GSI / CERN Collaborations

on the field of Accelerator Controls

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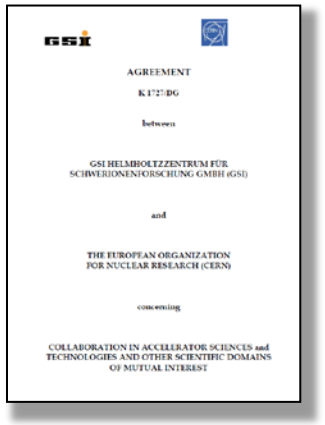
Overview on Controls Collaborations

- Active Collaborations
  - Common Development of Control System Components
- Collaborations in preparation
  - UNICOS
- Proposed New Collaborations
  - Personnel Safety System (PSS)

Active Collaborations

Already starting in 2007, GSI and CERN controls groups have started collaborating on several technical fields, exchanging experts and contributing during the LHC commissioning phase.

Based on the general CERN/GSI Agreement *"Collaboration in Accelerator Sciences and Technologies and other Scientific Domains of Mutual Interest"* several Controls collaborations have been initiated:


GSI

AGREEMENT

K 1727/DG

between

GSI HELMHOLTZZENTRUM FÜR SCHWERIONENFORSCHUNG GMBH (GSI)

and

THE EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (CERN)

concerning

COLLABORATION IN ACCELERATOR SCIENCES and TECHNOLOGIES AND OTHER SCIENTIFIC DOMAINS OF MUTUAL INTEREST

Intention: Common Development of Control System Components

Presently 6 active collaboration fields:

- LSA – LHC software architecture framework for acc. settings generation and management)
- FESA – Front-End System Architecture (acc. equipment control)
- Timing System – White Rabbit-based high-precision time and event distribution system
- CMW – Controls Middleware (communication fabric)
- SILECS – Software infrastructure for PLC-based low-level equipment controllers
- UI-Development – Graphical user Interface libraries and ACC-Soft common libraries

Common Developments

- LSA – LHC software architecture framework for acc. settings generation and management)
  - Manpower support given to LHC commissioning (2 developers x 2 years)
  - Common development (same or more number of LSA developers at GSI) boosts overall LSA development status and code quality
  - Technical features: flexible cycles, Testing framework, Code packaging (Lab modules), ...
- FESA – Front-End System Architecture (acc. equipment control)
  - Manpower support given to CERN (2 developers x 9 months)
  - Common development of a new FESA release (FESA3)
- Timing System – White Rabbit-based high-precision time and event distribution system
  - Substantial support to the White Rabbit development (White Rabbit Core in VHDL/C++)
  - All GSI developments (e.g. different form-factor Timing receiver boards) are shared and uploaded to CERN OHWR
  - First Accelerator timing system in operation at GSI/FAIR
  - 300 White Rabbit switches in production for FAIR
- CMW – Controls Middleware (communication fabric)
- SILECS – Software infrastructure for PLC-based low-level equipment controllers
- UI-Development – Graphical user Interface libraries and ACC-Soft common libraries
  - Substantial contributions to general ACC-Soft common libraries, e.g. polynomial data types, Units, ...
- *Suggested*: Analog Signals Digitization Systems (based on PicoScope COTS products)
  - Hardware Design and FESA classes implementation (offer to share GSI design and developments)

Collaboration contacts: Eugenia Hatziangeli, Katarina Sigerud, Javier Serrano (BE-CO)

Active Collaborations

Formal collaboration status:

Addendum to the general GSI/CERN Collaboration Agreement
"Concerning Development of Control System Components" was prepared by both parties, checked by legal offices, but finally has not yet signed...

Defines rights, obligations, ownership, copyright, licensing, IP, etc.

Collaborations are excellent examples for mutual benefit to both CERN and GSI.

However, collaboration activities and responsiveness on CERN-side went down in the last years and could be improved. Collaboration manpower efforts (e.g. for collaboration & design meetings, code revision, management and merge) requires time to be recognized and accepted by managements.

Proposed next steps:

- Continue the good work
- Hold an collaboration meeting in autumn at GSI/FAIR (proposal: Mid-September)
- Update and finalize the Addendum and push forward for signature by managements (Q4/19)
- Side question: more lightweight process for CERN collaboration account extensions (1 year) possible?

Collaborations in Preparation

GSI/FAIR took a strategic decision to base the control of its Cryogenic and Vacuum Infrastructure for the GSI and FAIR accelerators on the CERN **UNICOS** framework (Universal Industrial COntrol System)

Intention: Pursue a long-standing relationship and collaboration with CERN to implement, operate, enrich and further develop the UNICOS framework and related technologies.

- GSI/FAIR funds a Fellow position for 2 years (initial collaboration phase)
- License UNICOS and receive technical support

Formal collaboration status:
Addendum prepared and negotiated between both parties since November 2018 (IP part not yet checked by legal services). Process presently pending (licensing model presently checked at CERN due to unclear copyright situation of the UNICOS code base).

Proposed next steps:

- Finalize Addendum document and push for signature in Q4/2019

Collaboration contacts: Peter Sollander, Fernando Rodriguez (BE-ICS)

Proposed New Collaborations

The Personnel Safety System (PSS) is the access control and safety system for the FAIR accelerator tunnels and experimental caves.

Intention: Support for Development of the FAIR Personnel Safety System

Collaboration proposal (2 years project period):

- CERN works out a detailed specification of the system design (modules, structure of the code, Interfaces) and implements a prototype on PLC system for one area (safety and non-safety program code).
- Financial compensation (Fellow position 2 years 50% FTE, experts 15% FTE)

Status: Collaboration first suggested in 05/1029, first version of a Collaboration Addendum drafted, still missing project details

Proposed next steps:

- Organize a meeting at GSI with experts from CERN, agree about a basic specification
- Further discussions/negotiations between the parties needed, agree on financial compensation, manpower involved and time line

Collaboration contact: Jan Uythoven

50 YEARS GSI

thank you!