

HAZARD ANALYSIS

FPD Castle Decommissioning

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Description

The FPD detectors and associated electronics will be removed from the tunnel. FPD castles will be left in their current locations and will be permanently disabled. Access will be needed to the tunnel and to D0 platform. This procedure does not encompass decommissioning of the electronics in MCH1, the MCH1 porch, the D0 collision hall, or the control room.

Personal protective equipment

- Lab suits or covers
- Hard hats
- Closed toed shoes
- Ear plugs for prolonged work in noisy areas of the Tevatron tunnel
- Pocket Dosimeter, flashlight, LOTO lock, ODH monitor and fully charged Emergency Life Support Apparatus required for Tevatron tunnel access
- Dosimetry badge required for D0 collision hall and Tevatron tunnel access

Training required for the job

- Radiation Worker Training, Basic Electrical Safety, D0 Hazard Awareness, and relevant access Training required for access to D0 Collision Hall
- Radiation Worker Training, LOTO2, ODH Training and Medical Evaluation required for access to the Tevatron tunnel
- Read and sign the RWP for the Tevatron tunnel

Equipment required for the job

- Assorted screw drivers and Allen wrenches, multimeter, pliers, cable ties and cutters.
- Tags and pens to label disconnected cables.
- Insulating material to protect and insulate exposed ends of cables.

History information

The FPD castles were installed in the Tevatron during 2000. Several activities have been performed at the sites for maintenance, upgrading and tests. No incidents have happened during these operations. The system hardware is well known and understood by the person supervising the job.

Preparation work

Prior to start working, we must insure that necessary survey information is in hand. A baseline noise study should also be performed using a standard DZero calorimeter trigger. We must also make sure that the pots are all in the HOME position. All alarms (smoke, low voltages, high voltages) should be deactivated, and D0 control room and D0 cryo operators should be informed of planned activity. As a safety precaution, it is recommended that valves on both sides of each of the castles should be shut before these activities begin and be reopened only once the job is completed. Scott McCormack (smc@fnal.gov, phone x3691, long range pager 722-6795) has been identified as the appropriate contact to insure that the Tevatron gate valves are configured as desired. In addition, identify the HV supplies and verify that they are powered down, disconnect AC power to those supplies. Perform a radiation survey of the vicinity of the FPD castles to verify the working conditions (and respond accordingly).

Procedures followed in the FPD removal

Four of the FPD castles consist of four detectors each (QUAD castles) and two of them consist of a single detector each (DIP castles--18 detectors in all. All 18 Roman pots/detectors are identical except for orientation (up, down, in, out). For each of detector the removal should be done according to the following steps:

Phase I

- 0) Arrange for appropriate temporary storage of all removed items at D0.
- 1) Verify pot position (visually).
- 2) Disconnect AC power to racks and verify disconnected.
- 3) Disconnect control cables.
- 4) Disconnect HV cables and connect to grounding box.
- 5) Disconnect LED cables.
- 6) Map, disconnect and verify labeling of signal cables (including timing cables)
- 7) Remove and label upper part of cartridge.
- 8) Remove and label lower part of cartridge.
- 9) Close pot opening with its cover protection (not needed for DOWN pots).
- 10) Perform radiation survey of cartridges and remove to storage area.

Phase II

- 1) Remove step motor.
- 2) Remove digitizer.
- 3) Remove and label LVDT.
- 4) Remove and label LVDT conditioner from box.
- 5) Remove step motor drive from box.
- 6) Remove pot control card from rack.
- 7) Remove RM from rack.
- 8) Remove multiplexer from rack.
- 9) Remove electronics from VME crate.
- 10) Remove power supply from rack.
- 11) Wrap cables to protect against possibility of shorting to Tevatron ground.
- 12) Store cables in cable tray.
- 13) Disconnect and label cables in D0 platform.
- 14) Wrap cables to protect against possibility of shorting to Tevatron ground.
- 15) Store and secure cables.
- 16) Perform radiation survey of components removed from the tunnel.

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Step	Description	Hazards	Precautions/Safety Procedures
1	Removing the DIP FPD	HV, energized circuits, protruding overhead parts, fragile components belonging to other systems nearby the working area, electronic modules cabinet with loose panels. Evidence that wasps have made a home in the vicinity in the past.	<ul style="list-style-type: none"> a)Unplug all power cables before work. b)Verify HV supplies. c)Check power status with tester d)Use of hard hat e)Protect fragile components f)Handle panels with care. g)Use care when disturbing items that have been in place for years.
2	Removing A side QUAD FPD	HV, energized circuits, protruding overhead parts, hard to reach locations (between castle and tunnel wall).	<ul style="list-style-type: none"> a)Unplug all power cables before work. b)Verify HV supplies. c)Check power status with tester. d)Use of hard hat e)Clear area around to ease access to difficult parts. f)Use care when disturbing items that have been in place for years.
3	Removing P side QUAD FPD	HV, energized circuits, protruding overhead parts, hard to reach locations (between castle and tunnel wall). Noise environment	<ul style="list-style-type: none"> a)Unplug all power cables before work. b)Verify HV supplies. c)Check power status with tester. d)Use of hard hat e)Use of ear plugs f)Clear area around to easy access to difficult areas. g)Use care when disturbing items that have been in place for years
4	Removing FPD electronics from the D0 platform	Energized circuits, cables from other systems may make access difficult, overhead obstacle	<ul style="list-style-type: none"> a)Unplug power cables b)Use of hard hat c)Move carefully to avoid tripping

Be sure to frisk and survey all items removed from the collision hall and the Tevatron tunnel and tag appropriately. If any items are determined to be more than Class 1, then additional precautions will be required prior to moving those items from the radiation areas.

