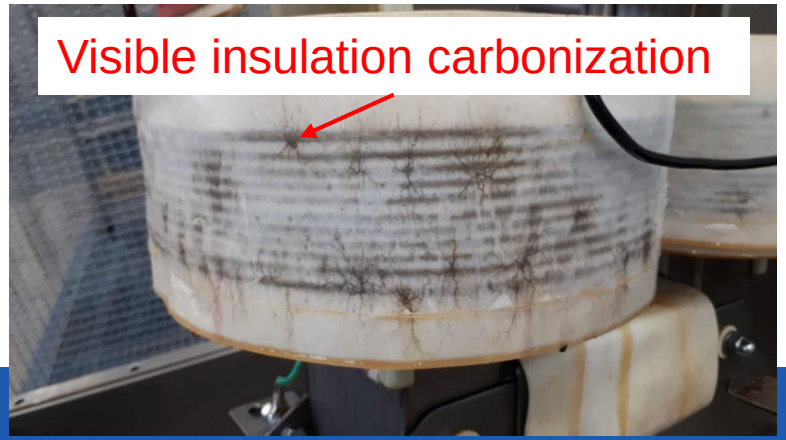
Status

- Successful operation in DC mode (2019)
- Partial discharges still audible
- Visual inspection:

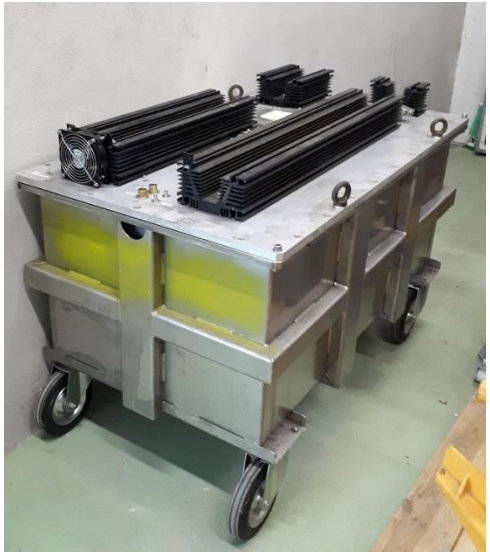


We do not feel confident & need to take actions to guarantee operation in DC mode (will work in pulsed mode)

Decision to increase distances between secondary coils and oil tank

Status

- Bigger oil tank found for free (from BE/RF)



- Dimensions increase wrt current tank:
  - W: +38cm, D: +22 cm, H: +10 cm
- Integration beside the Ion source will not be affected
- Manufacturing of a new top cover (HV connectors etc.) and oil retention tank

Status

- New tests carried out in our labs with bigger tank
  - Tests with positive polarity (more stressful)
  - Still some audible partial discharges
  - Spark at 95 kV (visually no degradation)
- Status summary
  - Transformer is ok for pulsed operation, we have concerns regarding DC operation on a long term basis & positive polarity

Plans

- Lab. tests with classical Shell Diala B oil (better insulation)
- Tests in negative polarity at ELENA to verify if transformer damaged by arc → ASAP
- Installation of a HV measurement system using existing optical transmission inside HV rack
  - Material expected end of March → installation in April

Plans

- TE-EPC wants to gain expertise and solve the partial discharge issue
- Thanks to new bigger oil tank, we are starting new design iterations with the company that delivered the last transformer → we double all insulation distances
- We cannot guarantee a delivery before June, but we proceed anyways
- All these additional costs are handled by TE-EPC as part of an effort to gain solid expertise in HV DC domain

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