Sample Project: Enhanced LHC Machine Protection system supervision and diagnostics

Code	TE4084
Programme	FCT
Department	TE
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Date Created	17-JUN-15
Date updated	19-JUN-15

Title

Enhanced LHC Machine Protection system supervision and diagnostics

Description

The Machine Protection group (MPE) is designing and maintaining the protection systems for all CERN accelerators, including th Large Hadron Collider (LHC). Each of the two proton beams stores up to 360MJ during the physics operations, an energy which, if not safely extracted from the machine in case of equipment failures, could lead to severe damage and downtime of the machine. Dedicated and highly reliable hardware based interlock systems , the so-called beam interlock system and the safe machine Parameter systems, are in charge of collecting and transmitting equipment failures to the beam dump system. Presenting and analyzing the status and transient data recording of these systems throughout all operational phases is of vital importance for the machine understanding and consequently their reliability.

Involved in a dynamic team of software engineers, practicing the agile methodology Scrum, you will participate to an enhancement the existing low- and high-level software components of the beam related interlocks system, with the main aim of facilitating the access of equipment an operations group to the data provided. This will consist in the development and provision of a generic API to retrieve and archive data in a simple and intuitive way during hardware and beam commissioning phases as well as to export this data in a more intuitive way to the Logging and Post Mortem systems during operation. In addition, new functionalities for continuous sanity checks of the system and improved operability and maintainability of the systems will be added.

Skills

Skills and assets: Java (80%), C/C++, Object Oriented design and Spring. Ability to work in a team, to participate in design discussions. Scrum is a plus.

Disciplines

Information Technologies

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