

A.4: ARPFOnline – A web portal for presenting live, historical and statistical data of linacs at ARPF

A linac-based Agricultural Radiation Processing Facility (ARPF) is being setup by RRCAT for irradiation of agricultural and food products. The facility consists of various sub-systems like RF systems, magnet power supplies, vacuum pumps and gauges, radiation monitoring systems, LCW devices, etc. ARPF control system software logs the data generated by these sub systems and devices in SQL databases at one-second log rate. ARPFOnline web portal has been developed by Accelerator Controls System Division (ACSD) for presenting the machine generated data of Linac-1 and Linac-2 on the web. Following are the main functionalities provided through this web portal:

1. Live data of important parameters of Linac-1 and Linac-2 are presented using multiple web pages consisting multiple axis graphical trends (Figure A.4.1).
2. Historical data on a specific date can be queried and retrieved in tabular and graphical format.
3. Historical data on a specific date can be queried, retrieved and downloaded in csv format zip file on user's local machine for offline analysis.

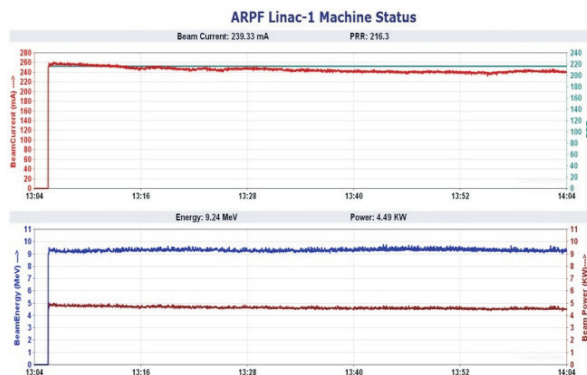


Fig. A.4.1: A screenshot showing live trend of information about ARPF Linac-1.

The software is based on three-tier software architecture, where web browser, web server and database server are residing on client tier, middle tier and data tier, respectively (Figure A.4.2). HTML, JavaServer Pages, JavaBeans and SQL have been used for development of various modules. Web contents (in HTML format) generated by JavaServer Pages are sent to client's web browser for rendering the information.

After receiving the client request, the JavaServer Page requests information from a JavaBean. The JavaBean can in turn query the required information from the database. Subsequently the JavaBean generates the desired content and the JavaServer Pages can serve the content to the client web browser for display.

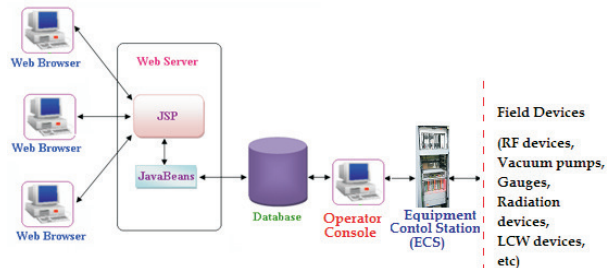


Fig. A.4.2: Software architecture and information flow.

Microsoft SQL Server based relational databases have been used for implementing the data tier of the software.

Nearly 1000 analog, status and diagnostics signals are logged in different tables of database at one second log rate. Signals generated from various control devices e.g. RF synthesizers, trigger units, oscilloscopes, etc. are also logged in same database for analysis of machine performance. Time stamp is a common parameter in each table and is used for joining two or more tables through SQL statements. Nearly 25 tables have been used for storing all types of signals/parameters generated from different sub-systems of Linac-1 and Linac-2.

This web portal has been deployed on Apache Tomcat Web Server installed on a server machine in ARPF control room.

The web portal is being used by operation crew members and system experts for monitoring the sub-system's live parameters during operations of Linac-1 and Linac-2. Historical data of machines are used for offline analysis of performance of different sub systems.

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