CAST Interlock Systems

The inner magnet tubes are separated from the exterior by four gate valves VT1,2,3,4 mounted on the four exit flanges of the magnet cryostat. The X-ray telescope is enclosed in its vacuum tank by two more gate valves VT5 and VT6 connected to the exit with valve VT4.

The Interlock System allows operating in two modes:

1) **Running mode:**

If there is no interlock and the vacuum is good, the valves are open. The operator will not succeed to go from closed or to open state of the valve. The Interlock System will automatically prevent him to do so.

2) **Manual mode:**

Turning a key starts the manual mode. The operator is allowed to close a particular gate valve without closure of the others, so not disturbing data taking of the other detectors. The manual mode permitting demounting, exchanging and remounting of detectors and the telescope without stopping the other detector systems.

*The general principle of the interlock system is to close automatically all four gates valves on the exit flanges if one of the conditions failed:*

These conditions are:

- Power failure
- Quenching of the magnet (to do)
- Vacuum rise in any of the volumes involved
- Drop of vacuum in the magnet (to do)
**Important:**

The gates valves VAT need always compressed air pressure to open or close the gate valve!

If the gate valve is OPEN and after you disconnect the compressed air pressure ⇒ THE VALVE IS ALWAYS OPEN and it is not possible to close the gate valve.

So, **never disconnect the compressed air pressure if the gate valve is open!**

(If the main compressed air pressure failed, there is a bottle of compressed air pressure to save the system)

**Work to do:**

A system is a hard-wired relay version and it is possible to receive back the indication of the status of valves and the interlock to visualize on the computer.

A more sophisticated system based on a programmable automate should be needed later.

It is necessary also to separate Interlock System for the protection of the telescope. The gates valves VT5/6 will be disconnect to actual interlock system and controlled independently by the X-ray telescope.