AUSTRALIAN NATIONAL UNIVERSITY

DEPARTMENT OF NUCLEAR PHYSICS

14 UD TANK OPENING REPORT # 108

17th to 18th April 2008

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REASON FOR TANK OPENING

The charging system voltage became limited to about 16 kV and, since the power supplies were ok, it was determined that the problem was inside the tank. It was decided that the platform would not be deployed as the problem would most probably be found in the bottom of the machine.

PUMP OUT 16-04-08

- Pump out tank, open doors and start ventilation system.

- The ventilation system was run overnight and the Oxygen monitor was used to check air quality before entering the machine.

SUMMARY OF WORK: 17 to 18-04-08

17-04-08

- The HV tester was used to check the charging wires for breakdown to ground with the inductors disconnected.
- The mushroom spark gaps were then disconnected and the voltage raised. The positive one broke down at about 16kV.
- The dome and feed through were removed and it was found that the nylon feed through was spark damaged.
- New feed throughs were machined and installed.

- While the nylon parts were being machined the outer edge of the feed through hole in the tank wall, which had been quite sharp, was radiused at about 1.5mm.
- All the nylon conductor standoffs were replaced as well.

18-04-08

- The charging system was re-assembled, the inductors cleaned and set, the bottom of the tank cleaned and the usual charging tests performed.
- The machine was closed.

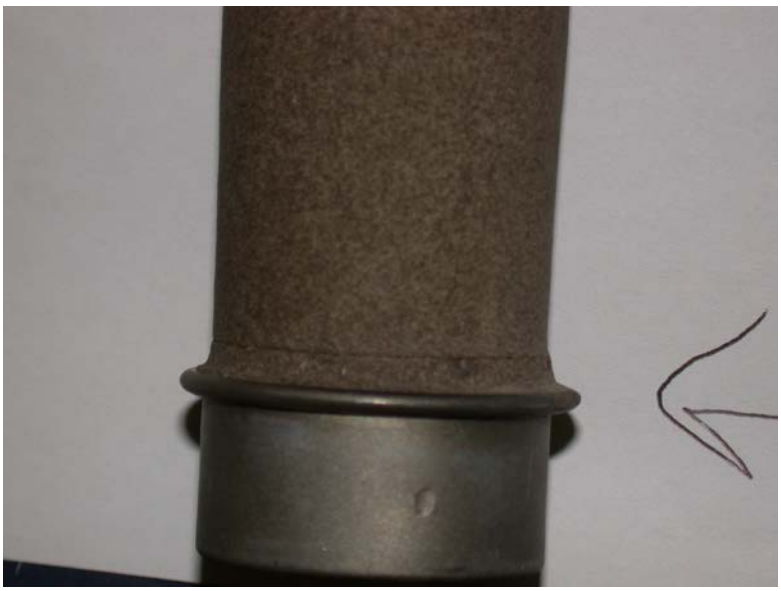
NYLON FEED THROUGH

The positive side 1” diameter nylon feed through had been sparked through between the central conductor and the tank wall.
The conductor is ¼” diameter steel rod.

The damage was adjacent to the sharpish outer edge of the hole in the tank wall. Earlier in the machines life the inner edge had been radiused to raise the spark threshold. It was not remembered why the outer one was not done at the same time. However, it is better late than never.

CHARGING CIRCUIT RESISTOR

During testing it was found that the positive circuit series resistor was open.
Closer inspection revealed a crack at each end of the ceramic coating. Since a spare resistor was on hand this problem was easily overcome and the machine was retested and closed.



It was thought that the cracks were caused during disassembly.
Another spare is being sourced.

INITIAL PERFORMANCE

The accelerator initially conditioned to 14.3 MV. The gamma group were not able to run above 13.6 MV without sparking, noting that it took a long time to recover from sparks.
The machine was further conditioned to 14.5 MV and EME ran successfully at 13.3 MV. Several sparks were reported.