INTERNAL AUDIT DIVISION

AUDIT REPORT

Audit of business continuity and disaster recovery planning at UNON

Overall results relating to business continuity and disaster recovery planning at UNON were initially assessed as partially satisfactory. Implementation of five important recommendations remains in progress.

FINAL OVERALL RATING: PARTIALLY SATISFACTORY

3 December 2012
ASSIGNMENT NO. AT2012/210/01
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AUDIT REPORT

Audit of business continuity and disaster recovery planning at UNON

I. BACKGROUND

1. The Office of Internal Oversight Services (OIOS) conducted an audit of business continuity and disaster recovery planning at the United Nations Office at Nairobi (UNON).

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. UNON provides administrative support to many United Nations entities located in Kenya. Given its role, the Secretary-General stated in his report on business continuity management (A/64/472) that it is important that the business continuity plan of UNON be robust.

4. In 2008, UNON started developing a business continuity plan that was completed in November 2011 with the formal issuance of the document by the Director-General. In addition to the overall plan, specific business continuity plans have been developed for each section of UNON.

5. A Business Continuity Planning Unit (BCU) has been established at UNON under the Office of the Director of the Division of Administrative Services to ensure the viability of business continuity management at UNON.

6. The Information and Communications Technology Service (ICTS) of UNON provides services, including support for business continuity and disaster recovery of information and communications technology (ICT) systems to UNON, the United Nations Environment Programme (UNEP), the United Nations Human Settlements Programme (UN-HABITAT), and the offices of the United Nations funds and programmes hosted in the Nairobi Gigiri compound. ICTS, in cooperation with the Office of Information and Communications Technology (OICT) at the United Nations Headquarters (UNHQ), also provides infrastructure support for enterprise-wide applications such as the Integrated Management Information System (IMIS), Galaxy, electronic performance assessment system (e-PAS), talent management system (INSPIRA), electronic mail and the Official Document System (ODS), as well as consulting and advisory services to all offices of UNON, UNEP and UN-HABITAT.

7. Comments provided by UNON are incorporated in italics.

II. OBJECTIVE AND SCOPE

8. The audit was conducted to assess the adequacy and effectiveness of governance, risk management and control processes established at UNON to provide reasonable assurance regarding the effectiveness of business continuity and disaster recovery planning.

9. The audit was selected because of the high risks associated with the continuity of operations of the large United Nations community hosted and supported by UNON in Kenya.
10. The key controls tested for the audit were: (a) risk management; (b) disaster recovery and business continuity plans; and (c) information technology support systems. For the purpose of this audit, OIOS defined these key controls as follows:

(a) **Risk management** - controls that provide reasonable assurance that risks relating to business continuity and disaster recovery are identified and assessed, and that action is taken to mitigate risks.

(b) **Disaster recovery and business continuity plans** - controls that provide reasonable assurance that disaster recovery and business continuity plans exist to ensure that UNON operations can withstand crisis and continue to operate within a reasonable time frame.

(c) **Information technology support systems** - controls that provide reasonable assurance that UNON ICT systems in support of business continuity and disaster recovery exist and address the programmes/functions’ needs.

11. The key controls were assessed for the control objectives shown in Table 1.

12. OIOS conducted the audit from 16 May 2012 to 8 August 2012. The audit covered the period from January 2010 to May 2012.

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

### III. AUDIT RESULTS

14. The UNON governance, risk management and control processes examined were assessed as **partially satisfactory** in providing reasonable assurance regarding the **effectiveness of business continuity and disaster recovery planning**. OIOS made eight recommendations in the report to address issues identified in the audit. UNON developed a business continuity plan and risk assessment, and tested the plan with the involvement of critical staff, using key applications, files and data. Specific contingency plans were also in place for the incident command system, water shortage, supply of fuel and generators, and medical services. However, additional controls needed to be implemented for completing the business continuity plan of two offices (Office of the Director-General and Safety and Security Service), integrating the continuity requirements of the other United Nations entities co-located in the Gigiri compound, developing the ICT disaster recovery plan, completing the details of some of the section specific plans, and ensuring the preparedness of the supporting ICT infrastructure. UNON implemented three recommendations addressing the control weaknesses pertaining to the periodic review of the business continuity plan, the completion of the section-specific plans, and the design and implementation of procedures for following-up on test results.

15. The initial overall rating was based on the assessment of key controls presented in Table 1. The final overall rating is **partially satisfactory** as implementation of five important recommendations remains in progress.
Table 1 Assessment of key controls

<table>
<thead>
<tr>
<th>Business objective</th>
<th>Key controls</th>
<th>Efficient and effective operations</th>
<th>Accurate financial and operational reporting</th>
<th>Safeguarding of assets</th>
<th>Compliance with mandates, regulations and rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective business continuity and disaster recovery planning</td>
<td>a) Risk management</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
</tr>
<tr>
<td></td>
<td>(b) Disaster recovery and business continuity plan</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
</tr>
<tr>
<td></td>
<td>b) ICT support systems</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
<td>Partially satisfactory</td>
</tr>
</tbody>
</table>

A. Risk management

16. A global UNON business continuity risk assessment is annexed to the UNON business continuity plan. In addition, section specific risk assessments were included in the individual business continuity plans developed by each organizational unit at UNON.

17. The global UNON risk assessment was adequately documented and complete with the identification of threat categories, existing mitigation measures, remaining vulnerabilities, likelihood, impact, risk level and additional mitigation measures needed. The global risk assessment included 18 risks of which four were considered high level.

18. Business continuity plans had been developed in alignment with the security risk assessments, considering those risks that could have an impact on UNON’s operations and, therefore, could trigger the invocation of a continuity plan. However, the business continuity plan showed that those related to the Safety and Security Service and the Office of the Director-General were in progress.

(1) UNON should complete the risk assessment of the business continuity plans of all Services, Sections, and Units.

UNON accepted recommendation 1 and stated that it has recently completed the business continuity plan (BCP) of the Safety and Security Service, and the Office of the Director-General. OIOS reviewed the documentation provided by UNON and confirmed the adequacy of the business continuity plan of the Safety and Security Service. However, the business continuity plan of the Office of the Director-General was in draft form. Therefore, recommendation 1 remains open pending receipt of the final BCP of the Office of the Director-General.

B. Disaster recovery and business continuity plans

Global business continuity plan of UNON

19. Business continuity focuses on planning for the continuity of the non-ICT operations required to ensure that an organization can continue its critical functions under all circumstances. Disaster recovery relates to planning for resumption of the functioning of the ICT infrastructure after a disruption. While
business continuity planning relies heavily on disaster recovery, its scope extends beyond disaster recovery.

20. A comprehensive BCP was in place for UNON, complemented by specific plans for each organizational unit. The BCP of UNON was well defined and structured with adequate details for the preparation, response and post event phases, as well as the maintenance of the plan. However, some control weaknesses were noted with regard to: (i) absence of a local disaster recovery plan; (ii) partial coverage of continuity requirements of other entities co-located in the Gigiri compound; (iii) estimation of all costs associated with the BCP; and (iv) need to conduct periodic reviews of the continuity plan. With regard to the cost estimates, UNON stated that this part of the plan will be addressed separately, in a different document.

(2) UNON should, in coordination with the Office of Information and Communications Technology, complement its business continuity plan with a local disaster recovery plan.

(3) UNON should conduct a consultative exercise with the entities co-located in the Gigiri compound (UNEP, UN-Habitat, and the other field offices of the United Nations funds and programmes) and integrate their continuity requirements and corresponding measures in the comprehensive business continuity plan.

(4) UNON should conduct a periodic review of the business continuity plan in accordance with the provisions defined for the maintenance of the plan.

UNON accepted recommendation 2 and stated that it has contacted OICT to seek their assistance. Recommendation 2 remains open pending receipt of the local disaster recovery plan of UNON.

UNON accepted recommendation 3 and stated that a consultative exercise has been conducted and follow-up actions with funds, programmes and agencies are ongoing. When responses are received, UNON will coordinate with the entities to ensure alignment between their respective BCPs, and that any inter-dependencies are adequately addressed. UNON raised concerns about: (i) the low response rate of the entities involved; (ii) the challenges in planning and interacting with all interested parties due to the absence of a Secretariat-wide standard BCP framework; (iii) inadequate focus; and (iv) lack of standard terminology. UNON has developed its own business continuity plan taking into account the services provided. When the business continuity plan of the other entities are received, necessary adjustments will be made to the business continuity plan. Recommendation 3 remains open pending receipt of the results of the consultative process started by UNON with the other entities of the Gigiri compound for integrating their continuity requirements in the UNON business continuity plan.

UNON accepted recommendation 4 and implemented it. OIOS reviewed and confirmed the adequacy of the updated documentation provided by UNON. Accordingly, recommendation 4 has been closed.

Section specific business continuity plans

21. In addition to the UNON global business continuity plan, specific plans were documented for each organizational entity. A detailed analysis of these specific plans showed that there were cases in which information was not complete (i.e., number of staff; number of critical function holders; risk assessments; communication trees; etc.).
(5) UNON should review the section specific business continuity plans to ensure that they are complete with all the information required.

UNON accepted recommendation 5 and stated that it has completed the information of the section specific business continuity plans. OIOS reviewed and confirmed the adequacy of the updated documentation provided by UNON. Accordingly, recommendation 5 has been closed.

Contingency plans

22. In addition to the global and section specific business continuity plans, a series of contingency plans were in place. However, some of these plans were either in draft form or lacked some information, as in the case of the Kenya security plan developed by the Safety and Security Service; the incident command system; the water shortage at the Gigiri compound; and the supply of fuel/generators.

(6) UNON should finalize and formalize all the contingency plans currently in draft version pertaining to the Kenya security plan, incident command system, water shortage, and supply of fuel/generators.

UNON accepted recommendation 6 and stated that all referenced contingency plans are complete. The Kenya security plan that includes UNON was approved by the Senior Management Team in February 2012. The incident command system was approved in May 2012. Both the water contingency and electrical mitigation plans were recently reviewed, signed and submitted. Recommendation 6 remains open pending receipt of the approved and updated version pertaining to the Kenya security plan, incident command system, water and supply of fuel/generators.

Testing of the BCP

23. UNON conducted a telecommuting test in February 2011, with the objective to pilot a one day remote office experience to: (i) identify potential issues and gaps hindering effective work from remote location; (ii) assess the adequacy of the tools and guidance available to staff; and (iii) provide a basis from which to develop the business continuity telecommuting project and determine needs for training, equipment, policies, and further testing.

24. The results of the tests were prepared with adequate details regarding follow-up recommendations and actions to be taken, responsible officers and follow-up timeline. These follow-up actions included the acquisition of additional laptops and remote devices for telecommuting, organizing transversal testing, completing office remote handbooks, and appointing staff of ICTS to facilitate the telecommuting project. However, a report to monitor and confirm the progress made in the completion of the follow-up actions was not prepared.

(7) UNON should design and implement procedures for ensuring that follow-up actions identified as a result of the business continuity testing are monitored for progress and completion.

UNON accepted recommendation 7 and stated that it conducts adequate testing and follow-up is done as necessary. The test referenced within the report is not the only one conducted, and evidence of other tests and follow up conducted has been provided with this response. OIOS reviewed the additional evidence provided by UNON, documenting the follow-up actions taken for the remote office communication, minutes of the telecommuting committee, communication tree test report, and
evaluation of the simulation completed. Based on the actions taken and evidence provided, recommendation 7 has been closed.

C. ICT support systems

25. The technical details regarding how the ICT infrastructure supports the business continuity plan should be part of a comprehensive disaster recovery plan. As already indicated above, UNON does not have a documented local disaster recovery plan. However, like all other sections of UNON, ICTS developed its own business continuity plan. Although this plan cannot be considered a replacement of the UNON disaster recovery plan, its content and provisions are relevant for the support of any measure that would be invoked in accordance with the established business continuity plans. OIOS conducted a series of technical tests of the ICTS business continuity plan and determined that there were weaknesses in 7 of the 17 controls areas tested. In addition, one area (Failover of the Internet connection and telecommunication equipment) could not be tested at the time of the audit because the service provider was performing maintenance work on the fiber links.

(8) UNON should ensure that the Information and Communications Technology Section implements additional controls for ensuring the continuity of its operations by: (i) establishing an off-site storage of backup tapes; (ii) installing fire proof safes and an adequate door in the tower house storage room; (iii) installing a CCTV system for entry and exit points of secure areas; (iv) documenting helpdesk procedures for data restoration; (v) implementing active directory to replace the current authentication server (Samba); (vi) testing the failover of the Internet connection; (vii) implementing the United Nations standard for disk-to-disk-to-tape backup solution; (viii) configuring a secure protocol for the asset tracking management system “Hardcat”; and (ix) acquiring four alternate servers (HPUX).

UNON accepted recommendation 8 and stated that actions have been started for each element of the recommendation, as follows: 8(i) a location has been identified for the off-site storage of backup tapes and implementation is in progress; 8(ii) and 8(iii) requirements have been identified and funding of approximately $190,000 are being sought for implementation; 8(iv), 8(v) and 8(vi) are ongoing; 8(vii) provision has been made in the 2013-14 budget proposal; 8(viii) implemented, documentary evidence has been provided to OIOS; and 8(ix) acquisition of recommended servers is in progress. Recommendation 8 remains open pending receipt of the evidence confirming the completion of the actions initiated by UNON for ensuring the continuity of its ICT systems and operations.

IV. ACKNOWLEDGEMENT

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

Ms. Fatoumata Ndiaye, Director
Internal Audit Division, OIOS
## STATUS OF AUDIT RECOMMENDATIONS

**Assignment No. AT2012/210/01 – Audit of business continuity and disaster recovery planning at UNON**

<table>
<thead>
<tr>
<th>Recom. no.</th>
<th>Recommendation</th>
<th>Critical(^1)/ Important(^2)</th>
<th>C/ O(^3)</th>
<th>Actions needed to close recommendation</th>
<th>Implementation date(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UNON should complete the risk assessment of the business continuity plans of all Services, Sections, and Units.</td>
<td>Important</td>
<td>O</td>
<td>Recommendation 1 remains open pending receipt of the BCP of the Office of the Director-General.</td>
<td>Dec 2012</td>
</tr>
<tr>
<td>2</td>
<td>UNON should, in coordination with the Office of Information and Communications Technology, complement its business continuity plan with a local disaster recovery plan.</td>
<td>Important</td>
<td>O</td>
<td>Recommendation 2 remains open pending receipt of the local disaster recovery plan.</td>
<td>Dec 2012</td>
</tr>
<tr>
<td>3</td>
<td>UNON should conduct a consultative exercise with the entities co-located in the Gigiri compound (UNEP, UN-Habitat, and the other field offices of the United Nations funds and programmes) and integrate their continuity requirements and corresponding measures in the comprehensive business continuity plan.</td>
<td>Important</td>
<td>O</td>
<td>Recommendation 3 remains open pending receipt of the results of the consultative process started by UNON with the other entities of the Gigiri compound for integrating their continuity requirements in the UNON BCP.</td>
<td>Dec 2012</td>
</tr>
<tr>
<td>4</td>
<td>UNON should conduct a periodic review of the business continuity plan in accordance with the provisions defined for the maintenance of the plan.</td>
<td>Important</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>UNON should review the section specific business continuity plans to ensure that they are complete with all the information required.</td>
<td>Important</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>UNON should finalize and formalize all the</td>
<td>Important</td>
<td>O</td>
<td>Recommendation 6 remains open pending</td>
<td>Dec 2012</td>
</tr>
</tbody>
</table>

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\(^1\) 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 [client] in response to recommendations. [Insert “Implemented” where recommendation is closed; (implementation date) given by the client.]
<table>
<thead>
<tr>
<th>Recom. no.</th>
<th>Recommendation</th>
<th>Critical(^1/) Important(^2)</th>
<th>C/ O(^3)</th>
<th>Actions needed to close recommendation</th>
<th>Implementation date(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>UNON should design and implement procedures for ensuring that follow-up actions identified as a result of the business continuity testing are monitored for progress and completion.</td>
<td>Important</td>
<td>C</td>
<td>receipt of the approved and updated Kenya security plan, incident command system, water and supply of fuel/generators.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>UNON should ensure that the Information and Communications Technology Section implements additional controls for ensuring the continuity of its operations by: (i) establishing an off-site storage of backup tapes; (ii) installing fire proof safes and an adequate door in the tower house storage room; (iii) installing a CCTV system for entry and exit points of secure areas; (iv) documenting helpdesk procedures for data restoration; (v) implementing active directory to replace the current authentication server (Samba); (vi) testing the failover of the Internet connection; (vii) implementing the United Nations standard for disk-to-disk-to-tape backup solution; (viii) configuring a secure protocol for the asset tracking management system “Hardcat”; and (ix) acquiring four alternate servers (HPUX).</td>
<td>Important</td>
<td>O</td>
<td>Recommendation 8 remains open pending receipt of the evidence confirming the completion of the actions initiated by UNON for ensuring the continuity of its ICT systems and operations.</td>
<td>31 Dec. 2013</td>
</tr>
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