



INTERNAL AUDIT DIVISION

REPORT 2014/125

Audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur

Overall results relating to the effective management of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur were initially assessed as unsatisfactory. Implementation of two critical and one important recommendations remains in progress

FINAL OVERALL RATING: UNSATISFACTORY

8 December 2014
Assignment No. AP2014/634/09

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AUDIT REPORT

Audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur

I. BACKGROUND

1. The Office of Internal Oversight Services (OIOS) conducted an audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur.
2. In accordance with its mandate, OIOS provides assurance and advice on the adequacy and effectiveness of the United Nations internal control system, the primary objectives of which are to ensure (a) efficient and effective operations; (b) accurate financial and operational reporting; (c) safeguarding of assets; and (d) compliance with mandates, regulations and rules.
3. The Generator Unit in the Engineering and Environment Protection Section was responsible for generator maintenance. The Engineering and Environment Protection Section was headed by the Chief Engineer at the P-5 level who reported to the Director of Mission Support through the Chief of Supply Chain Management Services. The Generator Unit was headed by a staff member at the FS-4 (Field Service) level and had a total of 45 generator technician posts deployed to sectors as follows: 6 in Sector Central, 1 in Sector East, 20 in Sector North, 11 in Sector South and 7 in Sector West.
4. The maintenance of generators was governed by the Department of Peacekeeping Operations/ Department of Field Support (DPKO/DFS) Guidelines on Generator Maintenance for United Nations Field Missions and manufacturer's service manuals.
5. As at 2 June 2014, UNAMID had a total of 1,002 generators with a depreciated value of \$18 million. The generator maintenance budgets for fiscal years 2012/13 and 2013/14 were \$668,792 and \$449,912 respectively.
6. Comments provided by UNAMID are incorporated in *italics*.

II. OBJECTIVE AND SCOPE

7. The audit of was conducted to assess the adequacy and effectiveness of UNAMID governance, risk management and control processes in providing reasonable assurance regarding the effective management of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur.
8. The audit was included in the 2014 risk-based work plan of OIOS due to the operational risks relating to generator maintenance.
9. The key control tested for the audit was regulatory framework. For the purpose of this audit, OIOS defined this key control as the one that provides reasonable assurance that policies and procedures: (a) exist to guide the maintenance of generators; (b) are implemented consistently; and (c) ensure the reliability and integrity of financial and operational information.
10. The key control was assessed for the control objectives shown in Table 1.

11. OIOS conducted the audit in July and August 2014. The audit covered the period from 1 January 2013 to 31 July 2014. The audit was limited to heavy duty generators, i.e., 250 Kilo Volt-Amps (KVA) to 750 KVA, as these were the ones that the Mission relied on for power generation to meet operational requirements. This category of generators comprised 321 generators with a depreciated value of about \$14 million.

12. OIOS conducted an activity-level risk assessment to identify and assess specific risk exposures, and to confirm the relevance of the selected key control in mitigating associated risks. Through interviews and analytical reviews, OIOS assessed the existence and adequacy of internal controls and conducted necessary tests to determine their effectiveness.

III. AUDIT RESULTS

13. The UNAMID governance, risk management and control processes examined were initially assessed as **unsatisfactory**¹ in providing reasonable assurance regarding the **effective management of generator maintenance in UNAMID**. OIOS made three recommendations to address the issues identified. UNAMID had not implemented adequate procedures over the supervision and management of the generator programme. UNAMID needed to: (a) implement appropriate procedures to properly monitor, document and supervise the operation and maintenance of generators; (b) conduct a comprehensive assessment of spare part requirements and initiate procurement of needed parts; and (c) improve security measures over generator workshops and record cannibalized parts in Galileo.

14. The initial overall rating was based on the assessment of the key control presented in Table 1. The final overall rating is **unsatisfactory** as implementation of two critical and one important recommendations remains in progress.

Table 1: Assessment of key control

Business objective	Key control	Control objectives			
		Efficient and effective operations	Accurate financial and operational reporting	Safeguarding of assets	Compliance with mandates, regulations and rules
Effective management of generator maintenance in UNAMID	Regulatory framework	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory

Regulatory framework

The Mission’s generator programme was not effective

15. The DPKO/DFS Guidelines on Generator Maintenance for United Nations Field Missions required adequate and up-to-date records of the operation and maintenance of generators to ensure that: (a) established service and maintenance schedules were complied with; (b) records of technical history of generator servicing were kept; (c) performance of the generators was assessed to discover and correct

¹ A rating of “**unsatisfactory**” means that one or more critical and/or pervasive important deficiencies exist in governance, risk management or control processes, such that reasonable assurance cannot be provided with regard to the achievement of control and/or business objectives under review.

defects before they caused serious damage or equipment failure; (d) recommendations for the disposal of generators that were no longer economical to maintain were properly made; and (e) frequently used service and spare parts were available. The Guidelines also required: generator workshops to be properly secured; and spare parts stripped from generators to be authorized and recorded in Galileo.

(a) Lack of monitoring, documentation and supervision of the generator programme

16. UNAMID only had maintenance information on 80 of its 321 generators rated 250 KVA or above. A review of available documents for the 80 generators indicated that they were not maintained in accordance with the prescribed schedules. For example, there were only 303 work orders and service reports, representing 39 per cent of the expected number of services that was required during the audit period. In addition, reviews and spot checks in five sector headquarters indicated that for these 80 generators, 51 were overdue for maintenance and 20 had no record of any previous maintenance.

17. UNAMID was not recording and monitoring the performance of generator sets in terms of power output to help assess the efficiency of generators, and to avert damage to engines in case of overloading or under loading of capacity. UNAMID also did not maintain consolidated records showing the cumulative cost of repairs and maintenance of its generators.

18. Not performing the scheduled maintenance and not monitoring performance resulted in a high number of generators breaking down before their full economic life (estimated at 10,000 operating hours). At the time of the audit, 85 generators, with a depreciated value of \$3.2 million, that had operated for less than 10,000 hours were out of service. Additionally, the lack of performance monitoring of generators, meant that UNAMID was not able to make informed decisions on when to dispose of generators that were uneconomical to maintain.

(b) Service and spare parts and engine overhaul kits were not available for maintaining and repairing generators in a timely manner

19. A comparison of the quantity of service and spare parts and engine overhaul kits on hand, for relevant generator sets, with the number of generators in use at the time of the audit indicated that UNAMID did not have sufficient inventory levels. For example: (a) in Sector South, UNAMID did not have any service parts for one of its major brands of generators from 2012 until May 2014; and (b) in sectors Central and West, the monthly delivery of parts from Mission Headquarters was often delayed and no strategic stock levels were being maintained for use if the monthly supply was delayed.

20. Due to the lack of readily available spare parts, routine maintenance was not being done as required. As at 21 August 2014, only 33 (representing 22 per cent) of 153 generators that required engine overhaul had been overhauled. Additionally, generator technicians were recycling parts to keep generators working. The use of recycled parts increased the risk of breakdowns and damage to generators.

(c) Inadequate management of generator workshop operations

21. UNAMID established generator workshops at all sector headquarters to facilitate the repair and maintenance of generators. A review of workshop operations indicated that log books were not kept to record details of generator sets brought into workshops for repair. Consequently, UNAMID was unable to accurately determine how long the 147 generators OIOS found in the workshops at the time of the audit had been out of service. The generator technicians indicated that many of the generators had been in the workshop for more than two years awaiting repair due to lack of spare parts, and others were awaiting technical assessment before the write-off process could be initiated.

22. A physical inspection of the 147 generators showed that 70 (representing 47 per cent) had missing parts including: control unit panel, fuel pumps, starter motors, automatic voltage regulators, alternators and electronic fuel control unit among others. These parts were missing due to generator technicians cannibalizing spare parts to repair other generators, and because of theft. UNAMID was unable to account for those parts that had been re-used and those stolen as there were no records of the parts that had been authorized for cannibalization.

23. The above conditions were caused by: the lack of supervision by UNAMID management over the generator maintenance and repair programme; inadequate training of generator technicians on maintaining records of generators in Galileo; and because UNAMID had not conducted a comprehensive assessment of its service and spare parts and engine overhaul kit requirements to ensure that adequate stocks were available when required. Moreover, UNAMID had not implemented procedures for: authorizing and accounting for cannibalized parts; and to ensure adequate security measures over workshop operations.

- (1) UNAMID should implement appropriate procedures and train concerned staff on ensuring that the maintenance and performance of generators is adequately monitored, documented and supervised.**
- (2) UNAMID should conduct a comprehensive needs assessment for service and spare parts and engine overhaul kits and procure required parts, including strategic stocks, for keeping generators operating effectively and efficiently.**
- (3) UNAMID should take steps to enhance security at workshops and ensure that only authorized parts are cannibalized from generators, and these are properly accounted for and recorded in Galileo.**

24. *UNAMID accepted recommendation 1 and stated that training to concerned staff on maintenance and performance of generators was ongoing and anticipated to be concluded by 31 March 2015. Furthermore, monitoring and a recordkeeping plan was effective 1 December 2014 and all engineering work requests were reflected in Galileo.* Recommendation 1 remains open pending receipt of evidence and OIOS verification that appropriate procedures for the operation and maintenance of generators have been implemented.

25. *UNAMID accepted recommendation 2 and stated that a comprehensive assessment for maintenance requirement was completed on 13 November 2014 and that shopping carts had been raised for the current year. The Mission added that it would need additional funds to ensure the availability of optimal quantity of spare parts.* Recommendation 2 remains open pending receipt of evidence that the required generator parts have been procured.

26. *UNAMID accepted recommendation 3 and stated that it would take steps to enhance security at workshops including: (a) ensuring adequate spare parts in the stock; (b) educating and training relevant staff to follow workshop rules; and (c) improving access control in and out of the workshop.* Recommendation 3 remains open pending receipt of evidence and OIOS verification that security measures have been enhanced and only authorized and properly recorded parts cannibalized from generator are being used.

IV. ACKNOWLEDGEMENT

27. OIOS wishes to express its appreciation to the Management and staff of UNAMID for the assistance and cooperation extended to the auditors during this assignment.

(Signed) David Kanja
Assistant Secretary-General for Internal Oversight Services

STATUS OF AUDIT RECOMMENDATIONS

Audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur

Recom. no.	Recommendation	Critical ¹ / Important ²	C/ O ³	Actions needed to close recommendation	Implementation date ⁴
1	UNAMID should implement appropriate procedures and train concerned staff on ensuring that the maintenance and performance of generators is adequately monitored, documented and supervised.	Critical	O	Receipt of evidence and OIOS verification that appropriate procedures for the operation and maintenance of generators have been implemented.	31 March 2015
2	UNAMID should conduct a comprehensive needs assessment for service and spare parts and engine overhaul kits and procure required parts, including strategic stocks, for keeping generators operating effectively and efficiently	Critical	O	Receipts of evidence that all needed generator parts have been procured.	31 August 2015
3	UNAMID should take steps to enhance security at workshops and ensure that only authorized parts are cannibalized from generators, and these are properly accounted for and recorded in Galileo.	Important	O	Receipt of evidence and OIOS verification that security measures have been enhanced and only authorized and properly recorded parts cannibalized from generator are being used.	31 March 2015

¹ Critical recommendations address significant and/or pervasive deficiencies or weaknesses in governance, risk management or internal control processes, such that reasonable assurance cannot be provided regarding the achievement of control and/or business objectives under review.

² Important recommendations address important deficiencies or weaknesses in governance, risk management or internal control processes, such that reasonable assurance may be at risk regarding the achievement of control and/or business objectives under review.

³ C = closed, O = open

⁴ Date provided by UNAMID in response to recommendations.

APPENDIX I

Management Response

AFRICAN UNION

الاتحاد الأفريقي



UNAMID



UNITED NATIONS

الأمم المتحدة

African Union – United Nations Hybrid Operation in Darfur

Office of the Joint Special Representative

04 December 2014

To: Ms. Eleanor T. Burns, Director
Internal Audit Division, OIOS

From: Abiodun Bashua
Acting Joint Special Representative a.i.
UNAMID

Subject: Draft report on an audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur (Assignment No. AP2014/634/09)

1. With reference to your memorandum of 03 December 2014, on the captioned-subject matter, please find attached UNAMID's response (Appendix I) to the draft report for your consideration.
2. I further confirm on the factual accuracy of the report.

Thank you.

cc: Mr. Anthony Nweke, Acting Director of Mission Support Division, UNAMID
Mr. Maqbool Mohammad, Chief, Supply Chain Management, UNAMID
Mr. Yonas Araia, OiC, Engineering and Environment Protection Section, UNAMID
Mr. Prances Sooja, Chief, Resident Auditor, OIOS/UNAMID
Mr. Velayutham Gopal, Audit Focal Point, UNAMID
Ms. Cynthia Avena-Castillo, Professional Practices Section, Internal Audit Division, OIOS

Management Response

Audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur

Rec. no.	Recommendation	Critical ¹ / Important ²	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
1	UNAMID should implement appropriate procedures and train concerned staff on ensuring that the maintenance and performance of generators is adequately monitored, documented and supervised.	Critical	Yes	Head of Electromechanical Unit	31 March 2015	Training to the concerned staff on the maintenance and performance of generators is still on-going at all field Mission level and anticipated to be concluded by 31 March 2015. Furthermore the monitoring and record keeping plan is effective since 01 Dec 2014 i.e. all engineering work requests are reflected in Galileo system to have an operative control.
2	UNAMID should conduct a comprehensive needs assessment for service and spare parts and engine overhaul kits and procure required parts, including strategic stocks, for keeping generators operating effectively and efficiently.	Critical	Yes	Head of Electromechanical Unit	31 August 2015	Comprehensive assessment for maintenance requirement was completed on 13 Nov 2014. However, for the current year, shopping carts have been timely raised. Nevertheless, additional funds is required to ensure the availability of optimal quantity.
3	UNAMID should take steps to enhance security at workshops and ensure that only authorized parts are cannibalized from generators, and	Important	Yes	Head of Electromechanical Unit in liaison	31 March 2015	The enhancement of the security at workshops will be based on the following steps

¹ Critical recommendations address significant and/or pervasive deficiencies or weaknesses in governance, risk management or internal control processes, such that reasonable assurance cannot be provided regarding the achievement of control and/or business objectives under review.

² Important recommendations address important deficiencies or weaknesses in governance, risk management or internal control processes, such that reasonable assurance may be at risk regarding the achievement of control and/or business objectives under review.

Management Response

Audit of generator maintenance in the African Union-United Nations Hybrid Operation in Darfur

Rec. no.	Recommendation	Critical ¹ / Important ²	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
	these are properly accounted for and recorded in Galileo.			with Security Section		including (a) ensuring adequate spare parts in the stock, (b) educate/train staff members involved to strictly follow the workshop rules, and (c) improve the access control in/out of the workshop.