# Title

Opening up Programmable Logic Controllers (PLC) development environment to software engineering tools.

# Introduction

CERN control systems (as many others in industry) will be operated and maintained during very long period of time (about 20 years). Thus, the user programs running in the corresponding PLCs have to follow the same lifecycle during which they have to be developed, maintained and managed, adapted and extended – and not necessarily by the same developer(s).
In addition, the increasing complexity of the control systems leads, sometimes, to the production and the deployment of the PLC programs with the help of external tools (e.g. model-driven development).
It would be beneficial that, following the trend of the convergence between the Automation and the Information Technology worlds, Siemens development solutions are open to external (open source or third party) tools to handle proper source code management (e.g. CVS, subversion), code production (e.g. UNICOS tools) and analysis (tools highlighting differences between two versions of code written in a graphical language).
Within the framework of the CERN openlab, CERN's Information Technology (IT) Department and Siemens Automation & Drives (AD) Department are collaborating to improve the offer of Siemens.

# Tasks

1. Improve the openness of Siemens PLC development environments toward software engineering and their integration with third parties software engineering tools (e.g. user friendly editors, external code production tools, third party source code management tools, code analysis tools, etc.). This includes the study of the Siemens current state of the art (e.g. Step7, Automation designer) as well as the evaluation of solutions available on the market. The candidate will then, in close collaboration with Siemens, validate Siemens' prototypes, and develop prototypes and modules for the Siemens solutions.
2. Study a solution to be able to install multiple instances of Siemens software in an automatic and autonomous manner. The work comprises of an analysis of the current methods and the development of alternatives.

# Required qualifications and skill

## *Required qualification*

University or equivalent in computer science or/and automation & controls, or a related field.

## *Experience and knowledge*

Up to 5 year's knowledge and practical experience in information technology, in particular the following areas:

- Good knowledge of programming languages: C, C++, or JAVA (or equivalent) .
- Good knowledge of modern programming environments.
- Knowledge in PLCs and their programming environments.

Flexibility and the capability of learning new tools and techniques rapidly.
Good communication skills and the ability to liaise effectively with third parties are essential, as is the ability to work as part of a team.
Good knowledge of English or French; basic knowledge of the other language or an undertaking to acquire it rapidly.