

CONTROL AND MONITORING OF PULSED POWER SUPPLIES  
FOR THE JULY 1984 TESTS

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1. INTRODUCTION

BT Group has to operate and control the two power supplies for the conducting target, horn and lithium lens. A single supply with two current outputs is to be used for the target and horn and another for the lithium lens. AA Group will operate the conducting target (including monitoring) but will supply the interlock in the form of a closed/open contact for the power supply.

BT will monitor all 3 current waveforms and derive additional interlock conditions based on their shape. Further analysis of fault conditions and performance monitoring for the conducting target will be done by AA.

2. LITHIUM LENS SYSTEM

The Fermilab lens used last summer at CERN is to be reinstalled as a proton prefocussing lens in the 26 GeV line. The monitoring equipment remaining consists of 2 thermocouples and a strain gauge. Fermilab will supply the readout for the strain gauge. Suitable level signals from the thermocouples are required. The closed

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loop cooling water system will be fitted within a conductivity meter and flow meter, both in the return path. Any other monitoring needed for the operation of the pumping system will be in addition to these two meters and are dealt with by PO Group.

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3. INTERLOCK CONDITIONS AND ACTIONS

Internal power supply interlocks are not considered here (e.g. as in existing horn supply, failure of ignitron oil cooling system etc.).

Any power supply capacitor charging stopped on detection of and firing inhibited on :

- a) internal fault
- b) last current waveform outside predetermined limits (2 currents in case of horn/target supply).
- c) Sum of external faults (detailed below for lithium lens)
- d) Safety conditions violated (e.g. red buttons, door interlocks).

4. LITHIUM LENS SUPPLY

- a) Water flow below minimum
- b) Conductivity of water too high.
- c) Horn/target supply not firing.  
e.g. not turned on or inhibited interlock given. If it is known in advance that the horn/target supply will not fire, the lithium lens supply must be inhibited.
- d) Water purge system in purged state.

In addition to inhibiting the power supply condition b) (water conductivity) has to also operate the water purge system.

The analog signals for water conductivity and lens temperatures should be available in the ACR.

Individual fault conditions should be available in memorized form in the ACR (with memory reset).

The power supply should supply via a status word (single transceiver?) the interlock condition to the NORD system.

The lithium lens supply will be located inside the AA ring at 9.00 a.m. The water pump and demineralizer will be in the hall, outside the ring, at about the same position as last year. The water and temperature analog signals will be treated at this position for distribution to the power supply (interlocks) and the ACR (analog signals).

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