Paris Session 2022

Asset Performance Management Systems Requirements: High Voltage Circuit Breaker Monitoring features, hardware and architecture

B3: Substations and Electrical Installations

PS3: Integration of Intelligence on Substations

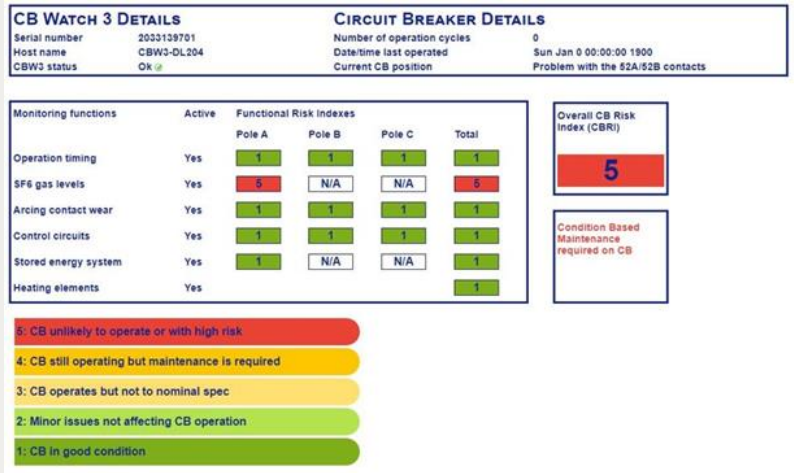
Q3: “What are the emerging requirements for asset performance management systems? What are the preferred hardware and software architectures? Are the planned benefits already recognizable regarding cost reduction for operation and maintenance and increase of reliability?”

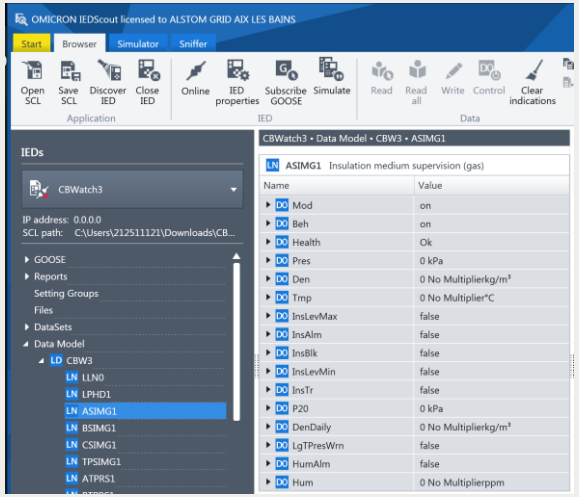
Nicolas GADACZ, France

High Voltage Circuit Breaker Monitoring System for APM

Minimum Required Features Example

- Computation of an accurate **Health Index** requires at least the standard versions of each of these features:
  - Gas monitoring
  - Operation Timings monitoring
  - Electrical Wear monitoring
  - Mechanical Drive monitoring
  - Control Circuit monitoring
- **IEC61850 ed.2** compatibility
- **Cybersecurity** through hardware and software



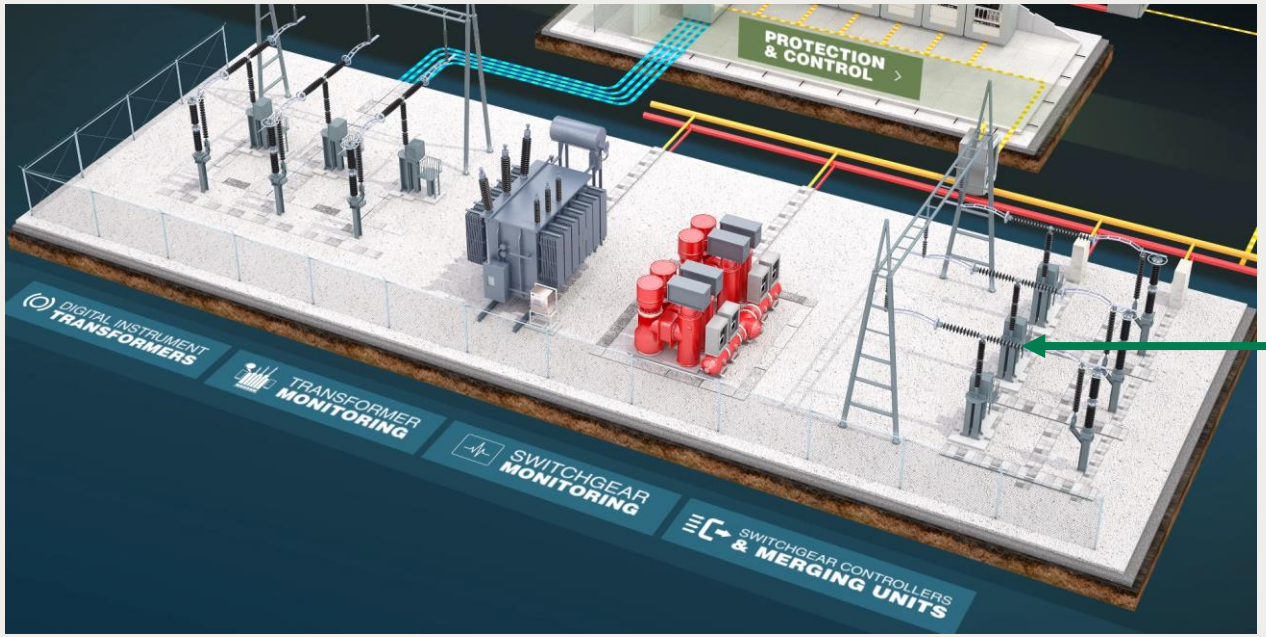


Group Discussion Meeting

High Voltage Circuit Breaker Monitoring System for APM

Specification example: local intelligence

- **Sensors** dedicated to the monitoring system are **integrated** in the Circuit Breaker **during manufacturing**
- **Local intelligence** collects sensor data and computes monitoring information to ensure **quality**, **reliability**, **readability** and **security** (gas thresholds for example) before sending to APM system



Integrated monitoring

High Voltage Circuit Breaker Monitoring System for APM

Specification example: architecture

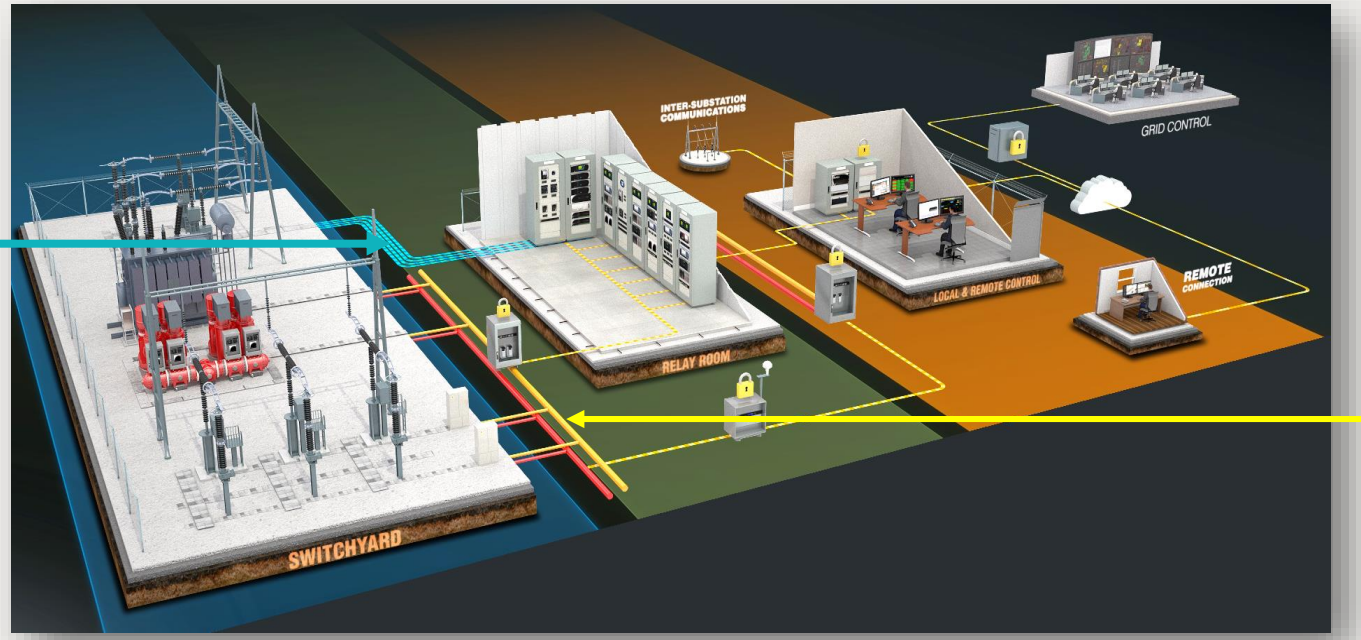
- Information can be accessed both **locally** and **remotely** (IEC61850), data is always accessible on the monitoring device
- **One single wire** connects to the Asset Performance Management system

No local intelligence:

-Conventional sensors

-Copper cables,

-1 sensor = 1 cable



Local Intelligence:

-Optical fiber

-1 single wire

-Redundancy