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OCTOBER 02, 2006

CMS OUTREACH HOME | CMS WORK HOME

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## Forthcoming activities

### October

- **Lower HF+- into UXC**
- **Start of magnetic field mapping**
- **End of MTCC**
- Installation of TIB+ into TOB+
- Start of Tracker commissioning in 186
- End of CSC installation
- Preparation of DTs complete
- End of long-term tests of RPCs

### November

- Start of ES cosmic calibration
- 20 EE supercrystals on one Dee
- Start of HO installation
- Install all 18 ECAL supermodules on + side
- DT installation on YB-1 and YB-2
- Start of YB0 cabling and commissioning
- **Lower YE+3, YE+2, YE+1**
- **Remove HB+ (equipped with ECAL supermodules)**

### December

- Mechanical support for BPIX ready
- End of DT installation
- Start of online computing installation
- **Lower YB+2, YB+1**

Updated information should be sent to [cmstimes@cern.ch](mailto:cmstimes@cern.ch)

## Introduction

### A Word from the Editors

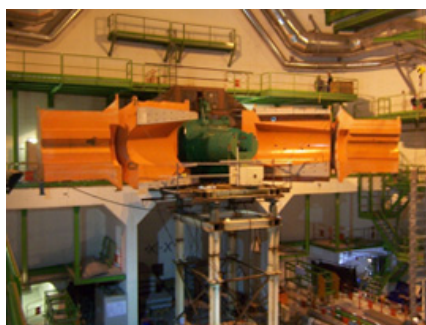
Many thanks to all of you who took the time to complete our questionnaire that appeared in the previous two editions of the CMS Times. Many of the comments received have been both encouraging and useful. The results of the questionnaire are shown in the plot below. It is pleasing to see that a large majority of the respondents read most or all editions of the CMS Times. It is also evident that all parts of the newsletter (forthcoming events, people/ institutes, features and the MTCC News) are appreciated. Only a small fraction appear to use the PDF version (for printing) but perhaps this is to be expected as those people who do so are not online to complete the questionnaire! In any case we will continue to provide the PDF version and attempt to keep it to two pages for convenience. The frequency of publishing the CMS Times may decrease in the future, but for the time being, during this period of intense activity, we will endeavour to bring a new edition every week.



Simple statistics from the recent

## Feature Stories

### The CMS Forward Shielding



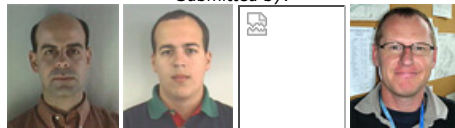
The Forward Shielding at Point 5 as installed in the CMS experimental cavern showing a Blockhouse (brown), a Fixed Iron Nose (green) and a Rotating Shielding in its open position (orange).

The CMS Forward Shielding (FS), located at the two ends of the UXC55 underground cavern, is designed to reduce the background radiation in the area and in the CMS detector. In particular, an effective radiation shielding along the beam line, especially around the TAS absorber protecting the inner triplet of the LHC Machine, is required to reduce the background rates in the CMS outer muon stations to acceptable levels and to protect the electronics in the cavern. The Forward Shielding is also an integral component of the personnel shielding during LHC operation.

The FS comprises three main components: the Blockhouses, the Fixed Iron Noses (FINs) and the Rotating Shieldings (RS). At the two ends where the beam enters the cavern a Blockhouse, comprising a cubical steel frame embedded in concrete extends in to the UXC55 cavern from the LHC tunnel. The Blockhouse supports the hinged RS, composed of the thick part surrounding the FIN housing the TAS absorber and of a separately-hinged thin part. Each Blockhouse weighs about 245 tonnes, each of the FINs weighs close to 60 tonnes, while the RS structures (steel, boron-loaded concrete and iron scrap) weigh 200 tonnes.

The FS project has been a collaboration between the CERN PH and TS Departments and IHEP Protvino and is now installed in its final location in the CMS experimental cavern.

Submitted by:



E. Tsesmelis, N. Dos Santos, L. Veillet, J. Osborne

## MTCC Latest News

Last week the Field Mapper was installed in the HCAL volume, in place of the Tracker and ECAL modules used in MTCC Phase I. The mapper is equipped with 10 sets of 3-dimensional Hall probes arranged on arms that traverse the HCAL volume. By the use of (non-magnetic!) air powered motors the arms can be rotated in azimuth ( $\phi$ ) by 7.5 degree steps and translated along the Z-axis of the coil in 5cm increments. At each Z-step a  $\phi$  rotation is performed reading out the Hall probes along with two NMR probes to give absolute field calibrations. The data steps and the probes are designed to give a 1 part in 10000 precision measurement of the three field components throughout the Tracker volume. The offline team is gearing up to check these data in real time, comparing them with the predicted field-map.

The planning for MTCC II has so far been closely respected, and we expect to close YE+1 on October 2-3. With YE+1 closed, we hope to run the coil at a "modest" current of about 5000A, B-field of about 1 tesla, in order to check out the field mapper in magnetic field before full closure of CMS. If all goes according to plan then YE+2 and +3 will be closed during Wednesday-Friday and the first field maps will be taken next Monday/Tuesday at 2 tesla.

As well as the field mapping work, MTCC II has goals to measure the performance of the Muon DT system in detail, particularly in some corners of chambers where the magnetic fields, and hence drift paths, can be difficult to predict. The HCAL has also been equipped last week with its radioactive sources that will be used to perform in-situ calibrations. The group plans to study the effect of "scintillator brightening" whereby the response of the detector is enhanced in a strong magnetic field due to increased path lengths of low energy tracks in the scintillator as their trajectories are curled up by the magnetic field. Finally the Trigger group plans to test many more features of the final trigger system during MTCC II - and is in a race against time to commission and test as much as possible before the end of October.

The goal is to map the magnetic field at least 6 times: 2T, 3.8T, 3.5T, 3.0T, 3.8T, 4.0T. As soon as the field mapping program is completed, CMS will be reopened. Initially the negative end will be opened to give access for muon detector installation (barrel and endcap). YE+3 will be opened also quite quickly to prepare it for lowering as soon as UXC55 and the lowering system are ready for it. The remainder of the positive end of the detector will be left in MTCC II configuration for a further week or so to allow zero-field trigger studies to continue. The next time the detector will be together enough to allow multiple sub-detectors to be read out will be late Spring 2007.

Submitted by

## CMS Times questionnaire

The "CMS in the media" section has now been expanded in scope to include items on visits to CMS and Outreach activities. We hope you find this of interest.

Finally, if you wish to contribute an article to CMS, please send a simple text file (ascii, WORD etc.) plus images as attachments, to [cmstimes@cern.ch](mailto:cmstimes@cern.ch).

## People

## 2006 CERN Road Race



John, Tina and Louis Osborne: winners of the "best family performance" in the 2006 CERN Road Race.

Perini, Herve Cornet, Michael Dittmar, Philippe Guillot, Carlos Laurencio, John Osborne and Daniel Teyssier.

Kati was awarded the bronze medal in the women's veterans category, whilst John Osborne, accompanied by his wife Tina and son Louis, was awarded the trophy for the best family participation. Congratulations go to all the runners.

## PDF Version

[Click here to download printable PDF version.](#)

## TEC Petals assembly

The production of the Tracker End Cap "petals" was completed in September.



A petal at module integration.

A TEC petal is a structure of 0.3m<sup>2</sup> mean area of silicon strip detectors divided into 17 to 28 individual modules accurately positioned on two sides of a carbon-fibre honeycomb structure. 292 petals have been built at an average rate of 1 per day by 7 institutes : RWTH-Aachen 1, RWTH-Aachen 3, IIHE (ULB-VUB)-Brussels, Hamburg-Univ., IEKP-Karlsruhe, FINU/UCL-Louvain and IPHC/DRS-Strasbourg. Two kinds of set-up were entirely developed to the construction purpose: one for the assembly including a partial functionality test; the other for the detailed qualification, including full detector read-out (around 15000 read-out channels for each petal) during 3 thermo-cycles between -25 and +16°C.

The logistics for the production of 8 different types of petal, housing 12 different types of modules, and involving 16 centres, was an issue demanding monitoring on an almost daily basis. A reliable construction database system, developed for the entire CMS tracker construction, was intensively used for this purpose and also to register the petal qualification data.

The petal quality was checked at the production centres on an individual basis and centrally using the overall data statistics. The number of faulty channels was maintained to about 2 per mil over the whole production. The yield of faulty parts was thoroughly monitored, exhibiting no systematic failures with a final loss of components at the level of few percent.

Submitted by



J-C Fontaine

## Safety during MTCC

For the duration of the MTCC visits to the point 5 assembly hall are restricted to specific areas. A special safety card including a map of the allowed areas can be found here. Private visits to point 5 should be announced by sending an email to [cms-experiment-visit@cern.ch](mailto:cms-experiment-visit@cern.ch).

## Links

MTCC website: <http://cms.cern.ch/MTCC.html>  
Agendas/minutes of all run meetings: <http://indico.cern.ch/categoryDisplay.py?categId=329>

## CMS Outreach, Visits and Media

## CMS Movie approaches completion



After more than two years the wait is almost over: the "CMS Particle Detectives" movie is in its final stages of production. The movie is aimed particularly at high school students, with the aim of showing them that particle physics is fun! Preview versions of the movie, in French or English, are available for download from <http://cmsinfo.cern.ch/outreach/temp/movie>. They are in mp4 format (view using e.g. Quicktime). Comments and suggestions are welcome by sending mail to [cmstimes@cern.ch](mailto:cmstimes@cern.ch) although it should be noted that large changes are no longer possible.

The movie will hopefully be available on DVD by the next CMS week, together with other selected materials (animations, brochures, posters etc.) - suggestions for this content are also welcome.

## Links

- [LHC](#)
- [ATLAS](#)
- [ALICE](#)
- [LHCb](#)
- [CERN](#)
- [CERN Bulletin](#)

## Web-cam latest images (click picture to enlarge)

