Paris Session 2022

Condition monitoring on installed switchgear without additional sensors

B3 & B5

PS3 Question 1 What are the benefits of digital solutions like IoT-sensors, machine learning, artificial intelligence, drones, robots etc. for substation life cycle from planning to maintenance? Which measures are necessary to increase the acceptance of intelligent IoT-based power equipment in substations?

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(without additional sensors)

- At Elia, the Belgian TSO, more than 2.000 circuit breakers and 6.000 disconnectors are maintained based on their condition derived from classic parameters like: construction type, construction year, #operations, #compressor hours, contact resistance and operating time measured during maintenance, …
  - \+ Good and reliable basis to adapt the maintenance interval and perform general fleet management
  - − Too slow data refresh rate to detect early failures and move to Predictive Asset Management

- Adding sensors to existing switchgear is the market advised solution to collect more data, but it is costly, requires an intervention and adds parts to the system that can fail as well.

As an alternative Elia has built a concept to harvest in a smart way more information/data from its existing digitalized installations, making use of IEC61850, Fault Recordings, Central Data Management and AI/ML techniques.

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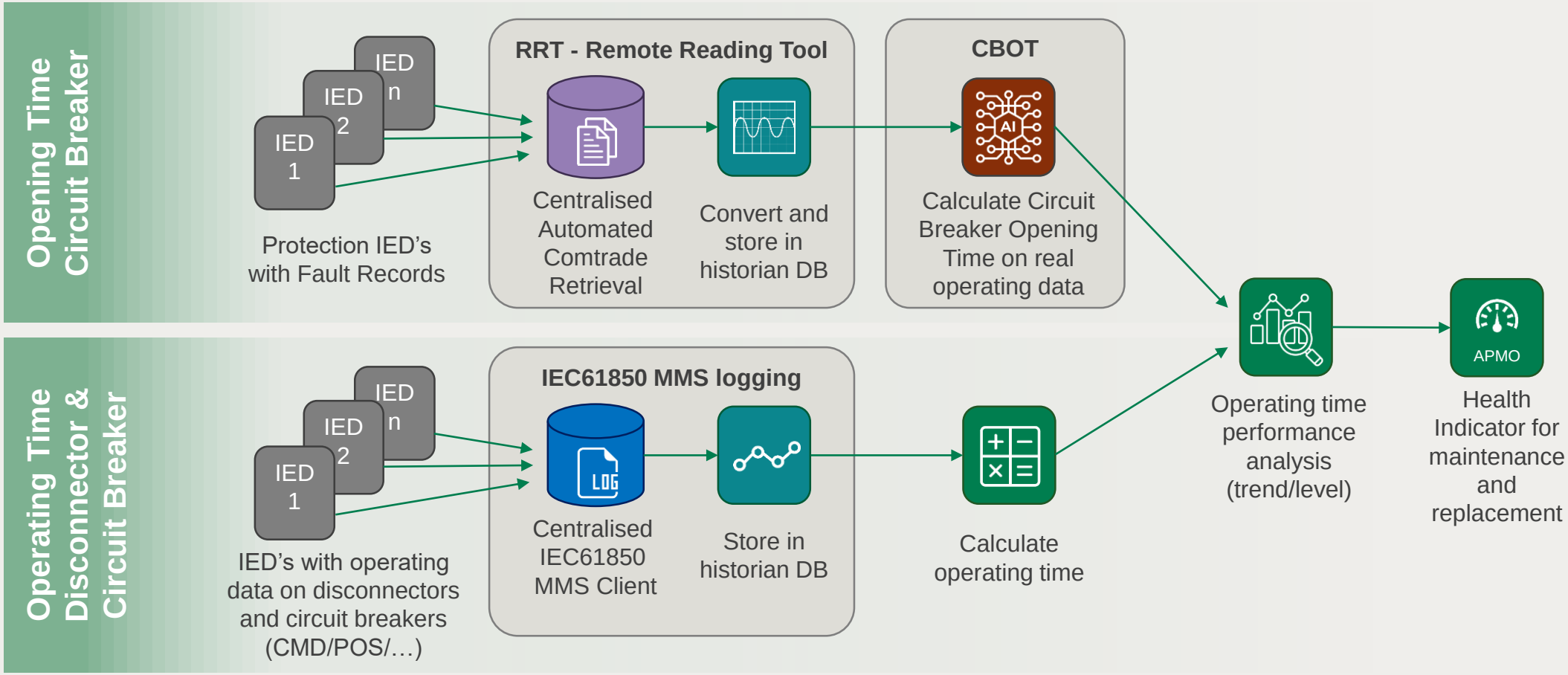

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Advantages of this approach:

- The concept uses existing digital data sources and doesn’t add parts to the circuit breaker or disconnector system
- With every switching operation we collect new data that will help us to assess the condition of the asset
- The condition monitoring is now based on real ‘in operation’ data, and not only on data obtained during maintenance
- With the fault recordings we even get the real electrical short circuit interruption time, which is very valuable to assess the condition