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RESPONSIBILITIES AND WORK PROGRAMME OF THE BR GROUP*)

1975 - 1976

K. H. Reich

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*) Up-dated version of MPS/BR Note/74-1, approved by MAC Meeting No. 41.

INTRODUCTION

The main accomplishments in 1974 were:

- a total of 3500 h. of PSB operation with low fault rate (5.7%); establishment of operational procedures, extensive training of EIC's and operators (>1000 h.).

- acceleration of the design intensity (and up to 40% higher) very nearly with the design emittances; transfer of this beam to the PS.

- considerable progress in refined beam observation and understanding of beam behaviour.

- completion of practically all machine systems (except spare parts); definition and, in some cases, partial implementation of several medium-size machine improvements (see Appendix for details).

Consequently, and OP having taken over the routine PSB operation from the MCR on the 1st April, 1975, our main tasks for the remainder of 1975 are:

- improving the beam characteristics, in particular the stability and uniformity at the design intensity level.

- to maintain the machine, and to carry out a broad programme of small to medium scale improvements.

- to explore the PSB performance limits.

- to investigate possibilities for further improvements.

I. PSB PERFORMANCE (EXPERIMENTAL AND THEORETICAL)

Experimental and theoretical studies: (all part-time except F. Sacherer)

J. Gareyte*)	(MST, all subjects)
P. Krempl	(betatron amplitude distributions)
L. Magnani	(damping of longitudinal instabilities)
J. P. Delahaye	(beam recombination and 800 MeV beam quality measurements)
F. Pedersen*)	(mainly longitudinal instabilities and beam control)
F. Sacherer*)	(Chairman of BPC)
K. Schindl*)	(Scheduling; injection line and injection, closed orbit, stop bands)
H. Schönauer	(transverse phase space)
P. Van der Stok	(OP, multi-turn injection)

Other related activities

C. Carter	(part-time, electronics lash-ups)
P. Heymans	(part-time, software lash-ups)
A. Saviolakis	(scientific programming)
PSB supervisors	(part-time, operational aspects)

These activities are promoted by the Booster Performance Committee (BPC), whose responsibilities and work programme for 1975 are:

1. Organize and conduct machine experiments to locate, study and cure if possible the present limitations to machine performance, mainly:

   a) transverse emittance blow up (at highest intensities).

   b) bunch to bunch longitudinal instabilities.

   c) RF cavity beam loading instabilities.

   d) imperfections of beam recombination and transfer to PS.

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*) Member of BPC

2. Specify, in collaboration with the PS people, beam quality requirements and provide guidelines for obtaining them.

3. Specify hardware and software performances as required to maintain and improve machine performance, in particular for beam observation equipment, multipoles for stop band compensation and Landau damping, and feed-back systems for damping longitudinal and transverse instabilities.

II. MAGNETS

P. Bossard, M. E. Chanel, P. Hoffmann, H. Megies, M. Perrin, G. Suberlucq, M. Schwarz.

1. Systems operation, maintenance, provision of spare parts and documentation for the following equipment: (H. Megies works on all equipment).

a)	PSB main magnet	M. Perrin
b)	PSB auxiliary magnets (RD, RM)	
c)	14 septum magnets in the injection line, the PSB rings and the transfer line.	P. Hoffmann
d)	all beam transport magnets in the BR part of the injection and transfer line.	M. Perrin
e)	beam stoppers, moving mechanisms for scintillation screens and SEM grids.	M. Perrin

2. Keeping of spare parts for, and assisting with repairs of, quadrupoles in non-BR parts of injection and transfer lines.

3. Main improvements and developments

a) Main and transfer line magnet systems

-	reinstallation of ring dipoles for PPM and beam scope.	M. Perrin et al.

-	installation and cabling of the new multipoles.	M. Perrin et al
-	auxiliary quadrupole windings in transfer line (if confirmed).	
-	pulsed T-BH magnet.	M. E. Chanel et al
b)	Special magnets.	P. Hoffmann et al
-	magnets for new I-DIS.	
-	if desired, study of I-SH with thinner septum.	
c)	Control electronics.	G. Suberlucq
-	interlocks for new magnets, including multipoles.	
-	improved remote control of septum magnet position.	
d)	Other activities.	
-	sieve for PPM.	
-	radiation dose measurement on main magnet.	M. E. Chanel (F. Coninckx, M. Hoefert)
-	modification to ease fault-finding (equipment monitoring).	G. Suberlucq
-	BR Free Workshop.	M. Schwarz A. Cantin (SB)

III. POWER SUPPLIES

P. Burla, H. Fiebiger, R. Gailloud, F. J. Gendre, S. Laudet, M. Métais, J. P. Royer, F. Völker.

1. Systems operation, maintenance, provision of spare parts and documentation for the following systems (S. Laudet, E. J. Gendre work on all of them).

a)	- Main magnet supply and trim supplies. - 18 kV/6 kV/0.4 kV substation and power distribution.	H. Fiebiger R. Gailloud
b)	- Transfer line supplies. - other power supplies in BHP.	P. Burla, H. Fiebiger
c)	Injection line supplies.	M. Métais J. P. Royer
d)	Correction supplies. (D, M, $\int$Bdl, special supplies).	H. Fiebiger M. Métais

2. Main improvements and developments.

-	PFN's and supplies for faster I-DIS.	J. P. Royer et al
-	multipole and Q-tuning supplies.	P. Burla R. Gailloud M. Métais
-	pulsed T-BH supply.	F. Völker et al,
-	improved equipment monitoring.	P. Burla et al.

IV. RF ACCELERATING SYSTEM AND KICKER MAGNETS

J. M. Baillod, J. F. Labeye, A. Plunser, B. Sutton, D. Zanaschi.

1. RF Accelerating system (J. M. Baillod, B. Sutton).

   a) Systems operation, maintenance, provision of spare parts and documentation.

   b) Main improvements and developments.

- improved protection of cavities against transients.
- remote switch over to standby units.
- reduction of cavity impedance.
- beam simulation on test cavity.

2. Kicker magnets (J. F. Labeye, A. Plunser)

a) Systems operation, maintenance, provision of spare parts and documentation (13 fast, 16 "slow" magnets).

b) Main improvements and developments.

- improvement of field vs time characteristics and of its measurement and display.
- improvement of oil-filled coaxial cables (leak-proof, non-corrosive oil).

V. ELECTRONIC SYSTEMS

M. Boffard, R. Boudot, L. Guerrero, G. Gelato, C. Herman, B. Kriegbaum, M. R. G. Le Gras, L. Magnani, F. Pedersen, G. Rentier, H. Schmall, J. D. Schnell, L. Symons, S. Tirard, R. Unell, D. J. Williams.

1. Beam control and synchronization systems

a) Systems operation, maintenance, provision of spare parts and documentation. B. Kriegbaum, L. Magnani, F. Pedersen, G. Rentier, S. Tirard (all part-time).

b) Support of BPC activities.

- RF knock out electronics. C. Carter, F. Pedersen
- transverse Schottky scans electronics. C. Carte-, F. Pedersen

- electronics for experimental transverse active damping.	To be defined
- longitudinal mode analyser and active damping.	P. Asboe Hansen B. Kriegbaum F. Pedersen
- studies of, and hardware for Magnani damping.	L. Magnani S. Tirard
c) Main improvements and developments.	
- modification of loop dynamics to counteract beam loading.	F. Pedersen et al
- modification for pulse-to-pulse intensity modulation.	L. Magnani et al
- improved equipment monitoring.	L. Magnani et al

2. Instrumentation for beam observation

a) Systems operation, maintenance, provision of spare parts and documentation of the injection line beam current transformers, the ring orbit observation system, and the transfer line beam position monitors.	R. Boudot M. Boffard L. Symons D. J. Williams
b) Main improvements and developments.	
- improved calibration and automatic range selector for transformers.	L. Symons
- normalization of Δ analog signal.	L. Symons D. J. Williams
- improved analog to time converter for ring pick-up electrodes.	M. Boffard D. J. Williams
- BLR suppression for transfer line pick-up electrodes.	L. Symons
- improved equipment monitoring.	L. Symons et al.
- wider aperture pick-up electrode	

3. Timing and general electronics

a) Systems operation, maintenance, extensions, provision of spare parts and documentation for the timing and sequencing systems, the low-level kicker electronics, and the wide-band position pick-up systems.

L. Guerrero
G. Rentier
S. Tirard
J. D. Schnell
D. J. Williams
(all part-time)

b) Main improvements and developments.

- modification of timing and sequencing for pulse-to-pulse modulation.
- development of electronics for quadrupolar p.u. electrode.
- improved electronics and multiplexer for wide-band stations.

M. R. G. Le Gras
L. Guerrero
J. D. Schnell
D. J. Williams et al.

4. Drawing Office

C. Herman, H. Schmall, R. Unell.

In order of priority this office deals with:

- new equipment
- building up a documentation of existing, non-obsolete equipment.
- assisting BR staff with standardization of procedures, symbols etc. and preparing their own documentation.

VI. CONTROLS AND DATA ACQUISITION (in collaboration with CCI)

G. Baribaud, G. Benincasa, J. Donnat, B. Frammery (OP, part-time), L. Gelato, F. Giudici, E. Gruet, B. Hallgren, P. Heymans, P. J. Horne, M. Lelaizant (part-time)

1. Systems operation, maintenance, provision of spare parts and documentation of the following systems.

G. Baribaud
J. Donnat

a)	Mobile maxi console.	
b)	PDS1 interface.	(together with K. Hansen and F. Perriollat)
c)	800 MeV measurement line electronics.	
d)	IBS data acquisition.	
2.	Operation, maintenance and provision of documentation for existing IBM 1800 BR software facilities.	G. Benincasa F. Giudici P. Heymans
3.	Main improvements and developments.	
a)	New multipoles.	G. Baribaud
-	control electronics.	B. Hallgren/P.J. Horne
-	acquisition electronics.	J. Donnat B. Frammery
-	software.	G. Benincasa F. Giudici
b)	Serial CAMAC for data transmission.	G. Baribaud G. Benincasa B. Hallgren/P.J. Horne (P. Heymans)
c)	Modifications asked for by the BPC and Operation (BR and CP), in particular extension of display programs.	G. Baribaud G. Benincasa F. Giudici P. Heymans M. Lelaizant (part-tim
d)	Pulse-to-pulse intensity modulation.	G. Baribaud P. Heymans
e)	Equipment monitoring.	P. Heymans
f)	Transfer of IBM 1800 programs to PDP 11.	L. Gelato E. Gruet et al
g)	Electronics for amplitude distribution measurement if accepted.	J. Donnat

h) Buffered data transfer. J. Donnat
P. Heymans

VII. CO-ORDINATION TASKS

1. PSB Systems II to V.

Systems operation, safety, maintenance, provision of spare parts, improvements and development. G. Nassibian

2. Activities related to operation.

J. P. Delahaye (BS, part-time, projected specialization: ejection, recombination), K. Schindl (BS, part-time, specialization: injection line, injection, use of correction magnets), H. Schönauer (future BS).

a) PSB operation under BR responsibility.

Operation for ME's (organization and implementation, in collaboration with OP).

b) Role of Booster supervisors (BS).

- to collaborate in the continuous updating of PSB operating procedures; to work out such procedures for new equipment.
- at the request of the PSS's, to collaborate in PSB trouble shooting.
- to make a major contribution to the preparation of the PSB Operation Handbook.

c) BOC. This will continue to serve (under OP chairmanship) as a discussion platform for current and future open/pending questions.

d) Liaison between OP operation, BOC, BPC, BR teams etc.

Where appropriate, this includes checking by experiment that subsystems meet performance specifications (particularly new equipment) and the follow up of PSB improvements asked for by operation or experiments.

3. Beam diagnostic equipment. C. Carter (part-time), J. P. Delahaye (part-time), B. Krempl (part-time), H. Schönauer (part-time), vacant, (to be discussed after the return of H. Koziol).

a) General responsibility and liaison for systems operated, maintained, improved and developed by CCI, ML, MU, OP and BR groups (TV beam observation system, beam current transformers in PSB rings and transfer line, measurement targets, IBS etc.).

b) For new developments liaison between, on the one hand the BPC and PSB operation, and on the other hand the PS Instrumentation Committee (BR representative: G. Nassibian) and the builders.

c) Full responsibility for certain measurement systems (Q-measurement, beam loss detectors, 800 MeV measurement line except electronics).

4. Industrial safety, buildings, utilities, co-ordination of installation, vacuum and shut-down work (P. Bossard et al).

a) Safety:

Safety Officer: P. Bossard

Safety Monitors: J. M. Baillod, M. Brouet, P. Burla, C. Carter, R. Gailloud, H. Megies, M. Métais, A. Plunser, J. P. Royer.

- regular inspection (in collaboration with the CERN Safety Services) of all PSB equipment and all other statutory safety activities.

b) Buildings/SB liaison: H. Megies

- general responsibility for PSB buildings, utility systems and PSB workshop (in liaison with SB), including any extensions.

c) Water-cooling plant: H. Megies

- Operation, maintenance and development of plant (in collaboration with PO Group for mechanical aspects)

d) Installation and vacuum work*) (in collaboration with ML Group):

- planning and co-ordination of work executed in PSB tunnel (building 360)

e) Liaison with PIO concerning PSB visits.

6. Theoretical support for projects and training.

Z. Grossman, I. Gumowski, J. P. Delahaye (PS projects No. 28 and 30, part-time), K. H. Reich (part-time), (K. Schindl projects 18 and 19, part-time).

As regards training, it is planned to provide i) an updated version of the seminars and exercises on accelerator theory and on feed-back control given in the SI Division in 1969/1970 and ii) a lecture series on the detailed action of the PSB equipment on the beam (with the collaboration of Operation).

7. Scientific computing. M. Lelaizant, H. Schönauer (part-time).

As before, priorities are in general on a "first come, first served" basis.

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*) PSB vacuum team (all ML): M. Brouet, M. Girardini, F. Hoekemeijer, C. Lacroix.

8. Documentation

(PSB Machine Handbook etc.) J. P. Delahaye (part-time), K. H. Reich (part-time), N. Pearce (ML, part-time), others to be added.

It is planned to complete the Handbook in 1976.

9. PSB medium and long term development. H. Koziol et al.

To be spelt out after H. Koziol's return.

10. Liaison and communication links between the Administration and the General Services, and BR Group. M. Innocenti

Main areas concerned are:

- Preparation and production of documents
- Purchase and work requests; film badges; insurance claims; leave requests; offices for visitors, etc.

Distribution (open)

List PS/5

APPENDIX - BR PROJECTS

No.	Item	Project Leader	Main Contributors	Status	Official Completion Date
1	Fast 50 MeV distributor and chopper	G. Nassibian	P. Bossard (magnets) F. Völker (PFN & power supplies) K. Schindl (beam optics)	PS 0018 authorized on 22/11/73	Mid 1975
2	Multipole correction lenses	G. Nassibian	A. Asner, J. Vlogaert, N. Pearce } lens unit design & product P. Bossard (install.) F. Völker et al. (see page 5) (power supplies) H. Koziol, K. Schindl } perform. specif. G. Baribaud, G. Benincasa } controls et al., see p.9	PS 0019 authorized on 7/12/73 and revised on 29/5/74	April 1976
3	Steering dipoles for PSB - PS transfer line	J.P. Delahaye	P. Bossard (dipoles) N. Pearce (vacuum chambers) F. Völker et al. (power supplies	PS 0028 authorized on 19/7/74	Beginning 1975 for dipoles 1977 for supplies
4	Pulsed TBH magnet	G. Nassibian	P. Bossard et al. (magnet) C. Metzger (beam optics) F. Völker et al. (power supply)	PS 0030 authorized on 8/11/74	End 1976
5	Pulse-to-pulse-modulation	J.P. Potier K.H. Reich	See project proposal	PS 0037 authorized on 12/3/75	Mid 1976/ End 1978
6	Injection line pick-up stations	K. Schindl	See project proposal	PS project 0040 authorized on 28/5/75	June/December 1976
7	Equipment monitoring	G. Gelato	See project proposal	Proposal being prepared	
8	Adiabatic betatron amplitude shaving	H. Schönauer	P. Krempl	Proposal being prepared	