



**MAIN-ACCELERATOR INTERLOCKS  
AND SEARCH-AND-SECURE PROCEDURES**

R. Parry and F. Schamber

June 1, 1971

A. Interlock Chain.

The main-accelerator tunnel is divided into 12 sections for interlock and search purposes. These sections are not of equal length. For example, the Transfer Hall and the RF Straight Section are each separate sections. The criterion used has been that a heavily used section (like the Transfer Hall or RF Straight Section) should be of a size that it can be secured in 6 minutes. The sections are separated by gates that are part of the hardwire-interlock chain and logic chain.

Each of the 24 service buildings around the main accelerator has three doors:

- (i) outer door to the ring road
- (ii) inner door to the tunnel
- (iii) emergency exit from the service building (can be opened only from inside).

There are altogether 76 doors or gates to the main accelerator.

There are also scram switches in the Transfer Hall and RF Straight Section.



For the main accelerator to accept beam, the following conditions must be met:

1. All doors and section gates closed and reset
2. Scram system armed
3. No ground faults in system.

In addition to this hardwire system, there is a logic loop operating through the main-accelerator multiplex system. This logic loop will be used to locate the precise position of an open interlock.

B. Search-and-Secure Procedure. Each section is searched by a two-man team, who must start and finish at a specified entrance. They go to the end of the section, test and reset the gate, then start back on the search. Each stairway and service building is checked and all doors are tested, locked, and reset. (The outer service-building doors are locked for electrical safety; the magnet power supplies are in the service buildings.) All doors must be reset in consecutive order for the interlock chain to be closed.

The main-accelerator system is connected to the booster and linac systems. The booster will not run unless either the main-ring search-and-secure is completed or the 5° bend magnet is locked out, and the booster dump magnet is locked in. The linac will not run unless main ring is searched and secured or the 5° bend magnet is off.

There is no controlled-access system in the main accelerator. It is believed that the sectioning of the ring described here will take the place of controlled access.