Eskom

Office of the Chief Executive

Assurance and Forensic Department

Contracted University of Fort Hare to execute this project

Measurement and Verification

Project Name: Union Mine

Project Number: 2010093

Report Type: Performance Assessment Report 3

Reporting Period: 01 May 2013 – 31 May 2013

Compiled by: ..... **Date:** 02 July 2013
M Simon
M&V Team member
University of Fort Hare

Authorised by: ..... **Date:** 10 July 2013
EL Meyer
M&V Team leader
University of Fort Hare

Accepted by: ..... **Date:** 23 July 2013
David Bekink
National Power Contractors
ESCO

Submitted to: ..... **Date:** .....
Office of the Chief Executive
Assurance and Forensic Department
Eskom

Report Issue Date: 11 JULY 2013
Report Number: PM/M&V/UFH- 13/14 -037
Revision Number: v1r0

1 Monthly savings report: May 2013

1.1 Project information

Project name: Union Mine Composite Fiber

Project number: 2010093
Project Type: Industrial Energy Efficiency

Report Compiled by: M Simon

Email: msimon@ufh.ac.za **Tel:** 040 602 2354

Report period: May 2013

Date of completion: March 2013

Intended Impact: N/A

1. Executive Summary

The 3rd performance assessment of the Union Mine Composite Fiber for the period of May 2013 resulted in an average demand impact of **0.707 MW** and the energy consumption was **526.142 MWh.**

The performance tracking of Union Mine Composite Project (EE) for the period of 14 February 2013 – 30 June 2013 resulted in an average weekday demand impact of **0.695 MW** during the weekday evening peak period of Eskom. The contracted demand impact for the same period is **0.486 MW**. The impact on the energy consumption for 14 February 2013 – 30 June 2013 was **2 840.138 MWh.**

A summary of the energy and demand impacts for May 2013 (current month) is section 1.2 below. The summary for the energy and demand impacts for 14 February 2013 – 30 June 2013 (ITD) is given in section 2.1 below. The summary of the energy and demand impacts for the YTD (01 April 2013 – 30 June 2013) period is given in section 3.1 below.

M&V Opinion:

Considering the challenges we had with regards to measurements of a huge sample of the fans, the data obtained from the measured ones can be a fairly good representative of the remaining fans, as such the average measured values were used to do both the adjustment and finally the savings of the report. All the installed fans are in perfect working condition as attested by the Mining underground ventilation manager.

1 PERFORMANCE ASSESMENT

1.1 Monthly DSM impact: 1 - 31 May 2013

Table 1 01 May 2013 - 31 May 2013

Average Demand (MW) TOU periods

Weekday (MW)							
	Morning Off peak	Morning Standard	Morning Peak	Midday Standard	Evening Peak	Evening Standard	Evening Off-peak
Av. Baseline (MW)	1.648	1.649	1.646	1.648	1.648	1.645	1.647
Av. Actual (MW)	0.941	0.942	0.940	0.941	0.942	0.940	0.941
Av. Impact (MW)	**0.707**	**0.707**	**0.706**	**0.706**	**0.707**	**0.705**	**0.706**

Saturday (MW)						Sunday (MW)
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak
Av. Baseline (MW)	1.646	1.645	1.646	1.644	1.645	1.651
Av. Actual (MW)	0.941	0.940	0.941	0.940	0.940	0.937
Av. Impact (MW)	**0.705**	**0.705**	**0.705**	**0.705**	**0.705**	**0.714**

Table 2 Energy Consumption (MWh) TOU periods

Monthly Weekday (MWh)							
	Morning Off peak	Morning Standard	Morning Peak	Midday Standard	Evening Peak	Evening Standard	Evening Off-peak
Baseline (MWh)	227.393	37.933	113.562	303.174	75.823	75.672	75.781
Actual (MWh)	129.895	21.669	64.871	173.184	43.313	43.226	43.289
Combined Impact (MWh)	**97.498**	**16.264**	**48.692**	**129.991**	**32.510**	**32.446**	**32.492**

Monthly Saturday (MWh)						Monthly Sunday (MWh)	Total Monthly Av. MWh
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak	
Baseline (MWh)	46.086	32.894	39.505	13.155	26.319	158.539	1,225.838
Actual (MWh)	26.335	18.797	22.575	7.517	15.040	89.987	699.697
Combined Impact (MWh)	**19.751**	**14.097**	**16.931**	**5.638**	**11.280**	**68.552**	**526.142**

Table 3

	Weekday (Rand)		Saturday & Sunday (Rand)		Total
	Max Demand	**Electricity Consu**	**Max Demand**	**Electricity Consum**	**Rand**
Baseline	79,336.61	336,455.74	79,242.88	116,889.83	611,925.07
Actual	45,319.80	33,397.49	45,282.18	66,794.98	190,794.44
Combined Impact	**34,016.81**	**303,058.25**	**33,960.70**	**50,094.86**	**421,130.63**

Table 4

Emmission values		CO_2	SO_2	NO_x	Particles	Water use
	Energy	kg	kg	kg	kg	l
	MWh	980	4.39	8.10	0.39	1.38
Baseline	1225.838	1,201,321.682	5,381.431	9,929.291	478.077	1,691.657
Actual	699.697	685,702.617	3,071.668	5,667.542	272.882	965.581
Combined Impact	**526.142**	**515,619.065**	**2,309.763**	**4,261.749**	**205.195**	**726.076**

2 Accumulated savings report: 14 February 2013 – 30 June 2013

2.1 Accumulated DSM impact: ITD

Table 1 **ITD** **14 February 2013 - 30 June 2013**

Weekday (MW)							
	Morning Off peak	Morning Standard	Morning Peak	Midday Standard	Evening Peak	Evening Standard	Evening Off-peak
Av. Baseline (MW)	1.648	1.649	1.646	1.648	1.648	1.645	1.647
Av. Actual (MW)	0.953	0.954	0.953	0.953	0.953	0.952	0.953
Av. Impact (MW)	**0.694**	**0.695**	**0.693**	**0.695**	**0.695**	**0.693**	**0.694**

Saturday (MW)						Sunday (MW)
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak
Baseline (MW)	1.646	1.645	1.646	1.644	1.645	1.651
Actual (MW)	0.953	0.952	0.951	0.950	0.950	0.947
Combined Impact (MW)	**0.693**	**0.693**	**0.695**	**0.694**	**0.695**	**0.704**

Table 2 **Energy Consumption (MWh) TOU periods**

ITD Weekday (MWh)							
	Morning Off peak	Morning Standard	Morning Peak	Midday Standard	Evening Peak	Evening Standard	Evening Off-peak
Baseline (MWh)	1,166.626	194.613	582.624	1,555.417	389.007	388.230	388.791
Actual (MWh)	666.417	111.170	332.815	888.508	222.214	221.770	222.091
Combined Impact (MWh)	**500.209**	**83.444**	**249.809**	**666.909**	**166.793**	**166.460**	**166.700**

Monthly Saturday (MWh)						Monthly Sunday (MWh)	Total ITD Av. MWh
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak	
Baseline (MWh)	288.038	205.585	246.909	82.217	164.497	990.871	6,643.425
Actual (MWh)	176.332	117.479	141.093	46.982	93.999	562.418	3,803.287
Combined Impact (MWh)	**111.706**	**88.106**	**105.817**	**35.235**	**70.497**	**428.453**	**2,840.138**

Table 3

	Weekday (Rand)		Saturday & Sunday (Rand)		Total
	Max Demand	**Electricity Consu**	**Max Demand**	**Electricity Consum**	**Rand**
Baseline	79,336.61	1,726,164.25	79,242.88	731,903.03	2,616,646.76
Actual	45,319.80	986,044.35	45,282.18	421,171.68	1,497,818.00
Combined Impact	**34,016.81**	**740,119.90**	**33,960.70**	**310,731.35**	**1,118,828.76**

Table 4

Emmission values		CO_2	SO_2	NO_x	Particles	Water use
	Energy	kg	kg	kg	kg	l
	MWh	980	4.39	8.10	0.39	1.38
Baseline	6,643.425	6,510,556.558	29,164.636	53,811.743	2,590.936	9,167.927
Actual	3,803.287	3,727,220.828	16,696.428	30,806.621	1,483.282	5,248.535
Combined Impact	**2,840.138**	**2,783,335.730**	**12,468.208**	**23,005.122**	**1,107.654**	**3,919.391**

3 Accumulated DSM impact: YTD (01 April 2013 – 30 June 2013)

Table 1 **YTD** **01 April 2013 - 30 June 2013**

Weekday (MW)							
	Morning Off peak	Morning Standard	Morning Peak	Midday Standard	Evening Peak	Evening Standard	Evening Off-peak
Baseline (MW)	1.648	1.649	1.646	1.648	1.648	1.645	1.647
Actual (MW)	0.953	0.954	0.953	0.953	0.953	0.952	0.953
Combined Impact (MW)	**0.694**	**0.695**	**0.693**	**0.695**	**0.695**	**0.693**	**0.694**

Saturday (MW)						Sunday (MW)
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak
Baseline (MW)	1.646	1.645	1.646	1.644	1.645	1.651
Actual (MW)	0.953	0.952	0.951	0.950	0.950	0.947
Combined Impact (MW)	**0.693**	**0.693**	**0.695**	**0.694**	**0.695**	**0.704**

Table 2 **Energy Consumption (MWh) TOU periods**

YTD Weekday (MWh)							
	Morning Off peak	Morning Standard	Morning Peak	Midday Standard	Evening Peak	Evening Standard	Evening Off-peak
Baseline (MWh)	107.105	107.202	106.979	107.100	107.142	106.928	107.082
Actual (MWh)	61.976	62.023	61.965	61.953	61.966	61.901	61.942
Combined Impact (MWh)	**45.129**	**45.179**	**45.014**	**45.147**	**45.176**	**45.027**	**45.140**

Monthly Saturday (MWh)						Monthly Sunday (MWh)	Total YTD Av. MWh
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak	
Baseline (MWh)	21.397	21.381	21.399	21.376	21.385	21.469	877.945
Actual (MWh)	12.389	12.371	12.364	12.349	12.345	12.312	507.857
Combined Impact (MWh)	**9.008**	**9.010**	**9.034**	**9.027**	**9.039**	**9.157**	**370.088**

Table 3

	Weekday (Rand)		Saturday & Sunday (Rand)		Total
	Max Demand	**Electricity Consu**	**Max Demand**	**Electricity Consum**	**Rand**
Baseline	79,336.61	277,329.20	79,242.88	47,510.41	483,419.10
Actual	45,319.80	160,478.58	45,282.18	27,428.55	278,509.11
Combined Impact	**34,016.81**	**116,850.62**	**33,960.70**	**20,081.86**	**204,909.99**

Table 4

Emmission values		CO_2	SO_2	NO_x	Particles	Water use
	Energy	kg	kg	kg	kg	l
	MWh	980	4.39	8.10	0.39	1.38
Baseline	877.945	860,385.999	3,854.178	7,111.354	342.399	1,211.564
Actual	507.857	497,699.970	2,229.493	4,113.643	198.064	700.843
Combined Impact	**370.088**	**362,686.028**	**1,624.685**	**2,997.711**	**144.334**	**510.721**

7 Comments

This report which was supposed to follow after the 1st and the 2nd PA report was delayed due to some logistical problems with the mine in securing the date for going underground. This could have been compounded by the challenging dynamics currently happening in the mining sector. The report reveals that the project is performing above the target as an average for the entire 36 fans.