UPGRADE OF J-PARC/MLF GENERAL CONTROL SYSTEM WITH EPICS/CSS

M. Ooi*, K. Sakai, A. Watanabe, A. Akutsu, S. Meigo and H. Takada
J-PARC Center, Japan Atomic Energy Agency, Tokai-mura, Naka-gun, Ibaraki 319-1195, Japan
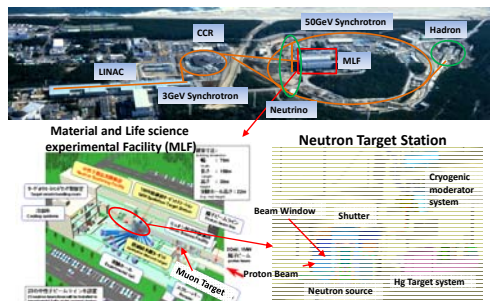
Introduction

- MLF is a muon and neutron experimental facility of the J-PARC.
- Beam operation of the MLF started in May 2008.
- Operator interface PCs and database server of the MLF control system need replacement. (Windows OS lifetime)

We considered about upgrade of the Operator Interfaces and Data Servers of the MLF General Control System (MLF-GCS)
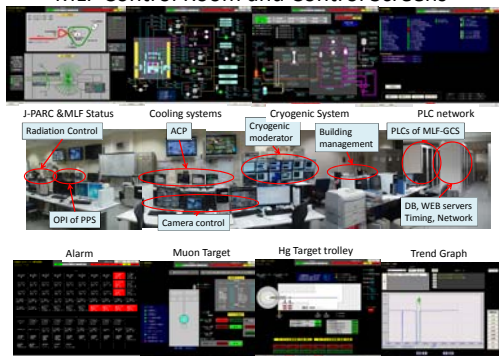
1

J-PARC and MLF

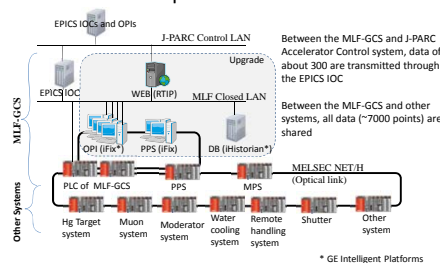

2

Structure of MLF-GCS

3
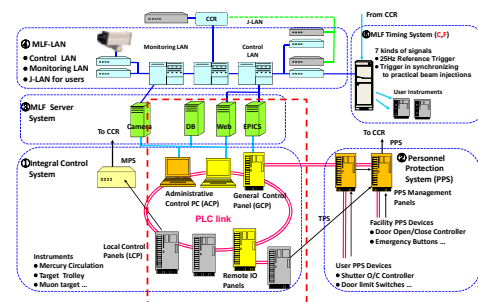
MLF Control Room and Control Screens

4

Functions of MLF-GCS

- Integrated remote control and monitoring of the other systems in the MLF (PLCs)
- Operator interfaces (OPI)
- Operating data storage (Database)
- Interlock system (MPS, PPS, TPS)
- Networking equipment
- Data sharing (WEB and EPICS IOC)
- Building monitoring system (Camera system)
- Timing distribution system

5

Structure of the Present MLF-GCS around Operator Interfaces

Between the MLF-GCS and J-PARC Accelerator Control system, data of about 300 are transmitted through the EPICS IOC

Between the MLF-GCS and other systems, all data (~7000 points) are shared

* GE Intelligent Platforms

6

Issue of Present System

- Life cycle of the system
  > Decided by the support period of the operating system (Windows)
- Version compatibility
  > Mixture of the different versions are not supported.
- Software license
  > Software license is expensive and the number of the client license is limited
- Scalability
  > VBA script only

Upgrade to the new system

7

System Requirement

- Inheritance of the present system
  > Change to the next system without discomfort
- Influence of update cycle of the OS
  > Independent on the technology of OS specific
- Version compatibility of the software
  > Use the general purpose protocol.
- Compatibility with EPICS
  > EPICS device driver developed already.
- Ease of the system modification
  > Not require complex programing in the screen creation.
- Maintainability
  > Components are replaceable quickly.
- Cost performance in long term

8

Comparison of Upgrade System Candidate

	iFix and iHistorian	LabView and SQL		CSS and postgreSQL	
OPI	iFix	LabView		CSS	
OS (OPI)	Windows	Win/Mac/Linux	△	Win/Mac/Linux	○
OPC server	iFiX	NI OPC *1		Tk-OPC *2	
DB	iHistorian	SQL	○	postgreSQL	○
Function of OPI	OK	OK	○	OK	○
OPC to EPICS	OK	Not easy	×	OK	○
Software fee	Expensive	Reasonable	△	Free	○
Build effort	Low	Very High	×	High	△
Ver. compatibility	Not enough	Unconfirmed	△	Good	○
Modification of OPI	Easy	Difficult /complex	×	Easy	○
EPICS IOC	EPICS OPC / other	EPICS LabView	○	EPICS OPC	○
Source Code	Private	Private	△	Open	○

Present — Selected

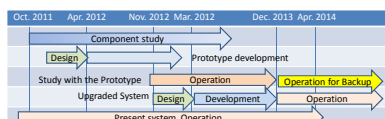*1 National Instruments OPC server *2 Takebishi OPC server

9

Performance of EPICS/CSS Prototype
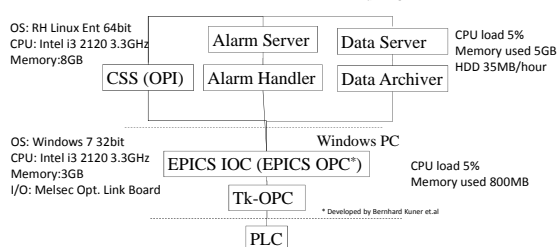
- Installation and performance study was successfully done.
- The prototype system connected with the PLCs of MLF-GCS.
- All data (~7000 points) are treated within 1 second.
- Prototype system is only five control screens .

10

Upgraded System

Schedule

11
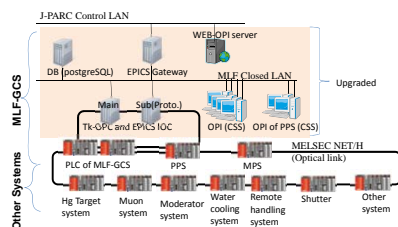
Summary

- We compared three kinds of the software as candidates for a new OPI and DB of the MLF-GCS.
- The EPICS and CSS system is considered to be the best candidate in terms of practicality and design concept.
- Performance of the upgraded system is confirmed with prototype system.
- Now we are developing the upgraded system with EPICS and CSS and its operation will start in December 2013.

12