

AUSTRALIAN NATIONAL UNIVERSITY
DEPARTMENT OF NUCLEAR PHYSICS
14 UD TANK OPENING REPORT # 98
1 to 4 Feb 2005

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REASON FOR TANK OPENING

The black Chain pulley tyre was known to be causing up to $38\mu\text{A}$ of self charge so it would be changed for an old blue one that had been out of the machine for more than 10 years. The replacement tyre would be machined to suit the wheel and fitted with new contact shim stock.

The persistent problem with the LE Mid-Section current readout was to be investigated further.

PUMP OUT 31-01-05

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

SUMMARY OF WORK 1-02-05 to 4-02-05

- 1-02-05
- The initial cruise down the column found the top half of the machine was very clean.
- The column was wiped down with RBS and water and the HV gap test found there to be no problems with the rings and resistors.
- “Breakdown products” again adhered to the up side pick off and lower casting of chain #1 and although very slight, as would be expected with such a short run, it indicated that the problems with “breakdown products” still persisted.

- David Anderson diagnosed the problem with the readout of the Mid Section Ion Pump as a failed DC-to-DC converter on the Ion Pump Fibre Optic Interface. This was replaced with a higher rating unit only because of its immediate local availability.

2-02-05

- Removed Chain #1 and fitted alignment jigs at the terminal and bottom pulley positions.
- The black tyre was removed, the old spare blue one machined, fitted with new shim stock and reinstalled.
- Chain #1 was reinstalled.
- U 6, Tubes 1,2,3 were HV gap tested at 5 kV and found to be normal.
- The column was blown down, wiped with RBS and water then HV gap tested. U 23 was found to have higher than usual current readings. The rings were removed and posts checked individually. The new post was drawing much more current than the refurbished ones. This was put down to the possibility of moisture on the ceramic sections as the new post had never been in the machine before and had been stored in a non air-conditioned area. There may also have been a voltage conditioning issue but, never the less, the potential problem has not been seen during subsequent operation of the machine.

CHARGING CHAIN # 1

The chain was removed, yet again, to the clean room, pressure washed with deionized water, rinsed in a bath of alcohol and left to dry out.

This chain is definitely the most washed chain ever in the 14 UD and this note of infamy would appear to well and truly deserved.

IDLERS

The Chain #1 idlers and petal assemblies were removed for a thorough clean with RBS and water.

MID SECTION ION PUMP READOUT

The DC-to-DC converter had blown but the reason was never determined. The replacement unit was a higher rated one that was purchased locally. Subsequently, during calibration checks, it was discovered that the output currents were not representative of the true pump current

The previous method of testing the calibration was flawed in that the three points measured did not show up the zero-offset - anything below 0.75mA would read back zero.

The interface was recalibrated using a DC voltage standard and a multimeter.

INITIAL PERFORMANCE

The machine sparked twice at 12 Mv and then twice at 13.6 Mv.

It conditioned at 14.4 Mv and ran OK until control of all terminal functions was lost leading to another opening.