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Long Distance Aspirating Smoke Detection for Large Radioactive Areas

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Abstract : Most of the CERN's facilities hosting particle accelerators are large, underground and radioactive areas. All fire detection systems installed in such areas, shall be carefully studied to cope with the particularities of this stringent environment. The detection equipment usually chosen by CERN to secure these underground facilities are based on air sampling technology. The electronic equipment is located in non-radioactive areas whereas air sampling networks are deployed in radioactive areas where fire detection is required. The air sampling technology provides very good detection performances and prevent the "radiation-to-electronic" effects. In addition, it reduces the exposure to radiations of maintenance workers and is permanently available during accelerator operation. In order to protect the Super Proton Synchrotron and its 7 km tunnels, a specific long distance aspirating smoke detector has been developed to detect smoke at up to 700 meters between electronic equipment and the last air sampling hole. This paper describes the architecture, performances and return of experience of the long distance fire detection system developed and installed to secure the CERN Super Proton Synchrotron tunnels.

Keywords : air sampling, fire detection, long distance, radioactive areas
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