Consortium during Long Shutdown 1 included the repair of masked cells and the replacement of Low Voltage Power Supplies. The Tile-Muon Trigger is scheduled to be ready for 25ns collisions and the entire Calibration System has been rerun. A new signal reconstruction that reduces out-of-time pile-up will be applied for Run II and the whole TileCal read-out electronics is being replaced in Phase-II.

**Consolidation during the Long Shutdown 1 (LS1)**

- **Masked Channels**
  - Consolidation Campaign successfully repaired masked channels of Run I
  - The status during last weeks has stayed approximately constant
  - The current level of masked channels is below 1%

- **New Low Voltage Power Supplies**
  - New LVPSi installed during LS1, which provide greater robustness against power trips
  - Electronic noise has been reduced considerably (mainly non-Gaussian tails) from October 2011, when an older version of the LVPSis was present in the drawers, to September 2014, after the LS1 maintenance campaign and installation of newer LVPSis

- **Minimum Bias Trigger Scintillators**
  - MBTS have been replaced, due to irradiation during Run I
  - Small increase of acceptance in $\eta$, $2.08<|\eta|<3.86$ (in Run I was 3.75)
  - Reduced granularity in outer counters to obtain full phi coverage of Tile Crack scintillators
  - New light collection layout for a more homogeneous response from the tiles
  - Installed in the experimental cavern in 2014

**Calibration**

- **Laser II System**
  - Installation of a new Laser system in October 2014 in USA15: new source, optics and electronics
  - Ongoing commissioning:
    - DAQ commissioning during last weeks
    - Good laser pulse-to-pulse stability: <3%
    - Focus on the stability of the photodiode response
  - Close to study the PMT stability in time

- **Charge Injection System**
  - CIS is used to define the ADC count to pC conversion for the High Gain and Low Gain readout
  - Since the end of LS1 consolidation and maintenance period, vast majority of TileCal channels have been stable from a CIS perspective

- **Cesium Calibration System**
  - Newest Cs scan without magnetic field
  - Results show similar up-drift as in the past
  - First iteration to set the HV based on Cs (same procedure adopted before Run I)
  - More Cs scans in the next week/months with full magnetic fields

**Data Preparation and Performance**

- **Response to isolated charged hadrons**
  - This measurement can be used to place constraints on the systematic uncertainty for the jet and tau energy scales
  - Comparisons 2012 data/MC are within few percent in all detector regions and are compatible with 2011 and 2010 measurements

- **New signal reconstruction for Run II**
  - Offline: Constrained Optimal Filtering (COF)
  - COF is a 2-step algorithm that aims to identify signals within the 7 bunch crossing read-out window
  - Better performance than Optimal Filtering 2 (OF2) in high pile-up conditions
  - Online: Optimal Filtering (OF1)

**Upgrade Phase-II**

- **Front-End boards**
  - Three alternatives being evaluated:
    - The modified 3-in-1 cards based on the current design using discrete components.
    - The QIE ASIC is a Charge Integrator and Encoder based on a current splitter.
    - The FATALIC ASIC solution is a current conveyor with pulse shaping and ADC functionalities.

- **On-detector electronics**
  - The Mainboard is the data and control interface between the very front-end boards and the Daughterboard. For each of the three alternatives a different type of Mainboard is required for the digitization of the signals of 12 PMTs.
  - The Daughterboard provides high speed communication between on- and off-detector electronics. Each side of the board hosts a Kintex7 FPGA that receives the digitized data from the Mainboard and transmits it to the sROD.

- **Off-detector electronics**
  - Interface between the detector and the L0/L1 trigger and DAQ systems
  - The module is equipped with Virtex7 and Kintex7 FPGAs. It is compliant with double AMC format to be in an Advanced Telecommunications Computing Architecture (ATCA) carrier.
  - It includes four QSFP connectors which provide full duplex communication with four MiniDrawers.

**Conclusion**

TileCal plans a complete replacement of the read-out electronics in Phase-II (except the PMTs). The new read-out architecture will transfer full digitized data to the off-detector system requiring a total data bandwidth of 80 Tbps. The demonstrator project aims to evaluate and qualify the new proposed read-out electronics. The validation program will include standalone beam tests and the insertion of the new electronics in part of the real detector.