Development of new operational log system for RIBF operation

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The operational log system is one of the electric log systems for recording and viewing the accelerator operation time and contents of an operated device. Zlog (Zope-based log system)[1] developed by KEK was utilized as the operational log system for the RIKEN RIBF control system. Zope is an open-source Web server and Web application framework written in Python programming language.[2] Using the Web application, information on accelerator operation is designated by a character string on Web browsers. However, the displayed string character on the Web browser will be complex for accelerator operators because many parameters are changed in accelerator operation, though the Web-based system has many advantages. For smoother accelerator operation, an ergonomically designed operational log system is required. Additionally, it is not always easy to set the many monitored parameters for Zlog without omission, because the user must code with Python programming language for one monitored parameter in the case of the Zlog system. Therefore, we developed a new operational log system for RIBF control system.

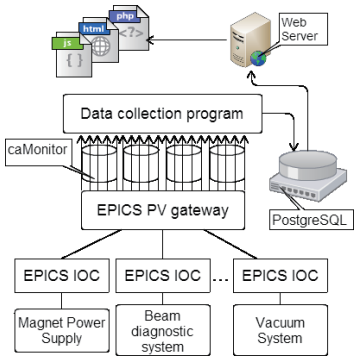

Fig. 1. Outline of the new operational log system.

In addition to the Zlog system, the PostgreSQL-based database, which is one of the major relational databases, is adopted for recording logs in the new operational log system. In order to ensure compatibility with Zlog, the new operational log system uses the same database table configuration as in Zlog. The system chart of new operational log system is shown in Fig.1. The RIBF control system consists of a distributed control system constructed using the Experimental Physics and Industrial Control System (EPICS).[3] Therefore, the feature to store the data into the database is developed on the basis of caMonitor, which is an event driven program using EPICS channel access (CA) protocol.

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When the monitored operation status, such as the DAC value of a magnet power supply, is changed, the status is stored as operational information into the database. As one of the features, the monitor program acquires the event signal via the EPICS PV gateway[4] because EPICS input/output controllers (IOCs) require much system resources when a large number of caMonitors are connected to EPICS IOCs. In order to construct a Web application as the user interface for providing operational information, the Apache Web server and Bootstrap Web framework[5], are used by the system. Therefore, it is possible to provide operational logs with a variety of rich GUI components.

As of now, the operational log system has been working for accelerator operation by monitoring approximately 3,000 points as the EPICS record without any serious problem since November 2013. As an example, the user interface of the operational log for magnet power supplies is shown in Fig. 2. The operational log is displayed by using a character string and line chart on a Web browser (Firefox). In the near future, we will update the system for improving the usability to fully satisfy the requirements of users.

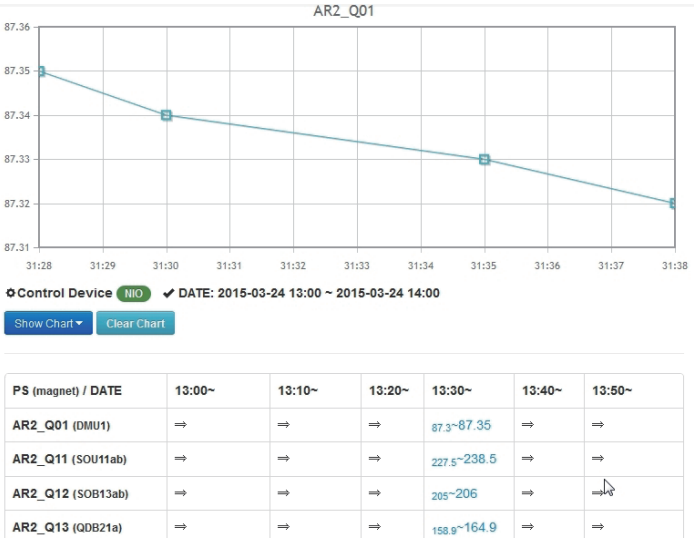

Fig. 2. User interface showing operational log for magnet power supply.

References
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2) http://www.zope.org/
3) M. Komiyama et al.: RIKEN Accel. Prog. Rep. 47.
4) K. Evans. Proc. ICALEPCS2005, (2005), PO1.033-6.
5) http://getbootstrap.com/