

Remote manipulations and application of unconventional repair technologies in the FCC tunnel

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Following the FCC study and its recent developments, it is evident that due to the nature, size, scale and complexity of the environment, the deployment of conventional repair methods and technologies will be insufficient in the FCC. Human intervention will be limited or even counterproductive because of the safety issues, time constraints and related costs. At the same time, it appears that the FCC infrastructure will be so large and complex that the potential for failures or malfunctions will increase exponentially. Therefore, the FCC may face an unprecedented amount of technical glitches and problems to resolve.

The prospective solution for the FCC is remote manipulations and unconventional repair technologies. However, this will largely depend on the general maintenance and repair strategy chosen for the FCC: preventive or predictive maintenance, or run-to-failure?

Advanced robotic and remote manipulation systems, along with novel in-situ repair technologies, offer tangible repair results. Hence one of the solutions for the FCC is a remotely controlled robotic platform performing in-situ additive manufacturing repairs. This could be performed at micro and macro levels, i.e. both in the accelerator structure and the actual civil engineering installations. Concrete examples of applications of this technology are provided in the paper and presentation.

Since there are numerous challenges to overcome, the new concepts have to be developed to address environmental, safety, technological and operational issues. This paper and the presentation includes analysis of these challenges.

Finally, the aforementioned concepts could be used not only during operation but also in the construction, installation and testing phase of the FCC.

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