TOROID SYSTEM INSPECTION

This procedure describes how to check the Toroid Power Supply System and Magnet **while access to the collision hall is available** before turning them on. This is to be sure that there are no cooling problems or exposed electrical hazards

Approvals:

(Research Division Head)	(Date)
(Research Division Safety Officer)	(Date)
(CDF Department Head)	(Date)

1.0 Controlled Copies of this procedure.

Copies of this procedure are located in :

1. CDF Department Office

2. CDF Gas Tech. Operations Bench

3. CDF Operations Electrical Group Leaders Office.

All other copies will be marked, " INFORMATIONAL COPY ONLY "

2.0 The Procedure.

This Procedure should be done by trained personnel only.

This procedure must be done if any of the following conditions apply. Check with the CDF Operations Manager.

A. If an open or supervised access has occurred.

B. If a controlled access has occurred and work has been done on, near or above toroid magnets.

IF A SYSTEM DISCREPANCY EXISTS IN ANY OF THESE CHECKS, PLEASE CALL THE CDF OPERATIONS MANAGER.

1. Make sure Toroid Power supply is locked and tagged out with the " **Toroid Administrative Lock** ".

Keys to administrative locks are only issued to personnel trained and authorized to operate the device in question. The training insures that qualified operators are familiar with all the hazards associated with the equipment.

2 Perform general lockout/tagout procedures as described in Fermilab ES&H manual.

A. Prepare. Understand the hazards.

B. Notify. Notify appropriate area personnel that you are locking out the toroid.

C. Shut down. Make sure that the power supply has been shutdown as per CDF procedure # 505 and that the reference voltage is zero.

D. Isolate. Make sure the power supply breaker is off.

E. Lock and tag out. Put on lock and tag.

F. Verify. This can only be done by looking at the meters on the front of the power supply and check that all input and output readouts are zero. The red mars light to the north of the supply should be off and not rotating.

3 Check LCW pressure in all 4 quadrants. Pressure should indicate greater than lOO PSIG (second major division) on all gauges. Gauges can also be viewed from control console D on cameras A,B,C and D which corresponds to NW, NE, SE and SW respectively.

4. Check for water leaks.

5. **A safety harness Must be worn while climbing on the Toroids.**
Check all 16 coil terminal areas for herculite covering. Everything must be covered.

6. Inspect top of toroids for loose parts, tools, etc. (East toroid has wooden equipment box on top, DO NOT REMOVE!).

7. Check reversing switches in Collision Hall SE and SW area. They should be in the NORMAL UP POSITION. If they are not up stop and call the CDF Operations Electrical Group Leader.

8. Test Klixon switch prior to search and secure. Test button is located on top of toroid power supply and the red light should come on when the button is pushed. If it does not come on stop and call the CDF Operations Electrical Group Leader.

9. Return Power supply to service.
A. Check equipment. Make sure the power supply is ready for safe operation.
B. Check work area. Make sure no one else is working on the power supply.
C. Verify. Make sure that all controls are in the neutral or off position.
D. Remove lock and tag. Remove your lock and tag.

DO NOT REENERGIZE EQUIPMENT.
This differs from the ES&H manual. CDF procedure 503 must be followed to turn on the supply. Operational requirements may dictate that the supply should not be turned on at this time.

E. Notify. Notify appropriate area personnel that you have finished the inspection.

10. Sign toroid checklist sheet on front of toroid power supply.

3.0 Checklist

See Next Page

4.0 Deviations from the Procedure

NONE

5.0 Required Training and Authorized Training Personnel.

You must have had Fermilab Level II LOTO Training.

You must go through this procedure with an instructor and demonstrate that you have a good working knowledge of it.

The training must be documented on a standard Fermilab Training Form and the completed form must be inserted in the CDF Department Office copy of this procedure.

List of authorized instructors.

Keith Schuh	ID # 2282
Mark Knapp	ID # 5384

Both are qualified because of work experience with the toroid system.

6.0 Training Materials.

Section 2.0 of this procedure, section 5120 of Fermilab ES&H manual a Fermilab training sheet and a tour of the toroid magnets and power supply.

7.0 List of Trained People for this procedure.

Eventually the list may reside in a lab-wide database.

Until that time, a list of trained personnel for this Toroid Inspection Procedure should be maintained in the CDF Department Office copy of the procedure in a separate section at the end of this procedure.

The CDF Department is responsible for the list and for updating all the copies.

8.0 References and Supporting Documentation.

Fermilab ES&H manual section 5120.