

HERA Status

HERA-Experiments Coordination Meeting

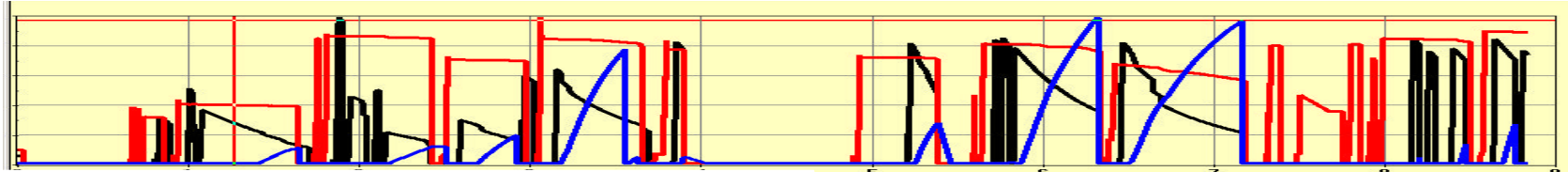
Monday, October 20, 2003

F. Willeke, DESY



- Present Status of the Accelerator Complex
- Technical and operational Problems and Concerns
- Schedule 2003
- Considerations for Running in 2004/2005

Present Accelerator Status



Since October 11, HERA in Luminosity Run

(few days late)

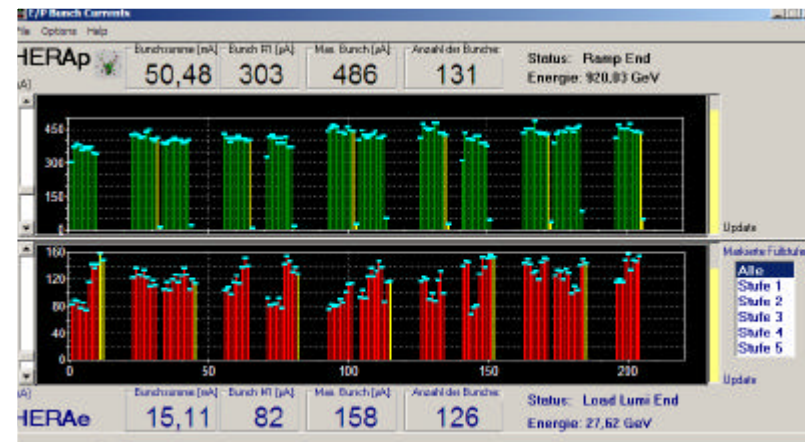
126 e+ x 120 p bunches

I_e deliberately limited to (15-20) mA

$I_p = 50$ mA

e-Spin Polarization is at the level of 30%
(not yet optimized)

At this level of Intensity ($I_e I_p$ = factor 6 below goal)
drift chamber dark currents at level of 50% of
maximum



Operating:

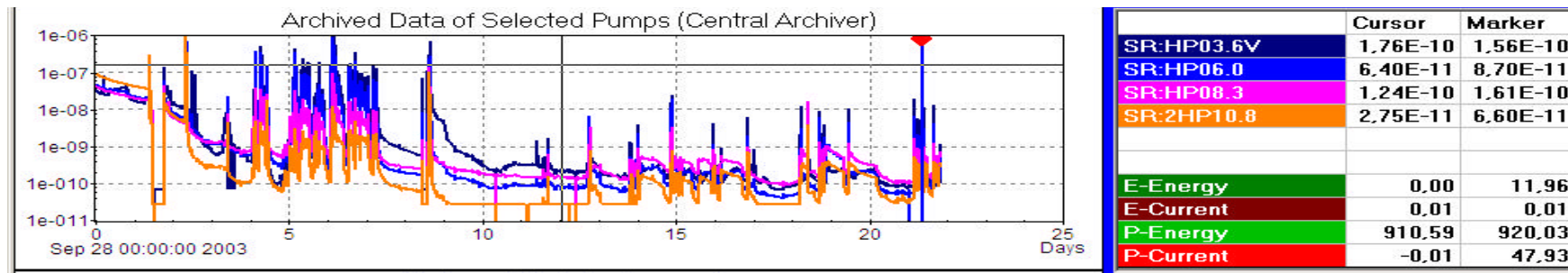
Standard operating procedures are established and are executed routinely. In particular, the injection efficiency of lepton and protons is acceptable (effort underway for further improvements). High temperatures observed at NR/SR! Pre-accelerator chain not fully optimized yet

Specific Luminosity up to $1.7 \cdot 10^{30} \text{mA}^{-2} \text{cm}^{-2} \text{sec}^{-2}$, not yet fully optimized

Background tuning still time consuming

Operational Problems

Beam Induced Vacuum leak at SR11m on Sept 26 during high intensity conditioning,



Fast recovery of the South IR Vacuum

The reasons analyzed and understood: Bad file with extreme Orbit in GI 7SR 10mm, → large SR power and critical energy from GI 7SR

(machine state validation procedures in preparation)

More **temperature sensors** installed,

Start up with moderate lepton current to learn about beam orbit tolerances before increasing intensities

Under discussion: Additional improved local cooling

Further planned improvements: Improved orbit feedback, automatic bump closing

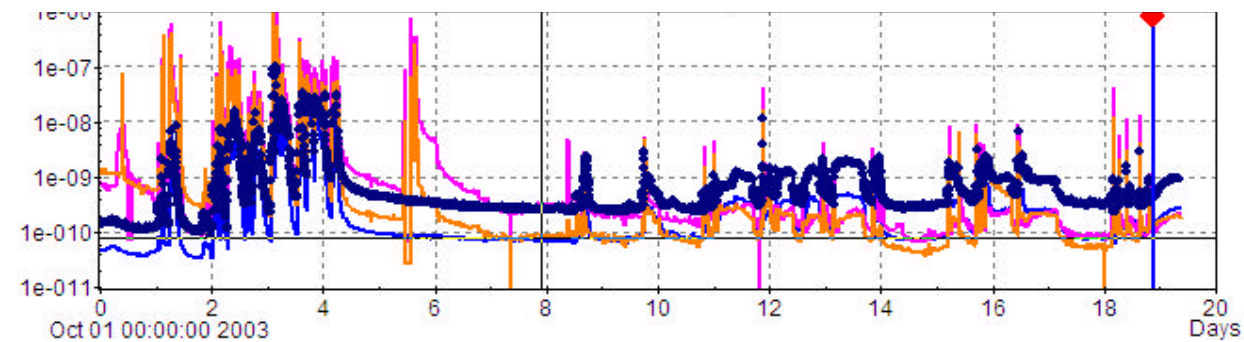
Vacuum Conditions

Vacuum behaves quite friendly

No strong increase of IR pressure during e injection,

General level of IR pressure at 15mA 1nTorr

→ Measures to improve and condition vacuum system were successful



Technical Problem: Ground fault in BU NL 73 (p- Main Circuit)

Immediate Fix: Accept to operate with the ground fault, Modify ground fault detection circuitry (tricky because of non-steady leakage-resistance to ground and voltage transients due to capacitive coupling to ground → largest part of delay, hidden partially behind ZEUS Solenoid problems)

Medium -Term Plan:

Aggressive program to replace suspicious BU coils. 9 Coils ordered, production will start soon. First 3 coils will be delivered by March 2004, last in August. Replacements of all BU coils in NL planned in the next shut down

Technical Problem

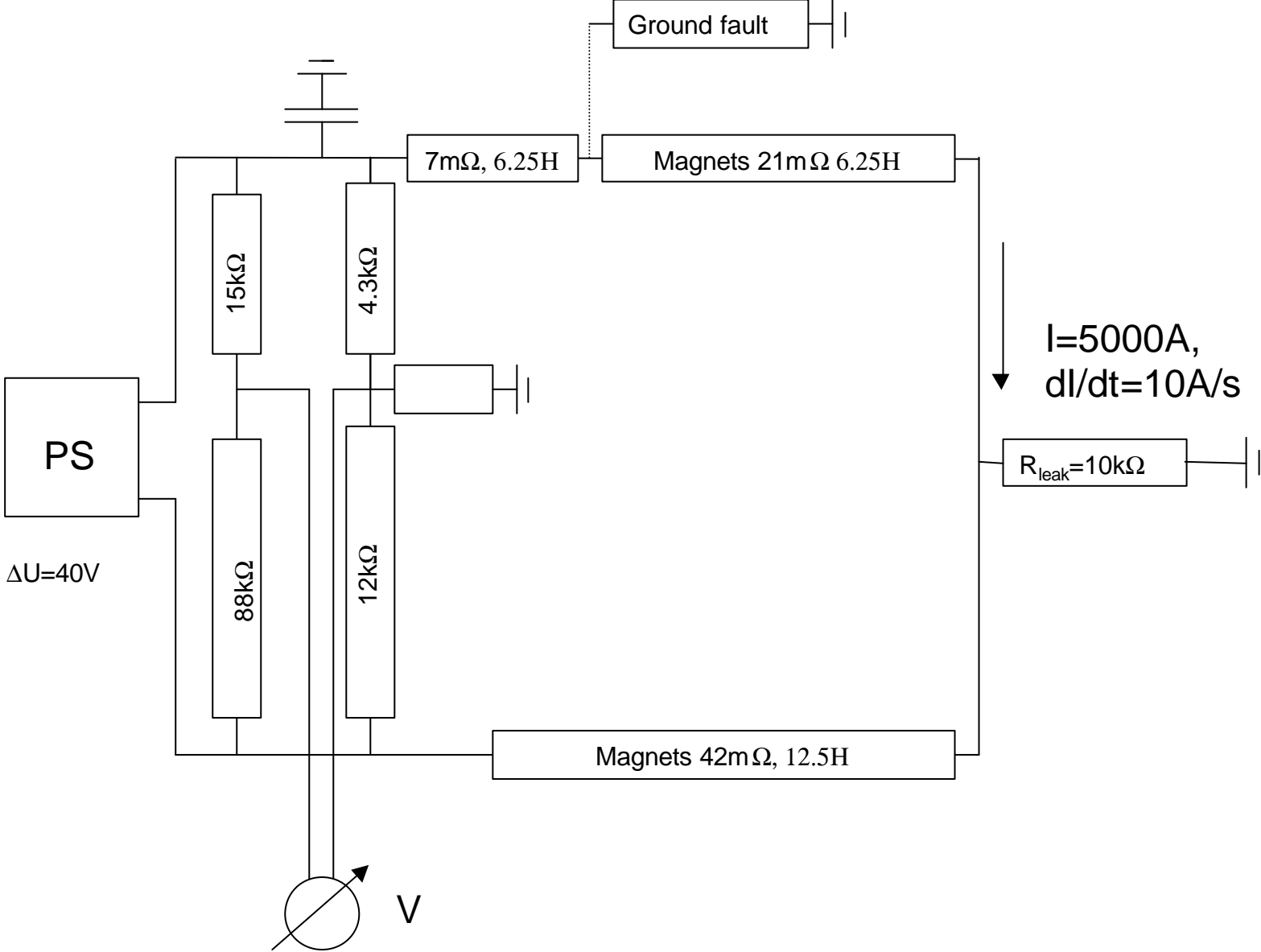
Frequent trips of RF stations, mainly due to cavity vacuum

→ Frequent beam loss, poor efficiency

→ This problem will improve after some time of operation

(Transmitter SR expected back in December)

Treatment of Ground fault NL BU73



HERA Start-up and Schedule 2003

	Start	Dt / 8h	End
Start-up with beam p&e	25.07.2003 15:00	33	05.08.2003 15:00
Machine studies	05.08.2003 15:00	7	07.08.2003 23:00
Machine studies	07.08.2003 23:00	36	19.08.2003 23:00
12GeV conditioning e	19.08.2003 23:00	46	04.09.2003 07:00
<i>Maintenance Day</i>	04.09.2003 07:00	2	04.09.2003 23:00
12GeV conditioning e	04.09.2003 23:00	38	17.09.2003 15:00
Preparation of Polarization Studies	17.09.2003 15:00	3	18.09.2003 15:00
Polarization+ 27GeV conditioning	18.09.2003 15:00	29	28.09.2003 07:00
<i>Tag der offenen Tuer</i>	28.09.2003 07:00	3	29.09.2003 07:00
<i>Maintenance Day</i>	29.09.2003 07:00	2	29.09.2003 23:00
Prepare Luminosity Run	29.09.2003 23:00	25	08.10.2003 07:00
Lumirun	08.10.2003 07:00	87	06.11.2003 07:00
<i>Maintenance Day</i>	06.11.2003 07:00	2	06.11.2003 23:00
Lumirun	06.11.2003 23:00	82	04.12.2003 07:00
<i>Maintenance Day</i>	04.12.2003 07:00	2	04.12.2003 23:00
Lumirun	04.12.2003 23:00	37	17.12.2003 07:00
Machine studies	17.12.2003 07:00	15	22.12.2003 07:00

First Considerations to 2004/2005 Running

- Try to minimize break between the years 03/04 (keep running possible?)
- Need a break in 2004 for Interlock tests (5 weeks)
(in August 2004 at latest, needs to be discuss with AFA)

A number of desired activities should be combined:

- HASYLAB Installation (4 weeks, desired in July)
- BU Magnet NL exchange coils (4 weeks, not before August)
- Cryogenic Maintenance on screw-compressors (4 weeks, desired time September)
- DESY I Main Choke (3-6 Weeks)
- Miscellaneous Maintenance and Improvements
(cooling tower heat exchanger, quench protection, works interlock system to be performed before the test)

What is the input of HERMES, H1 and ZEUS?

- To be Avoided: Summer Vacations from June24-August 18 (HH, NS, SH)
- Need to decide at some point:
Shall we switch to electrons in summer 2004 or summer 2005
(extended shutdown in January 2005 not desirable)