



The Operation Group at BEPCII

Workshop on Accelerator Operations
August 6, 2012

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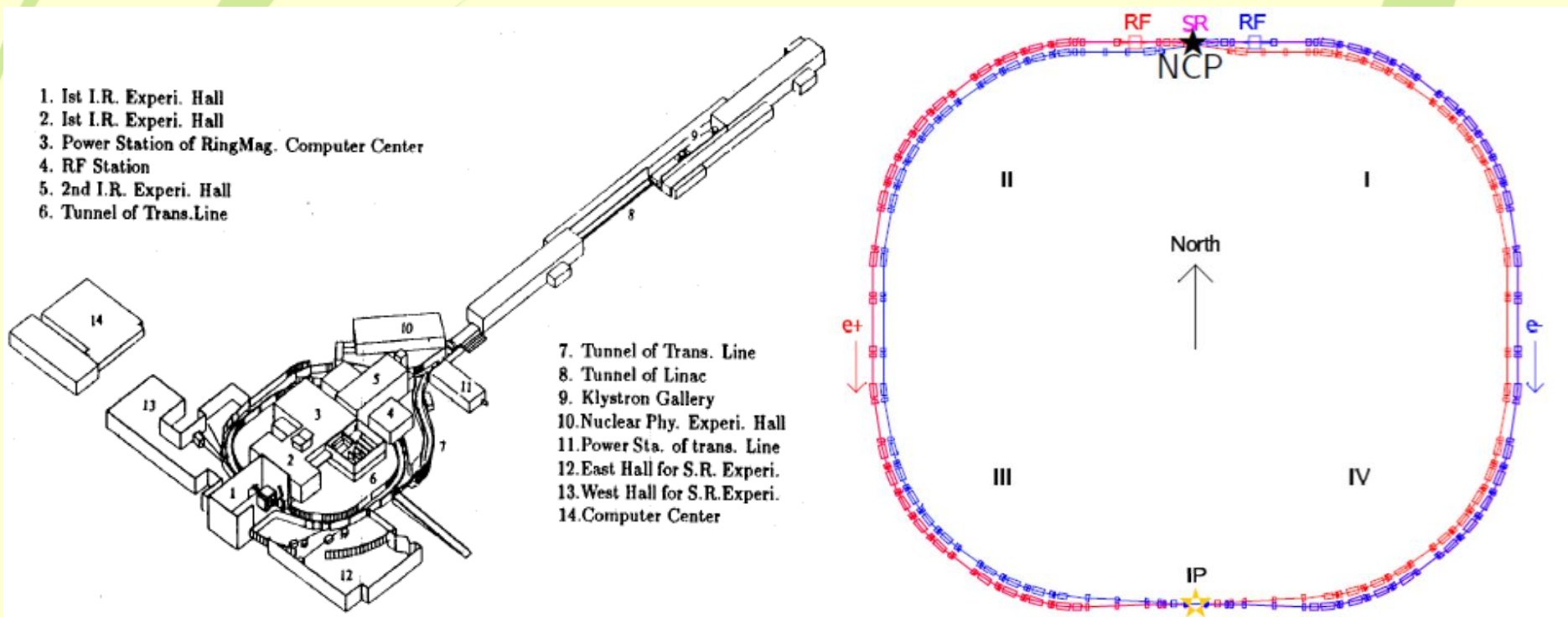
For the Operation Group
IHEP, Beijing, P.R. China

Overview

- Brief introduction on the BEPC-II
- Group mission
- The operation group
 - Brief history
 - Shift arrangement
 - encouragement
- Operator training
- Future

Brief introduction on the BEPC-II

- An upgrade project of the BEPC
- A double-ring factory-like machine
- Deliver beams to both HEP & SR



Main parameters achieved (collision mode)

Parameters	Design	Achieved	
		BER	BPR
Energy (GeV)	1.89	1.89	1.89
Beam curr. (mA)	910	~800	~800
Bunch curr. (mA)	9.8	~9.0	~9.0
Bunch number	93	80 – 88	80 – 88
RF voltage	1.5	1.5 – 1.7	1.5 – 1.7
β_y^* (m)	0.015	0.014 – 0.015	0.014 – 0.015
Lifetime (hrs)	3.5@910mA	~1.8@720mA	~1.8@720mA
B – B parameter	0.04	0.0327	
Lum. ($\times 10^{32} \text{cm}^{-2} \text{s}^{-1}$)	10	6.492	

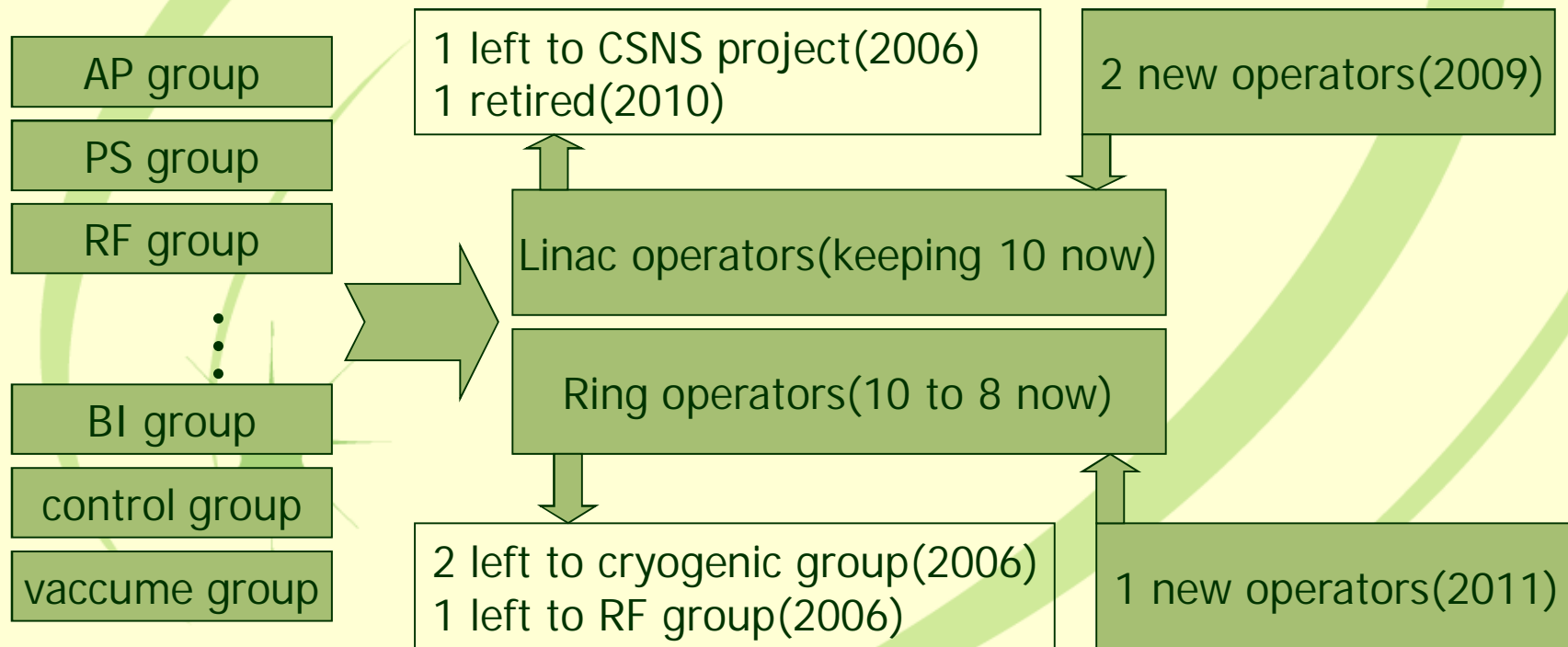
Group mission

- The linac
 - Deliver electron and positron beams to the storage rings
 - Deliver electron beam to the nuclear physics experiments
- The storage ring
 - Deliver beams to the HEP
 - Deliver electron beam to the SR users
- Equipments inspection and reset simply
- Machine development with other groups
- Be coordinator when troubleshooting & shutdown

High quality beams, stable status, well communications

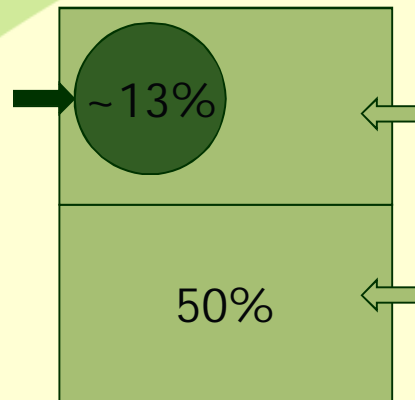
The brief history of the operation group

- Established in 2001, operators are staffs from different group
 - 10 operators for the linac
 - 10 operators for the storage rings



manpower distribution of the accelerator center

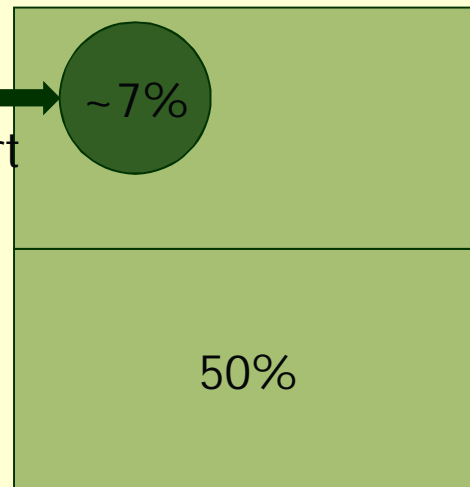
- The operation group taken the routine operation(BEPC) from 2001 to 2005.



- Staffs both for on-call of the BEPC and for the design and the construction of BEPC-II.
- Staffs for the design and the construction of BEPC-II.

after ten years... ..

- The operation group taken the routine operation and part of the commissioning work(BEPC-II) from 2006.



- Staffs for the BEPC-II and other project.
- Staffs for the design and the construction of the CSNS.

Shift arrangement(before 2000)

- Running 9~10 months per year
- Each shift (12 hours,6~8 staff)
 - Ring control room
 - 1~2 operators from the accelerator group
 - 1 staff from control group or BI group
 - 1 RF staff
 - 1 staff from power supply group or vacuum group
 - Linac control room
 - 2~3 staffs

Shift arrangement(2001 - now)

- 10~11 months per year, no weekends and public holidays.



- 5-shift rotation
- 12 hours per shift.
- 2 operators for each shift, both in the linac and the ring.
- 4 accelerator physics members take one operator position in the ring.
- One operator position in the ring is for the new CSNS staffs to get the experience of operating a real accelerator.
- Additional persons on some shift for operator training or machine development.

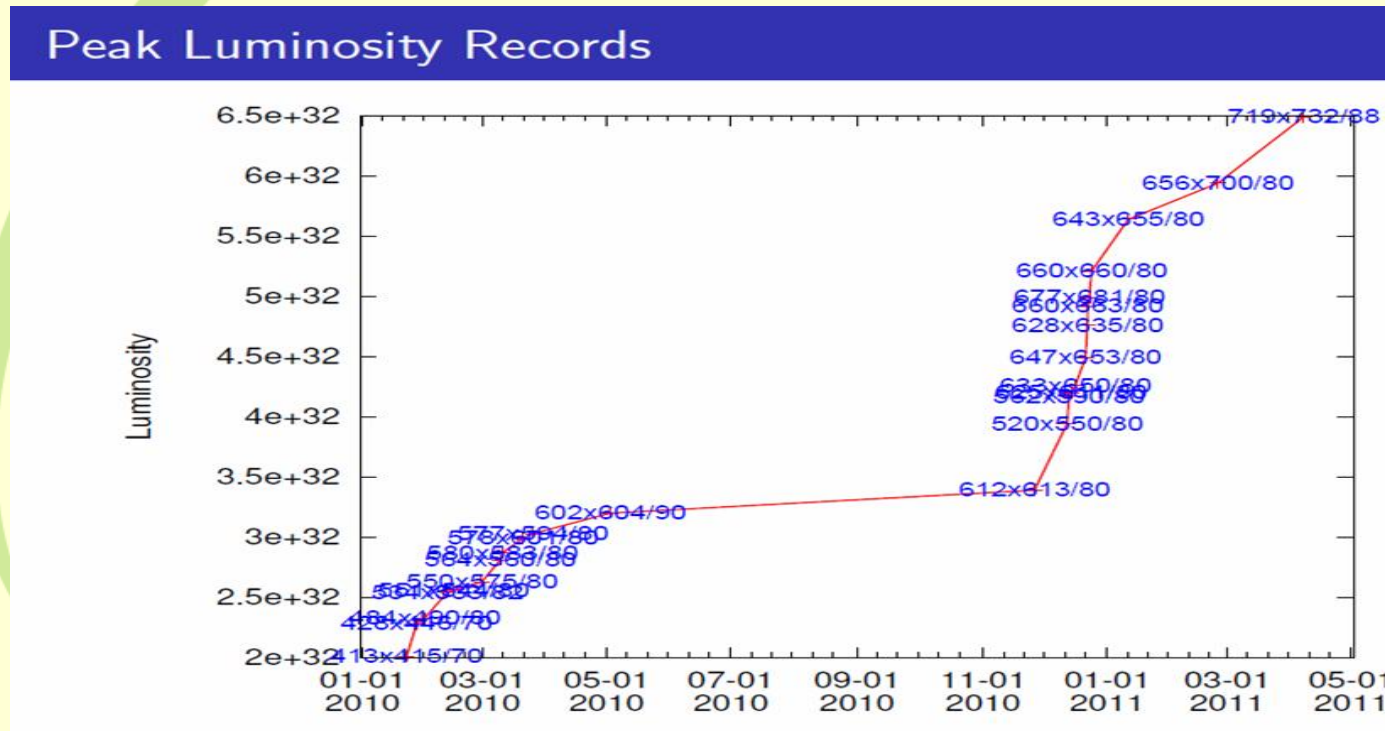
Encouragement

We have small bonus and team activities for encouragement.

- New peak luminosity record
- Maximum shift integral luminosity weekly
- Outing and barbecue in the spring and autumn

The optimization of the collider during the routine operation is very important to achieve a higher luminosity.

The figure shows the great progress of the luminosity by the effort of the operators during the HEP routine operation.



Operator training

- Centralized training
- Trainee style, training by qualified operators
- Training continuing

We don't really have a training program now.

- Centralized training for three times(all operators) in 2001(BEPC),2006(BEPC-II),2010(recent progress)
 - Brief introduction of accelerator physics
 - Collider, Linac
 - Software used in operation
 - Equipment
 - Control system, PS system, RF system...
 - Safety
 - Practice

A seminar for 2~3 weeks

- Trainee style, training by qualified operators

- First stage

- Safety

- Equipment

- Control system, PS system, RF system...

- Practice of Equipments inspection and simple reset

- Second stage

- Brief introduction of accelerator physics


- Collider, Linac

- Software used in operation

- Practice of operation

- Independent operation(with guidance)

Become a junior operator in 6~9 months

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- Training continuing
 - more opportunity for operator training
 - Regular meeting
 - Shift meeting
 - Weekly meeting
 - Annual meeting
 - Special topic that operation-related
 - Good operator need well communicate and collaborate with other professional groups.

Future

- Increase in manpower, especially in the ring
- To update the operation manual
 - Need cooperation with other groups
- Compile troubleshooting guide
- Developing the standards of the operator training
 - Electronic document
 - Training timetable
 - Standard assessment

Thank you!

