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## The FCC Safety Feasibility Study

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The Future Circular Collider is an accelerator research facility with unprecedented dimensions, located in a tunnel with 91 km circumference in a depth of around 200 metres underground. Safety hazards such as ionising radiation, fire, cryogenic gas releases, and oxygen deficiency paired with complicated emergency access and evacuation require solutions for risk mitigation already embedded in the facility's design.

In the Conceptual Design Report, a few solutions were studied, while the Feasibility Study must show that they can be implemented in the underground infrastructure. The FCC Safety Working Group concentrates on fire safety, extending the fire safety concept presented in the CDR to service caverns and experiments and developing a workable solution for the compartmentalisation. This is also a key element for cryogenics safety in FCC-ee and FCC-hh, where compartment walls and extraction systems will be used to protect personnel from oxygen deficiency. The validity of this approach shall be demonstrated with analytic and numerical models, which remain to be partly developed. Radiation protection studies will focus on the effects of ionising radiation in an  $e^-/e^+$  collider, both in the facility and in the environment, while making sure that the safety requirements for FCC-hh can be equally met. Finally, proposals for beam- and access safety will be elaborated, drawing on the experience with LHC and its injectors. This element includes also the use of remotely controlled or autonomous equipment for transport and well-defined technical tasks with the aim to keep personnel out of the potentially hazardous accelerator environment.

The work will be underpinned by a hazard register with "standard best practice" mitigation measures and will be summarised in a FCC Feasibility Study Safety Report.

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