Reactor Data at your Desk V2.0

Alexander Hull
Joe Reyenga

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The National Bureau of Standard Reactor (NBSR) houses a 20MW research reactor

NBSR facilitates thousands of research projects with this one reactor

Reactor Operation Engineers goal is to keep reactor running for the researchers
Reactor Operations
Background

- Control Room Upgrade
  - Make reactor data more accessible
  - Improve Historical data for reactor

- Reactor Data at your Desk V1.0
  - C#.NET based Desktop application
  - Apache server based webpages (nbsr.nist.gov)
Requirements

- Monitor Major systems of the reactor
- Graph the reactors historical data
- Make it easy to use and access
Data Acquisition

- Physical signal (current based) is converted to a digital form
- Data from the consoles and PAC panels are merged in a central Ethernet switch
- Data coming directly from the console is pushed through a read-only firewall
Data sent through the firewall is received by a computer using an OPC server.

Data is displayed on the PAC room consoles using labVIEW.

Data is formatted and pushed by DiodeTx, a C#.NET program, every 2 seconds.
Data sent from the control room (left) is sent through a read-only firewall and the data acquisition systems are separate from the controls.

Data sent from the PAC room is sent through a one-way “Data Diode” to allow only a one directional flow of information.
Data Handling

- Data is received by DiodeRx, another C#.NET program.
- Every 2 seconds DiodeRx formats the data and pushes it to the MySQL database.
- A historical log is made every 20 seconds by appending a table with the current values at that time.
Welcome to Reactor Data at Your Desk
Click on an icon to view data for that system.
A custom date range can be selected as well as a custom mixture of analogue and binary values. Hovering over data points shows exact value and time. Graphed series can be exported to an Excel compatible CSV file.
RD&D Website Trending

Reactor Data Graph

Data Format: YYYY-mm-dd HH:mm:ss
Enter start date: 2014-07-27 00:01:15
Enter end date: 2014-07-29 11:41:59

Graph Data
The Next Step

- Step 1: Finish connecting the control room to the network
- Step 2: User Testing
- Step 3: Profit?
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