



Visit Report

Name of firm : Babcock Noell	Places : Würzburg and Zeitz, Germany
Date of visit : 18 – 21 January 2005	Author : P. Galbraith

Administrative reference : F301/LHC/LHC (Number of Contract or Order, Call for Tender, Price Enquiry, Market Survey, etc...)
Commercial contact (FI Division) : A. Unnervik

Aim of the visit : To perform maintenance on the dipole warm magnetic measuring systems - DIMM3, in Würzburg and DIMM2 in Zeitz.

CERN participants: Peter Galbraith, Xavier Reynes (AT/MTM), Eric Michel (AB/CO).

Persons met and function : Dr R. Kenklies, Mr M. Zehner (Würzburg), Mr H.-P. Langenberg (Zeitz)

REPORT

Würzburg

When we arrived at the factory on Tuesday 18th January, the collared coil number 3319 had been measured the day before. This magnet was left on the test stand to allow comparison of the system before and after maintenance.

Overall, the system was found to be in good shape. The electrical connectors on both motor modules had become loose so their screws were tightened and some Loctite put on the threads. The Delrin feet of both moles were changed as well as the Delrin rings on both motor modules. The electro-magnetic clutch on the traction winch was cleaned and the gap reset to 0.2mm. The traction cables, Stegmann cables (mole displacement measurement) and signal cables were all found to be in good condition and did not need replacing. The moles and motor modules were checked for compressed air leaks.

At the same time, Eric Michel (AB/CO) installed the latest version of the LabVIEW program – MMP216. This version, as before, does a check on the values of magnetic field obtained during the 6 measurements at each longitudinal position. However, it now does this check on the positive and negative values separately, to allow tighter limits to be applied. This limit is set to $\pm 0.0012\text{mT}$ ($\pm 0.02\%$ of the nominal field value) and if exceeded, the measurements are repeated. This modification was requested after several collared coils in Noell showed peaks of several 10⁻⁴ at one or two longitudinal positions.

This MMP version also incorporated a feature to prevent the same magnet name being used for more than one set of measurements. This modification was apparently requested by Ansaldo, but Noell had been expressly asked by C. Vollinger to use the same name in the case of a magnet being re-measured! This second modification was therefore disabled for Noell.

Once these modifications were completed, the collared coil 3319 was re-measured. The results were sent to CERN. Dr Kenklies processed the results in the Excel macro and found they compared well with the previous day's measurement of the same magnet.

Measuring mole number 25 with short coils:

This mole has been left at Noell in case some special measurements are required in the future. However, the level conditioner module (MUPI) needed to be modified to allow this mole to be used in either aperture 1 or 2 of the magnet. This module was brought back to CERN. It has since been modified and returned to Würzburg with P. Fessia.

Zeitz

When we arrived at the factory on Thursday 20th January, the cold mass number 3249 had been measured the day before. This magnet was left on the test stand to allow comparison of the system before and after maintenance.

Once again, in general, the system was found to be in good shape. The electrical connectors on both motor modules had become loose so their screws were tightened and some Loctite put on the threads. The Delrin feet of both moles were changed as well as the Delrin rings on both motor modules. The electro-magnetic clutch on the traction winch was cleaned and its gap checked to be 0.2mm. The traction cables, Stegmann cables and the motor module signal cables were found to be in good condition and did not need replacing. The mole signal cables are still of the old type which are slightly more rigid than the present ones. Mr Langenberg explained that they had tried the new cables but had found that there was less torsion on the moles using the old ones. The new cables were left in the factory, in case of problems. As before, the moles and motor modules were checked for compressed air leaks.

Once these modifications were completed, the cold mass 3249 was re-measured. The results were sent to CERN. Mr Langenberg processed the results in the Excel macro. They compared well with the previous day's measurement of the same magnet, except for a difference of about 0.5mrad in the field angles of aperture 1 over the first three or four longitudinal positions. Both sets of measurements were accepted by CERN.

To investigate further this difference, Mr Langenberg agreed to put another cold mass (number 3288) on the test stand. X. Reynes and I measured this magnet on Thursday afternoon and Noell personnel re-measured it on Friday morning. Again, approximately the same difference in the angles of aperture 1 was seen. This phenomenon has been observed in measurements in SMA18 and an investigation is on-going.

Mr Langenberg requested a new traction cable ('aiguille') for pulling the moles to their starting positions, as the present cable is worn and slightly damaged. Three such cables are at present being manufactured and one will be sent to Noell, Zeitz as soon as possible.

CONCLUSIONS, RECOMMENDATIONS & ACTIONS

General maintenance has been performed on the warm magnetic measurement systems, DIMM3 at Noell, Würzburg and DIMM2 at Noell, Zeitz.

Distribution list:

/ NOELL

Participants + section AT/MTM-FM, J.Hadre, L.Walckiers.

P. Fessia, P. Hagen, J. Miles, L.Rossi, E.Todesco, C.Vollinger (AT/MAS)