Medupi achieved a key milestone on Friday 17 October when the First Oil Fire of Unit 6 was ignited and smoke emerged from the chimney.

Why is this so significant?

One of the major milestones towards the Commercial Operation of Medupi Power Station Unit 6 is First Coal Fire. First Coal Fire is the activity where the boiler is fired below full capacity using a combination of coal, oil and air for combustion. During this activity major systems of the plant are tested and fine-tuned to get ready for blow through, which is the next major step for Medupi Unit 6. In order to achieve First Coal Fire and Steam Blow through, a significant activity known as Fuel Oil Fire is essential. The reason for this is that pulverized coal (as used for both first coal fire and blow through) can only be ignited using burning fuel oil. Unless the fuel oil firing system is operational, these milestones cannot be achieved.

Fuel Oil Fire is the process where the boiler is fired using fuel oil only.

During this activity the commissioning team tests and fine tunes the oil firing system and ensures that safe operation of the combustion system is ensured.

The Blow through operation is when the steam system will be cleaned to a state that will be acceptable for Steam to Turbine.

To achieve Fuel oil fire various subsystems are required. Firstly, the oil supply system must be ready. This system includes the fuel oil offloading station, storage and distribution systems. The fuel oil is ignited by use of liquefied petroleum gas, which is the second system to be fully operational. The third system required for first fires is the draught group. The draught group is a series of fans which supplies the air required for combustion.

Medupi Unit 6 is equipped with 30 burners, which are the interfaces where the Liquefied Petroleum Gas, Fuel Oil and Air combine to create the conditions as required for ignition and Fuel Oil Fire. Various other systems are also required for Fuel Oil Fire. Among others, these include the atomizing steam system, firefighting system, compressed air system, electrical supply systems, control and instrumentation system, trace heating system, boiler feed water and circulation systems, cooling water system and the auxiliary steam supply system.
This follows after Medupi received the Pressure Equipment Regulation Certificate of Registration for Unit 6 from the Department of Labour on Thursday 16 October 2014.

The Fuel Oil Fire activity thus paves the way for the next major activities towards Commercial Operation of the Medupi Power Station Unit 6.

Excitement filled the air at Medupi Site and team members of the Team Medupi shared how proud they felt of this accomplishment and that they are honored to form part of the Project Team that is now progressing swiftly towards 1st Synchronisation.

A special vote of thanks goes to the Unit 6 Delivery, Commissioning and Engineering teams. This achievement would not have been possible without your absolute efforts and dedication.

We have come a long way and achieved a lot but the greater reward is now well in sight.

John Gildenhuys, Unit 6 Commissioning Manager

Left to Right: JW van Niekerk, Unit Area Manager (Units 6 – 1); Johan Venter Senior, Advisor Commissioning; Freddie Els, Site Commissioning Manager; Gerhard Venter, Unit 6 Delivery Manager and Antonie Coetzee, Electrical and C&I Manager
Medupi has already achieved most of its Key Milestones for Unit 6

Please Ctrl-click on the following link to view a new video clips covering First Oil Fire

http://medupiproject.eskom.co.za/videos/MedupiFirstOilFire.mp4
There are many challenges in managing integration when multiple contractors work in one area. The Unit 5 team is using Virtual Design and Construction (VDC) to effectively manage the interfaces. As a result the Turbine team is managing interfaces and access issues more successfully between all the different contractors working in the Turbine and ACC areas.

Weekly progress meetings are being held with the various contractors in the Computer Analysis and Visualization Environment (CAVE); and by use of the 3D model. The contractors are given the opportunity to share achieved progress on site and also point out any issues affecting their progress. This provides the same result as having a combined site walk down; the only difference is that it is being done on screen. The main benefit as a result of using this initiative is the control it has provided the team relative to challenges on site. Problems are highlighted a lot faster. Battery limits are well defined and any pipe clashes are identified in advance whilst navigating into the various areas.

This also allows the Unit 5 team to establish and plan ahead and has become their main planning tool to review all aspects affecting their activities when we are planning any access and phases of work.

The Turbine and ACCs have a vast number of systems and sub-systems which are required to be installed for the various milestones leading up to the synchronisation of Unit 5. It is important that the progress be tracked for each system, in order to ensure readiness. The Unit 5 system Supervisors undertook the task of creating separate models for specific systems and sub-systems. These systems are linked to the Turn over Packages (ToP) of the main contractor, Alstom, and are also hyperlinked to the required Piping and Instrumentation Drawings (P&ID), providing access to every detail of the constructed plant with the click of a button.
Image showing construction status of the LBQ – Feed Heating

Image showing construction status of the LBG – Start-up and Heating Steam System

HP Heaters

Pending Construction

Construction Complete

Start-up Ejectors

Pending Construction

Construction Complete

Feed Water Tank

Image of Construction Update
Image showing pressure test status of the LAB – Feed Water System
Unit 4 Generator Transformer was safely delivered onto its foundation, and final positioning is in progress. Installation of Auxiliaries will start after the Transformer is finally positioned.

Unit 4 Boiler Service Transformers were both placed in position. Installation of the Auxiliaries will now commence.

Unit 3 Cable tunnel between the Turbine House and ACCC Substation roof slab (Turbine end) was poured. Earth works for the transformer spur/ tunnel is complete and blinding preparation is in progress.

Unit 3 Auxiliary bay 20.6m level slab is complete and external brick work commenced on gridlines G and E.
The ash contained in the coal is non-combustible and thus it persists after combustion has completed. The ash particles either fall to the bottom of the furnace where they are removed by a submerged scraper conveyor or they are blown out of the boiler in the flue gas stream. This dust is carried to the fabric filter plant where between 99.2% and 99.7% of it is removed from the gas stream. The dust collected in the filter bags is pneumatically conveyed to the ash conditioning complex using dense phase pneumatic handling technology over distances of up to 1.2km. Here the ash is mixed with a low percentage of water to produce a conditioned ash. This ash is then mixed with boiler bottom ash and conveyed to the ash dump via an overland conveying system and stacking onto the dump with the aid of crawler mounted stacker machines.

The cleaned flue gases pass through to the induced draft fan and then up the smoke stack and into the atmosphere. Medupi will discharge less than 50mg of dust per normal cubic metre of gas into the atmosphere.

Roman Crookes
Project Director: Medupi Power Station Project