

A detailed wireframe model of a particle accelerator, likely the Superconducting Super Ring (SSRF) at Shanghai. The model shows a large, roughly circular ring structure with a complex internal lattice of pipes and support structures. The ring is composed of many segments, and the overall design is highly technical and precise.

WAO'16 – SSRF - Shanghai

18.09. - 23.09.

Stephan Reimann

outline

- WAO facts
- interesting talks
- GSI contribution and discussion



WAO facts

- 10th workshop on accelerator operation (SSRF, Shanghai)
- 127 participants from 36 Labs from 17 countries
 - members of operation groups
 - heads of operation
 - operators
- session topics
 - how we do business
 - performance and statistics
 - machine commissioning & re-commissioning
 - beam commissioning
 - operator issues
 - operator tools and projects
 - operator and machine physicist interaction
 - operation of compact accelerators
 - dramatic incidents and lessons learned
 - new control room issues and technologies

<http://wao2016.csp.escience.cn/dct/page/70013>

Some interesting topics

- 2 operators 24/7 + 3 experts on call
- within one year staff size grew from 1 to 17
- hiring parallel to beam commissioning
- first medical treatment started directly when operations group was complete
- Engineers, technicians: Good expert skills, partly previous working experience in their special field. but Mostly no experience in particle accelerators.
- Physicists: All with previous work experience at research accelerators (GSI/FAIR, S-DALINAC, MPI for Nuclear Physics) but no experience in therapy application of ion beams

The Performance Improvement Initiative at ISIS neutron source - Julian Brower (STFC)



- FLD, First Line Diagnosis, now four years on and becoming the backbone of ISIS's fault analysis toolkit.
- interesting software for failure analysis based on flow diagrams
- database is filled by the concerned technical department

When Less is More - Violeta Toma (TRIUMF)

- 1974 cyclotron commissioning + control room
- 1993 medical cyclotron □ 2nd control room
- 1998 ISAC I □ 3rd control room
- 2010 ARIEL project □ 4th control room
- 4 control rooms, 4 operations groups, 28 operators
- building an operations group rom existing operation groups is as challenging as, or more than, starting one from scratch

- 1 of 7 operators + 1 of 7 engineers in charge on 24/7 shift + 2 machine experts + equipment experts
- role of operations team
 - Beam commissioning with safe beam
 - Non standard operations and measurements
 - Fine tuning of the parameters along the operational cycle
 - Work closely with experts, learn from them

- 6 weeks commissioning (3 weeks without beam, 3 weeks with beam) after a long shutdown at PETRA III
- machine development beam time directly after shutdown
- beam setup is done by operators (3) + commissioning support by physicist during daytime with very long evenings
- hardware setup is done by system owners (expert systems with hidden knobs, unknown to the operators)
- beam optics check are done by physicists (expert systems, no usable GUIs, routines with matlab, not documented)
- Some operators are curious enough to cross these borders

- some thoughts about “future” human device interaction
- at the moment all is about mouse-click interaction, control rooms and applications are optimized for it
- but next generation operators are familiar with other interfaces (touch, tab, gestures or personal assistants like SIRI) “smartphone generation”
- □ R&D project

misc.

- Energy Saving Potential for Proton Facilities on the Example of HIPA @ PSI (A. Parfenova)
 - ca. 1GWh/a energy saving by setting magnets to standby
- Operator tools from operators @ BNL
 - mobile display for machine data, log book, databases

GSI contribution

- 1 Poster
 - Operator training shift experience (M. Vossberg)

- 2 Talks
 1. Building an operation team for FAIR nearly from scratch (S. Reimann)
 2. Report on the status of GSI accelerator data archiving and analysis (M. Sapinski)

poster feedback

- the response was very high, many questions, discussions
- no lab provides exclusive training shifts for operators, but all think it would be a good idea
- 2nd place in poster voting

conclusions “operations team for fair”

Shift working places	Full-time Operators	Situation
2	14	UNILAC only operation
3	21	UNILAC, SIS18, ESR
4	28	SIS100 commissioning*
5	32	FAIR-operations*

- Conditions
 - larger control room
 - new skill profile for operators
 - stable long term beam time scheduling is needed, the big experiments must be scheduled starting sequential
 - fully digital control room
 - high level automation, no misuse of rare manpower
 - generic operating software/ consistent look and feel
 - restricted parallel access on machine settings

□ only 5 operators per shift needed, to run the whole facility

feedback

- the number of operators was judged to be realistic
- the conditions are useful and necessary to fulfil
- all modern control rooms are going in the direction of digitalisation and automation
- for so many new operators a good training concept is needed
 - the training shifts were considered to be a great improvement
 - old operators should be trained on new machines, new operators on the old machines □ to avoid a split in the group
 - old operators could provide procedures
 - involve operators in commissioning!
- comments to the skill profile
 - software skills are highly recommended (big consensus)
 - technicians, engineers
 - connection to a technical department (2nd job)
 - physics background
 - physicists? no

Ende