

21/ Sep / 04

35  
30 lpm  
x 60  
x 24 x 2.5  
~~36000~~  
5000  
70 l

15:15 Regulator set point.

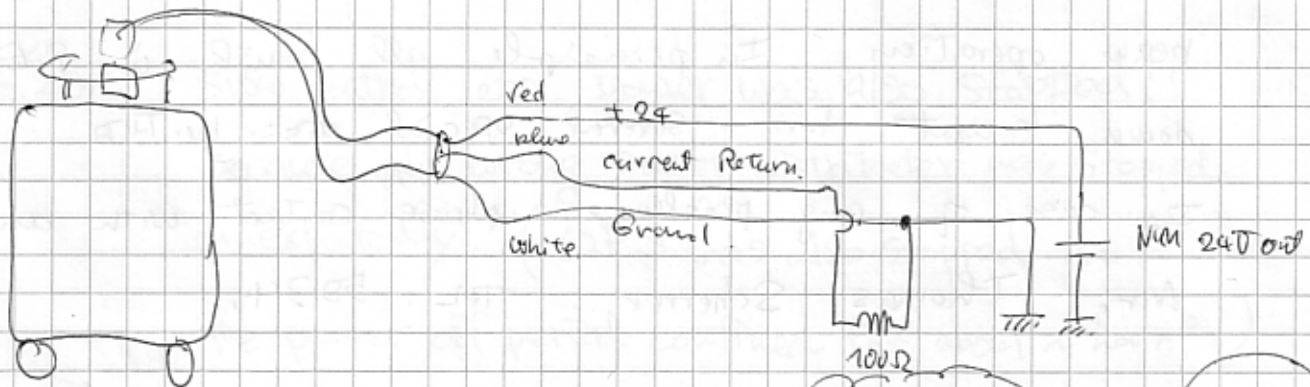
800 mT → 850 mT.

15:45

850 mT → 900 mT.

16:00

Liquid Nitrogen dewar level meter is in.



MSCB module  
address input 7  
10

offset  
-0.4 (V)

Gain  
100 %  
20.4 (V)

The level is above 100% , but do not worry  
it's normal.

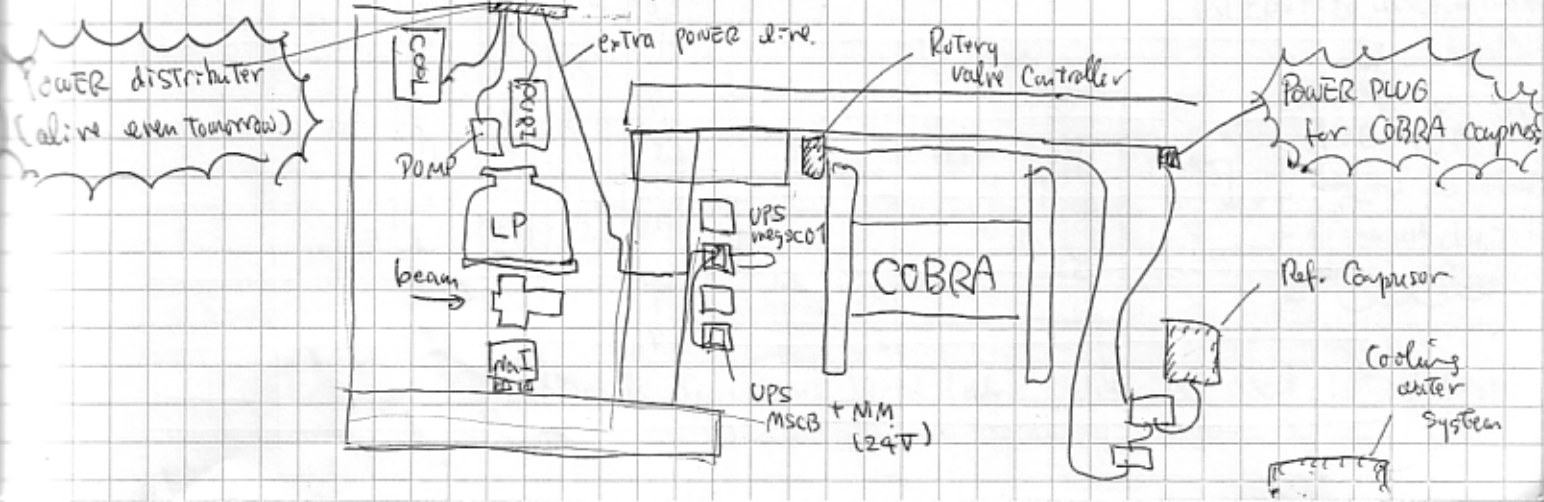
17:10

Set Point 900mT → 950 mT

19:00

Power distribution is modified for

tomorrow power out



21/Sep/04

## POWER CUT!!

There will be POWER CUT tomorrow from 8:00 to 17:00 (8)

for ~~re~~ rearranging POWER CONNECTION for beam line magnets

in order to avoid transformer heat up when ~~112~~ <sup>112</sup> MeV/c

beam operation. In principle all power in PIES goes down except for several special distributions.

In case of any problem, please contact with an electrician

Mr. Thomas Scherrer. TEL. 5934.

repaired some cables between Separator and bundy

F10	replaced bundy pin	
R10	replaced bundy pin	000    <sup>3-3</sup> 000
	changed bundy channel to	3-3
BT25	replaced bundy pin	

• changed offset of LM<sub>2</sub> Level from -0.4 to -25

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7:00 Pressure Reducer Output  $\sim 0.2 \text{ MPa}$   
Inner Vessel Pressure  $0.12 \text{ MPa}$   
Flow rate  $10.0 \text{ lpm}$

Regulator Set Point changed from  $950 \text{ mT} \rightarrow 1000 \text{ mT}$

7:50 Pressure Reducer Output  $0.21 \text{ MPa}$   
Inner Vessel Pressure  $0.120 \text{ MPa}$   
Flow Rate  $12.0 \text{ lpm}$

Cold head heater is started to be activated.  
(pressure control mode)

8:00 Set Point  $1000 \text{ mT} \rightarrow 1100 \text{ mT}$   
Pressure Reducer Output  $0.23 \text{ MPa} \rightarrow 0.23 \text{ MPa}$   
Inner Vessel Pressure  $0.121 \text{ MPa} \rightarrow 0.123 \text{ MPa}$   
Flow rate  $15.5 \text{ lpm} \rightarrow 17.48 \text{ lpm}$

8:30

9:10 Set Point  $1100 \text{ mT} \rightarrow 1150 \text{ mT}$

14:30 Pressure Reducer Output  $0.28 \text{ MPa}$   
Inner Vessel Pressure  $0.136 \text{ MPa}$   
Flow rate  $18.39 \text{ lpm}$

Inner Vessel Pressure is slightly increasing while the flow rate does not change. This suggests that cooling power is at limit. Reduce Set Point for keeping margin.

15:05 Set Point  $1150 \text{ mT} \rightarrow 1100 \text{ mT}$



22:30

Pressure Reducer out put 0.28 MPa  
 Inner Vessel Pressure 0.146 MPa  
 Flow rate 18.07 ~~L~~ L/min  
 Set point 1100  $\rightarrow$  1050 mV

24/Sep/04

7:55

Pressure Reducer Output 0.27 MPa  
 Inner Vessel Pressure 0.160 MPa  
 Flow rate 18.80 L/min  
 Set. Point 1050  $\rightarrow$  1000 mV

8:07

Pressure Reducer Output 0.26 MPa  
 Inner Vessel Pressure 0.160 MPa  
 Flow Rate 17.65 L/min

Still the Inner vessel pressure level is increasing...

~~Set Point 1000  $\rightarrow$  850 mV~~

12:50

1000 mV  $\rightarrow$  850 mV

16:20

End of configuration

Storage tank pressure 0.85 MPa.

Switch off the regulator  
 & close the pneumatic valve.

- Main valve of the tank is closed.
- Change the valve configuration to circulation mode.

29/Sep/04

17:00 Start circulation  $\sim 9.6$  l/min

HV ON (HV cables are connected in the zone)

Circulation status (15 minutes later after circulation start.)

- Circulation speed.  $9.8 \sim 10.2$  l/min
- Cold head temperature.  $-105.20^\circ\text{C}$
- Inner Vessel Pressure.  $0.155$  MPa (Pat. control set point  $0.155$  MPa)
- Cold head heater Power.  $35 \sim 45\%$

17:20. HV for all PNTs.  $500\text{V}$ .

HV error L7  $28\Omega$  between ground and signal line  
 $\Rightarrow$  set  $0\text{V}$  at HV output  
unplugged L7

19:23.

- Circulation Speed.  $9.7 \sim 9.8$  l/min
- Cold head temperature.  $-104.5^\circ\text{C}$
- Inner Vessel Pressure.  $0.155$  MPa.
- Cold head heater Power.  $50 \sim 60\%$



We can probably increase the flow rate (by opening a valve at the ~~exit~~<sup>input</sup> of the circulation pump (with yellow tape on its handle)) up to the level where heater power stays around  $10 \sim 20\%$ .

## Summary of pre-cooling & liquefaction

• Vacuum level (inner vessel) before filling  $\sim 3 \times 10^{-2}$  Pa

After closing the gate valve, the level reached  $\sim 1.4$  Pa  
(build up test)

• Pre-cooling was started at 1:00 on 18/Sep

This time, xenon gas was continuously supplied to the cryostat to keep inner vessel pressure at 0.2 MPa during pre-cooling

Pressure Regulator Set Point was set around 625 - 650 mT, corresponding to 0.2 MPa output pressure

pre-cooling was finished at 1:00 on 21/Sep. It took 72 hours to cool the detector for liquefaction.

• Liquefaction was started at 9:20 on 21/Sep.

Regulator set point was changed gradually from around 600 mT to max 4750 mT. Liquefaction speed was 10 - 15 l/min (gas) at the beginning and increased to 18 - 19 l/min later.

Liquefaction ends at 16:20 on 24/Sep. For liquefaction we used 79 hours. During liquefaction, inner vessel pressure was in the range of 0.12 - 0.17 MPa.

### Very IMPORTANT

Radiation alarm at the gallery was invoked with 11.2 MeV/c beam setting. In this situation, radiation level behind the concrete wall (where our electronics are located) is "slightly" higher than usual. Please do not stay there for very long time if it is not necessary. Now beam tuning is continued with closing the momentum slit, giving about 4 times less beam intensity at the target location (and below the alarm level).  
radiation level at the monitor