

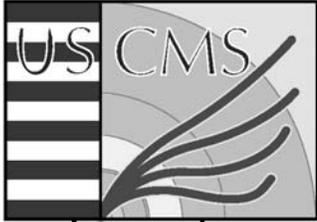
Source Driver Update

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On behalf of Paul Debbins and Ianos Schmidt

HCAL Run Planning Meeting

6 Nov. 2008



Status of Air & Mechanical Drivers



Ianos has studied the data from Sasha . There is one driver, locate on HE- in the sector 5-6 position that has a problem.

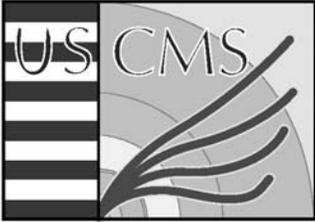
The test scans show that there are three possible explanations:

1. Slippage within the reel motors planetary gear Assembly
2. clutch slipping at a lower than nominal force.
3. A damaged wire from a broken or open tube.

Option one : Although the motors were guaranteed for life time industrial service, Virgil had tampered with the planetary gear assemblies in an attempt to improve them. Unfortunately we have discovered that some of the motors exhibit slippage within the gear train considerably below the specified limit.

Option two: Clutch slippage, could be the cause as we were very conservative with the clutch setting, and had set them to slip just beyond the limit that activates the "peck" switch, thus at ~1.3 to 1.5 kg. The adjustment is a bit tricky to make so it is possible that the clutch is set too low. This is less likely to be the cause of the problem because the slipping should not exhibit a degeneration or weakening. If the clutch is slipping we should see a recovery of the clutch after sitting for a while. Again inconsistent with the present behavior.

Option three: damaged wire, is very unlikely as all the tubes had been tested before, and there is no evidence of periodic loading of the reel which would indicate a damaged wire.



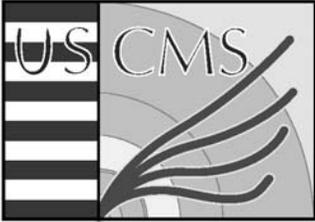
-We have delivered about 20 Drivers –Mechanical and Air Drivers for All HCAL systems (HB, HE and HF)

- 100% reliability is not a realistic criteria.

The failure modes that we must convince ourselves are unlikely to happen in the lifetime of the experiment are those that damage a wire thus presenting a situation where the source is difficult to recover. After sever hundred km of source travel with the new driver enhancements without any wire damage being induced in a driver, we still remain confident that wire damage originating from the driver is much less likely than other failure scenarios.

-We do not consider other breakdowns that lead to a stopped driver to be dangerous. The source wire is still contained within our system and can be recovered if necessary without difficulty whenever appropriate access is possible. The down side of such failures is simply the inability to use the driver until appropriate repairs are possible.

-It is not reasonable to consider a stopped driver to be a type of failure that should disqualify use of the drivers.



Recommendations:

At the moment we do not think there is enough evidence to suggest that we have some kind of systematic failure, most likely just a failure of a previously damaged component, possibly induced by additional loading on the motor from the magnetic field.

We recommend that Sasha leave this driver for examination after CMS is opened, and continue with full test scans under field of the other air drivers. Recall that we ran two drivers at 4T during MTCC without problem.

Ianos will be back around November 22nd at CERN. He will be at work in Iowa on Nov 10th. He estimates that a couple of days of work in Pt 5-will solve the problems.

Sasha's help and presence is well appreciated and we will be happy to send Paul Debbins as well if requested.

I have requested funding for the spare parts to maintain and operate 20 Source Drivers- unfortunately there were no funding possibilities at that moment. I think we should buy at least 4-6 spare air-motors from the original factory