
BESSY II Status Update

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BESSY II

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General Status

The commissioning phase of the BESSY II project has been completed. In 1998 there were 16 operation weeks dedicated to machine studies and additional 3 weeks of regular user operation. Last January BESSY II entered regular user operation. The 1999 schedule consists of 9 weeks dedicated to machine studies, 20 weeks of shutdown (implementation and installation of new systems and features) and 23 weeks of regular user operation.

Operations

Commissioning has shown that all design parameters for BESSY II have been exceeded. For a more detailed document see the contribution to the PAC '99 at <http://ftp.pac99.bnl.gov/Papers/Wpac/TUCL3.pdf>.

At the U125 plane grating monochromator beamline a resolution power (E/dE) of more than 100,000 has been demonstrated. (For a more detailed document see <http://www.bessy.de/~follath/beitrag1.html>)

An APPLE (Advanced Planar Polarised Light Emitter) type undulator at BESSY II generated circularly polarized undulator radiation. (A more detailed report is available at <http://www.bessy.de/INFO/PolarizedLight.html>)

The PTB (Physikalisch-Technische Bundesanstalt, i.e. National Bureau of Standards), one of the main customers of BESSY II, has successfully measured the energy of the electron beam using Compton back-scattering. This indicates that BESSY II will be used as a primary radiation standard (as a successor to BESSY I).

The vacuum sections of the storage ring are so large that in each shutdown almost the complete ring had to be opened. This led to a situation where at the beginning of each run several days were needed to improve the vacuum to a point that resulted in acceptable beam lifetime.

Main operation projects of this year include calibration and test of the longitudinal feedback system (SLAC built) and the characterization of the insertion devices in terms of their influence on the orbit.

Controls

At this time the BESSY II control system (device control) uses approx. 26,000 EPICS database records. About 6,000 of these are hardware related, 5,700 of which are connected to CAN field bus lines. I.e., more than 95% of the raw I/O signals are connected using the field bus. For a more complete description of BESSY's modular I/O system and extensive use of the CAN field bus see the ICALEPCS '97 paper at <http://www.bessy.de/control/Docs/icalepcs97/p240.ps.gz>.

The least reliable part (apart from human operating errors) seems to be the GPIB interface. (The HP made GPIB-to-ethernet boxes we use obviously have some problems handling power failure situations. Also these boxes are resettable by telnet access only, so the IOC has to open a telnet session and issue commands when resetting the interface, which fails from time to time leaving the GPIB interface in an undefined status.)

Scheduled projects of this year include the implementation of a few "black box" type subsystems, such as two new insertion devices (wave length shifters) and the SLAC-made longitudinal feedback system. Note: All these systems have either a CAN bus or an EPICS interface specified.

Manpower issues have led to a situation where parts of the control system (insertion device, monochromator and beamline control) suffer of low reliability and insufficient maintenance. There will be efforts to merge these with the existing device control system into an unified control system structure which (hopefully) will be much easier to maintain. This includes introducing a new approach to application release control and enhancing the existing configuration management (based on an ORACLE database) as well as network topology issues and extensive use of the Channel Access proxy gateway.

Long-term archiving will be a major topic in the next phase. (Current archiving is based on the SDDS tool suite developed at APS.)

There will be miscellaneous software updates in different areas: Changing to Tornado (resp. vxWorks 5.3) on the IOC, Embedded Controller software updates etc.

BESSY II Status Update

- 1998:** *Commissioning*
16 w Machine Studies, 3 w User Operation
- 1999:** *Beginning of User Operation*
9 w Machine, 20 w Shutdown, 23 w User Operation



Operations

Status

- + All Design Parameters Exceeded
- + Resolution of 100,000 has been Demonstrated
- + UE56 (Helical Device): First Successful Tests
- + Working Compton Back-Scattering Energy Measurements Indicate that BESSY II will be Used as Primary Radiation Standard
- Too Large Vacuum Sections

Plans

- Insertion Device Characterization

Controls

Status

- + 26K Records (6K Hardware, 5.7K CAN) on 25 IOCs
- Least Reliable Parts: GPIB Interface (*and Operator!*)

Plans

- Implementation of “Add-On” Packages: LFB, WLS
- Controls Integration: IDs, Mono, Optical Diagnostics
 - => Release Control / Configuration Management
 - => CA Gateway / Network Topology
- ARCHIVING
- Misc. Updates: Tornado, Embedded Software