# DevOps project for PJAS

Continuous Integration/Continuous Delivery (CI/CD) and Quality Assurance (QA)

The Frameworks and Development Section in the Industrial Controls and Safety Group, part of the Beams Department at CERN is responsible for the design, the development, the maintenance and the advanced support of the industrial control frameworks JCOP and UNICOS used throughout CERN. The section (BE-ICS-FD) also provides advanced support and consulting services, and also focuses on the long term evolution of industrial control technologies.

The JCOP framework is an integrated set of guidelines and software tools which is used by control system developers to build parts of their control system application. The UNICOS framework is similar in scope and deals with the two upper layers of a classical control system – supervision and control – and proposes a method to design and develop the control application which will run in commercial off-the-shelf products (e.g. SCADA and PLCs).

Recently, the BE-ICS-FD section has invested in setting up a CI/CD and QA pipeline for their software products, implemented in GitLab. As a result, a completely automated build system is presently in place, as well as the infrastructure for unit and nightly integration tests. By using DevOps best practices, the development cycle is shortened and high quality software can be continuously delivered to users.

The project will continue to deploy, improve and expand the scope of the existing CI/CD and QA system.

The upcoming tasks will include:
- Implementing tools to programmatically inspect projects for anomalies (configuration, manual deploy stages not executed, expiring release artefacts, etc.).
- Expanding the automated and continuous testing of the DevOps tools to include:
  - runtime code profiling;
  - static code analysis;
  - deployment tests.
- Increasing the coverage of the unit and integration tests.
- Rewriting the CI/CD status server and web site, including summary pages for frameworks.
- Implementing improvements to the DevOps tools, further integrating them with GitLab API.
- Additional tasks related to GitLab project configurations for DevOps including but not limited to:
  - Further integrate the DevOps tools with other infrastructure, such as our ticketing system
  - Deploy secure configurations for GitLab projects
- Developing a statically-generated frameworks website, with up to date release details

The required skills for the persons involved in the project are:
- Experience with Linux and shell (Bash) scripting
- Experience with git versioning system

Additional useful skills include:
- Experience with Python and C/C++
- Experience with container technology
- Experience with GitLab