



INTERNAL AUDIT DIVISION

AUDIT REPORT

Audit of the Virtual Small Aperture Terminal (VSAT) Satellite System at the United Nations Logistics Base in Brindisi, Italy

15 April 2008

Assignment No. AT2007/610/01

United Nations  Nations Unies

INTEROFFICE MEMORANDUM

MEMORANDUM INTERIEUR

INTERNAL AUDIT DIVISION · DIVISION DE L'AUDIT INTERNE

OFFICE OF INTERNAL OVERSIGHT SERVICES · BUREAU DES SERVICES DE CONTRÔLE INTERNE

TO: Ms. Jane Holl Lute, Officer-in-Charge

DATE: 15 April 2008

A: Department of Field Support

REFERENCE: IAD: 08- 01231

for
FROM: Dagfinn Knutsen, Director
DE: Internal Audit Division, OIOS

Faturuf

SUBJECT: **Assignment No. AT2007/600/01 – Audit of the Virtual Small Aperture Terminal (VSAT)**
OBJET: **Satellite System at the United Nations Logistics Base in Brindisi, Italy**

1. I am pleased to present the report on the above-mentioned audit.
2. In order for us to close the remaining recommendations, we request that you provide us with the additional information as discussed in the text of the report and also summarized in Annex 1.
3. Your response indicated that you did not accept recommendation 8. In OIOS' opinion however, this recommendation seeks to address significant risk areas. We are therefore reiterating it and request that you reconsider your initial response based on the additional information provided in the report.
4. Please note that OIOS will report on the progress made to implement its recommendations, particularly those designated as critical (i.e., recommendations 1, 3, 4, 7, 12, and 14, in its annual report to the General Assembly and semi-annual report to the Secretary-General.

cc: Mr. Rudy Sanchez, Chief, Headquarters CITS, DFS
Mr. Swatantra Goolsarran, Executive Secretary, UN Board of Auditors
Mr. Jonathan Childerley, Chief, Oversight Support Unit, Department of Management
Ms. Maria Gomez Troncoso, Officer-in-Charge, JIU Secretariat
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Ms. Eleanor Burns, Chief, Chief Peacekeeping Audit Service, OIOS

INTERNAL AUDIT DIVISION

FUNCTION

“The Office shall, in accordance with the relevant provisions of the Financial Regulations and Rules of the United Nations examine, review and appraise the use of financial resources of the United Nations in order to guarantee the implementation of programmes and legislative mandates, ascertain compliance of programme managers with the financial and administrative regulations and rules, as well as with the approved recommendations of external oversight bodies, undertake management audits, reviews and surveys to improve the structure of the Organization and its responsiveness to the requirements of programmes and legislative mandates, and monitor the effectiveness of the systems of internal control of the Organization” (General Assembly Resolution 48/218 B).

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EXECUTIVE SUMMARY

Audit of the Virtual Small Aperture Terminal (VSAT) Satellite System at UNLB in Brindisi, Italy

OIOS conducted an audit of the Virtual Small Aperture Terminal Satellite System (VSAT) located at the United Nations Logistics Base (UNLB) in Brindisi, Italy. The overall objectives of the audit were to assess the adequacy and effectiveness of internal controls to restrict physical & logical access to authorized personnel only; protect sensitive reference information; ensure that appropriate change control procedures are in place over VSAT configurations; ensure that Disaster Recovery and Business Continuity Plans are in place; monitor unauthorized use of VSAT resources; and ensure that available communication bandwidth meets the requirements of the organizations. The audit was conducted in accordance with the International Standards for the Professional Practice of Internal Auditing.

OIOS found that in general, both satellite and network operations were well organized, with an overall good management of video conference operations, including security. UNLB has standard operating procedures for network, capacity and configuration management, and implements a consistent monitoring of satellite utilization and incidents.

OIOS identified, however, some risks related with insecure satellite communication from/to mission critical applications, inadequate definition of network standards and change management procedures for the mission sites, undocumented and unmonitored voice operations, lack of policy on vulnerability assessments, and lack of a disaster recovery plan. These risks could have a negative impact on UNLB operations in terms of loss of confidentiality and integrity of data transmissions, logical and physical security breaches.

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I. INTRODUCTION

1. The Office of Internal Oversight Services (OIOS) conducted an audit of Virtual Small Aperture Terminal Satellite System (VSAT) located at the United Nations Logistics Base (UNLB) in Brindisi, Italy. The audit was conducted in accordance with the International Standards for the Professional Practice of Internal Auditing.
2. The Communication Centre at the UNLB in Brindisi, Italy provides information technology and communications support globally to approximately 80,000 personnel stationed at 23 mission sites around the world.
3. UNLB serves as the hub for most network operations and communication with field mission sites. Each field mission has one or several data centers depending on the size and layout of the mission. The in-mission communications and information technology network (Wide Area Network or WAN) typically consists of VSAT, microwave systems, and/or other radio systems. The WAN network is then terminated in each field mission with local wired or wireless local area network (LAN) deployment supporting computers or other devices for voice, video, and data applications.
4. In order to connect with the various sites of the peacekeeping missions, there is a Satellite Network with 453 Satellite Earth Stations with four operational hubs at UNLB. As of September 2007, the total amount of Bandwidth was 293 MHz distributed on three different satellites and eleven transponders. Recently (October 2007), a fifth hub became operational, pointing at another satellite for a total of four satellites and twelve transponders with an operational bandwidth in excess of 300 MHz.
5. The Department of Peacekeeping Operations recently obtained the security certification ISO 27001 for the data center located in building 261 at UNLB.
6. Comments made by the Department of Field Support are shown in *italics*.

II. AUDIT OBJECTIVES

7. The major objectives of the audit were to assess the adequacy and effectiveness of internal controls to:
 - (a) Restrict physical access to satellite (VSAT) facilities to authorized personnel only;
 - (b) Restrict virtual access to VSAT infrastructure to authorized personnel only;
 - (c) Protect sensitive reference information including coordinates and location information for Earth stations and orbiting satellites;
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- (d) Ensure that appropriate change control procedures over VSAT configurations exist;
 - (e) Ensure that Disaster Recovery and Business Continuity plans are in place that can be put into operation should the need arise;
 - (f) Monitor unauthorized use of VSAT resources; and
 - (g) Ensure that the available communication bandwidth meets the requirements of the Organization.

III. AUDIT SCOPE AND METHODOLOGY

8. The audit was undertaken at the VSAT Communication Centre located within the UNLB in Brindisi, Italy.

9. Interviews were held with key officers responsible for processes and assets. Documentation was obtained and reviewed so as to ascertain the systems and the ICT and VSAT operating environment. Tests were performed on all key control areas to ascertain the existence and effectiveness of the controls.

10. An evaluation of all the information gathered was undertaken to reach a conclusion on the adequacy of the controls in operation within the system and the operating environment. Furthermore, the evaluation also enabled the identification of threats, risks and vulnerabilities.

11. The audit covered the following areas:

- a) Policies & Procedures;
- b) Allocation of ICT related responsibilities;
- c) Secure processing;
- d) Technical vulnerability management;
- e) Business continuity management;
- f) Management of information security incidents and improvements; and
- g) Awareness, education, and training.

IV. AUDIT FINDINGS AND RECOMMENDATIONS

A. Information Security Guidelines and Risk Assessment Procedures

Information Security and Risk Assessment

12. UNLB plans to construct a consolidated satellite communications facility, including 600 square meter satellite farm building capable of hosting engineers, systems and workshops, in compliance with the ISO 27001 standard.

13. The Communication and Information Technology Service (CITS) at UNLB has recently obtained formal compliance with the international security standard ISO 27001 for its data center. The certification process has led to the production of relevant documentation pertaining to the definition of an information security management system (ISMS), scope definition, and risks analysis reports. For the satellite communication system, however, UNLB has not yet developed security guidelines and risk assessment processes, to allow staff and management to adequately identify and assess threats, vulnerabilities, and the impact of any breach on information and processing facilities, as well as the likelihood of it occurring and to determine appropriate actions and priorities for managing and mitigating risks.

Recommendations 1 to 3

(1) UNLB/CITS should develop, document and disseminate information security procedures and guidelines for the satellite communication system, providing direction to staff on how to preserve and process information confidentially, as well as preserve the integrity of the communication. The policy should cover at the minimum the following areas: Confidentiality, Integrity, Authorization, Authentication, Access, Intrusion Protection, Backups, Retention, Auditing, Monitoring, Disaster Recovery and Remote Connectivity.

(2) UNLB/CITS should ensure that the requirements of documented procedures and guidelines issued to aid the efficient, effective operation of satellite services are complied with.

(3) UNLB/CITS should develop and implement a risk management framework to enable the identification and control of the risks associated with the management of VSAT operations at UNLB.

14. *DFS accepted recommendation 1 and stated that CITS/UNLB will extend its Information Security Management System (ISMS) in this area in conjunction with the overhaul and enhancement of the Satellite Communications Infrastructure at UNLB. DFS also indicated that maintenance and expansion of the ISMS implemented in CITS at UNLB is subject to approval of a dedicated Information Security function/resource as part of UNLB's 2008-09 budget. Recommendation 1 remains open pending the issuance of the information security procedures and guidelines for the satellite communication system.*

15. *DFS accepted recommendation 2 and stated that it has been implemented, since operations and implementation activities are, and will continue to be monitored for compliance with policies and standard operating procedures. Recommendation 2 remains open pending the issuance of the additional security procedures and guidelines referred to in recommendation 1.*

16. *DFS accepted recommendation 3 and stated that in conjunction with the overhaul and enhancement of the Satellite Communications Infrastructure at UNLB, UNLB/CITS will extend its ISMS to this area. DFS also indicated that the implementation of the ISMS will entail Risk Analysis and Risk Management, and that this is also subject to the creation of a dedicated Information Security function at UNLB. Recommendation 3 remains open pending the development and implementation of the risk management framework.*

B. Physical and Environmental Security

UNLB VSAT Communication Centre

17. The UNLB VSAT communication centre plays a critical role in the whole communication system between mission sites and UNLB. The VSAT farm is located within the UNLB campus, in an area limited by a fence and a gate but with no video surveillance.

18. OIOS noted that the absence of any form of electronic (video) surveillance or devices to record the access into the satellite farm exposes the system to physical security risks. This is a weakness that could result in a breach of security with unauthorized access going undetected. OIOS was informed that there are plans to reorganize the current satellite farm and build a mirroring site of UNLB in Valencia, Spain. These plans could serve as an opportunity to strengthen the physical security of the site in Brindisi.

Recommendation 4

(4) UNLB/CITS should undertake a review of the physical security around the VSAT site and ensure that physical security is reinforced by using electronic surveillance equipment and an electronic access control system to secure access onto the site.

19. *DFS accepted recommendation 4 and stated that the necessary physical protection and access control systems are currently being deployed and will be further enhanced in conjunction with the overhaul of the Satellite Communications Infrastructure at UNLB. Recommendation 4 remains open pending the full deployment of the access control systems of the Satellite Communications Infrastructure at UNLB.*

C. VSAT and Network Security

Interface

20. The VSAT site at UNLB controls approximately 150 satellite links. The traffic traveling through the communication links between the various missions and UNLB is regulated by border routers that are controlled with standard configuration requirements. OIOS noted, however, that no requirements (hardware/software) exist for the equipment used and connected at the mission

sites to interface with the satellite communication network. As a consequence of this condition, unknown hardware devices with potentially malicious software components could be attached to the missions' LANs, exposing critical applications and the entire network to serious security risks. Furthermore, this condition limits the ability of UNLB/CITS to provide better support to the mission sites and improve performance and reliability of the communication system.

21. OIOS noted that there is a proposal to standardize the interface between the VSAT based communication system and the remote mission sites. This proposal, however, was not yet implemented at the time of the audit.

Recommendation 5

(5) UNLB/CITS should finalize, approve and formally issue the proposed policy for 'Mission Network Standardization'. High priority should be given to the implementation of the policy to ensure well defined interfaces between the information and communication systems installed in the missions and those at UNLB.

22. *DFS accepted recommendation 5 and stated that a final draft of the Mission Network Standardization document will be prepared for review by all missions and is expected to be formally distributed to missions by third quarter of 2008.* Recommendation 5 remains open pending the formal issuance of the Mission Network Standardization document.

Internet Protocol (IP) Traffic

23. OIOS analyzed a sample of the network traffic between UNLB and the mission sites, and found that the main IP traffic appears to be in compliance with the network rules enforced by the Network Control Center (NCC) firewall. Also, connections between the IP traffic coming from/to the VSAT farm and the external network (internet) is regulated and directed towards port 80 (i.e. HTTP traffic). OIOS noted that remote mission sites can ask for exemptions to network access rules. This exemption is not governed by any policy or procedure to control the process. This condition could potentially expose the network to a malicious attack or unauthorized access.

Recommendation 6

(6) UNLB/CITS should define and enforce a standard procedure to ensure that any change requests to the network access rules are reviewed for authenticity and need. Furthermore, such requests should be appropriately authorized. Checks should be undertaken to verify whether the configurations are changed back to the regulated position as soon as the exemption is no longer required.

24. *DFS accepted recommendation 6 and stated that UNLB will ensure that a policy regulating deviation from approved standards and configuration is in place and adhered to by the second quarter of 2009.* Recommendation 6 remains open pending the issuance and implementation of the UNLB policy for the management of network configuration and access rules.

Security of data transmission

25. The VSAT site is compliant with the Intelsat Earth Station Standards (IESS) and the Satellite Systems Operations Guide (SSOG). OIOS noted, however, that these standards do not address data confidentiality requirements.

26. The satellite link traffic between mission sites and UNLB, with the exception of the video conference service, travels in “clear text” and it is not protected with encryption mechanisms. The problems of integrity and confidentiality of data traveling along the satellite links have not been considered in the design of missions’ critical applications that communicate using the suite of network protocols TCP/IP. OIOS is of the opinion that the satellite communications of data pertaining to existing mission critical applications, such as Galileo, Sun, and Mercury, as well as to the upcoming Enterprise Resource Planning (ERP) system, should be protected.

Recommendation 7

(7) UNLB/CITS should assess the risks posed by Internet traffic traveling in ‘clear text’ over satellite links. The assessment should take into consideration the various technical alternatives available for the implementation of mitigating controls based on the functional requirements of each application (i.e. in the short term Galileo, Sun, Mercury and in the medium/long term the new ERP system).

27. *DFS accepted recommendation 7 and stated that UNLB has requested a dedicated Information Security function as part of its 2008/2009 budget. DFS maintained that the new function will allow for professional and proficient management of the information security framework at UNLB and include a risk assessment of the implications of Internet traffic traveling in “clear text” over satellite links.* Recommendation 7 remains open pending UNLB implementation of the risk assessment, and the controls to mitigate the risk posed by Internet traffic traveling in “clear text”.

Security of Fax communication

28. OIOS found that fax transmissions are currently sent in ‘clear text’ and are not encrypted. This is a weakness that could result in unauthorized interception of mission critical information. The document “CITS vision for the period 1 July 2006 to 30 June 2007” outlined that an encrypted data transmission system was under test. This project was not completed at the time of the audit. As such, fax transmissions are still not protected against the risk of interception.

Recommendation 8

(8) UNLB/CITS should implement fax encrypting software to enable fax communication between the mission sites and the communication centre to be encrypted.

29. *DFS did not accept recommendation 8 and stated that all DFS supported missions have hardware secure fax capabilities for senior officials, which enables the secure fax transmission of documents between missions and to and from UNHQ. DFS also indicated that the Information Technology Services Division (ITSD) is leading a project to review, configure and implement a software based system for transmission of secure documents, and that it does not seem feasible that the rest of the facsimile traffic, which are generally to internal and external offices in missions, to be secured. OIOS takes note of the additional information provided by DFS with regard to hardware secure fax capabilities available to senior officials, and the ITSD project for the transmission of secure documents. However, since DFS has not yet implemented a classification scheme of data and documents, the risk of interception of confidential information transmitted internally and/or externally is still present. Therefore, recommendation 8 remains open pending the implementation by UNLB of the encrypted data transmission system currently under test, and the completion of ITSD software based system for the transmission of secure documents.*

Vulnerability Assessments Procedures

30. Penetration testing activities are conducted by the Network Control Center managed by the International Computing Center. These activities, however, are not based on defined policies and systematic procedures for a proactive security program.

Recommendation 9

(9) UNLB/CITS should define, document and implement policies and procedures for the regular conduct of vulnerability assessments of network communications.

31. *DFS accepted recommendation 9 and stated that UNLB will take appropriate action to implement the recommendation. Recommendation 9 remains open pending UNLB definition, documentation and implementation of policies and procedures for the regular conduct of vulnerability assessments of network communications.*

D. Satellite Operations

Staffing

32. The satellite engineering support unit for the VSAT operations has seven posts, of which two were vacant at the time of the audit. In addition, all posts are classified as field service and general service levels, with no dedicated professional staff accountable for planning, managing and monitoring satellite operations.

Recommendation 10

(10) UNLB/CITS should appoint a professional staff member so that the accountability for planning, managing and monitoring the operations of the satellite farm can be assigned and effectively discharged by a dedicated resource.

33. *DFS accepted recommendation 10 and stated that a position of Senior Satellite Communications Engineer (P-4 level) has been requested as part of the 2008/2009 UNLB Budget submission. DFS additionally indicated that since this proposal has been declined, it will re-submit the request in the 2009/2010 budget of UNLB.* Recommendation 10 remains open pending the results of the budget review process.

Change Control Procedures

34. Change control procedures were well managed. However, there is no guaranteed response time: It could take between 24-48 hours before a change request is actioned. This is partly due to the VSAT support group staffing shortages.

Monitoring

35. Well defined administrative roles and log mechanisms were in place to track the processes within the VSAT site. However, there was no officer dedicated to all security related issues of the systems and network infrastructure at the UNLB. The potential impact of this condition is that ICT security breaches or vulnerabilities may not be routinely investigated and remedial action promptly taken.

Recommendation 11

(11) UNLB/CITS should allocate a dedicated resource and assign clear responsibility for information and the communication system security at the VSAT site. In the interim, existing technical staff should be tasked with the responsibilities of checking mailing lists containing updated information regarding ICT security threats and vulnerabilities.

36. *DFS accepted recommendation 11 and stated that UNLB has requested a dedicated Information Security function as part of its 2008/2009 budget. DFS additionally stated that, in the interim, UNLB will task existing technical staff with the responsibility of checking mailing list containing updated information regarding ICT security threats and vulnerabilities. Recommendation 11 remains open pending the results of the budget review process.*

New Enterprise Resource Planning (ERP) System, bandwidth and capacity planning

37. The implementation of a new ERP System will be greatly affected by the available capacity of satellite communication systems, widely used in peacekeeping missions. OIOS is aware of existing connectivity problems with missions based in Africa where the demand for bandwidth capacity exceeds availability. The recent Secretary-General's report A/62/510 makes a general reference to this issue in paragraph 41(a).

38. In December 2006 the Secretariat held a workshop with United Nations and other international organizations who had already implemented ERP systems. During this workshop, the United Nations International Computing Centre announced a study commissioned by ITSD to determine the capability of the satellite links at the UNLB to support a potential new ERP system. OIOS requested but did not receive copy of the report documenting the results of this study.

Recommendation 12

(12) UNLB/CITS should ensure that in the planned reorganization of the satellite farm, adequate consideration is given to the results of any studies and/or tests conducted to determine the capacity of the current VSAT system in supporting the new ERP System. In the absence of reliable test data, UNLB/CITS should conduct these tests and ensure that the UNLB satellite infrastructure is adequately sized to support the deployment of the future ERP System in field missions.

39. *DFS accepted recommendation 12 and stated that the overhaul and enhancement of the Satellite Communications Infrastructure at UNLB will allow for the support of the future ERP. Recommendation 12 remains open pending the completion of the overhaul and enhancement of the satellite communications infrastructure at UNLB.*

Voice Operations

40. OIOS found that voice operations were not supported by documented procedures and evidence of internal processes for periodic monitoring and reporting on band allocation, usage and analysis of traffic. The only written information are those related to Telephone Capacity Management in the Network

Systems monthly report. The lack of a clear and public security policy for voice/fax calls could lead to information leakage.

41. Bandwidth utilization is monitored through the multi router traffic grapher. There is no automatic system to warn or alert operators when a pre-defined event occurs. Event monitoring is done visually by operators, leading to the potential risk that some event will be missed. Furthermore, there is no direct feedback of actual usage/abuse of satellite links from UNLB to remote mission sites. This condition limits the ability of the network administrators at the remote sites to check and plan the adequacy of their requests for bandwidth utilization.

Recommendation 13

(14) UNLB/CITS should ensure that voice operations are based on internal documented procedures, including monitoring and reporting on band allocation, traffic and usage.

42. *DFS accepted recommendation 13 and stated that the Network Control centre team, satellite and telephony staff have a range of monitoring tools which enable ad-hoc monitoring. DFS additionally stated that due to the dynamic nature of field missions supported, automated alerting is a challenge to configure. DFS is working with ITSD on a project to evaluate tools available to consolidate information from the various monitoring tools currently in use. According to DFS, these tools will enable higher level monitoring and reporting on network availability usage and traffic patterns.* Recommendation 14 remains open pending the development and implementation of monitoring and reporting procedures and tools for band allocation, traffic and usage.

E. Disaster Recovery and Business Continuity

Disaster Recovery Plan

43. OIOS found that the VSAT site did not have a documented Disaster Recovery plan. The VSAT supporting staff had an informal contingency plan in case a disaster occurs. This informal plan included a rough estimate of recovery times. This weakness could lead to delays or a failure to recover business critical systems and processes should the need arise. There are also no disaster recovery instructions for video/fax services. The lack of a disaster recovery plan for these services makes unpredictable the times of recovery of voice-calls service in case of incidents with the satellite links.

44. The VSAT supporting staff maintains in stock, as a contingency measure, transportable C-Band and Ku Band earth stations for deployment to missions and/or for immediate use in case any or all active systems fail. Also in stock there are two 9.3 meters Satellite Earth Stations that could be installed and commissioned in a very short period of time (i.e., one week). In addition, there are two 7.0 meters transportable Satellite Earth Stations which at the time of the audit were on loan to missions.

Recommendation 14

(14) UNLB/CITS should develop and test a formal disaster recovery plan (DRP) for all the services supported by the satellite communication system. This plan should also incorporate instructions for the recovery of video and fax services during any incident. Pending the development of the DRP, interim instructions should be documented and made available to staff to follow should any incident occur.

45. *DFS accepted recommendation 14 and stated that until a secondary active site becomes active, the disaster recovery plan will only be possible through the use of high availability systems at UNLB. DFS additionally stated that while all production data are currently mirrored to a secondary site at UNLB to allow for Disaster Recovery and Business Continuity, the satellite communications infrastructure remains a single point of failure. Recommendation 14 remains open pending the development and test of a formal disaster recovery plan for all services supported by the satellite communication system.*

V. ACKNOWLEDGEMENT

46. We wish to express our appreciation to the Management and staff of UNLB and CITS for the assistance and cooperation extended to the auditors during this assignment.

STATUS OF AUDIT RECOMMENDATIONS

Recom. no.	C/O ¹	Actions needed to close recommendation	Implementation date ²
1	O	UNLB/CITS should develop, document and disseminate information security procedures and guidelines for the satellite communication system, providing direction to staff on how to preserve and process information confidentially, as well as preserve the integrity of the communication. The policy should cover at the minimum the following areas: Confidentiality, Integrity, Authorization, Authentication, Access, Intrusion Protection, Backups, Retention, Auditing, Monitoring, Disaster Recovery and Remote Connectivity.	Not provided
2	O	UNLB/CITS should ensure that the requirements of documented procedures and guidelines issued to aid the efficient, effective operation of satellite services are complied with.	Not provided
3	O	UNLB/CITS should develop and implement a risk management framework to enable the identification and control of the risks associated with the management of VSAT operations at UNLB.	Not provided
4	O	UNLB/CITS should undertake a review of the physical security around the VSAT site and ensure that physical security is reinforced by using electronic surveillance equipment and an electronic access control system to secure access onto the site.	2 nd Quarter 2009
5	O	UNLB/CITS should finalize, approve and formally issue the proposed policy for 'Mission Network Standardization'. High priority should be given to the implementation of the policy to ensure well defined interfaces between the information and communication systems installed in the missions and those at UNLB.	3 rd Quarter 2008
6	O	UNLB/CITS should define and enforce a standard procedure to ensure that any change requests to the network access rules are reviewed for authenticity and need. Furthermore, such requests should be appropriately authorized. Checks should be undertaken to verify whether the configurations are changed back to the regulated position as soon as the exemption is no longer required.	2 nd Quarter 2009
7	O	UNLB/CITS should assess the risks posed by Internet traffic traveling in 'clear text' over satellite links. The assessment should take into consideration the various technical alternatives available for the implementation of mitigating controls based on the functional requirements of each application (i.e. in the short term Galileo, Sun, Mercury and in the medium/long term the new ERP system).	2 nd Quarter 2009
8	O	UNLB/CITS should implement fax encrypting software to enable fax communication between the mission sites and the communication	Not provided

		centre to be encrypted.	
9	O	UNLB/CITS should define, document and implement policies and procedures for the regular conduct of vulnerability assessments of network communications.	2 nd Quarter 2009
10	O	UNLB/CITS should appoint a professional staff member so that the accountability for planning, managing and monitoring the operations of the satellite farm can be assigned and effectively discharged by a dedicated resource.	Not Provided
11	O	UNLB/CITS should allocate a dedicated resource and assign clear responsibility for the information and communication system security at the VSAT site. In the interim, existing technical staff should be tasked with the responsibilities of checking mailing lists containing updated information regarding ICT security threats and vulnerabilities.	2 nd Quarter 2009
12	O	UNLB/CITS should ensure that in the planned reorganization of the satellite farm, adequate consideration is given to the results of any studies and/or tests conducted to determine the capacity of the current VSAT system in supporting the new ERP System. In the absence of reliable test data, UNLB/CITS should conduct these tests and ensure that the UNLB satellite infrastructure is adequately sized to support the deployment of the future ERP System in field missions.	2 nd Quarter 2009
13	O	UNLB/CITS should ensure that voice operations are based on internal documented procedures, including monitoring and reporting on band allocation, traffic and usage.	Not Provided
14	O	UNLB/CITS should develop and test a formal disaster recovery plan (DRP) for all the services supported by the satellite communication system. This plan should also incorporate instructions for the recovery of video and fax services during any incident. Pending the development of the DRP, interim instructions should be documented and made available to staff to follow should any incident occur.	Not Provided

1. C = closed, O = open

2. Date provided by DFS in response to recommendations.