

Magnet Power Supply

Number of Power Supplies installed

Type	Rec. Mode	Output Volt.	Output Curr.	Quantity
Recycled PS	S C R	550 ~ 740	840 ~ 1250	7
Large Power (Q)	S C R	60 ~ 930	500 ~ 3500	20
Middle Power (B , Q)	Switching	20 ~ 130	200 ~ 1250	360
Small Power (ST)	Switching	50 ~ 100	5 ~ 10	1842

Required Current Stability and Field Ripple Content (P - P)

Magnet	Current Stability	Field Ripple
B	$1 \times 10^{-4} / y$	1×10^{-5}
QCS	$1 \times 10^{-4} / y$	1×10^{-5}
Q(Arc)	$1 \times 10^{-4} / y$	1×10^{-5}
Sx	$5 \times 10^{-4} / y$	5×10^{-5}
St	$5 \times 10^{-4} / y$	5×10^{-5}

1. Manufacture smoothly finished as a whole
met with EMI trouble to the communication
I/F(Interface) of St PS at the manufacturing
procedure
2. Installation finished on schedule from Jan. '98 to Jul.'98
3. Checking out and adjustment
finished before accelerator operation

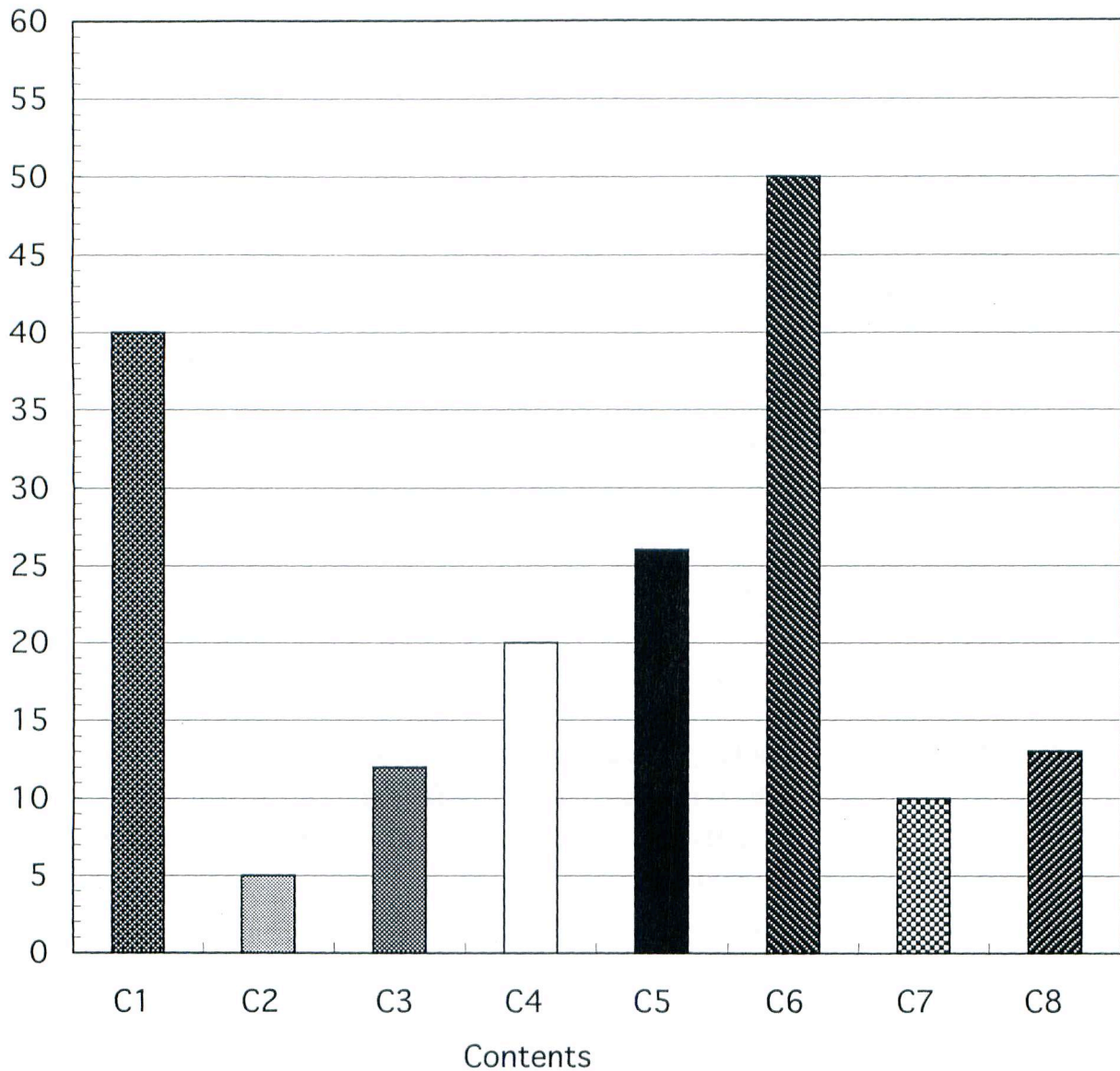
Summary

1. Checking out and adjustment
 - 1) 3 months from Sep. '98 to Nov. '98
 - 2) 2,229 Power Supplies
 - 3) Cable connection check
Magnet current ripple check
Communication check of I/F

Refer to the next Graph

Failures in Power Supply Check Out Period

Number



Contents

- C 1 : Power Cable Wiring Error
- C 2 : Control Cable Wiring Error
- C 3 : PLC Address Error
- C 4 : Interface Address Error
- C 5 : Current Monitor Address Error
- C 6 : Power Supply Failure
- C 7 : Magnet Failure
- C 8 : Others

Number of Failures : 176

Total Check Number : 4920

Failure Rate : 3.6%

2. Main troubles happened after accelerator operation

- 1) Cable connection error BSWFRP
- 2) Early days failures

Steering Mag. PS	12 PS	exchanged PS
Quadrupole Mag. PS	1 PS	exchanged SCR
	3 PS	exchanged Cooling Fan
	2 PS	exchanged DCCT
- 3) Failures of PLC (Programmable Logic Controller) receives magnet interlock signals
 due to the failures of communication interface module
 and the connector of communication cable

Refer to the next Graph

3. Remaining problems to be improved

- 1) Field ripples of QC1LE and QC2RE
 Content of field ripples for these magnets does not satisfy the required specification (10ppm(p-p)) at present even if considering the attenuation effect by the Al chamber and block magnet.
- 2) Current drift of St and Sx magnet PS
 The St and Sx magnet PS current had drifted in the same direction by the temperature change in power supply stations due to the on/off effect of fresh air ventilation fan. Even if each power supply satisfy the required specification, beam quality will be affected by this collective current drift of power supply. Near future, fan control system will be improved.

Failures in Commissioning Period [Dec 1, '98 ~ Feb 27, '99]

Number

20

18

16

14

12

10

8





6

4

2

0

Contents

-  PLC (for Magnet interlocks)
-  Magnet Cable Connection Error
-  Current Monitor System
-  Power Supply (QCS)
-  Power Supply (MR)
-  Power Supply (BT)

Dec 1 ~ 5, '98

Dec 6 ~ 12

Dec 13 ~ 19

Dec 20 ~ 26

Dec 27, '98 ~ Jan 2, '99

Jan 3 ~ 9

Jan 10 ~ 16

Jan 17 ~ 23

Jan 24 ~ 30

Jan 30 ~ Feb 6

Feb 7 ~ 13

Feb 14 ~ 20

Feb 21 ~ 27

Date

